2012 - 2013 Bates Technical College

# Course Catalog

*To inspire, challenge and educate*

www.bates.ctc.edu

Bates TECHNICAL COLLEGE

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# DIRECTORY OF SERVICES

| GENERAL INFORMATION | 253.680.7000 |
|---|---|
| **Downtown Campus** | **253.680.7000** |
| **Mohler Campus** | **253.680.7700** |
| **South Campus** | **253.680.7400** |
| **Toll Free In-State** | **800.562.7099** |
| Academics | 253.680.7260 |
| Admissions | |
| Career Education, Downtown Campus | 253.680.7002 |
| Career Education, South Campus | 253.680.7410 |
| Adult Basic Education/GED | 253.680.7274 |
| Adult Completion | 253.680.7274 |
| Advising | 253.680.7002 |
| Apprenticeship Training | 253.680.7300/7402 |
| Assessment/Testing Center | 253.680.7030 |
| Business & Management Training Center | 253.680.7186 |
| Career Education | 253.680.7000 |
| Child Care Center, DT Campus | 253.680.7228 |
| Closure/Weather Information Line | 253.680.7060 |
| Communications & Marketing | 253.680.7106 |
| Continuing Education | 253.680.7300/7402 |
| Dental Clinic, Downtown Campus | 253.680.7310 |
| Denturist Clinic, Downtown Campus | 253.680.7314 |
| Disability Support Services | 253.680.7012 |
| Dislocated Workers | 253.680.7299 |
| Displaced Homemakers | 253.680.7299 |
| Distance Learning | 253.680.7161 |
| Diversity Center | 253.680.7178 |
| ECEAP | 253.680.7320 |
| English as a Second Language (ESL) | 253.680.7558 |
| Extended Learning | 253.680.7300, 253.680.7402 |
| Financial Aid | 253.680.7020 |
| Foundation | 253.680.7160 |
| Hearing Clinic, Downtown Campus | 253.680.7362 |
| High School | 253.680.7004 |
| Home & Family Life | 253.680.7500 |
| Human Resources | 253.680.7181 |
| Job Readiness Training Center | 253.680.7290 |
| Job Service Center | 253.680.7240 |
| KBTC Public Television | 253.680.7700 |
| Library | 253.680.7220/7550 |
| Paraeducator Training | 253.680.7161 |
| Registration | 253.680.7000 |
| Running Start | 253.680.7004 |
| Student Services | 253.680.7002 |
| Teacher Certification Training | 253.680.7161 |
| TDD | 253.680.7045 |
| Tutoring Center | 253.680.7208 |
| Veterans Benefits | 253.680.7529, 253.680.7035 |
| Worker Retraining | 253.680.7299 |
| WorkFirst | 253.680.7286 |

| GENERAL INFORMATION | info@bates.ctc.edu |
|---|---|
| Academics | academic@bates.ctc.edu |
| Admissions | info@bates.ctc.edu |
| Adult Education/GED | adult-ed@bates.ctc.edu |
| Advising | info@bates.ctc.edu |
| Apprenticeship Training | apprentice@bates.ctc.edu |
| Assessment/Testing Center | testing@bates.ctc.edu |
| Business & Management Training | bmtc@bates.ctc.edu |
| Career Education | info@bates.ctc.edu |
| Childcare Center | childcare@bates.ctc.edu |
| Communications & Marketing | communications@bates.ctc.edu |
| Continuing Education | cont-ed@bates.ctc.edu |
| Disability Support Services | dss@bates.ctc.edu |
| Dislocated Workers | retraining@bates.ctc.edu |
| Displaced Homemakers | retraining@bates.ctc.edu |
| Diversity Center | diversity@bates.ctc.edu |
| ECEAP | eceap@bates.ctc.edu |
| English as a Second Language | adult-ed@bates.ctc.edu |
| Financial Aid | financial-aid@bates.ctc.edu |
| Foundation | foundation@bates.ctc.edu |
| General Education | academic@bates.ctc.edu |
| Home & Family Life | family@bates.ctc.edu |
| Human Resources | hr@bates.ctc.edu |
| Job Readiness Training Center | jrtc@bates.ctc.edu |
| Job Services | jobservices@bates.ctc.edu |
| KBTC Public Television | kbtc@bates.ctc.edu |
| Library | library@bates.ctc.edu |
| Paraeducator | paraeducator@bates.ctc.edu |
| President's Office | president@bates.ctc.edu |
| Registration for Career Education | registration@bates.ctc.edu |
| Running Start | running-start@bates.ctc.edu |
| Teacher Certification | teachertrain@bates.ctc.edu |
| Technical High School | highschool@bates.ctc.edu |
| Tutoring Center | tutors@bates.ctc.edu |
| Veterans' Benefits | vabenefits@bates.ctc.edu |
| WorkFirst | jrtc@bates.ctc.edu |
| Worker Retraining | retraining@bates.ctc.edu |

CHAPTER 1

# About Our College

# About Bates Technical College

### History of Bates Technical College

Vocational training began in Tacoma on Sept. 4, 1940, in the basement of Hawthorne Elementary School. During the 1941-42 school year, the program became known as the Tacoma Vocational School.

In 1944 the Tacoma School District hired L. H. (LaVerne Hazen) Bates as the school's director. The school's name was changed to the Tacoma Vocational-Technical Institute in 1947.

Verne Bates retired from the director's position in 1969. The Tacoma School Board changed the Institute's name to the L. H. Bates Vocational Technical Institute in honor of Mr. Bates' service and dedication to the Institute and vocational education.

In 1991, state legislation separated the state's vocational technical institutes from local school districts and merged them under the State Board for Community and Technical Colleges.

Today, Bates Technical College annaully serves approximately 3,000 career training students and 10,000 more community members in programs such as Continuing Education, Home & Family Life, High School, Business & Management Training Center, and others. The college is governed by a five-member board of trustees appointed by the governor.

### Advisory Committees

Some 500 individuals serve on more than 40 program advisory committees.

These committee members represent partnerships with business, labor and industry; provide curriculum recommedations to the college; and often offer program equipment, scholarships and job opportunities for students.

The General Advisory Council advises college administration on career education programs as well as other instruction and services.

### Our Mission

The mission of Bates Technical College is, **"To inspire, challenge and educate."**

### Bates Technical College Foundation

Bates Technical College Foundation exists to support student and program success by securing resources through building community relationships and awareness. Through this nonprofit organization, local businesses, community members and Bates employees contribute to the foundation, providing over $250,000 annually in scholarships, grants, faculty development opportunities, program support and emergency student assistance.

### Career Training

Unique classroom settings mirror the workplace, providing students with opportunities to practice and develop skills to levels required for successful employment. Students in specific programs gain hands-on experience in campus facilities that include:

- Dental and denturist clinics
- An auto body and fender shop
- A child care center
- A full-service cafeteria
- An auto service facility and automotive parts/accessories store
- A 10-chair barber shop
- A hearing clinic
- Fully-operational machine, sheet metal, and cabinet shops

### Diverse Population

Our students and staff are from diverse backgrounds, races, religions, and points of view. The ages of students in any given class might range from 16 to 60, and can be high school students just starting their educational or career tracks, or people returning to school for a career change or to update job skills.

*Information in this catalog is accurate as of Aug. 20, 2012.*

## DEGREE AND CERTIFICATE PROGRAMS

- Administrative Medical Assistant
- Administrative Office Assistant
- Architectural Woodworking/Cabinet Making Technology
- Audio/Sound Technology
- Auto Body Rebuilding & Refinishing
- Automotive Mechanic
- Barber
- Biomedical Service Technician: Clinical Engineering
- Biotechnology Lab Technician
- Broadcasting/Audio/Video Production
- Carpentry
- Civil Engineering Technology
- CNC Machinist
- Commercial Truck Driving-Entry Level
- Computer Information Systems
- Computer Networking Systems Technician
- Computer Repair & Network Support
- Culinary Arts
- Dental Assisting
- Dental Lab Technician
- Denturist
- Diesel & Heavy Equipment Mechanic
- Digital Media
- Early Childhood Education/Child Care
- Electrical Construction
- Electrical Engineering Technician
- Electrical Power & Process Automation/ Electronics Technician
- Electronic Equipment Service Technology
- Electronics Engineering Technician
- Electronics Technician
- Facilities Maintenance Engineer
- Fire Protection Engineering Technology
- Fire Service
- Hearing Instrument Technology
- Heating, Ventilation, Air Conditioning, & Refrigeration Technician
- Information Technology Specialist
- Legal Assistant
- Machinist
- Manufacturing: Electronics: IBEST
- Marketing & Business Management
- Mechanical Engineering
- Occupational Therapy Assistant
- Power Sports & Equipment Technology
- Practical Nurse
- Sheet Metal Technology
- Vehicle Parts/Accessories Marketing
- Welding
- Wireless Voice & Data Communications

# Frequently Asked Questions

## When can I start?

Students may enroll in courses during the first 3 instructional days of the quarter in which that program accepts students. If a program is full, a student may be placed on a waitlist after paying a non-refundable application fee. Some programs have prerequisites that must be met prior to entry.

## Can I get help in choosing a career and program of study?

Our career advisors understand the importance of your career decision and will work with you to help match your strengths, interests, and abilities with appropriate educational choices. You may start your decision-making process by taking a self-inventory of what's important to you. Bates' assessment center offers Career Cruising, College-Level Examination Program (CLEP), COMPASS, ESL COMPASS, GED, and various aptitude tests. Testing services are available to students and the general public.

If you have questions or are uncertain about which program to choose, select an area of interest and attend a **Career Education Information Session**. More information: 253.680.7002 or www.bates.ctc.edu/InformationSessions.

## What's the difference between an application form and a registration form?

Application forms are used for admission to Bates Technical College. You must have an application on file in order to register for classes. Registration forms are used to register for specific courses.

## Will I receive personal attention from instructors?

Yes! At Bates, students are with their program instructor from six to eight hours each day. Class sizes are limited to optimize individual attention.

## Is Bates accredited?

Bates Technical College is accredited by the Northwest Commission on Colleges and Universities, an institutional accrediting body recognized by the Council for Higher Education Accreditation and the Secretary of the U.S. Department of Education.

## Does Bates accept transcripts from other institutions?

Yes. Transcripts must be sent in a sealed envelope to the attention of the credentials evaluator in the registrar's office. Electronic transcripts will also be accepted.

## Is financial aid available?

Students are encouraged to contact our financial aid office for assistance, 253.680.7020, in determining financial aid eligibility. Students and their families don't need to be low income to qualify for some kinds of financial aid. We compare the difference between the cost of attending school and the student's Expected Family Contribution (EFC) number provided on the FAFSA to determine eligibility.

To learn more about the process, pick up a free information packet in the financial aid and student services offices. You must be registered in a degree or certificate program to receive federal financial aid. **It is recommended that students apply for financial aid as early as possible.** Pre-qualification may take up to eight weeks after the application has been mailed. (See page 7.)

## TO REGISTER FOR A CAREER EDUCATION PROGRAM

1. **Attend an Information Session.**

2. **Complete the COMPASS placement test**. All students registering in career education programs must take the COMPASS assessment, which measures reading, writing, and math skills, for appropriate placement in general education, developmental, and basic skills classes. The testing fee is payable at time of testing.

3. **Schedule an appointment with a career advisor** for assistance in making program choices, general education requirements, degree and certificate requirements, program costs, support services, and college policies and procedures.

Bring your COMPASS test results with you. At this time, the career advisor will discuss your start date, and you will pay a non-refundable application fee.

**Note**: For returning students, all college financial obligations (e.g., library fines, high school deposits, tuition) must be satisfied prior to registration. Students with unpaid debts to the college will not be allowed to re-register until debts are paid.

4. **Complete a registration form**
Forms are available in student services, or call 253.680.7002, 1.800.562.7099 in-state toll free.

5. **Pay tuition and fees**
A career advisor will notify you of your start date. Tuition and fees are payable by cash, check, credit card or financial aid/agency funding on or before the start of your program.

6. **Attend a New Student Orientation**
New students are required to attend an orientation **and** receive a Student Handbook. Check with student services for dates and times of orientations.

7. **Begin your career education program!**

**More information: 253.680.7002**
**www.bates.ctc.edu**

# Registration & Attendance Policies

### Full-time Students
Full-time students attend classes from six to eight hours each school day, depending on the program. The academic year is 11 months, with four, 10-week quarters: fall, winter, spring and summer. Students are expected to attend class during all four quarters of the academic year.

Most classes are held from approximately 7:15 a.m. to 3 p.m., Monday through Friday. Students may register any day the college is open, pay a nonrefundable application fee, and begin classes at the next available entry point. If a program is full, a student may be placed on a waitlist after the application fee has been paid.

### Health & Medical Students
Students applying for entrance into the Dental Assisting, Dental Lab Technician, Denturist, Occupational Therapy Assistant, and Practical Nurse programs are required to submit official transcripts of any college-level credit they wish to transfer to Bates, to the registrar's office. Some of these programs have specific start dates. Contact your career advisor for more information.

### Students with Special Needs/Disabilities
Qualified individuals with disabilities interested in furthering their education are encouraged to use the services of Bates' Disability Support Services (DSS). Students requesting special accommodation(s) should contact DSS.

**More information:**
253.680.7013,TTY, 253.680.7045,
email: dss@bates.ctc.edu.
(See page 24.)

### Enrollment/Registration Policy
Students must enroll by the tenth day of each quarter. Persons over 16 may register subject to the conditions of Bates' enrollment/registration policy.

If you are undecided about your program of study, consider attending a Career Education Information Session or contact one of our career advisors. More information: 253.680.7002, www.bates.ctc.edu/InformationSessions.

### Admissions Testing
All students registering in a career education program are required to take the COMPASS test. Contact the Assessment/Testing Center at 253.680.7030.

COMPASS/ASSET scores determine placement in 100-level general education courses and in developmental and basic skills classes in mathematics, reading, and writing. Comparable ASSET scores may be used in lieu of COMPASS scores.

Students registering in general education courses, English, human relations and mathematics, must have the prerequisite COMPASS scores in reading, writing, pre-algebra, algebra or college algebra test levels. Students scoring below those levels are required to register in developmental or basic studies classes to prepare for 100-level courses.

### Attendance Policy
The college retains the right to fill a vacant seat during the first 10 days from the beginning of each quarter. Consequently, if a student fails to attend class during the first three days of the quarter, the faculty member may withdraw that student in order to allow another student to enroll.

Bates has a goal of 100 percent attendance, the standard for employees in industry, and students are expected to attend class each time it meets. Individual faculty members will state class attendance expectations in the course syllabi. Because unusual circumstances do occur, a leave of absence will be allowed at the instructor's discretion for illness (personal, dependent, spouse), accident, bereavement, pregnancy, military and jury duty.

### Leave of Absence
An approved leave of absence is counted as an absence. To qualify for leave of absence, a student must present the instructor appropriate documentation of need, prior to the absence, if possible. Students who return from an approved leave and have lost their place will be re-registered for the next available opening.

### Withdrawals
Students may initiate withdrawal proceedings in the registration office.

### School Delays & Closures
In the case of severe weather conditions or college emergencies, information regarding the status of Bates' operations can be found on the college website, www.bates.ctc.edu/Weather, or by phoning the weather and schedule information line, 253.680.7060. College closure information also will be available on major Puget Sound radio and television stations through the Public Emergency Communications System and on their website, www.schoolreport.org.

If classes are canceled, students and faculty do NOT report to the college. If classes are on a delayed schedule, by 5:30 a.m. on the affected day, the college will announce a specific start time for students to report.

# International Student Information

## International Students
## www.bates.ctc.edu/International

Bates Technical College is dedicated to promoting international education and training within the college, the community, and around the world. Faculty and staff are eager to assist students throughout their educational experience. Bates offers international students superior academic opportunities, unique cultural experiences, and a friendly campus environment.

## International Student Resources/ Services

- Airport pickup
- Registration assistance, advising
- International student orientation
- Access to computer resource labs
- Access to Bates' Diversity Center

International students who plan to register must:

- Show sufficient financial resources to pay college and living expenses for 11 months.
- Demonstrate English language ability:

Please send English proficiency scores as part of your application. We accept the following tests:

- TOEFL Score of 61 (iBT) /173 (CBT) /500 (PBT)
- IELTS Score of 5.5
- ELS Language Centers - Completion of Level 109 (112 for select programs*)
- STEP EIKEN Grade 2A (Minimum)

Once a student is admitted and arrives at Bates, they are given a COMPASS test. This test determines reading, listening, writing and mathematics levels so that we can place them in the appropriate level of English and mathematics classes.

Students who do not have a basic command of English, or who do not wish to take the TOEFL or IELTS test, must apply to ELS Language Centers, which will begin operating on our campus fall 2012. Once completing ELS Level 109*, students then transfer to Bates to continue in their career training program of choice.

Students from English-speaking countries who attended a secondary school, college or university in which English was the language of instruction, may demonstrate proficiency through official transcripts. In order to be official, a transcript must either be sent to Bates directly from the secondary school, college/university, or, if the student sends the transcript, it must be in the original, sealed envelope from the school or college/university. If the envelope has been opened, it is no longer official and will not be accepted.

Students with official transcripts from English-speaking countries will still be required to take the COMPASS test in order to determine English and math placement levels. Students who do not meet the minimum English proficiency for their chosen career training program will be referred to ELS Language Centers to bring their English level up to the minimum required by their program.

***Programs that require ELS 112:***

- Biotechnology Lab Technician
- Civil Engineering Technician
- Denturist
- Hearing Instrument Technology
- Legal Assistant
- Occupational Therapy Assistant
- Practical Nurse

## Admission Application

Obtain an admission application online at www.bates.ctc.edu/International or via email: International@bates.ctc.edu.

Bates Technical College issues F-1 and M-1 Certificates of Eligibility and I-20 forms required for the issuance of an F-1 Visa. Please take the I-20 form to the U. S. Consulate in your country to apply for a student visa.

**Mail the completed admission application and forms to:**

International Advisor
International Student Services
Bates Technical College
1101 S. Yakima Ave., Room M323I
Tacoma, WA 98405-4895, USA

When Bates Technical College receives the required admission application and forms, the college will determine your eligibility for enrollment at Bates.

More information: 253.680.7127, email international@bates.ctc.edu or visit www.bates.ctc.edu/International.

## Tuition and Expenses for International Students

The cost to attend Bates Technical College, including books, supplies, tuition, and living expenses is approximately $2,500 (US) per month. This does not include the cost of travel to or from the United States. The college provides limited scholarships for which international students cam apply. For a schedule of international tuition and fees, www.bates.ctc.edu/International.

## Financial Responsibility

International student applicants supported by personal funds must return the *Financial Resources Information* document to the college with the appropriate signatures. Applicants supported by family, government, or agency funds must also obtain the signature of the party providing support.

## International Contract Training

Bates Technical College provides international and distance learning contract training for industry-specific training and/or for international educational partners. More information: 253.680.7030, www.bates.ctc.edu/International.

# Transcripts, Transfer of Credits

### Transcripts
**www.bates.ctc.edu/Transcripts**

Official transcripts for courses completed at Bates Technical College are available through the registrar's office at $5 per copy.

A transcript request form may be obtained by mail or online at www.bates.ctc.edu/Transcripts. Transcript requests must be submitted in writing and signed by the student. Telephone requests are not accepted, and transcripts will not be released without the student's signature.

A transcript may be requested via written request containing the student's name at the time of attendance, student identification number (SID), and dates of attendance. Transcripts are released provided that all outstanding financial obligations to the college have been satisfied.

Unofficial transcripts may be printed from the college website at www.bates.ctc.edu/Transcripts.

High school transcripts may be requested from Bates' Technical High School office. More information: 253.680.7004.

### Transfer of Credits

Credits, qualifications, or requirements waived by one college may not necessarily be waived by another college. Those decisions are made at each institution. Upon student application, each college evaluates and, if appropriate, transfers recognized credits which apply to the area of study for which the student has applied. Students may earn credit for prior learning or submit a course challenge based on established procedures. Military transcripts will be evaluated based on American Council on Education (ACE) recommendations. The enrolling college determines transfer credits earned elsewhere.

Students may request that prior credits be transferred to satisfy general education requirements. Students must complete a Request for Evaluation in the registrar's office.

Students must specifically request official transcripts be forwarded directly to the registrar's office from accredited post-secondary institutions or military service.

Courses will be evaluated, and accepted transfer courses and credits will be reported on the transcript, which students may view online at www.bates.ctc.edu/Transcripts.

### College-Level Examination Program
**www.bates.ctc.edu/Testing**

The College-Level Examination Program (CLEP) is the most widely accepted credit-by-examination program in the country. Through CLEP, students can:

- Demonstrate their knowledge in a subject area to earn exemption from taking introductory college courses;
- Show their level of competency in a subject to determine placement; and
- Accumulate credit toward a degree by demonstrating knowledge they have gained independently.

There are no eligibility requirements or prerequisites to take a CLEP exam. More information: 253.680.7030.

### Transferability of Credits

To determine transferability of credits earned at Bates Technical College to other institutions, students may request an official Bates transcript be forwarded to the college by which they wish to have credits evaluated. The receiving college determines the transferability of courses completed at Bates. Contact the registrar at the college to which you wish to send transcripts for evaluation.

### Transferability of General Education Credits

The transferability of general education credits earned at Bates Technical College is subject to the policies of the receiving institution. General education courses are required in career education programs and are necessary to pursue higher-level degrees.

Successful scores on appropriate College-Level Examination Program (CLEP) examinations may be used to meet general education requirements for a degree or certificate.

### Work-Based Learning

In collaboration with the instructor, student, and employer, students may, with appropriate approval, supplement their instruction with paid and unpaid work-based learning experiences in businesses throughout the Puget Sound area.

Veterans Administration and other program-funded students may participate in work-based learning experiences only if it is completed in-residence at the college, with permission of the funding agency. More information: 253.680.7529 or 680.7035.

# Financial Aid

### Financial Aid
### www.bates.ctc.edu/FinancialAid

Financial aid is available for eligible students. Students and their families need not be low-income to qualify for some kinds of financial aid. Students must demonstrate financial need to be eligible for federal assistance.

Even if receiving financial assistance from agency sources (L&I, VA, DVR, WorkSource, WorkFirst), students may be eligible for additional grant aid from state and federal financial aid sources to attend school.

Eligibility is determined by comparing the difference between the cost of attending school and the student's Expected Family Contribution (EFC) number provided on the FAFSA.

Students are encouraged to apply for financial aid as early as possible since pre-qualification may take up to eight weeks from the application submission date. Students who apply for financial aid give voluntary consent to use the college's electronic processes. The student must notify the financial aid office in writing if they choose not to use Bates' electronic processes. Electronic financial aid award notifications begin in July.

Financial aid is intended to supplement, not replace, a person's resources. If combined resources are not sufficient to cover expenses, you may be eligible for financial aid in the form of grants, scholarships, low-interest loans, or work study employment. (See page 8.)

Information submitted on the financial aid form determines eligibility for grants, scholarships, work study, and low-interest loans. Students should plan to use personal resources to buy books and supplies prior to their first financial aid disbursement.

### Eligibility for Financial Aid

A student is eligible for financial aid if they are:

- Attending Bates to obtain a degree or certificate
- A U.S. citizen or eligible non-citizen
- Making satisfactory progress in a program of study, as defined by the institution's satisfactory progress criteria
- Not in default on any previous student loans or owe a refund on any grant
- Registered for the draft with Selective Service if required by law
- A high school graduate, or a GED completer

Students entering Bates with a bachelor's degree are limited to applying for loans, scholarships, and work study assistance. (See page 8.)

### Satisfactory Progress

Any student receiving financial aid must make Pace of Progression and receive a quarterly GPA of 2.0, or "C", or higher. They must also maintain the minimum required credits to receive a financial aid disbursement.

Students who receive financial aid will be placed on warning status their first quarter of unsatisfactory progress. Students are still eligible for a financial aid disbursement while on warning status. Students who do not make progress into the second quarter are ineligible for financial aid funding.

If a student is suspended from aid, they have a right to appeal their status. Students should continue to attend college courses while their appeal is being considered.

### Withdrawals

A student may initiate withdrawal proceedings in the registrar's office or with an instructor.

### Return of Title IV Financial Aid

Students who are awarded Title IV aid and withdraw from courses are subject to the Return of Title IV regulations. The regulations require the college to evaluate the time the student was enrolled, using the Return of Title IV calculation.

Please refer to the student handbook at www.bates.ctc/MyBates for a full description of Return of Title Four Funds and/or inquire at the Financial Aid Office.

Students who are in Return of Title IV status will receive an overpayment letter and will be ineligible for further Title IV and state aid, until the funds are repaid. The calculation is based on the last recorded day of attendance for the student. (Sample calculations are available upon request in the Financial Aid office).

## To Apply for Financial Aid

1. Complete and submit the Free Application For Student Aid (FAFSA) as soon as possible. Get forms in the financial aid and student services offices, and online at www.bates.ctc.edu/FinancialAid or www.fafsa.ed.gov.

2. Complete a Financial Aid Data Sheet and return it to the financial aid office.

3. Stay in touch with the financial aid office to ensure that they have the correct information to complete your file.

4. Remember that you must reapply for financial aid each year. Electronic notification of financial aid awards begin in July each year.

# Grants, Loans & Scholarships

Our Financial Aid Office can answer your questions about grants, loans and employment programs that can help students pay for their education. More information: 253.680.7020 or www.bates.ctc.edu/financialaid.

## Grants

| | | |
|---|---|---|
| Federal Pell Grant* | $192 to $5,550/year | For undergraduate students (federal) |
| Federal Supplemental* | $100 to $300/year | For undergraduate students (federal) |
| WA State Need Grant* | Up to $3,696 + $885 daycare allowance | For undergraduate students (state) |
| 3.5 Percent Fund* | Amount varies | For full- and part-time students (institutional) |

*Grant amounts and the availability of funds are subject to change

## Loan Programs

Bates participates in the William D. Ford Direct Loan program. For more inforamtion, go to www.bates.ctc.edu/financialaid.

| | | |
|---|---|---|
| Federal | Maximum 1st year: $3,500 | Subsidized: Deferred repayment and fixed interest rates |
| | Maximum 2nd year: $4,500 | Subsidized: Deferred repayment and fixed interest rates |
| | Amount varies | Unsubsidized:Deferred repayment and fixed interest rates |
| Federal Plus Loan | Maximum loan can cover cost of education; a non-need based program for parents of undergraduate dependent students with immediate repayment fixed interest rates | |

## Employment Programs

| | | |
|---|---|---|
| Federal and State Work Study | $500 to $6,000/year | On- and off-campus employment opportunities |

## SCHOLARSHIPS

The Bates Technical College Foundation offers scholarships to new and current students every quarter. Scholarship offerings vary with awards ranging from $100 to $1,000 per quarter. Applications are available online at www.bates.ctc.edu/Foundation. To request information by email, please contact foundation@bates.ctc.edu.

**1. Who is eligible to apply for scholarships through the Bates Technical College Foundation?**
All Bates students registered in degree and certificate programs are eligible to apply for scholarships. Some scholarships are open to all students in any program, while others are limited to specific programs. Please read each scholarship announcement to determine eligibility.

**2. Can I still apply for a scholarship even if I receive financial aid?**
Yes. Students are encouraged to apply for scholarships even if they are receiving financial aid. However, funds received as a scholarship may be deducted from a student's financial aid budget. Students should consult with the financial aid office to determine how a scholarship will affect their financial aid package.

**3. Can I apply for a scholarship even if I received one in a previous quarter?**
Yes. Students are encouraged to apply for scholarships each quarter.

**4. What is involved in the application process?**
The entire scholarship application is filled out online at https://scholarships.bates.ctc.edu/Stars/. The application consists of filling out a brief biographical and financial section, several short-answer questions and an essay question. Applicants also submit an unofficial transcript and a recommendation letter. Students must be in good academic standing to be considered for a scholarship.

**5. Can I use my scholarship for living expenses such as rent, utilities and childcare?**
No. With the exception of a few scholarships designated for childcare, scholarships through the foundation may only be used towards tuition, books, tools or supplies.

**Learn more at www.bates.ctc.edu/Foundation.**

# Grading System

## Grading Procedures

The following grading practices support academic freedom and provide a uniform and fair grading system for students and faculty.

1. Instructors are empowered to select criteria used to grade the courses they teach, and how those criteria will be weighted. Elements that contribute to grades can be as broad as needed and may include various methods of measuring student learning and achievement. For example: a possible combination of test scores, assignments, evaluation of lab/shop work, attendance, workplace behaviors evaluation, and other elements may be used.

2. At the beginning of each course students will be provided with a syllabus detailing what will be learned in the course and how outcomes will be measured and graded. Grading information will explain how the various factors will be weighted and how they contribute to the final grade.

3. Reporting:
• Numerical grades earned by students will be reported for each course at the end of the quarter using a scale from 4.0 to 0.7, or 0.0, and will apply to grade point average (GPA) calculations.
• Numerical grades may be considered equivalent to letter grades as follows:

| Numerical Grades | Letter |
|---|---|
| 4.0 | A |
| 3.9-3.7 | A- |
| 3.6-3.3 | B+ |
| 3.2-3.0 | B |
| 2.9-2.7 | B- |
| 2.6-2.3 | C+ |
| 2.2-2.0 | C |
| 1.9-1.7 | C- |
| 1.6-1.3 | D+ |
| 1.2-1.0 | D |
| 0.9-0.7 | D- |
| 0.0 | N/C |

**N/C-No Credit**: counted in GPA
**S:** Satisfactory completion of a pass/fail Course (not factored in GPA)
**U:** Unsatisfactory completion of a pass/fail course(not factored in GPA)
**W:** Withdrawal - not counted in GPA
**IC:**Incomplete

4. Withdrawals (W): Students will be allowed to self-withdraw from courses in accordance with college procedures.

5. Incomplete marks (IC)
a. An incomplete (IC) may be granted for a course in which the student enrolled but did not complete all work required to earn a letter grade due to unusual or emergency circumstances beyond the student's control.
b. An IC is not a student right, but is an instructor granted extension of the time needed to finish and submit required work the student was unable to complete during the regular course timeframe.
c. The student need not re-register nor pay additional tuition in the following quarter for the individual course in which an IC is granted.
d. An instructor may give an IC to a student provided there is a contract in place between the student and the instructor specifying:
• what work must be completed
• by what date the work will be completed
• what the final grade for the course will be if the student does not complete all required work by the required date
e. If the student fails to complete the required work by the deadline set by the instructor (in no case beyond the end of the subsequent quarter), the IC will automatically change to the grade designated on the contract.

## Academic Suspension

A student who is suspended from Bates Technical College will not be permitted to enroll for any credit courses for three consecutive quarters, from the end of the quarter for which the suspension occurred. A student who returns after suspension will automatically be placed on first quarter probation status.

A suspended student who fails to maintain the required academic standards due to special or extraordinary circumstances may petition the Academic Standards Committee for conditional reinstatement. Petition forms are available in the office of the vice president for student services.

## Program Curriculum

The program descriptions in this catalog are provided for reference and list all curricula that exist for individual programs. Selection of specific elective classes will depend on the area(s) of program emphasis a student wishes to pursue; therefore, students may not need to complete every class segment that is listed in the catalog. Students should consult with their advisors and faculty to determine the most appropriate and/or required classes for their desired program path and completion credential.

## Program Completion Times

Completion time ranges listed for each career education program in this catalog are averages based on the schedule of when courses will be offered and the number of credits needed to complete the required curriculum for that program. Program completion rates may vary from those listed based on individual student skills, aptitudes, and academic progress.

## Academic Standards Procedure

Bates' Academic Standards Procedure applies to all Bates students enrolled in credit courses. Standards were established to maintain academic excellence and to encourage students to assume responsibility for their own academic progress. Academic standards procedures also ensure that students with educational difficulties are informed of the many resources available at Bates.

A student enrolled in graded courses at Bates will be placed on academic probation when the student's cumulative grade point average (GPA) falls below 2.0. Students who remain on probation for three quarters are subject to suspension from academic study at the college for three consecutive quarters. A hard copy of the complete Academic Standards Procedure is available in Student Services.

# Degrees & Certificates

### Degrees & Certificates

In addition to degree and certificate options, Bates has agreements with other institutions to provide options for students to earn a four-year degree.

All degree and certificate options require a minimum cumulative grade point average (GPA) of at least a 2.0 to earn a credential. Individual programs may require a higher grade point average.

### Associate of Technology Degree

The Associate of Technology degree prepares graduates for the workforce, leading the graduate directly to employment in a specific occupation. Associate of Technology degree career education programs have general education requirements. Students must complete college-level credits in communications, human relations and social science, and mathematics.

### Associate of Applied Science - T

The Associate of Applied Science-T degree provides students of specific career education programs with pathways to further educational opportunities through articulation (transferable) agreements with baccalaureate institutions. Completion requirements generally include no less than 20 general education credits for courses generally accepted in transfer, and comprised of five credits of English composition, five credits of college-level mathematics, and 10 credits in social science, humanities or science.

### Associate of Technology in Apprenticeship Studies

Former students may be eligible if requirements are met, and if they have spent at least two of the least three years employed within the technical specialty (such as supervisor, foreman, manager, inspector, or instructor.) Completion requirements for this degree include:

- Completion of a Bates Technical College apprenticeship program that is at least three years (6,000 hours) in length.
- Meeting general education requirements at Bates or transferring credits (subject to approval by Bates' registration office).

### Certificate of Competency

This completion credential is designed specifically for non-licensed programs at least 45 credits in length. Completion requirements include:

- Completion of the minimum number of pre-college (90-level) and college-level program-specific credits.
- Meeting general education requirements by completing 90- or 100-level classes as stated in general education requirements—Certificate of Competency by completing a minimum of 15 general education credits, five each, in communications, human relations and mathematics.

### Certificate of Training

Certificates of Training are awarded to students who successfully complete programs that are less than 45 credits in length.

### Articulation Agreements

Bates has articulation agreements with University of Washington Tacoma and The Evergreen State College for AAS-T degrees. For more information, see career training program information or contact a Bates' career advisor.

**Articulation with University of Washington Tacoma**

Currently three Bates career education programs have an articulation agreement with the University of Washington Tacoma for transfer of credits: Database Management & Development, Software Development and Web Developer. Completion requirements for this degree differ. Students are advised on specific requirements upon their declaration of degree intent and while attending their specific program. Students are cautioned that the general education requirements of specific program articulation agreements may be more stringent and require more than 20 credits.

**Articulation with The Evergreen State College**

Currently the Fire Protection Engineering Technology career education program at Bates has an articulation agreement with The Evergreen State College for transfer of credits. Completion requirements for this degree differ. Students are advised on specific requirements upon their declaration of degree intent and while attending this specific program, and are cautioned that the general education requirements of specific program articulation agreements may be more stringent and require more than 20 credits.

# Certifications & Professional License Preparation

## Certifications for Industry

Bates offers many courses that prepare students for industry-standard certifications as part of a degree program or as a separate professional track. Students are encouraged to obtain as many certifications as possible while completing career education programs. Certifications indicate to prospective employers that a person has successfully shown an understanding of the technical knowledge required in a chosen field. Certifications include:

ARI Industry Competency Exam (Air Conditioning and Refrigeration Institute)
- Commercial Refrigeration
- Light Commercial Heating and AC
- Residential Heating and AC

ASE (Automotive Service Excellence)
CDA (Certified Dental Assistant)
CMT (Certified Medical Transcriptionist)
CSI (Construction Specifications Institute
CWTS (Certified Wireless Technology Specialist)
Cisco (Bates Technical College is an official Cisco Network Academy)
CCNA (Certified Network Associate)
CCENT (Cisco Cert Entry Networking Technician)

**CompTIA**
A+
Net+
Security +
Project +
DHTI Digital Home Technology Integration
EET (Electrical Engineering Technician)
EET (Electronic Engineering Technician)
EPA 608 (DFC Refrigerants)
ETAI (Wireless Network Installer)
FOA (Certified Fiber Optics Technician)
I-CAR (Inter-Industry Conference on Auto Collision Repair)
ICBO (International Conference of Building Officials)

**Microsoft Corporation**
MCP (Certified Professional)
MCSA (Certified Systems Administrator)
MCSE (Certified Systems Engineer)
MCITP (Certified Information Technology Professional)
MCDST (Certified Desktop Support Technician)

**Other**
Network Cabling Specialist
MECP (Mobile Electronics Certified Professional)
NICET (National Institute for the Certification of Engineering Technicians)

**Oracle**
Oracle 10G
Oracle/0g
PL/SQL Developer
OCA (Oracle Certified Associate

**Fire Service**
Bates Fire Service Training is accredited to National Fire Protection Association (NFPA) standards by the Washington State Patrol, Office of the State Fire Marshall, and the Fire Protection Policy Board through the International Fire Service Accreditation Congress (IFSAC) at the following levels:
Firefighter I
Firefighter II
Fire Apparatus Driver/Operator*
Fire Instructor I
Fire Instructor II
Fire Officer I
Fire Officer II
Fire Officer III*
Fire Safety Officer*
Fire and Life Safety Educator I
Hazardous Materials Awareness
Hazardous Materials Operations
Public Information Officer*

*Pending approval from the Washington State Fire Marshall

**Certification Preparation, Training and Testing**
Bates is a primary trainer and provider of certification testing in several professions, including:
Boiler Testing and Certification
Class I, II, III Operating Engineer
Class IV Fireman, Operator
Class V Boiler Fireman
CDL Truck Driver testing, certification
Engine and Equipment Training Center
High school career and technical teacher preparation
Post-secondary professional-technical certifications
WABO (Washington Association of Building Officials)
AWS (American Welding Society)
SBE (Society of Broadcast Engineers)
CBT (Certified Broadcast Technology

## Professional License Preparation

Students are encouraged to prepare and apply for the appropriate license for their profession prior to program completion.

**Federal Communications Commission**
General Radiotelephone Operator License
Radar Endorsement
GMDSS (Maritime Duties and Disaster System)

**State of Washington**
Barber
Class A Communications
Denturist
Hearing Aid Fitter/Dispenser
Licensed Practical Nurse
STARS (State Training and Registry System

**National Board for Certification in Dental Technology**
- RG (Recognized Graduate)
- CDT (Certified Dental Technician)

**National Board for Certification in Occupational Therapy** (NBCOT)

# General Education

### General Education Courses www.bates.ctc.edu/GeneralEd

General education (academic) courses provide students with pre-college (90-level) instruction, and college (100- and 200-level) instruction in academic areas such as biology, chemistry, mathematics, English, psychology, communications and human relations.

General education courses teach skills that apply to all areas of career education, and ensure that our Bates graduates have professional communication and computation skills that complement their career choice.

General education courses are required as part of degree and certificate achievement, and are necessary for the pursuit of higher-level degrees. General education requirements for degree and certificate programs at Bates Technical College vary, depending upon the program, the credential, and the track the student chooses to pursue.

A prospective Bates student should check with their program advisor, and determine the actual general education courses required to complete their degree or certificate.

Students who seek to complete their 100- or 200-level academic prerequisites for admittance into competitive degree programs at area colleges are welcome to enroll in any of Bates' general education 100- or 200-level college transfer courses. Transfer course numbers are listed on page 13.

Students who wish to enroll in transfer courses are welcome to contact the advising office at 253.680.7002 to request an advising appointment to facilitate registration into these courses.

Students must register for general education classes quarterly. Early registration is recommended, as space is limited, and certain classes and class offering times tend to fill up quickly.

The current general education class schedule may be accessed at www.bates.ctc.edu/Registration.

Some general education courses are available in alternative delivery formats (i.e. online courses or hybrid courses that provide a mix of online and face to face interaction with the instructor).

### Meeting the general education requirement

- Complete general education classes at Bates Technical College.

- Receive transfer credits based upon an evaluation of courses taken while in military service or by passing recognized post-secondary exams such as DANTES, CLEP, AP or IB in a relevant subject area.

- Request transfer of course credit completed at other colleges to Bates Technical College. Students must provide the college registrar's office with an official transcript and request a transfer evaluation. The registrar will determine if courses can be applied to a student's credential or degree requirements.

### Transferring Bates General Education credits earned at Bates to another college

The transferability of general education credits earned at Bates is subject to the policies of the receiving institution.

### General Education class credits and high school students

Students registered as Running Start students must take 100-level or above general education classes to be eligible for Running Start funding. Bates Technical High School students may take general education courses at any level, if they meet or exceed the minimum course requirements. General education credit earned is applied to a student's college and high school transcript, and helps students meet their high school diploma requirements and to degree and certificate requirements at Bates Technical College.

# General Education Pathways

## General Education Pathways

Courses in English, communications, human relations, social sciences, science and mathematics satisfy degree and certificate requirements. Each Bates degree and certificate program has specific requirements for general education classes. Students should seek the advice of their career advisor and instructors regarding the sequence in which they take their general education classes. Typically several available general education courses may satisfy a particular degree requirement, however students should consider which of those courses best complements their degree program, check the future general education course schedules, and plan their registration accordingly. Also, some general education courses are easier to transfer to other institutions. Students with educational goals beyond an associate degree should consider Common Course Numbered general education courses.

**Note:** Students register in initial general education courses based on COMPASS or CASAS scores and move sequentially through the General Education Pathway.

| GENERAL EDUCATION COURSES REQUIRED FOR A DEGREE | | | | |
|---|---|---|---|---|
| **General Education Preparation Prerequisite Selected for Program** | **Computations/ Mathematics** | **Communications/ English** | **Human Relations** | **Maximum Number of General Education Courses Required for Degree** |
| **Ready for 100-Level** | **1** Course | **1** Course | **1** Course | **3** (See note 1.) |
| **Ready for 90-Level** | Up to **2** Additional Courses* **MATH 92 and MATH 098** or **MATH 096** | **1** Additional Course **ENGL 091* or ENGL 090** | **0** None | **3** Additional at 90-level depending on COMPASS scores<br><br>Total General Education Courses **6** (See note 2.) |
| **Ready for 80-Level** | Up to **2** Additional Courses **MATH 087** **MATH 086** | **1** Additional Courses **READ 089** | **0** None | **3** Additional at 80-level depending on COMPASS or CASAS scores |

**Notes:**

1) Some AT and AAS-T degrees require additional 100-level courses.
2) Some students may require only one 90-level MATH course.
* Successful completion of ENGL 091 or MATH 098 is a prerequisite for entry into 100-level math or English common course numbered college transfer courses.

## Common Course Numbering

Common course numbering makes course transfer between and among Washington state's 34 community and technical colleges easier for students, advisors, career advisors and receiving institutions.

| Bates Common Course Numbers | |
|---|---|
| ART& 100 Art Appreciation | CS& 131 Computer Science I C++ |
| ASL& 121 American Sign Language I | CS& 231 Computer Science I Java |
| BIOL& 175 Human Biology | ENGL& 101 College Composition I |
| BIOL& 210 General Biology | ENGL& 102 College Composition II |
| BIOL& 241 Anatomy and Physiology I | ENGL& 235 Technical Writing |
| BIOL& 242 Anatomy and Physiology II | MATH& 141 Precalculus I |
| BIOL& 260 Microbilogy | MATH& 142 Precalculus II |
| CHEM& 121 General Chemistry | MATH& 146 Introduction to Statistics |
| CMST& 102 Media and Society | MATH& 151 Calculus I |
| CMST& 210 Interpersonal Communications | PYCH& 100 General Psychology |
| CMST& 220 Public Speaking | PYCH& 200 Lifespan Psychology |
| CMST& 230 Small Group Communications | SOC& 101 Introduction to Sociology |

# Adult Basic Education, Adult High School Completion, ESL/GED

### Adult Basic Education (Basic Studies)
**www.bates.ctc.edu/GeneralEd**

Bates offers Adult Basic Education (ABE) classes and services in:

- Mathematics, reading, writing
- Educational planning
- GED preparation
- Adult high school completion
- English as a Second Language

ABE classes are intended to help students improve mathematics, reading, and writing skills whether or not they have a high school diploma.

Students register for basic studies to prepare for further general education courses, to complement career education, to prepare for General Education Development (GED) testing, and for personal growth. Day and evening classes are offered with monthly start dates. More information: 253.680.7274.

### Basic Studies Educational Planning

Basic studies educational planning (BSEP) assists students in selecting appropriate basic studies classes.

Students take assessment tests and are then placed in classes appropriate for their skill level and personal educational goals.

### Adult High School Completion
**www.bates.ctc.edu/HighSchool**

Students 18 years of age and older may earn a high school diploma at Bates Technical College by completing high school general education courses, continuing education courses, career education programs, and by receiving credit for work-based and community learning experiences.
More information: 253.680.7260.

### Adult High School Completion Graduation Requirements
**www.bates.ctc.edu/HighSchool**

1. Complete a written High School and Beyond Plan, outlining how you will meet your high school requirements and spend your first year after graduation. A career advisor will assist you in developing and adjusting your plan as necessary.
2. Students must earn at least 19 credits (expressed in Carnegie Units), according to the graduation requirements of the year in which they should have graduated, and in core subject areas below:

| | |
|---|---|
| English | 3 credits |
| Mathematics | 2 credits |
| Science (Including 1 credit of laboratory sciences) | 2 credits |
| Social Studies (Including study of the U.S. and Washington State constitutions) | 2.5 credits |
| Art | 1 credit |
| Occupational Education | 1 credit |
| Health and Fitness | 2 credits |
| Electives | 5.5 credits |

3. Complete a culminating project. (Instructors will assist in choosing and planning projects within three quarters prior to graduation.)
4. Students who began 9th grade in September 2004 or later must earn a Certificate of Academic Achievement (CAA), by passing the reading and writing High School Proficiency Exam (HSPE) and an End-of-Course (EOC) mathematics exam, or an approved alternative for each area.

### English as a Second Language (ESL)

Students whose primary language is not English have the opportunity to take classes to improve skills in reading, writing, and listening, and then move progressively to greater levels of competence as basic skills levels improve.

ESL classes help students transition to general education courses and can be taken as a complement to a career education program. ESL students participate in civics programs which assist individuals with access to public services, participation in community activities and use of available information sources within the college and the community.

### GED Test Preparation
**www.bates.ctc.edu/Testing**

Specialized classes assist students in preparing for the five General Education Development (GED) examinations. Day and evening classes are offered. More information: 253.680.7274.

### How to Register (ABE/ESL/GED)

1. Call 253.680.7274 for orientation dates.
2. Attend an orientation session. At the orientation, you will take the assessment test and may register for classes.

# Running Start & Technical High School

### Running Start
**www.bates.ctc.edu/HighSchool**

Most of the career education programs at Bates Technical College are state-approved Running Start courses. The Running Start program allows academically qualified high school juniors and seniors to register in career education programs at Bates to earn credit toward a high school diploma and an Associate of Technology degree or a certificate concurrently.

Approved college courses are tuition-free, but fees, supplies, books and other incidental expenses are the student's responsibility.

Running Start students may also complete college-level general education courses required by their high school at Bates. Interested students must obtain permission from their current high school district to register in Running Start at Bates. Contact your high school counselor or call 253.680.7264.

### Technical High School
**www.bates.ctc.edu/HighSchool**

Bates Technical High School is available to students 16-20 years of age who have not yet earned a high school diploma. General Education Development (GED) completers are eligible to enroll in Bates Technical High School. Students may transfer to Bates' Technical High School from their current school district.

Students work toward a high school diploma and an Associate of Technology degree or certificate simultaneously. Individual graduation plans will vary depending on a student's choice of program.

Technical high school students pay a $30 quarterly registration fee, and may be responsible for other fees, uniform, equipment and supply expenses.

### Technical High School Graduation Requirements

1. Earn at least 20 credits high school credits.

| | |
|---|---|
| English | 3 credits |
| Mathematics | 3 credits |
| Science | 2 credits |
| Social Studies | 2.5 credits |
| Art | 1 credit |
| Occupational Education | 1 credit |
| Health and Fitness | 2 credits |
| Electives | 5.5 credits |

2. Complete a culminating project and High School and Beyond Plan. Your high school advisor will help you plan each step to complete your high school graduation requirements.

3. Pass State Tests or State-approved alternative. Students who began 9th grade in September 2004 or later must earn a Certificate of Academic Achievement (CAA), by passing the reading and writing High School Proficiency Exam (HSPE) and an End-of-Course (EOC) mathematics exam, or an approved alternative for each area.

### Afternoon Technical High School
**www.bates.ctc.edu/HighSchool**

Since 2010, the Afternoon Technical High School at Bates' South Campus has provided area high school students the opportunity to enroll in specific career training programs from 3-6 p.m. while working simultaneously toward their high school diploma.

The programs offered as part of the Afternoon Technical High School are: Auto Body Rebuilding and Refinishing, Automotive Mechanic, Diesel and Heavy Equipment Mechanic, Early Childhood Education/Child Care, Electrical Construction, and Welding.

Afternoon Technical High School students take academic classes at South Campus prior to their career training course. Afternoon high school students who complete all their afternoon high school program classes with good academic standing may transfer into the full-time day program at the next program entry point. More information: 253.680.7004 or www.bates.ctc.edu/HighSchool.

## TO REGISTER FOR RUNNING START & TECHNICAL HIGH SCHOOL

1. Attend a Running Start or Technical High School orientation session (see www.bates.ctc.edu/HighSchool for current orientation schedule).
2. Complete your orientation assignment, complete application packet, take COMPASS placement test, and obtain approval and transcripts from your previous high school.
3. Call the high school office 253.680.7004 to schedule a meeting with a high school advisor.
4. Meet with an advisor and complete an education plan, register, pay fees, and begin your classes.

CHAPTER 2

# Specialized Programs

# Specialized Programs

## Articulation Agreements with Industry

Bates Technical College has a 65-year history providing Washington state-approved apprenticeship training programs. Pre-apprenticeship career education programs at Bates include:

- Carpentry
- Electrical Construction
- Machinist
- Sheet Metal Technology
- Welding

Bates offers a degree in Apprenticeship Studies. More information: 253.680.7300 or 680.7402, www.bates.ctc.edu/Apprenticeship.

## Apprenticeship Committees

**www.bates.ctc.edu/Apprenticeship**

**Aerospace Joint Apprenticeship Committee (AJAC)/Tacoma Machinist Apprenticeship Committee,** Roger Peters, Program Specialist, 206.764.7940

**Operating Engineers Regional Training JATC**, Ole Fjellstad, Training Director, 1.800.333.9752

**Pacific NW Iron Workers & Employers Local #86 Apprenticeship Committee**
Greg Christiansen, Coordinator, 206.244.2993

**Pierce County Meat Cutters Apprenticeship Committee**, Benny Rolland, Director, 253.589.0367

**Skookum Corporation & Directorate of Logistics, Fort Lewis, Washington JATC**
Tom Whipple, Coordinator, 253.405.0865

**Washington State UBC JATC (South Puget Sound Carpenters JATC)**
Dan Lindbo, Coordinator, 253.472.2629

**Southwest Washington Electrical Joint Apprenticeship & Training Committee**
Tony Lewis, Coordinator, 253.475.2922

**Southwest Washington Pipe Trades Apprenticeship Committee,** Elmer Arter, Coordinator, 360.486.9400

**Washington State Fire Fighters Joint Apprenticeship & Training Committee**
Dave Myers, Coordinator, 253.318.1638

**Western Washington Sheet Metal JATC**
Eric Peterson, Training Administrator, 425.438.1406

**Western Washington Operating Engineers Facilities Custodial Services Apprenticeship Committee**
Jim Burnson, Training Director, 253.351.0184

**Western Washington Stationary Engineers Apprenticeship Committee**
Jim Burnson, Training Director, 253.351.0184

## Manufacturing Academy

The Manufacturing Academy was created in a joint effort between Workforce Central, Bates Technical College and Aerospace Joint Apprenticeship Committee (AJAC) to provide students with the skills and knowledge necessary to secure entry-level employment in the advanced manufacturing field.

So that students gain industry-relevant knowledge, curriculum content is aligned with state standards for manufacturing. While participating in the Manufacturing Academy, students actively search for a job utilizing all of the resources of both Workforce Central and AJAC.

The goal of this program is to build a workforce to fill industry need, and to provide long-term employment and career ladders for graduates within that industry. Employers participated in development of course content, ensuring it is relevant and meets industry need.

Graduates are hired directly by employers that support the program; resulting in a skilled pipeline of entry level workers to support the growing number of aerospace/manufacturing jobs.

The Academy provides students with a pathway to enter into an apprenticeship or continue their education with Bates. Credits earned in this program transfer into the CNC Machinist program at Bates Technical College.

Successful completion of the Manufacturing Academy satisfies the minimum requirements for entry into an aerospace apprenticeship.

Veterans may be eligible to use their post-911/GI Bill benefits for this program.

## Articulation Agreements with Colleges and Universities

Bates currently has agreements with several public and private colleges and universities to facilitate the transfer of credits and entry to educational options after earning a Bates credential:

- City University (multiple programs)
- The Evergreen State College (multiple AAS-T degrees)
- Mayville State University, North Dakota (distance learning option for Early Childhood Education/Child Care)
- Montana State University-Northern (Diesel Technology)
- University of Phoenix (multiple)
- University of Washington Tacoma (Computer Sciences)

Beyond the formalized articulation agreements, colleges have reciprocal transfer agreements and understandings relating to the transfer of courses. General education courses meeting guidelines of the Intercollege Relations Commission are identified as 'generally transferable' in course descriptions. To determine if Bates credits are transferable to a specific college or university, contact the registrar at the receiving institution.

## Articulation Agreements with K-12

Bates works with K-12 school districts and other colleges and universities to provide additional educational options for students. K-12 articulation agreements are managed through the Pierce County Careers Connection.

These agreements provide students the opportunity to earn credit in the college's career education programs for Career and Technical Education programs at their high school. Students should inquire at their district high school about which Bates options are available.

# Specialized Programs

### Business and Management Training
**www.bates.ctc.edu/BMTC**

Bates' Business and Management Training Center provides on-site professional development, technical skills, leadership and business management training to companies, governmental entities and non-profit organizations looking for cost-effective ways to address workforce development.

More information: 253.680.7190, www.bates.ctc.edu/BMTC.

### Continuing Education
**www.bates.ctc.edu/ContinuingEd**

Continuing education courses for professional development and personal enrichment are student-supported and may include computer training, health and medical training, and training in construction and skilled trades areas. Generally held in the evenings and on weekends, the courses have quarterly start and end dates and include for-credit and not-for-credit courses. A schedule of continuing education courses is available online at www.bates.ctc.edu/ContinuingEd. Registration is available online, by phone, or in person at the South Campus. More information: 253.680.7300/7402.

### Distance Learning

Bates offers a variety of distance-learning options in career education, general education, and extended learning, including paraeducator training, teacher preparation, international education, and home and family life.

Web-facilitated formats blend face-to-face delivery with distance learning as well as offerings where most or all of the content is delivered via distance learning. More information: 253.680.7161.

### Extended Learning

Extended learning courses are intended to be short-term training opportunities. The courses have specific start and end dates and are usually held evenings and weekends.

Bates also offers contract-funded or student-funded, non-credit extended learning courses to earn continuing education Units (CEUs). Ten clock-hours of instruction equals one CEU. Documentation of coursework may be provided to the student in letter or certificate form, listing the student's name, course of study, and the number of CEUs awarded. After a student satisfactorily completes a designated element, a card is given to the student documenting course completion. More information: 253.680.7000.

### General Educational Development
**www.bates.ctc.edu/Testing**

The General Educational Development (GED) test certifies achievement of a high school level of academic knowledge and skills. GED testing is available through Bates' Assessment Center. More information: 253.680.7030, www.bates.ctc.edu/testing.

### Industry Partnerships
**www.bates.ctc.edu/Partnerships**

In many career education programs, full-circle partnerships exist between Bates and industry. As new technologies and equipment are developed, they may be tested at Bates or provided to Bates for industry and student training. In some partnerships, industry provides specialized training according to specific hiring requirements. Students who meet those qualifications may apply for job openings as they occur and are often considered for internships (work-based learning opportunities).

### Paraeducator Training
**www.bates.ctc.edu/EducatorTraining**

Through the convenience of distance learning, Bates' paraeducator training offers the opportunity to earn 100-level college credits from home.

Courses are designed to address the Washington State Core Competencies for Paraeducators and to meet the demand for accessible, affordable, and appropriate training for paraeducators. (See page 78.) A grant from the Office of the Superintendent of Public Instruction (OSPI) helps to support the program.

Although paraeducators are the primary audience, people from a variety of life situations register for the courses. For teachers and other certificated individuals, the OSPI accepts the courses for certificate maintenance.

A certificate of training in Paraeducator Foundations is available. More information: 253.680.7230, www.bates.ctc.edu/eLearning

### Career & Technical Education Teacher Preparation

As a Washington State Professional Educator Standards Board-approved provider of teacher certification, Bates offers professionals in business and industry a clear route to pursue career and technical education (CTE) teacher certification. The training prepares individuals with business and industry experience for CTE teaching careers at the secondary level.

Flexible scheduling makes it easy for to design a plan for program pacing and completion. We offer courses quarterly on weeknights and weekends and via distance learning. An accelerated summer weekday offering provides an opportunity to complete the majority of the courses during the summer. More information: 253.680.7161, www.bates.ctc.edu/teacherprep.

### Professional Improvement Units

Through staff development activities, Bates offers a variety of non-credit staff and instructor improvement courses. Staff and student participation in these courses may be recognized with professional improvement units (PIUs) based on a standardized ratio: 10 clock-hours of instruction equals one PIU.

Documentation of student participation may be made in letter or certificate form and will list the student's name, course of study, and the number of PIUs awarded. Documentation provided to the student must be signed by the program administrator/manager.

### Step Up

In this short-term training program offered through the Job Readiness Training Center (JRTC), people earn certifications to acquire entry-level jobs. Job placement assistance is available for graduates of classes such as CPR/first aid, flagging certification, and forklift operations. More information: 253.680.7290.

# Specialized Programs & Home and Family Life

### Veterans
**www.bates.ctc.edu/FinancialAid**
**www.bates.ctc.edu/Veterans**
Veterans who want to use veterans' benefits to attend Bates must meet with the veterans' coordinator located in student services.

Veterans Administration-funded students may participate in work-based learning experiences if they are completed in-residence at the college.

More information: 253.680.7529 or 680.7035, www.bates.ctc.edu/FinancialAid.

### WorkFirst
Bates partners with the Department of Social and Health Services, Employment Security, Pierce County WorkSource, and community-based organizations to provide free job search, job placement, and work experience opportunities for individuals who receive Temporary Aid for Needy Families (TANF).

Training programs are designed by industry professionals to satisfy the specific needs of each career field. Job placement assistance is available upon successful completion of training.

Eligible WorkFirst participants may qualify for up to one year of full-time training in several high-demand fields. More information: 253.680.7286

### Worker Retraining
**www.bates.ctc.edu/WorkerRetraining**
Worker Retraining funding provides unemployed and laid-off workers with immediate access to training, including:
- New job readiness programs for displaced workers
- New and expanded training spaces in high-wage, high demand careers
- An on-site Job Service Center that helps individuals find employment

More information: 253.680.7299, www.bates.ctc.edu/WorkerRetraining, or email retraining@bates.ctc.edu.

### Home and Family Life
**www.bates.ctc.edu/Family**
Bates' Home and Family Life department offers job training and extended learning programs emphasizing knowledge, skills, and the understanding of values, attitudes, and standards that are important to specific careers and family life. More information: 253.680.7500, www.bates.ctc.edu/Family.

### Child Development/Early Education Staff Training Program
This program is a cooperative effort between approximately 30 licensed child care centers and Bates Technical College. The program offers affiliation opportunities for licensed child care centers in the greater Pierce County area to receive on-site technical training, formal classes and support in early childhood education.

### Cooperative Preschools
Parents participate in a hands-on, interactive parent/child preschool classroom, learning the newest developmentally-appropriate early childhood education and guidance techniques to meet the developmental needs of children aged two through five years. Experienced, trained teachers supervise in a safe and secure preschool environment.

College faculty provide training, assistance and support. A trained early childhood educator assists children in activities and provides safety and supervision.

Professional college staff also provide parenting education classes, teacher and preschool board leadership training, and non-profit business assistance and support. More information: 253.680.7500.

### Early Childhood Education and Assistance Program (ECEAP)
The Early Childhood Education and Assistance Program (ECEAP) is incorporated into the child care center at Bates and in several sites throughout Pierce County. ECEAP provides additional services for young children, including health screening, developmental screening, and help with fees. The program is for families that qualify due to limited income. More information: 253.680.7324

### Effective Parenting Courses
The research-based and nationally acclaimed Effective Parenting with Positive Discipline courses help build positive parenting skills that include winning cooperation, building relationships, and reducing struggles. More information: 253.680.7500.

### Love and Logic
These courses are offered in English and Spanish. Love allows children to grow through their mistakes, and logic allows them to learn how to live with the consequences of their choices with parental guidance and support. More information: 253.680.7500.

### Parent/Infant/Toddler Programs
An eight-week series of classes in which parents with children (birth to three years) participate in educational, age-appropriate activities with an emphasis on making brain connections through movement and music.

### Early Education Resource Center
A resource center for teachers and parents is located at Bates' South Campus to help students, teachers, parents, and child care staff facilitate learning for infants, toddlers, preschoolers, and school-aged children.

Ongoing displays and activities include music, language, math, social skills, cognitive development skills, science, games, and rule development.

A library of resource books, videos, curriculum kits for teachers, and take-home activities is available. More information: 253.680.7500.

### Washington State Training and Registry System (STARS)
STARS is based on Washington State WAC requirements for licensed child care centers. Bates accepts STARS courses from other state community and technical colleges, and Bates STARS courses transfer to other colleges. More information: 253.680.7500.

### Early Childhood Education/Child Care Degree Program
This two-year degree program is offered during the day for full-time students at the college's Downtown Campus. The second year of this program is also available during the evening for part-time students. Classes include lecture, discussion and hands-on learning. Students will prepare for roles as lead teachers, and program supervisors and directors. More information: 253.680.7322 or 253.680.7010.

CHAPTER 3

# Student Services

# Student Services

### Advising
Students are advised by career advisors and program instructors. Contact with career advisors and instructors on a continual basis is an important part of student success. Career advisors assist with:
- COMPASS results and general education placement
- Career education program choices
- College resources, support services
- Degree and certificate requirements
- Information on program costs
- Educational and program planning
- Understanding college policies and procedures

Instructors are available to help with:
- COMPASS results review
- Curriculum requirements
- Program prerequisites
- Licensing requirements
- Employment opportunities
- Job searches

More information: 253.680.7002.

### Associated Student Government (ASG)
**www.bates.ctc.edu/ASG**
The ASG is strongly supported by administration and faculty, helps in the promotion and development of student activities, and provides for direct student representation in establishing college policies. The ASG is responsible for developing student activities, the student activity budgets, and for representing student interests on
college committees, including the General Advisory Committee and program advisories.

ASG officers meet with the college president regularly and the ASG president provides a monthly report to the Board of Trustees.

Each career education program is encouraged to send a representative to ASG meetings.

### Barber Shop
**www.bates.ctc.edu/BarberShop**
Students have access to the low-cost services of a 10-chair barber shop. All work is performed by students in the Barber program.

### Bookstores
**www.bates.ctc.edu/Bookstore**
Bookstores at the Downtown and South Campuses stock books, supplies and equipment used in high school and college programs. Operating hours are from 8 a.m. to 4 p.m., Monday through Friday. A list of required books, supplies, and equipment is available from program instructors.

Agency-funded students must present itemized authorization to the financial aid office for approval. Upon approval, items will be issued by the bookstore. Additional items will be issued by the bookstore with written approval from the instructor and funding agency. Book vouchers are not issued for students receiving state or federal financial aid. Students should plan to purchase books and supplies prior to the first disbursement of financial aid.

### Bookstore Refund and Return Policy
Cash refunds are not permitted. Refunds of cash purchases or purchases made by check will be made via a refund check from the college. Credit card purchases are refunded to the credit card.

Sales of textbooks are refundable. Sales of safety equipment, optional books (including study guides), software, supplies, tools and kits are not returnable. More information: www.bates.ctc.edu/Bookstore.

### Career Education Information Sessions
**www.bates.ctc.edu/InformationSessions**
If you are uncertain about which program to choose, select an area of interest and attend a Career Education Information Session. More information: 253.680.7002.

### Career Cruiser
Students seeking advice, guidance, or information about career options are encouraged to take the Career Cruiser which consists of four tests to help make well-informed career choices based on aptitudes, career interests, personality type, and achievement. More information: 253.680.7030.

### Child Care
Bates' child care center is available to students and staff and includes an Early Childhood Education and Assistance Program (ECEAP) preschool. The center serves one-year olds through pre-kindergarten.

Hours are 6:30 a.m.-4:30 p.m., Monday through Friday, based on the college student calendar.

Several non-college child care centers are close to Bates. Financial support for child care is available for students who qualify through other college programs. For more information, call 253.680.7228 or 253.680.7320.

### Dental Clinic
**www.bates.ctc.edu/DentalClinic**
Bates' Downtown Campus Dental Clinic is open from 8 a.m. - 2 p.m., Monday-Thursday, and is available to Bates students, their families and the general public, age 5 and older. Services provided include fillings, extractions, crown and bridge, and limited root canals. The clinic is not-for-profit, with patient fees designed to cover the cost of dental salaries and patient service materials. Assistants in the clinic are students completing training in dental assisting techniques, theory and application.

Payment is due at the time of service. DSHS with the CNP identifier is accepted. Private dental insurance is not accepted.

Operating hours may change due to instructional needs. For more information, call 253.680.7310.

### Diversity Center
**www.bates.ctc.edu/Diversity**
The Downtown Campus Diversity Center advocates a college environment in which diverse cultures are respected and valued. Located in E301, the center is a welcoming space where discussions exist in an atmosphere of respect and trust, while providing an environment to learn about the diverse nature of our community. The center offers meeting spaces, computer workstations, a conversation corner, and a library with community information and diversity-related materials. Call 253.680.7178 or visit www.bates.ctc.edu/Diversity.

### Drug-Free Environment
It is the intent of the college to provide a drug free and secure work and learning environment and to comply with the Federal Drug Free Workplace Act of 1988 and the Drug Free Schools and Communities Act of 1986 (Public Law 99-570, Title IV, Sub-Title B) and its amendment of 1989 (Public Law 101-226).

Unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in and on college-owned or controlled property. The use of alcohol while on college-owned or controlled property is also prohibited, except when authorized in writing by the president for special functions.

# Student Services

### Educational Opportunity Center
EOC provides free educational support for adults in the following areas: educational planning, career advising and exploration, assistance with financial aid forms and college applications, and student loan default. The EOC at Bates is located in Room M306B, Downtown Campus. Call 253.680.7153 for more information.

### Email Accounts for Students
**www.bates.ctc.edu/StudentEmail**
Registered career education students at Bates Technical College have a student email account provided as a service from Bates.

### Emergency Closures/School Delays
**www.bates.ctc.edu/Weather**
In the case of severe weather conditions or college emergencies, information regarding the status of Bates operations can be found by phoning the weather and schedule information line, 253.680.7060, and on the college website, www.bates.ctc.edu/weather. College closure information will also be available on major Puget Sound radio and television stations through the Public Schools Emergency Communication System, and on their website, www.schoolreport.org.

### Financial Aid
**www.bates.ctc.edu/FinancialAid**
See page 7 for financial aid eligibility standards and application procedures.
More information: 253.680.7020.

### Food Service
**www.bates.ctc.edu/Dining**
Several food service options varying in offering and price are available. The culinary arts program provides food service at the Downtown Campus cafeteria. Snacks are available in the bookstores; vending machines are located on campus.

### Hearing Clinic
**www.bates.ctc.edu/HearingClinic**
Bates operates a full service hearing clinic at the Downtown Campus in Room E214. Students and the general public have access to free hearing assessments and hearing aid checks. Hearing aids are sold and serviced for a fee. More information: 253.680.7362.

### Insurance
Enrollment at Bates does not include health or medical insurance. Students who desire medical coverage must purchase their own. Basic Accident Medical Expense, Basic Sickness Medical Expense and Dental and Major Medical Expense programs are available at low cost to Bates students while they are attending the college. Students who do not have accident insurance are strongly encouraged to take advantage of this reduced-cost option. Forms are available in the advising center, or visit www.summitamerica-ins.com.

### Job Placement
Job placement assistance is generally provided by program instructors who have close ties with advisory committees and industry representatives.

### Job Service Center
**www.bates.ctc.edu/JobServices**
The Washington State Department of Employment Security maintains an office at the Downtown Campus, M214, to assist with job placement. Lists of jobs openings are available in the center. More information: 253.680.7240, www.Go2WorkSource.com.

### Library
**www.bates.ctc.edu/Library**
Library facilities are at the downtown and south campuses, and electronic resources are available from any internet-connected computer. Resources and services support the curriculum and the work of the college. Materials are available in many formats (print, video, audio, computerized) to better serve various learning styles. More information: email (library@bates.ctc.edu), call 253.680.7220 (Downtown Campus), 253.680.7550 (South Campus).

### Limitation of Liability
The college's total liability for claims arising from a contractual relationship with the student in any way related to classes or programs shall be limited to the tuition and expenses paid by the student to the college for those classes or programs. In no event shall the college be liable for any special, indirect, incidental, or consequential damages, including but not limited to, loss of earning or profits.

### Notice of Non-Discrimination
Bates Technical College reaffirms its policy of equal opportunity and does not discriminate on the basis of race, color, creed, religion, national origin, sex, sexual orientation, age, marital status, disability, or status as a disabled veteran or Vietnam era veteran in its programs and activities in accordance with college policy and applicable federal and state statutes and regulations.

Inquiries regarding Bates' non-discriminatory policies should be directed to the Vice President of Human Resources, 1101 South Yakima Avenue, Tacoma, Washington 98405, 253.680.7180. For further information on notice of non-discrimination and equal opportunity, see the list of OCR enforcement offices for the address and phone number of the office that serves your area, or call 1.800.421.3481.

Questions concerning the application of Title IX and its implementing regulations should be directed to the Vice President for Student Services, 1101 South Yakima Avenue, Tacoma, Washington 98405, 253.680.7005 or 1.800.562.7099, extension 7002.

### Translations of Non-Discrimination Statement
Bates Technical College's notice of non-discrimination is available in English, Korean, Chinese, Russian and Spanish. If you would like a copy of the statement in one of the above languages, please request a copy from the Vice President for Human Resources and Campus Safety, 253.680.7180, or vlackman@bates.ctc.edu.

#### Korean
베이츠 기술 대학의 비 차별 통지는 영어, 한국어, 중국어, 러시아어, 스페인어로 보실수 있읍니다. 만약 당신이 이 비 차별 통지내용을 위의 상기한 나라의 언어로 원하시면, 인사과 부사장님께 전화로 253.680.7180 아니면 이멜일 vlackman@bates.ctc.edu 로 요청하시길를 바랍니다.

#### Chinese
贝茨技术学院现提供英语，韩语，汉语，俄语及 西班牙语版的《无歧视通知》。如果你想得到上述任何一种语言的该通知的复印件，请到本校兼管人事部及校园安全部的副主任那里申请领取。可通过电话或电子邮件联络。电话:253.680.7180
电邮地址: vlackman@bates.ctc.edu

#### Russian
Информация о недискриминации в Техническом Колледже им. Бейтса сейчас доступна на английском, корейском, китайском, русском и испанском языках. Если вы хотели бы приобрести её копию на любом из выше перечисленных языков, пожалуйста обратитесь в офис Прав и Обязаностей человека или в офис Охраны и Безопасности, 253.680.7180, или vlackman@bates.ctc.edu.

#### Spanish
El aviso de no discriminación de Bates Technical College está disponible en inglés, coreano, chino, ruso y español. Si desea una copia de la declaración en una de las lenguas indicadas, por favor, solicite una copia del Vicepresidente de recursos humanos y seguridad del campus, 253.680.7180 o vlackman@bates.ctc.edu.

# Student Services

### National Voter Registration Act

Voter registration forms are available in the registration office in conformance of Program Participation Requirement, Section 487(a)20 U.S.C. 1094(a).

### Parking
### www.bates.ctc.edu/Parking

It is the responsibility of every Bates student to follow all parking rules and regulations. Check the website for detailed information. Parking permits are required for parking on any school property or in any official parking place and can be obtained from Campus Public Safety; www.bates.ctc.edu/Safety.

**Parking Fines:**

- No valid permit displayed: $25
- Parking in area not authorized by permit: $25
- *Blocking or obstructing traffic or impeding college operations: $50
- Parking in reserved staff space without authorization: $50
- Handicapped parking violation (RCW 46.16.381): $450
- *Parking adjacent to fire hydrant: $25
- *Parking in fire lane: $25
- Parking in zone or area marked "no parking": $25

***Traffic Fines:**

- Speeding: $40-$85
- Reckless/negligent driving: $40-$100
- First offense: Parking privileges on all campuses revoked

**Fine to be reduced 50 percent if paid within five days of citation issuance.*

**Parking Fine Appeal:** Parking fines, penalties, and permit revocations may be appealed in some cases. A formal request, including details of the circumstances surrounding the infraction, should be submitted to the college's VP for Human Resources and Campus Public Safety within five business days of receipt of the citation. If denied, it will be forwarded to the Parking Advisory Committee for review. All decisions made by the parking advisory committee shall be final. Repeated or continued violations may result in having parking privileges revoked and/or vehicle impoundment at owner's expense.

### Safety
### www.bates.ctc.edu/Safety

Campus public safety officers provide escorts for students and staff; respond to campus emergencies; patrol buildings, parking areas and campus surroundings; and work with local law enforcement agencies.

All personal property should be kept under lock and key. Safety officers are on duty and should be contacted in case of theft or other concerns about property damage or physical endangerment. More information: www.bates.ctc.edu/Safety. Downtown/Mohler/South Campus, call 253.680.7711.

### MyBates
### www.bates.ctc.edu/MyBates

MyBates allows students to view and print an unofficial copy of their transcript, a form to request an official transcript, to find out which required financial aid documents have not been received, and if and when the college has sent an award letter.

### Tuition Refund Policy

**State Funded Instruction**

A student who has paid tuition before the quarter starts but is unable to attend the class may receive a full tuition refund. After the first day of class, Bates grants refunds as follows:

- From the 1st to the 5th calendar day of class – 80%
- From the 6th day to the 15th day calendar day – 40%
- After the 15th calendar day there is no refund

The general refund policy applies to all students in state-supported programs. It is the student's responsibility to complete a withdrawal form and submit it the registration office. The date the withdrawal is received will be used for calculating refunds.

- Refunds will not be granted for students withdrawn for disciplinary reasons.
- Students called for military active duty will be granted a refund of tuition and laboratory/supply/computer use fees paid for the current payment period, subject to the rules and regulations of their respective funding sources. Presentation of written confirmation is required.

The general refund policy applies to all Bates students, regardless of financial aid status. The refund for students registered in courses or programs with an enrollment period other than the standard quarter will be applied on a prorated basis consistent with the general refund policy.

Refunds must be requested in writing by the student or the funding agency administrator. Refunds for special programs will be made directly to the funding agency administrator.

### Tuition Refund Policy
### Financial Aid Recipients

Financial aid recipients are subject to the Return of Title IV Aid regulations. as stated in this catalog. (See page 7.)

### Tuition Refund Policy
### Self-Support Classes

| | |
|---|---|
| 100% | If college cancels class |
| 100% | Withdrawal on or before one business day prior to 1st class |
| 0% | Student registers, but does not attend |
| 0% | Student withdraws after 1st class |

### Tutoring
### www.bates.ctc.edu/Tutoring

Tutoring is available at all campuses to registered students seeking assistance in any area related to academic success, including math, reading, writing, study skills, and program-specific materials. Assistance is also available to prospective students who are preparing to take the COMPASS or GED tests.

# Special Needs & Disability Accommodation

## Disability Support Services

**www.bates.ctc.edu/DisabilitySupportServices**

The primary focus of Disability Support Services (DSS) is to assure nondiscrimination on the basis of disability.

Through DSS, qualified persons with disabilities can address their concerns regarding attitudinal or procedural barriers encountered, as well as any need for academic adjustments and/or auxiliary aids to assure equal access. DSS will provide information and auxiliary aids or services, serving as a resource to the campus community while striving to make Bates Technical College both an accessible and hospitable place for persons with disabilities to enjoy full and equal participation. We work with individuals who have physical, learning and/or mental disabilities, are academically or economically disadvantaged, limited English speaking, single parents, ex-offenders, displaced homemakers, and gender equality programs.

## Eligibility

It is the student's responsibility to identify him or herself as having a documented disability and seek assistance from DSS. Bates Technical College recognizes that traditional methods, programs, and services may need to be altered to assure full accessibility to qualified persons with disabilities.

A qualified student is one who:

- Has a physical, mental or sensory impairment that substantially limits one or more of her or his major life activities. Major life activity is defined as the ability to perform functions such as self-care, manual test taking, walking, seeing, hearing, speaking, breathing, learning, or working, and is either permanent or temporary;
- Has a record of such an impairment or;
- Is perceived to have such an impairment, or a student who has an abnormal condition that is medically cognizable or diagnosable.

## Attendance

Students are expected to attend all of their scheduled classes. It is the instructor who determines the number of absences that are allowed in his or her class. If a student with a disability has an absence from class due to a disability-related circumstance, he or she should contact DSS. Documentation must support the disability-related circumstance. The absence does not excuse the student from the obligation of any assignments, homework, tests/exams, and obtaining material missed during the absence. Students are responsible for contacting their instructors.

## Student Rights

You have a right to services and reasonable accommodations that allow you to compete on an equal basis as long as you meet the basic requirement to perform the activities of the program.

## Equal Access

No qualified individual with a disability shall, by reason of such disability, be excluded from the participation in, or be denied the benefits of the services, programs or activities of any public entity, or be subject to discrimination by any such entity. Americans with Disabilities Act, 1990 (Section 202).

No otherwise qualified handicapped person shall, on the basis of a handicap, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives or benefits from Federal financial assistance. Rehabilitation Act of Congress, 1973; Title V (Section 504).

## Obtaining Services

We are committed to helping you succeed. In order to receive and retain reasonable accommodations, you must:

- Make an appointment with Disability Support Services at 253.680.7013, Relay Services 711
- Bring formal written documentation of your disability to the first meeting with Disability Support Services. Documentation must be from a licensed professional;
- Request the accommodations you desire;
- Request services early for timely accommodations (preferably six weeks before starting classes).
- When your eligibility is established, it is your responsibility to present the Letter of Accommodation to all instructors at the beginning of each quarter. Discuss your accommodations with your instructor at the beginning of your class or program to ensure successful program completion.

## Confidentiality

Information regarding a student's disability is considered confidential. Information will not be released to anyone outside of the college without the written permission of the student. Information may be shared within the college with appropriate faculty and staff to facilitate services and reasonable accommodations.

## Transportation

Bates Technical College is accessible to students with physical disabilities through the Pierce Transit shuttle service.

## Course Substitutions/Waivers

Bates Technical College does not substitute courses or waive course requirements that would alter essential program requirements.

The college considers requests for course substitutions or waivers according to procedures outlined in the Policies and Procedures Regarding Reasonable Accommodations for Students with Disabilities Under 504-ADA. The procedure is located in the downtown campus Disability Support Services office, room M211.

## Student Grievance

A student with disabilities who may have a grievance with Bates Technical College staff or faculty regarding disability-related issues should contact DSS to obtain a copy of the grievance procedure.

# Student Rights & Responsibilities

### WAC Student Rights & Responsibilities Chapter 495A-121

Bates Technical College is a two-year public institution of higher education. The college is maintained by the State of Washington for the provision of programs of instruction in higher education and related community services.

Broadly stated, the purpose of the college is to provide opportunities for all who desire to pursue educational goals. Like any other institution having its own special purposes, the college must maintain conditions conducive to the effective performance of its functions.

To implement this objective, it is necessary to ensure that an environment is created wherein all students may progress in accordance with their capability and intensity of interest. The responsibility to create and maintain such an environment is shared by all members of the college community: students, faculty, staff and administration.

Upon registration, all students will receive a copy of the Bates Technical College Student Handbook which details Student Rights & Responsibilities and includes chapters of the Washington Administrative Code (WAC) pertaining to student conduct.

Conduct codes are subject to change. The most current code provisions are in the Washington State Register and available at http://apps.leg.wa.gov/WAC/default.aspx?dispo=true&cite=132E-120

### Family Educational Rights and Privacy Act (FERPA): Confidentiality of Student Records

In compliance with the Family Educational Rights and Privacy Act (FERPA) and the Washington Administrative Code, the following information is designated as directory information: student's name; program in which the student is registered; dates of attendance; date and place of birth; degrees and awards received; and most recent previous education agency or institution attended. Only designated members of the registration staff may disclose directory information.

The FERPA affords students certain rights with respect to their educational records:
(1) The right to inspect and review the student's education records within 45 days of the day the college receives a request for access;
(2) The right to request the amendment of information contained in the student's education records that the student believes is inaccurate or misleading;
(3) The right to consent to disclosures of personally identifiable information contained in the student's education records, except to the extent that FERPA authorizes disclosure without consent;
(4) The right to file a complaint with the U.S. Department of Education concerning alleged failures of the college to comply with the requirements of FERPA. Visit www.bates.ctc.edu/MyBates.

Directory information may be released by Bates Technical College without parental or student consent unless parents or adult students 18 years of age or older specifically request that such information not be released.

Bates Technical College does not release directory information for commercial purposes. Parents of students under age 18 or adult students currently attending Bates should complete a form in the registration office if they do not wish to have directory information released.

### Student Right To Know

The Federal Student Right-To-Know and Campus Security Act requires institutions of higher education to report the percentages of completion and graduation rates for students registered full time, first time entering college, and degree or certificate students. Title II of this law, the Crime Awareness and Campus Security Act of 1990, requires publication of campus crime statistics and campus security policies. The third part of the law requires disclosure of student loan default rates.

These and other important, relevant statistics for each program, each campus, and the entire college can be viewed on the following websites: nces.ed.gov/collegenavigator (completion and graduate rates), ope.ed.gov/security (campus security data), and www.ed.gov/about/offices/list/fsa/ (federal student aid).

Copies of these reports are also available in student services and the registrar's office. These reports reflect past student participation, completion rates, and placement wages ninety days after completion.

### Policy Prohibiting Hazing

Hazing is prohibited at Bates. Consistent with state law, hazing is defined as any method of initiation into a student organization or group that causes or is likely to cause bodily danger or physical, mental, or emotional harm.

Examples of prohibited activities, regardless of location, include but are not limited to: forced consumption of alcohol or drugs, excessive exercise, activities that may threaten an individual's health, or compelling individuals to engage in activities which violate Bates' Student Code of Rights and Responsibilities.

### Sexual Harassment Policy

All students must be allowed to learn in an environment free from sexual harassment. Sexual harassment may include unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature carried out by someone in the workplace or educational setting. Such behavior may offend the recipient, cause discomfort or humiliation, and interfere with job or school performance.

It is Bates' policy that sexual harassment is unacceptable conduct and will not be tolerated. Anyone violating this policy is subject to disciplinary procedures.

Bates is committed to communicating this policy to all staff and students, and to investigating and resolving promptly any complaints of sexual harassment. If a student feels his/her rights have been violated, he/she should contact the vice president of Student Services or the Vice President of Human Resources.

CHAPTER 4

# Degrees and Certificate Programs

# Administrative Medical Assistant

Students prepare for careers as integral members of a health care team in an outpatient setting. Competency-based activities in the program provide extensive hands-on practice for students in the use of computer application skills to create and handle medical information. Medical transcription and terminology, patient administrative services, and professional ethics are presented with emphasis on the billing procedures of the insurance industry. The program also provides extended learning opportunities for persons previously or currently employed in related professions. In addition, work-based learning experiences are available in many medical settings that support the theory presented in the classroom.

**Note:** Students must possess basic keyboarding/word processing skills prior to enrollment in the program.

**FACULTY**
Diane Goracke, 253.680.7372, dgoracke@bates.ctc.edu
www.bates.ctc.edu/AdminMedicalAssistant

**Certificate of Competency: 75 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ADMA | 101 | Introduction to the Health Care Profession | 5 |
| ADMA | 102 | Introduction to Medical Terminology | 4 |
| ADMA | 103 | Medical Transcription I | 3 |
| ADMA | 104 | Medical Office Procedures I | 3 |
| ADMA | 105 | Administrative Medical Procedures I | 4 |
| ADMA | 106 | Medical Terminology II | 4 |
| ADMA | 107 | Medical Office Procedures II | 3 |
| ADMA | 108 | Medical Transcription II | 4 |
| ADMA | 109 | Administrative Medical Procedures II | 4 |
| ADMA | 110 | Medical Terminology III | 4 |
| ADMA | 111 | Medical Insurance | 4 |
| ADMA | 112 | Medical Data Base | 2 |
| ADMA | 113 | Administrative Medical Procedures III | 4 |
| ADMA | 114 | Medical Terminology IV | 4 |
| ADMA | 115 | Coding | 5 |
| ADMA | 120 | Practical Applications * | 3 |

* This course may be substituted with a work-based learning component.

# Administrative Office Assistant

Students learn records management, grammar, business writing, professional ethics, and telephone techniques in preparation for jobs as office assistants, administrative assistants, secretaries, word processing specialists, and a variety of other office support positions. Students receive practical experience in several areas, including computer software technology, office procedures and accounting, and often gain work-based learning experience in temporary internships at local businesses or in residence at the college. The program also provides extended learning opportunities for persons previously or currently employed in related professions.

**FACULTY**
Sharon Netter, 253.680.7370, snetter@bates.ctc.edu

## Associate of Technology Degree: 105 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AOA | 101 | Professional Communications | 1 |
| AOA | 102 | Professional Office Procedures | 5 |
| AOA | 103 | Telecommunications | 1 |
| AOA | 104 | Office Lead | 1 |
| AOA | 105 | Keyboarding I | 5 |
| AOA | 106 | MS Windows | 3 |
| AOA | 108 | Records Management | 4 |
| AOA | 109 | Business Ethics | 2 |
| AOA | 110 | MS Word I | 5 |
| AOA | 111 | MS Outlook | 2 |
| AOA | 120 | Keyboarding II | 5 |
| AOA | 121 | MS Word II | 5 |
| AOA | 122 | Business Grammar I | 2 |
| AOA | 123 | Business Documentation | 5 |
| AOA | 124 | Business Presentations | 3 |
| AOA | 125 | Accounting Software | 2 |
| AOA | 201 | Beginning Accounting | 5 |
| AOA | 203 | MS Excel I | 5 |
| AOA | 204 | MS PowerPoint | 3 |
| AOA | 205 | MS Access I | 3 |
| AOA | 206 | Voice Recognition Software | 2 |
| AOA | 220 | Keyboarding III | |
| | | or | 5 |
| AOA | 231 | Machine Transcription | |
| AOA | 222 | Business Grammar II | 2 |
| AOA | 223 | MS Excel II | 5 |
| AOA | 224 | Desktop Publishing | 3 |
| AOA | 225 | MS Access II | 3 |
| AOA | 234 | Employment Preparation | 1 |
| AOA | 240 | Independent AOA Project * | 2 |

*This course may be substituted with a work-based learning component

## Certificate of Competency: 61 Credits

BASIC OFFICE SUPPORT

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AOA | 101 | Professional Communications | 1 |
| AOA | 102 | Professional Office Procedures | 5 |
| AOA | 103 | Telecommunications | 1 |
| AOA | 104 | Office Lead | 1 |
| AOA | 105 | Keyboarding I | 5 |
| AOA | 106 | MS Windows | 3 |
| AOA | 108 | Records Management | 4 |
| AOA | 109 | Business Ethics | 2 |
| AOA | 110 | MS Word I | 5 |
| AOA | 111 | MS Outlook | 2 |
| AOA | 120 | Keyboarding II | 5 |
| AOA | 122 | Business Grammar I | 2 |
| AOA | 123 | Business Documentation | 5 |
| AOA | 203 | MS Excel I | 5 |

## Certificate of Training: 19 Credits

OFFICE FUNDAMENTALS

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AOA | 101 | Professional Communications | 1 |
| AOA | 102 | Professional Office Procedures | 5 |
| AOA | 105 | Keyboarding I | 5 |
| AOA | 111 | MS Outlook | 2 |
| AOA | 110 | MS Word I | 5 |
| AOA | 234 | Employment Preparation | 1 |

# Architectural Woodworking/ Cabinet Making Technology

Students prepare for careers in cabinet making and millwork crafts, in positions such as wood pattern maker, cabinet maker, door assembler, solid surface fabricator, cabinet and millwork installer, project manager, sander, utility worker, wood pattern maker and machine operator. Shop activities are an integral part of the program and provide training and practical applications in complex joinery, finishing, and installation. Students work with wood and high-tech laminates, perform component design and fabrication, and learn the use of tools and equipment. This is a pre-apprenticeship program for the Seattle/Tacoma Millmen and Cabinet Makers Apprenticeship Committee. This program also provides extended learning opportunities for persons previously or currently employed in these and other related occupations.

## FACULTY

Steve Dziedziak, 253.680.7251, sdziedziak@bates.ctc.edu

### Associate of Technology Degree: 112 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ Level | | Human Relations | 5 |
| 100+ Level | | Communication | 5 |
| 100+ Level | | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ARWC | 101 | Introduction to Cabinetmaking | 3 |
| ARWC | 102 | Safety Principles | 4 |
| ARWC | 103 | Cabinetry Blueprints/Plans | 4 |
| ARWC | 104 | Materials | 2 |
| ARWC | 105 | Machine Tools I | 4 |
| ARWC | 106 | Machine Tools II | 4 |
| ARWC | 107 | Machine Tools \CNC | 3 |
| ARWC | 108 | Portable Power Tools | 3 |
| ARWC | 109 | Hand Tools | 3 |
| ARWC | 110 | Basic Cabinet Joinery | 4 |
| ARWC | 111 | Tool Maintenance/Sharpening | 3 |
| ARWC | 112 | Cabinetmaking/ Face Frame Construction I | 4 |
| ARWC | 113 | Cabinetmaking/ Face Frame Construction II | 4 |
| ARWC | 114 | Cabinetmaking/32mm System | 3 |
| ARWC | 115 | Finishing Methods I | 3 |
| ARWC | 116 | Drawers and Doors | 2 |
| ARWC | 117 | Laminates / Countertops /Solid Surface | 3 |
| ARWC | 118 | Occupational Math | 3 |
| ARWC | 119 | Jigs and Fixtures | 2 |
| ARWC | 120 | Cabinetmaking/Commercial Construction | 3 |
| ARWC | 201 | Wood Bending/Lamination Techniques | 3 |
| ARWC | 202 | Architectural Millwork | 3 |
| ARWC | 203 | Beginning Furniture Projects | 5 |
| ARWC | 204 | Cabinet Installation- Residential/Commercial | 4 |
| ARWC | 205 | Advanced Joinery | 4 |
| ARWC | 206 | Cabinetmaking Computer Technology | 4 |
| ARWC | 207 | Veneering Technology | 2 |
| ARWC | 208 | Employment Preparation | 3 |
| ARWC | 209 | Advanced Projects * | 5 |

*This course may be substituted with a work-based learning component.

### Certificate of Competency: 79 Credits

PRODUCTION CABINET MAKING

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ARWC | 101 | Introduction to Cabinetmaking | 3 |
| ARWC | 102 | Safety Principles | 4 |
| ARWC | 103 | Cabinetry Blueprints/Plans | 4 |
| ARWC | 104 | Materials | 2 |
| ARWC | 105 | Machine Tools I | 4 |
| ARWC | 106 | Machine Tools II | 4 |
| ARWC | 107 | Machine Tools \CNC | 3 |
| ARWC | 108 | Portable Power Tools | 3 |
| ARWC | 109 | Hand Tools | 3 |
| ARWC | 110 | Basic Cabinet Joinery | 4 |
| ARWC | 111 | Tool Maintenance/Sharpening | 3 |
| ARWC | 112 | Cabinetmaking/ Face Frame Construction I | 4 |
| ARWC | 113 | Cabinetmaking/ Face Frame Construction II | 4 |
| ARWC | 114 | Cabinetmaking/32mm System | 3 |
| ARWC | 115 | Finishing Methods I | 3 |
| ARWC | 116 | Drawers and Doors | 2 |
| ARWC | 117 | Laminates / Countertops /Solid Surface | 3 |
| ARWC | 118 | Occupational Math | 3 |
| ARWC | 119 | Jigs and Fixtures | 2 |
| ARWC | 120 | Cabinetmaking/Commercial Construction | 3 |

# Audio/Sound Technology

Students prepare for careers in the audio, video, film, television, and multimedia industries, specializing in the technical and creative aspects of audio and sound, in one of the few audio programs offered in Washington State. Career paths could include audio record mixer, audio specialist, audio and video equipment technician, sound engineering technician, sound recording engineers, and sound specialist. Employment opportunities may be found in commercial, industrial, and educational production and broadcast facilities. Students have the option of becoming certified broadcast technologists through the Society of Broadcast Engineers.

**FACULTY**

Willie Kelley, 253.680.7761, wkelley@bates.ctc.edu
www.bates.ctc.edu/AudioSoundTech

**Certificate of Competency: 49 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AUDIO | 109 | Characteristics of Sound | 2 |
| AUDIO | 110 | Introduction to Digital Systems | 2 |
| AUDIO | 113 | Studio Acoustics | 2 |
| AUDIO | 114 | Microphones | 3 |
| AUDIO | 201 | Introduction to Digital Audio Recording | 2 |
| AUDIO | 202 | Digital Audio Recording Techniques | 5 |
| AUDIO | 208 | Introduction to Audio Production Console | 1 |
| AUDIO | 206 | Audio Processing | 5 |
| AUDIO | 211 | Production Audio Preparation | 5 |
| AUDIO | 217 | Monitoring | 2 |
| AUDIO | 218 | Musical Instrumental Digital Interface (MIDI) | 1 |
| AUDIO | 219 | Audio Production Console Techniques | 4 |

# Auto Body Rebuilding & Refinishing

Students prepare for apprenticeship employment in the auto body rebuilding and refinishing industry, serving independent auto shops, automotive dealerships, government agencies, utility firms, and other companies that maintain vehicle fleets. Positions include auto body repairer, automotive refinisher, frame repairer, glass installer, painter, renovator, and shop estimator. Upon successful completion of the program, students can qualify to take the I-CAR steel welding qualification test. The program also provides extended learning opportunities for persons previously or currently employed in related professions.

**FACULTY**

Bill Byrn, 253.680.7458, bbyrn@bates.ctc.edu
Doug Yarbrough, 253.680.7457, dyarbrough@bates.ctc.edu

### Associate of Technology Degree: 116 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AUTOB | 101 | Auto Body Math Applications | 3 |
| AUTOB | 102 | Safety Principles | 3 |
| AUTOB | 103 | Materials Identification | 3 |
| AUTOB | 104 | Minor Body Repair Methods | 5 |
| AUTOB | 105 | Major Panel Replacement | 5 |
| AUTOB | 106 | Alignment – Sheet Metal | 5 |
| AUTOB | 107 | Alignment – Bumpers | 3 |
| AUTOB | 108 | Alignment – Head Lamps | 1 |
| AUTOB | 109 | Trim and Accessories | 3 |
| AUTOB | 110 | Window Mechanisms | 4 |
| AUTOB | 111 | Introduction to Surface Preparation | 2 |
| AUTOB | 112 | Surface Preparation Applications | 5 |
| AUTOB | 113 | Advanced Surface Preparations | 5 |
| AUTOB | 201 | Topcoat Systems | 5 |
| AUTOB | 202 | Topcoat Systems Applications | 5 |
| AUTOB | 203 | Shop Welding | 5 |
| AUTOB | 204 | Unibody Alignment | 5 |
| AUTOB | 205 | Body Over Frame Alignment | 4 |
| AUTOB | 206 | Glass Installation | 4 |
| AUTOB | 207 | Introduction to Plastic Repair | 2 |
| AUTOB | 208 | Plastic Repair Methods | 5 |
| AUTOB | 209 | Shop Management | 3 |
| AUTOB | 210 | Introduction to Estimating | 4 |
| AUTOB | 211 | Special Projects * | 4 |
| WBAS | 101 | Welding Basics | 8 |

*This course may be substituted with a work-based learning component.

### Certificate of Competency: 116 Credits

AUTO BODY REPAIR

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AUTOB | 101 | Auto Body Math Applications | 3 |
| AUTOB | 102 | Safety Principles | 3 |
| AUTOB | 103 | Materials Identification | 3 |
| AUTOB | 104 | Minor Body Repair Methods | 5 |
| AUTOB | 105 | Major Panel Replacement | 5 |
| AUTOB | 106 | Alignment ñ Sheet Metal | 5 |
| AUTOB | 107 | Alignment ñ Bumpers | 3 |
| AUTOB | 108 | Alignment ñ Head Lamps | 1 |
| AUTOB | 109 | Trim and Accessories | 3 |
| AUTOB | 110 | Window Mechanisms | 4 |
| AUTOB | 111 | Introduction to Surface Preparation | 2 |
| AUTOB | 112 | Surface Preparation Applications | 5 |
| AUTOB | 113 | Advanced Surface Preparations | 5 |
| AUTOB | 201 | Topcoat Systems | 5 |
| AUTOB | 202 | Topcoat Systems Applications | 5 |
| AUTOB | 203 | Shop Welding | 5 |
| AUTOB | 204 | Unibody Alignment | 5 |
| AUTOB | 205 | Body Over Frame Alignment | 4 |
| AUTOB | 206 | Glass Installation | 4 |
| AUTOB | 207 | Introduction to Plastic Repair | 2 |
| AUTOB | 208 | Plastic Repair Methods | 5 |
| AUTOB | 209 | Shop Management | 3 |
| AUTOB | 210 | Introduction to Estimating | 4 |
| AUTOB | 211 | Special Projects * | 4 |
| WBAS | 101 | Welding Basics | 8 |

*This course may be substituted with a work-based learning component.

### Certificate of Training: 20 Credits

AUTOMOTIVE REFINISHING

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AUTOB | 102 | Safety Principles | 3 |
| AUTOB | 111 | Introduction to Surface Preparation | 2 |
| AUTOB | 112 | Surface Preparation Applications | 5 |
| AUTOB | 201 | Topcoat Systems | 5 |
| AUTOB | 202 | Topcoat Systems Applications | 5 |

# Automotive Mechanic

In an active, campus auto service facility, students practice all aspects of the profession, from balancing tires to diagnosing engine problems. Using advanced computerized analyzers, students learn to perform repairs, overhaul engines and transmissions, service fuel injection systems, and much more. Bates' automotive program is certified by the National Automotive Technicians Education Foundation (NATEF) for both secondary and post-secondary levels. Bates' Automotive Mechanic program instructors are Evaluation Team Leaders for NATEF and evaluate other programs in the Puget Sound area for NATEF membership eligibility. Instruction is configured according to Automotive Service Excellence (ASE) certification requirements, and students are encouraged to take one or more ASE certification tests while completing the program.

**FACULTY**
Terry Shaffer, 253.680.7468, tshaffer@bates.ctc.edu

**Associate of Technology Degree: 142 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AUTOM | 101 | Basic Engines | 4 |
| AUTOM | 102 | Engine Systems | 4 |
| AUTOM | 103 | Basic Electrical Theory | 4 |
| AUTOM | 104 | Engines/Electrical Applications | 4 |
| AUTOM | 121 | Basic Engine Performance | 5 |
| AUTOM | 122 | Basic Ignition Systems | 5 |
| AUTOM | 123 | Introduction to Fuel Systems | 4 |
| AUTOM | 124 | Introduction to Emissions Systems | 2 |
| AUTOM | 125 | Introduction to Fuel Injection | 2 |
| AUTOM | 130 | Introduction to Lighting and Instruments | 4 |
| AUTOM | 131 | Introduction to Clutches and Manual Transmissions | 4 |
| AUTOM | 132 | Automatic Transmissions/Transaxles | 4 |
| AUTOM | 133 | Four and All-wheel Drive | 4 |
| AUTOM | 140 | Wheel Alignment and Steering Systems | 4 |
| AUTOM | 141 | Brake Systems | 4 |
| AUTOM | 142 | Disc and Drum Brakes | 4 |
| AUTOM | 143 | Heating and Air Conditioning Systems | 4 |
| AUTOM | 201 | Advanced Engine Repair | 5 |
| AUTOM | 202 | Engine Assembly | 3 |
| AUTOM | 203 | Automotive Electrical Systems | 4 |
| AUTOM | 204 | Battery, Starters, and Charging Systems | 4 |
| AUTOM | 220 | Ignition Systems Service | 4 |
| AUTOM | 221 | Fuel Systems Service | 4 |
| AUTOM | 222 | Emissions Systems Service | 3 |
| AUTOM | 223 | Fuel Injection | 3 |
| AUTOM | 230 | Lighting and Instrument Service | 3 |
| AUTOM | 231 | Clutches and Manual Transmission Service | 5 |
| AUTOM | 232 | Automatic Transmission and Transaxle Service | 4 |
| AUTOM | 233 | Four and All-Wheel Drive Service | 4 |
| AUTOM | 240 | Advanced Wheel Alignment and Steering Systems Service | 4 |
| AUTOM | 241 | Advanced Brake Service | 4 |
| AUTOM | 242 | Advanced Disc and Drum Brake Service | 4 |
| AUTOM | 243 | Applied HVAC Service | 3 |

# Automotive Parts/Inventory/ Warehousing

Instruction takes place in a warehouse environment and in a fully-operational vehicle parts and accessories store open to the general public, giving students the opportunity to gain hands-on experience in inventory merchandise, wholesale and retail customers and working with vehicle parts vendors. Employment opportunities may include inventory and stock specialist, vehicle parts counter person, warehouse and distribution specialist, inventory clerk, shipping and receiving clerk, shipping documentation specialist, stock merchandiser, procurement specialist, counter and accessories sales, parts managers, materials movement worker, forklift operator, order puller and loading dock worker.

**FACULTY**

Jeff Lovin, 253.680.7497, jlovin@bates.ctc.edu

### Certficate of Competency: 65 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| VPM | 101 | Applied Math | 40 |
| VPM | 106 | Material Movement | 2 |
| VPM | 107 | Storage and Distribution | 5 |
| VPM | 108 | Shipping and Receiving | 5 |
| VPM | 109 | Introduction to Vehicle Parts Merchandising | 5 |
| VPM | 110 | Principles of Inventory Control | 5 |
| VPM | 112 | Stock/Product Order | 4 |
| VPM | 115 | Principles of Salesmanship | 5 |
| VPM | 116 | Retail Point of Sale | 3 |
| VPM | 119 | Principles of Management | 5 |
| VPM | 120 | Employment Preparation | 3 |
| VPM | 121 | Retail Applications* | 3 |
| VPM | 122 | Warehouse Applications* | 3 |
| VPM | 123 | Stock Merchandising | 3 |
| VPM | 124 | Automotive Parts Systems | 4 |
| VPM | 125 | Product Research Systems | 4 |
| VPM | 126 | Returns, Exchanges, and POs | 2 |

*This course may be substituted with a work-based learning component.

### Certificate of Training: 17 Credits

INVENTORY/STOCK SPECIALIST

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| VPM | 109 | Introduction to Vehicle Parts Merchandising | 5 |
| VPM | 110 | Principles of Inventory Control | 5 |
| VPM | 112 | Stock/Product Order | 4 |
| VPM | 123 | Stock Merchandising | 3 |

### Certificate of Training: 29 Credits

VEHICLE PARTS COUNTER PERSON

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| VPM | 109 | Introduction to Vehicle Parts Merchandising | 5 |
| VPM | 116 | Retail Point of Sale | 3 |
| VPM | 119 | Principles of Management | 5 |
| VPM | 120 | Employment Preparation | 3 |
| VPM | 121 | Retail Applications* | 3 |
| VPM | 124 | Automotive Parts Systems | 4 |
| VPM | 125 | Product Research Systems | 4 |
| VPM | 126 | Returns, Exchanges, and POs | 2 |

*This course may be substituted with a work-based learning component.

### Certificate of Training: 24 Credits

WAREHOUSE/DISTRIBUTION SPECIALIST

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| VPM | 101 | Applied Math | 4 |
| VPM | 106 | Material Movement | 2 |
| VPM | 107 | Storage and Distribution | 5 |
| VPM | 108 | Shipping and Receiving | 5 |
| VPM | 109 | Introduction to Vehicle Parts Merchandising | 5 |
| VPM | 122 | Warehouse Applications* | 3 |

*This course may be substituted with a work-based learning component.

# Barber

Bates Technical College has the only college barber program in the State of Washington in which students prepare to become licensed barbers while learning in a stand-alone program and working in an on-campus shop that serves the public. Students are evaluated on the performance of each competency of the curriculum to ensure readiness to meet state licensure requirements and enter the profession. Prior to program completion, each student must take and pass a comprehensive written and practical examination that includes theoretical concepts. The program also provides extended learning opportunities for persons previously or currently employed in related professions.

**Note:** The minimum age for licensure as a barber in the State of Washington is 17 years of age.

**FACULTY**
Jeff Olson, 253.680.7248, jolson@bates.ctc.edu
www.bates.ctc.edu/Barber

**Certificate of Competency: 75 Credits**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BARB | 110 | Barbering Theory | 1 |
| BARB | 111 | Scalp and Hair Analysis | 2 |
| BARB | 112 | Shampooing | 3 |
| BARB | 113 | Decontamination and Infection Control | 5 |
| BARB | 114 | Introduction to Barbering | 5 |
| BARB | 115 | Safety/First Aid | 2 |
| BARB | 116 | Basic Haircutting Techniques | 4 |
| BARB | 117 | Customer Service | 3 |
| BARB | 118 | Applied Communications | 3 |
| BARB | 120 | Math for Barbers | 3 |
| BARB | 121 | Facial Hair | 5 |
| BARB | 122 | Barbering Applications | 5 |
| BARB | 123 | Intermediate Haircutting Techniques | 3 |
| BARB | 124 | Haircutting Applications | 5 |
| BARB | 125 | Applied Human Relations | 3 |
| BARB | 131 | Advanced Techniques | 4 |
| BARB | 132 | Advanced Applications | 4 |
| BARB | 133 | Cutting and Styling Methods | 4 |
| BARB | 134 | Cutting and Styling Applications | 5 |
| BARB | 135 | Hair Styling | 2 |
| BARB | 136 | Artificial Hair Services | 2 |
| BARB | 137 | Practical Applications* | 2 |

*This course may be substituted with a work-based learning component.

# Biomedical Equipment Service Technician: Clinical Engineering

Health care, the largest industry in the country, employs more than 14 million people, and figures continues to mount. From small-town private practices to mammoth inner-city hospitals, health care workers are in high demand. The patients in those practices and hospitals depend not only on the expertise of doctors and nurses, but on the proper functioning of sophisticated biomedical equipment. The people responsible for repairing and maintaining these highly specialized machines and instruments such as defibrillators, heart monitors, electric wheelchairs, medical imaging equipment (x rays, CAT scanners, and ultrasound equipment), are biomedical service technicians. They inspect and install equipment used by doctors, nurses, and other healthcare providers for researching, monitoring, diagnosing, and treating illnesses and disorders. They also repair, calibrate, and safety test the equipment in order to ensure proper function and safety for both the operator and the patient.

**FACULTY**

Art Cutting, 253.680.7252, acutting@bates.ctc.edu
Keith Hawkins, 253.680.7212, khawkins@bates.ctc.edu
www.bates.ctc.edu/Biomedical

**Associate of Technology Degree: 118 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BMST | 101 | Safety Principles | 4 |
| BMST | 102 | Blood borne Pathogens | 3 |
| BMST | 103 | HIPAA | 2 |
| BMST | 104 | Applied Math | 4 |
| EEST | 103 | Electronics Principles I | 5 |
| EEST | 104 | DC Electronics | 4 |
| EEST | 105 | AC Electronics | 5 |
| EEST | 106 | Capacitors | 4 |
| EEST | 107 | Electronics Principles II | 5 |
| EEST | 108 | Amplifiers and Transistors | 4 |
| EEST | 109 | Electronic Devices | 2 |
| EEST | 110 | Introduction to Programmable Logic Controllers | 5 |
| EEST | 201 | Electronic Principles - Automation | 5 |
| EEST | 202 | Antenna and Satellite Systems | 3 |
| EEST | 203 | Magnetic and Laser Media | 3 |
| EEST | 204 | RF Receivers and Audio Amps | 4 |
| BMST | 105 | Testing Equipment | 5 |
| BMST | 106 | Soldering | 2 |
| BMST | 107 | Schematics | 3 |
| BMST | 109 | Applied Service I | 3 |
| BMST | 110 | Applied Service II | 2 |
| BMST | 119 | Medical Equipment Reseach I | 1 |
| BMST | 201 | Imaging Systems | 3 |
| BMST | 204 | Basic A&P for Biomedical Technology | 4 |
| BMST | 215 | Introduction to Medical Terminology | 3 |
| BMST | 217 | Biomedical Instrumentation | 5 |
| BMST | 218 | Biomedical Equipment | 3 |
| BMST | 219 | Medical Equipment Research II | 2 |
| BMST | 220 | Biomedical Engineering Applications * | 5 |

*This course may be substituted with a work-based learning component.

# Biotechnology Lab Technician

Biotechnology is the use of genetically engineered cells to produce useful products including medicines, food additives and DNA testing. It also includes mapping of the human genome and learning how genes interact to make us who we are. Students in this program prepare for careers as technicians in labs, manufacturing facilities and media. Other employment areas include diagnostics and testing, genetic research, production and manufacturing, quality assurance, scientific product sales, and tissue culture and micro rogation.

**FACULTY**
Sheryl Horstman, 253.680.7470, shorstman@bates.ctc.edu
www.bates.ctc.edu/Biotechnology

**Associate of Technology Degree:**
**AAS-T Degree - Biomanufacturing: Credits 117**
**AAS-T Degree – Tissue Culture/Contemporary Issues : Credits 117**
**AAS-T Degree – Flow Cytometry: Credits 117**
**AT Degree - Biomanufacturing: Credits 112**
**AT Degree – Tissue Culture/Contemporary Issues: Credits 112**
**AT Degree – Flow Cytometry: Credits 112**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Mathematics | 5 |
| ENGL& | 101 | English Composition I | 5 |
| BIOL& | 160 | Biology | 5 |
| BIOL& | 222 | Molecular, Cellular, and Developmental Biology | 5 |
| BIOL& | 260 | Microbiology | 5 |
| CHEM& | 121 | Introduction to Chemistry | 5 |
| CHEM& | 141 | Chemistry | 5 |
| Elective | | *Humanities/Social Sciences (See list.) (AAS-T Only) | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BTECH | 110 | Basic Laboratory Safety | 2 |
| BTECH | 111 | Biohazard Abatement | 2 |
| BTECH | 112 | Hazardous Chemicals | 2 |
| BTECH | 113 | Introduction to Biotechnology I | 5 |
| BTECH | 120 | Introduction to Biotechnology II | 5 |
| BTECH | 121 | Media and Solutions | 4 |
| BTECH | 130 | Employment Preparation | 3 |
| BTECH | 131 | Laboratory Management | 4 |
| BTECH | 132 | Ethics and Science | 3 |
| BTECH | 210 | Journal Club | 4 |
| BTECH | 211 | Tissue and Cell Culture | 5 |
| BTECH | 212 | Advanced Laboratory Management | 3 |
| BTECH | 220 | Introduction to Molecular Techniques | 5 |
| BTECH | 221 | Protein Purification and Analysis I | 5 |

Students must choose one option:

**Option A: Biomanufacturing**

| | | | |
|---|---|---|---|
| BTECH | 230 | Biomanufacturing I: Regulatory Compliance | 4 |
| BTECH | 231 | Biomanufacturing II : Upstream Manufacturing Processes | 4 |
| BTECH | 232 | Biomanufacturing III: Downstream Manufacturing Processes | 4 |
| BTECH | 233 | Principles of Biomolecule Isolation | 3 |

**Option B: Tissue Culture/Contemporary Issues**

| | | | |
|---|---|---|---|
| BTECH | 240 | Plant Tissue Culture | 5 |
| BTECH | 241 | Tissue and Cell Culture | 5 |
| BTECH | 242 | Advanced Projects: Plant Tissue Culture | 5 |

**Option C: Flow Cytometry**

| | | | |
|---|---|---|---|
| BTECH | 250 | Topics in Immunology | 5 |
| BTECH | 251 | Advanced Projects: Immunology | 2 |
| BTECH | 252 | Flow Cytometry | 5 |
| BTECH | 253 | Advanced Projects: Flow Cytometry | 3 |

Students must choose any three of the following courses.

| | | | |
|---|---|---|---|
| BTECH | 260 | Advanced Projects: Flow Cytometry* | 5 |
| BTECH | 261 | Advanced Projects: Advanced Molecular Techniques* | 5 |
| BTECH | 262 | Advanced Projects: Laboratory Management* | 5 |
| BTECH | 263 | Advanced Projects: Immunology* | 5 |
| BTECH | 264 | Advanced Projects: Genetics* | 5 |
| BTECH | 265 | Advanced Projects: Mammalian Tissue Culture* | 5 |

*This course may be substituted with a work-based learning component.

**SOCIAL SCIENCES/HUMANITIES ELECTIVES LIST**
Students must choose one course from the following list:

| | | |
|---|---|---|
| ART& | 100 | Art Appreciation (WAOL) |
| CMST& | 210 | Interpersonal Communication |
| CMST& | 220 | Public Speaking |
| HIST | 101 | History of Science and Technology |
| PSYC& | 100 | General Psychology |
| SOC& | 101 | Introduction to Sociology (WAOL) |
| SOC | 111 | Understanding Diversity |

**Certificate of Competency: 90 Credits**
**BIOTECHNOLOGY LAB TECHNICIAN**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Mathematics | 5 |
| 90+ | Level | Communications | 5 |
| BIOL& | 160 | Biology | 5 |
| BIOL& | 222 | Molecular, Cellular, and Developmental Biology | 5 |
| BIOL& | 260 | Microbiology | 5 |
| CHEM& | 121 | Introduction to Chemistry | 5 |
| CHEM& | 141 | Chemistry | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BTECH | 100 | Basic Laboratory Safety | 2 |
| BTECH | 111 | Biohazard Abatement | 2 |
| BTECH | 112 | Hazardous Chemicals | 2 |
| BTECH | 113 | Introduction to Biotechnology I | 5 |
| BTECH | 120 | Introduction to Biotechnology II | 5 |
| BTECH | 121 | Media and Solutions | 4 |
| BTECH | 211 | Tissue and Cell Culture | 5 |
| BTECH | 220 | Introduction to Molecular Techniques | 5 |
| BTECH | 221 | Protein Purification and Analysis | 5 |

Students must choose one option:

**Option A: Biomanufacturing**

| | | | |
|---|---|---|---|
| BTECH | 230 | Biomanufacturing I: Regulatory Compliance | 4 |
| BTECH | 231 | Biomanufacturing II : Upstream Manufacturing Processes | 4 |
| BTECH | 232 | Biomanufacturing III: Downstream Manufacturing Processes | 4 |
| BTECH | 233 | Principles of Biomolecule Isolation | 3 |

**Option B: Tissue Culture/Contemporary Issues**

| | | | |
|---|---|---|---|
| BTECH | 240 | Plant Tissue Culture | 5 |
| BTECH | 241 | Tissue and Cell Culture | 5 |
| BTECH | 242 | Advanced Projects: Plant Tissue Culture | 5 |

**Biotechnology Lab Technician (continued)**

Option C: Flow Cytometry

| | | | |
|---|---|---|---|
| BTECH | 250 | Topics in Immunology | 5 |
| BTECH | 251 | Advanced Projects: Immunology | 2 |
| BTECH | 252 | Flow Cytometry | 5 |
| BTECH | 253 | Advanced Projects: Flow Cytometry | 3 |

**Certificate of Training: 15 Credits**

BIOMANUFACTURING

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BTECH | 230 | Biomanufacturing I: Regulatory Compliance | 3 |
| BTECH | 231 | Biomanufacturing II : Upstream Manufacturing Processes | 5 |
| BTECH | 232 | Biomanufacturing III: Downstream Manufacturing Processes | 5 |
| BTECH | 233 | Principles of Biomolecule Isolation | 2 |

**Certificate of Training: 15 Credits**

TISSUE CULTURE

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BTECH | 240 | Plant Tissue Culture | 5 |
| BTECH | 241 | Tissue and Cell Culture | 5 |
| BTECH | 242 | Advanced Projects: Plant Tissue Culture | 5 |

**Certificate of Training: 15 Credits**

FLOW CYTOMETRY

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BTECH | 250 | Topics in Immunology | 5 |
| BTECH | 251 | Advanced Projects: Immunology | 2 |
| BTECH | 252 | Flow Cytometry | 5 |
| BTECH | 253 | Advanced Projects: Flow Cytometry | 3 |

# Boat Building

Students prepare for apprentice-level employment in the boat building industry, filling positions in shipyards, marinas, and private boat building companies. Students obtain experience, through extensive hands-on training, in the construction of wood and fiberglass boats and are prepared for employment as aluminum fabricators, fiberglass laminators, wood and fiberglass toolmakers, joiners, and marine carpenters. The program also provides extended learning opportunities for persons previously or currently employed in the industry.

**FACULTY**
Chuck Graydon, 253.680.7439, cgraydon@bates.ctc.edu
www.bates.ctc.edu/Boatbuilding

## Associate of Technology Degree: 105-118 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communicationsv | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BOATS | 101 | Industrial and Shop Safety | 3 |
| BOATS | 102 | Tools, Materials, and Fasteners | 3 |
| BOATS | 103 | Shop Math and Planning | 3 |
| BOATS | 104 | Woodworking Lab | 5 |
| BOATS | 105 | Line Drawing | 3 |
| BOATS | 106 | Templates | 3 |
| BOATS | 107 | Scale Modeling | 6 |
| BOATS | 108 | Damage Assessment | 3 |
| BOATS | 109 | Documentation | 3 |
| BOATS | 110 | Repair Techniques | 5 |
| BOATS | 111 | Vessel Documentation and Research | 3 |
| BOATS | 112 | Vessel Stabilization | 3 |
| BOATS | 113 | Restoration Techniques | 6 |
| BOATS | 120 | Practical Applications* | 2 |

Students must choose one option:

**Option A: Boatbuilding**

| | | | |
|---|---|---|---|
| BOATS | 201 | Full-Sized Lofting | 3 |
| BOATS | 202 | Bevel Calculation | 3 |
| BOATS | 203 | Construction Drawing | 3 |
| BOATS | 204 | Line Pickup | 3 |
| BOATS | 205 | Planning Methods | 3 |
| BOATS | 206 | Component Fabrication | 3 |
| BOATS | 207 | Building Setup | 6 |
| BOATS | 208 | Framing | 6 |
| BOATS | 209 | Hull Fabrication | 6 |
| BOATS | 210 | Fitting-Out | 6 |
| BOATS | 211 | Rigging and Systems | 6 |
| BOATS | 220 | Practical Applications* | 4 |

**Option B: Marine Interior Joiner and Deckhouse**

| | | | |
|---|---|---|---|
| BOATS | 212 | Planning/Layout | 3 |
| BOATS | 213 | Mockups | 6 |
| BOATS | 214 | Joinery Methods | 3 |
| BOATS | 215 | Parts Fabrication | 6 |
| BOATS | 216 | Veneers and Laminates | 3 |
| BOATS | 217 | Pre-Assembly Methods | 4 |
| BOATS | 218 | Hardware Installation Methods | 4 |
| BOATS | 219 | Final Assembly | 4 |
| BOATS | 221 | Practical Applications* | 3 |

*This course may be substituted with a work-based learning component.

## Certificate of Competency: 105-118 Credits

BOAT BUILDER

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BOATS | 101 | Industrial and Shop Safety | 3 |
| BOATS | 102 | Tools, Materials, and Fasteners | 3 |
| BOATS | 103 | Shop Math and Planning | 3 |
| BOATS | 104 | Woodworking Lab | 5 |
| BOATS | 105 | Line Drawing | 3 |
| BOATS | 106 | Templates | 3 |
| BOATS | 107 | Scale Modeling | 6 |
| BOATS | 108 | Damage Assessment | 3 |
| BOATS | 109 | Documentation | 3 |
| BOATS | 110 | Repair Techniques | 5 |
| BOATS | 111 | Vessel Documentation and Research | 3 |
| BOATS | 112 | Vessel Stabilization | 3 |
| BOATS | 113 | Restoration Techniques | 6 |
| BOATS | 120 | Practical Applications* | 2 |

Students must choose one option:

**Option A: Boatbuilding**

| | | | |
|---|---|---|---|
| BOATS | 201 | Full-Sized Lofting | 3 |
| BOATS | 202 | Bevel Calculation | 3 |
| BOATS | 203 | Construction Drawing | 3 |
| BOATS | 204 | Line Pickup | 3 |
| BOATS | 205 | Planning Methods | 3 |
| BOATS | 206 | Component Fabrication | 3 |
| BOATS | 207 | Building Setup | 6 |
| BOATS | 208 | Framing | 6 |
| BOATS | 209 | Hull Fabrication | 6 |
| BOATS | 210 | Fitting-Out | 6 |
| BOATS | 211 | Rigging and Systems | 6 |
| BOATS | 220 | Practical Applications* | 4 |

**Option B: Marine Interior Joiner and Deckhouse**

| | | | |
|---|---|---|---|
| BOATS | 212 | Planning/Layout | 3 |
| BOATS | 213 | Mockups | 6 |
| BOATS | 214 | Joinery Methods | 3 |
| BOATS | 215 | Parts Fabrication | 6 |
| BOATS | 216 | Veneers and Laminates | 6 |
| BOATS | 217 | Pre-Assembly Methods | 4 |
| BOATS | 218 | Hardware Installation Methods | 4 |
| BOATS | 219 | Final Assembly | 4 |
| BOATS | 221 | Practical Applications* | 3 |

*This course may be substituted with a work-based learning component.

**Boat Building (continued)**

### Certificate of Training: 14 Credits

INTRODUCTION TO WOODWORKING

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BOATS | 101 | Industrial and Shop Safety | 3 |
| BOATS | 102 | Tools, Materials, and Fasteners | 3 |
| BOATS | 103 | Shop Math and Planning | 3 |
| BOATS | 104 | Woodworking Lab | 5 |

### Certificate of Training: 12 Credits

SCALE MODELING

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BOATS | 105 | Line Drawing | 3 |
| BOATS | 106 | Templates | 3 |
| BOATS | 107 | Scale Modeling | 6 |

### Certificate of Training: 19 Credits

BOAT REPAIR

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BOATS | 108 | Damage Assessment | 3 |
| BOATS | 109 | Documentation | 3 |
| BOATS | 110 | Repair Techniques | 5 |
| WBAS | 101 | Welding Basics | 8 |

### Certificate of Training: 12 Credits

VESSEL RESTORATION

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| BOATS | 111 | Vessel Documentation and Research | 3 |
| BOATS | 112 | Vessel Stabilization | 3 |
| BOATS | 113 | Restoration Techniques | 6 |

# Broadcasting/Audio/Video Production

The broadcasting curriculum has been examined by and meets the requirements of the Society of Broadcast Engineers (SBE). Students are encouraged to test for the SBE certification upon completion of the program. Four options are offered:
**Broadcast Operations** includes on-air master control, content storage, playback operations, and editing; satellite downlink operations; operations/systems technician; automation technician; and VIS (visual information specialist).
**Broadcast Engineering** includes transmitter/microwave operations; video server/non-linear editing; technical training to support electronic news, sports, and field productions; transcoding and compression systems; broadcast equipment installation, maintenance, operation; and the technical training to support electronic news, sports and field productions.
**Video Production** includes planning and script development; lighting; set design and construction; camera operation; sound mixing; technical directing; content editing; graphics generation; and equipment training to support studio and remote production.
**Audio/Sound** includes careers in the audio, video, film, television, and multimedia industries, specializing in the technical and creative aspects of audio and sound .

**FACULTY**
Willie Kelley, 253.680.7761, wkelley@bates.ctc.edu
Roland Robinson, 253.680.7754, rrobinson@bates.ctc.edu
Mike Scott, 253.680.7756, mscott@bates.ctc.edu
www.bates.ctc.edu/Broadcasting

## Associate Degree: 118-120 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED CORE FOR ALL OPTIONS | | | |
|---|---|---|---|
| BROAD | 101 | Safety Principles | 1 |
| BROAD | 102 | Introduction to Broadcast and Media Careers | 3 |
| BROAD | 105 | Broadcast Electronics Theory | 5 |
| BROAD | 106 | Applied Electronics | 3 |
| BROAD | 107 | Electronic Concepts | 5 |
| BROAD | 108 | Electronic Principles | 5 |
| BROAD | 111 | Master Control Operations I | 5 |
| BROAD | 117 | Program Editing I | 3 |
| BROAD | 118 | Control Room Equipment I | 3 |
| BROAD | 119 | Basic Maintenance and Troubleshooting | 3 |
| BROAD | 121 | Production Process Theory | 3 |
| BROAD | 123 | Introduction to Broadcast Systems | 3 |
| BROAD | 125 | Video Tape | 3 |
| BROAD | 126 | Elements of Audio I | 3 |
| BROAD | 127 | Production Editing I | 3 |
| BROAD | 128 | Employment Preparation | 3 |
| BROAD | 129 | Audio Techniques | 4 |
| BROAD | 133 | Communications Management | 3 |
| Electives | | Choose from approved electives list. | 8 |

Students must choose one option:

| Option A: Engineering | | | Credits |
|---|---|---|---|
| BROAD | 201 | Analog Systems I | 3 |
| BROAD | 202 | Advanced Broadcast Formats | 3 |
| BROAD | 203 | Introduction to Digital Systems | 2 |
| BROAD | 209 | AC/DC Circuits | 5 |
| BROAD | 210 | AC/DC Applications | 4 |
| BROAD | 217 | Audio Engineering | 5 |
| BROAD | 219 | Video Engineering | 4 |
| BROAD | 285 | Practicum I * | 5 |
| Electives | | Choose from approved electives list. | 3-5 |

| Option B: Operations | | | |
|---|---|---|---|
| BROAD | 221 | Satellite Communications | 2 |
| BROAD | 223 | Systems Maintenance | 5 |
| BROAD | 231 | Broadcast Station Operations | 5 |
| BROAD | 237 | Control Room Equipment II | 5 |
| BROAD | 243 | Master Control Operations II | 5 |
| BROAD | 248 | Network Storage and Control | 4 |
| BROAD | 286 | Practicum II * | 5 |
| Electives | | Choose from approved electives list. | 3-5 |

| Option C: Production | | | |
|---|---|---|---|
| BROAD | 251 | Introduction to the TV Process | 3 |
| BROAD | 252 | TV Production Applications | 5 |
| BROAD | 254 | Principles of Lighting | 5 |
| BROAD | 255 | Lighting Techniques | 5 |
| BROAD | 260 | Studio Camera Equipment | 3 |
| BROAD | 262 | Set Design | 3 |
| BROAD | 267 | Production Editing II | 2 |
| BROAD | 287 | Practicum III * | 5 |
| Electives | | Choose from approved electives list. | 3-5 |

| Option D: Audio/Sound | | | |
|---|---|---|---|
| AUDIO | 109 | Characteristics of Sound | 2 |
| AUDIO | 110 | Introduction to Digital Systems | 2 |
| AUDIO | 113 | Studio Acoustics | 2 |
| AUDIO | 114 | Microphones | 3 |
| AUDIO | 201 | Introduction to Digital Audio Recording | 2 |
| AUDIO | 202 | Digital Audio Recording Techniques | 5 |
| AUDIO | 208 | Introduction to Audio Production Console | 1 |
| AUDIO | 206 | Audio Processing | 5 |
| AUDIO | 211 | Production Audio Preparation | 5 |
| AUDIO | 217 | Monitoring | 2 |
| AUDIO | 218 | Musical Instrumental Digital Interface (MIDI) | 1 |
| AUDIO | 219 | Audio Production Console Techniques | 4 |

**Credit totals for Associate Degree:**

| | |
|---|---|
| At Degree - Engineering | 118-120 |
| AT Degree - Operations | 118-120 |
| AT Degree - Productions | 118-120 |
| AT Degree – Audio/Sound | 118 |

**Broadcasting/Audio/Video Production (continued)**

## Certificate of Competency: 84 Credits

**BROADCAST AND VIDEO ELEMENTS**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| BROAD | 101 | Safety Principles | 1 |
| BROAD | 102 | Introduction to Broadcast and Media Careers | 3 |
| BROAD | 105 | Broadcast Electronics Theory | 5 |
| BROAD | 106 | Applied Electronics | 3 |
| BROAD | 107 | Electronic Concepts | 5 |
| BROAD | 108 | Electronic Principles | 5 |
| BROAD | 111 | Master Control Operations I | 5 |
| BROAD | 117 | Program Editing I | 3 |
| BROAD | 118 | Control Room Equipment I | 3 |
| BROAD | 119 | Basic Maintenance and Troubleshooting | 3 |
| BROAD | 121 | Production Process Theory | 3 |
| BROAD | 123 | Introduction to Broadcast Systems | 3 |
| BROAD | 125 | Video Tape | 3 |
| BROAD | 126 | Elements of Audio I | 3 |
| BROAD | 127 | Production Editing I | 3 |
| BROAD | 128 | Employment Preparation | 3 |
| BROAD | 129 | Audio Techniques | 4 |
| BROAD | 133 | Communications Management | 3 |
| Electives: Choose from approved electives list. | | | 8 |

## Certificate of Competency: 49 Credits

**AUDIO/SOUND TECHNOLOGY**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| AUDIO | 109 | Characteristics of Sound | 2 |
| AUDIO | 110 | Introduction to Digital Systems | 2 |
| AUDIO | 113 | Studio Acoustics | 2 |
| AUDIO | 114 | Microphones | 3 |
| AUDIO | 201 | Introduction to Digital Audio Recording | 2 |
| AUDIO | 202 | Digital Audio Recording Techniques | 5 |
| AUDIO | 208 | Introduction to Audio Production Console | 1 |
| AUDIO | 206 | Audio Processing | 5 |
| AUDIO | 211 | Production Audio Preparation | 5 |
| AUDIO | 217 | Monitoring | 2 |
| AUDIO | 218 | Musical Instrumental Digital Interface (MIDI) | 1 |
| AUDIO | 219 | Audio Production Console Techniques | 4 |

| ELECTIVES LIST | | | Credits |
|---|---|---|---|
| AUDIO | 109 | Characteristics of Sound | 2 |
| AUDIO | 111 | Basic Maintenance and Troubleshooting | 3 |
| AUDIO | 113 | Studio Acoustics | 2 |
| AUDIO | 114 | Microphones | 3 |
| AUDIO | 201 | Introduction to Digital Audio Recording | 2 |
| AUDIO | 202 | Digital Audio Recording Techniques | 5 |
| AUDIO | 204 | Studio Operations | 4 |
| AUDIO | 205 | Synchronization | 2 |
| AUDIO | 210 | Amplification | 2 |
| | | | |
| BROAD | 111 | Master Control Operations I | 5 |
| BROAD | 118 | Control Room Equipment I | 3 |
| BROAD | 126 | Elements of Audio I | 3 |
| BROAD | 129 | Audio Techniques | 4 |
| BROAD | 133 | Communications Management | 3 |
| BROAD | 204 | Introduction to Operating Systems | 3 |
| BROAD | 205 | Receivers/Transmitters | 5 |
| BROAD | 206 | Power and Communication Systems | 3 |
| BROAD | 207 | Advanced Editing Projects | 5 |
| BROAD | 213 | Digital Television Standards | 3 |
| BROAD | 215 | ATSC Formats and Transcoding | 2 |
| BROAD | 221 | Satellite Communications | 2 |
| BROAD | 223 | Systems Maintenance | 5 |
| BROAD | 225 | Installation and Maintenance Methods | 4 |
| BROAD | 227 | DTV Trans-Systems /8VSB | 4 |
| BROAD | 229 | Compression MPEG-II & AC-3 | 2 |
| BROAD | 245 | Non-Linear Editing / Format and Systems | 4 |
| BROAD | 247 | Program Editing II | 5 |
| BROAD | 261 | Studio Camera Operations | 5 |
| BROAD | 265 | Field Production | 7 |
| BROAD | 267 | Production Editing II | 2 |
| BROAD | 272 | Introduction to Video Graphics | 5 |
| BROAD | 273 | Video Graphics Applications | 5 |
| BROAD | 276 | Technical Directing I | 6 |
| BROAD | 277 | Technical Systems Methods | 6 |
| BROAD | 281 | Introduction to Digital TV | 2 |
| BROAD | 282 | Introduction to Video Formats | 3 |
| BROAD | 283 | Emerging Technologies | 3 |
| BROAD | 288 | Practicum IV * | 5 |
| BROAD | 289 | Practicum V * | 5 |
| BROAD | 290 | Practicum VI * | 5 |
| | | | |
| DIGIT | 101 | Digital Imaging | 2 |
| DIGIT | 102 | Image Editing | 5 |
| DIGIT | 103 | Graphic Generation I | 5 |
| DIGIT | 104 | Introduction to Computers | 5 |
| DIGIT | 120 | Introduction to Digital Media Concepts | 4 |
| DIGIT | 121 | Pre-production Process | 5 |
| DIGIT | 122 | Production Process | 4 |
| DIGIT | 123 | Post-production Process | 4 |
| DIGIT | 130 | Non-linear Editing | 3 |
| DIGIT | 131 | Editing Process | 3 |
| DIGIT | 132 | Digital Media – Video | 5 |
| DIGIT | 133 | Advanced Editing Project | 5 |
| DIGIT | 140 | Copyright and Ethics | 2 |
| DIGIT | 141 | Composition Design | 5 |
| DIGIT | 142 | Composition Applications | 5 |
| DIGIT | 143 | Digital Media – Animation | 5 |
| DIGIT | 145 | Digital Media – Audio | 5 |
| DIGIT | 210 | Capstone Project: Pre-production Process | 5 |
| DIGIT | 211 | Capstone Project: Production Process | 5 |
| DIGIT | 212 | Capstone Project: Post-production Process | 5 |

*This course may be substituted with a work-based learning component.

# Carpentry

Students prepare for apprenticeship employment in the construction industry, filling positions such as carpenter, framer, concrete worker, and interior and exterior finisher. Off-campus building and remodeling projects provide opportunities for extensive practical training, giving students valuable experience in the trade, from estimating construction projects through all phases of construction. This is a pre-apprenticeship program for the South Puget Sound Carpenters Joint Apprenticeship Training Committee.

**FACULTY**

Chris Buselmeier, 253.680.7453, cbuselmeier@bates.ctc.edu
www.bates.ctc.edu/Carpentry

## Associate of Technology Degree: 120 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARPT | 101 | Carpentry Math | 3 |
| CARPT | 102 | Safety Principles | 3 |
| CARPT | 103 | Prints and Plans | 4 |
| CARPT | 104 | Construction Materials | 2 |
| CARPT | 105 | Tools and Equipment | 4 |
| CARPT | 106 | Power Tools | 5 |
| CARPT | 107 | Optical Instruments | 3 |
| CARPT | 108 | Plot Plans and Building Layout | 3 |
| CARPT | 109 | Introduction to Framing | 4 |
| CARPT | 110 | Foundation | 3 |
| CARPT | 111 | Foundation Footings | 3 |
| CARPT | 112 | Foundation Walls | 5 |
| CARPT | 201 | Floor Systems | 5 |
| CARPT | 202 | Wall and Ceiling Construction | 5 |
| CARPT | 203 | Stairs | 3 |
| CARPT | 204 | Introduction to Roofing | 3 |
| CARPT | 205 | Roof Construction | 5 |
| CARPT | 206 | Introduction to Exterior Finish Methods | 4 |
| CARPT | 207 | Exterior Doors and Windows | 5 |
| CARPT | 208 | Siding | 5 |
| CARPT | 209 | Introduction to Interior Finish Methods | 3 |
| CARPT | 210 | Interior Floors, Walls, and Ceilings | 4 |
| CARPT | 211 | Interior Doors and Windows | 5 |
| CARPT | 212 | Moldings | 4 |
| CARPT | 213 | Employment Preparation | 2 |
| CARPT | 215 | Practical Applications* | 2 |
| WBAS | 101 | Welding Basics | 8 |

*This course may be substituted with a work-based learning component.

## Certificate of Competency: 77 Credits

CARPENTRY TECHNICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARPT | 101 | Carpentry Math | 3 |
| CARPT | 102 | Safety Principles | 3 |
| CARPT | 103 | Prints and Plans | 4 |
| CARPT | 104 | Construction Materials | 2 |
| CARPT | 105 | Tools and Equipment | 4 |
| CARPT | 106 | Power Tools | 5 |
| CARPT | 110 | Foundation | 3 |
| CARPT | 111 | Foundation Footings | 3 |
| CARPT | 112 | Foundation Walls | 5 |
| CARPT | 201 | Floor Systems | 5 |
| CARPT | 202 | Wall and Ceiling Construction | 5 |
| CARPT | 203 | Stairs | 3 |
| CARPT | 205 | Roof Construction | 5 |
| CARPT | 208 | Siding | 5 |
| CARPT | 211 | Interior Doors and Windows | 5 |
| CARPT | 215 | Practical Applications* | 2 |

*This course may be substituted with a work-based learning component.

## Certificates of Training

CONCRETE FOUNDATIONS: 14 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARPT | 108 | Plot Plans and Building Layout | 3 |
| CARPT | 110 | Foundation | 3 |
| CARPT | 111 | Foundation Footings | 3 |
| CARPT | 112 | Foundation Walls | 5 |

EXTERIOR FINISHING: 22 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARPT | 204 | Introduction to Roofing | 3 |
| CARPT | 205 | Roof Construction | 5 |
| CARPT | 206 | Introduction to Exterior Finish Methods | 4 |
| CARPT | 207 | Exterior Doors and Windows | 5 |
| CARPT | 208 | Siding | 5 |

INTERIOR FINISHING: 16 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARPT | 209 | Introduction to Interior Finish Methods | 3 |
| CARPT | 210 | Interior Floors, Walls, and Ceilings | 4 |
| CARPT | 211 | Interior Doors and Windows | 5 |
| CARPT | 212 | Moldings | 4 |

WOOD FRAMING: 22 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARPT | 109 | Introduction to Framing | 4 |
| CARPT | 201 | Floor Systems | 5 |
| CARPT | 202 | Wall and Ceiling Construction | 5 |
| CARPT | 203 | Stairs | 3 |
| CARPT | 205 | Roof Construction | 5 |

# Civil Engineering

Students prepare for careers as civil engineering technicians who typically work under the direct supervision of a project engineer. The program environment emulates a civil engineering/surveying firm, giving students practice in many aspects of the profession, including defining project requirements, conducting survey/field work, field engineering, construction staking, designing, estimating, modeling and client presentations. Instruction includes computer-aided design, the preparation of engineering calculations, and coordinate systems which include lengths, directions, slopes, bearings areas, volumes, weights densities, moments, forces, reactions, flows, and loads. Students learn to use a variety of computer software application packages, including, but not limited to Word, Excel, CadreLite, Hydrocad, Civil 3D, and GIS.

**Prerequisites:** Successful completion of MATH 98 and Writing 98 or equivalents.

**FACULTY**

E. J. Fancett, 253.680.7341, ejfancett@bates.ctc.edu
www.bates.ctc.edu/CivilEngineering

## Associate of Technology Degree: 102 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CET | 101 | Introduction to Civil Engineering | 3 |
| CET | 103 | Statics | 3 |
| CET | 105 | Structural Analysis | 3 |
| CET | 107 | CAD – 2Dimension | 3 |
| CET | 109 | Introduction to Surveying | 3 |
| CET | 111 | Civil 3D Surfaces and Points | 3 |
| CET | 113 | Hydrology | 3 |
| CET | 115 | Agency Requisites | 3 |
| CET | 117 | GIS Resources | 3 |
| CET | 121 | Coordinate Geometry | 3 |
| CET | 123 | Alignment and Profiles | 3 |
| CET | 125 | Basic Corridors in Civil 3D | 3 |
| CET | 127 | Surveying - Control | 3 |
| CET | 131 | Construction Materials | 3 |
| CET | 133 | Civil 3D Grading | 3 |
| CET | 135 | Utilities Design | 3 |
| CET | 137 | Topographic Surveying | 3 |
| CET | 202 | Finite Element Models | 3 |
| CET | 204 | 3D Structural Modeling | 3 |
| CET | 208 | Civil 3D Structural Sections | 3 |
| CET | 210 | Contract Documents | 3 |
| CET | 212 | Open Channel Flow | 3 |
| CET | 214 | Drainage Reports | 3 |
| CET | 216 | Civil 3D – Storm Plans | 3 |
| CET | 218 | Erosion Control | 3 |
| CET | 220 | Road Design | 3 |
| CET | 222 | Construction Drawings | 3 |
| CET | 224 | Advanced Corridors in Civil 3D | 3 |
| CET | 226 | Construction Staking | 3 |

## Certificate of Competency: 66 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CET | 101 | Introduction to Civil Engineering | 3 |
| CET | 103 | Statics | 3 |
| CET | 105 | Structural Analysis | 3 |
| CET | 107 | CAD – 2Dimension | 3 |
| CET | 109 | Introduction to Surveying | 3 |
| CET | 111 | Civil 3D Surfaces and Points | 3 |
| CET | 113 | Hydrology | 3 |
| CET | 115 | Agency Requisites | 3 |
| CET | 117 | GIS Resources | 3 |
| CET | 121 | Coordinate Geometry | 3 |
| CET | 123 | Alignment and Profiles | 3 |
| CET | 125 | Basic Corridors in Civil 3D | 3 |
| CET | 127 | Surveying - Control | 3 |
| CET | 131 | Construction Materials | 3 |
| CET | 133 | Civil 3D Grading | 3 |
| CET | 135 | Utilities Design | 3 |
| CET | 137 | Topographic Surveying | 3 |

# CNC Machinist

This program prepares students for employment in the machinist/manufacturing field. Using a variety of machine tools including computer numeric control (CNC) equipment, students learn to make metal parts to precise specifications. Knowledge of the working properties of metal, capabilities of machine tools and equipment, and standard shop practices prepare students for employment in all types of factories, industries, and maintenance shops.

**FACULTY**
Randy Cox, 253.680.7214, rcox@bates.ctc.edu
Barry Young, 253.680.7214, byoung@bates.ctc.edu
www.bates.ctc.edu

## Associate of Technology: Option A: CNC Machinist 91 Credits
## Option B: CNC Technician 97 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CNCM | 101 | Introduction to Machine Manufacturing Processes | 3 |
| CNCM | 102 | Machining Fundamentals | 3 |
| CNCM | 103 | Engineering Drawing Interpretation | 4 |
| CNCM | 104 | Geometric Dimensioning and Tolerancing | 2 |
| CNCM | 105 | Secondary Operations, Benchwork | 2 |
| CNCM | 106 | Precision Measurement | 3 |
| CNCM | 109 | Lathe I | 4 |
| CNCM | 110 | Mill I | 2 |
| CNCM | 111 | Introduction to CNC Technology | 2 |
| CNCM | 112 | CNC Controls | 3 |
| CNCM | 113 | CNC Programming | 4 |
| CNCM | 114 | CNC Troubleshooting | 3 |

Students must choose one option:

Option A: CNC Machinist

| | | | |
|---|---|---|---|
| CNCM | 201 | CNC Lathe I | 4 |
| CNCM | 202 | CNC Lathe II | 4 |
| CNCM | 203 | CNC Milling I | 5 |
| CNCM | 204 | CNC Milling II | 5 |
| CNCM | 205 | Computer-Aided Manufacturing | 4 |
| CNCM | 206 | Introduction to Computer-Aided Drafting (CAD) | 2 |
| CNCM | 207 | Advanced Projects I | 5 |
| CNCM | 208 | Advanced Projects II | 5 |
| CNCM | 209 | Advanced Manufacturing Processes | 3 |
| CNCM | 210 | Emergent Technologies | 4 |

Option B: CNC Technician

| | | | |
|---|---|---|---|
| CNCM | 205 | Computer Aided Manufacturing | 4 |
| CNCM | 209 | Manufacturing Processes | 3 |
| CNCM | 210 | Emerging Technologies | 4 |
| CNCM | 220 | CAD I | 3 |
| CNCM | 221 | CAD II | 3 |
| CNCM | 222 | CAD III | 4 |
| CNCM | 223 | Electronic Fundamentals | 4 |
| CNCM | 224 | Electronic Applications | 3 |
| CNCM | 225 | Microcontrollers | 3 |
| CNCM | 226 | Hydraulics and Fluid Power | 2 |
| CNCM | 227 | Sensors/Scanner Technology | 3 |
| CNCM | 228 | Programmable Controllers | 4 |
| CNCM | 229 | Plastic Mold Manufacturing | 2 |
| CNCM | 230 | Introduction to Mechatronics | 3 |
| CNCM | 231 | Basic Robotics | 2 |

## Certificate of Competency: 50 Credits

CNC MACHINING

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| CNCM | 101 | Introduction to Machine Manufacturing Processes | 3 |
| CNCM | 102 | Machining Fundamentals | 3 |
| CNCM | 103 | Engineering Drawing Interpretation | 4 |
| CNCM | 104 | Geometric Dimensioning and Tolerancing | 2 |
| CNCM | 105 | Secondary Operations, Benchwork | 2 |
| CNCM | 106 | Precision Measurement | 3 |
| CNCM | 109 | Lathe I | 4 |
| CNCM | 110 | Mill I | 2 |
| CNCM | 111 | Introduction to CNC Technology | 2 |
| CNCM | 112 | CNC Controls | 3 |
| CNCM | 113 | CNC Programming | 4 |
| CNCM | 114 | CNC Troubleshooting | 3 |

## Certificate of Training: 44 Credits

CNC OPERATOR

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CNCM | 101 | Introduction to Machine Manufacturing Processes | 3 |
| CNCM | 102 | Machining Fundamentals | 3 |
| CNCM | 103 | Engineering Drawing Interpretation | 4 |
| CNCM | 104 | Geometric Dimensioning and Tolerancing | 2 |
| CNCM | 105 | Secondary Operations, Benchwork | 2 |
| CNCM | 106 | Precision Measurement | 3 |
| CNCM | 109 | Lathe I | 4 |
| CNCM | 110 | Mill I | 2 |
| CNCM | 113 | CNC Programming | 4 |
| CNCM | 114 | CNC Troubleshooting | 3 |
| CNCM | 201 | CNC Lathe I | 4 |
| CNCM | 203 | CNC Milling I | 5 |
| CNCM | 207 | Advanced Projects I | 5 |

# Commercial Truck Driving-Entry Level

Bates Technical College is the only school in Washington State certified by the Professional Truck Driver Institute. Students prepare for entry-level employment as commercial truck drivers with the goal of a Class A Commercial Driver's License (CDL) with all endorsements. Training takes place in classrooms, on Bates' truck driving range, and on the road, using a variety of equipment.

**Note:** Through an Opportunity Grant, special tuition and book funding is available to assist low-income adult students entering this program. Contact Ramon Burton, 253.680.7544, for more information.

**Prerequisites:**
1. Applicants must have a valid Washington State driver's license and a good driving record.
2. Applicants must pass the Washington State Department of Transportation physical exam and drug screen.
3. Applicants must be a minimum of 18 years of age to enroll in local commercial driving.
4. Applicants must be a minimum of 21 years of age to enroll in long-haul commercial driving.

**FACULTY**
Tom Deligeannis, 253.680.7493, tdeligeannis@bates.ctc.edu
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Louie French, 253.680.7484, lfrench@bates.ctc.edu
Bob Gunter, 253.680.7486, bgunter@bates.ctc.edu
Ken Thompson, 253.680.7485, kthompson@bates.ctc.edu
Wade Westphal, 253.680.7491, wwestphal@bates.ctc.edu
www.bates.ctc.edu/TruckDriving

**Certificate of Training: 40 Credits**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| TRUCK | 101 | Safety/First Aid | 3 |
| TRUCK | 102 | Introduction to the Trucking Industry | 4 |
| TRUCK | 103 | Commercial Driver's License (CDL) | 4 |
| TRUCK | 104 | Pre-Trip Requirements | 3 |
| TRUCK | 105 | Close Quarters Operation | 5 |
| TRUCK | 106 | Materials/Cargo I | 3 |
| TRUCK | 107 | City/Town Driving | 5 |
| TRUCK | 108 | Freeway/Open Road I | 5 |

Students must choose one option:

| OPTION A: Local | | | |
|---|---|---|---|
| TRUCK | 110 | City/Town Driving | 4 |
| TRUCK | 111 | Materials/Cargo II | 4 |

| OPTION B: Long Haul | | | |
|---|---|---|---|
| TRUCK | 112 | Freeway/Open Road II | 4 |
| TRUCK | 113 | Advanced Commercial Driving | 4 |

# Computer Networking Systems Technician

Computer network systems technicians link the hardware and software that comprise computer data communications networks. They install, configure and maintain network components, work on client workstations, servers, domain controllers, shared printers, cables, and routers. They maintain network equipment, applications, data and user interfaces and workstations as well as troubleshoot local and wide area networks. Desktop, server and network administration positions are needed in all industries due to the ongoing movement towards computer automation. Students are encouraged to obtain Microsoft, Comptia and Cisco certifications, including A+, MCSA, MCITP, MCTS, MCDST and CCNA.

**FACULTY**

Emmett Peterson, 253.680.7066, epeterson@bates.ctc.edu
Laura Robertson, 253.680.7358, lrobertson@bates.ctc.edu
www.bates.ctc.edu/ComputerNetworking

**Associate of Technology Degree: 112 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ETECH | 101 | Introduction to Electronics | 2 |
| ETECH | 102 | DC Circuits | 5 |
| ETECH | 103 | AC Circuits | 5 |
| ETECH | 104 | Analog Circuits | 5 |
| ETECH | 105 | Digital Circuits | 5 |
| ETECH | 106 | Microcontrollers | 5 |
| CNST | 110 | MS Client Operating Systems | 5 |
| CNST | 201 | Cisco Network Fundamentals | 5 |
| CNST | 202 | Cisco Routing Protocols and Concepts | 5 |
| CNST | 205 | Fundamentals of Linux | 5 |
| CNST | 207 | Network Infrastructure | 5 |
| CNST | 209 | Directory Services | 5 |
| CNST | 210 | Network Security | 5 |
| INFO | 101 | Computer Applications Essentials | 5 |
| INFO | 104 | A+ Essentials | 5 |
| INFO | 105 | A+ Practical | 5 |
| INFO | 110 | Emerging Technologies | 5 |

Students must choose 15 credits from the attached elective list.

| ELECTIVES LIST | | | CREDITS |
|---|---|---|---|
| WIRE | 201 | Telecommunications Network Cabling | 5 |
| WIRE | 202 | Fiber Optics | 5 |
| CNST | 212 | Cisco LAN Switching and Wireless | 5 |
| CNST | 213 | Cisco-Accessing the WAN | 5 |
| INFO | 108 | Project Management | 5 |
| INFO | 109 | Employment Preparation | 5 |

# Computer Repair & Network Support

Structured as a shorter alternative to the computer networking systems technician evening program, students prepare for employment as computer systems technicians. Instruction includes A+, CCNA or CCENT, and MCP (Microsoft Certified Professional) Windows operating systems, and one of two electives: This program is the first in Washington to participate in the global Cisco Academy, providing the very best in on-line curriculum. Students are strongly encouraged to obtain industry certifications before graduating, including Cisco Networking Academy, CompTIA A+ (two tests), and Microsoft Certified Professional (one test).

**FACULTY**

Tom Denney, 253.680.7351, tdenney@bates.ctc.edu

Joe Toth, 253.680.7355, jtoth@bates.ctc.edu

## Certificate of Competency: 64 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CRNS | 103 | A+ Essentials | 5 |
| CRNS | 104 | A+ Practical | 5 |
| CRNS | 106 | Cisco Network Fundamentals | 5 |
| CRNS | 107 | Cisco Routing Protocols and Concepts | 5 |
| CRNS | 109 | MS Client Operating System | 5 |
| CRNS | 110 | MS Client Operating System Lab | 4 |
| CRNS | 111 | Advanced Projects | 5 |

Students must choose 15 credits from the electives list.

## Certificate of Training: 42 Credits

A+/MCP CERTIFICATION TRAINING

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CRNS | 102 | Fundamentals of Computer Repair | 2 |
| CRNS | 103 | A+ Essentials | 5 |
| CRNS | 104 | A+ Practical | 5 |
| CRNS | 106 | Cisco Networking Fundamentals | 5 |
| CRNS | 107 | Cisco Routing Protocols and Concepts | 5 |
| CRNS | 109 | MS Client Operating System | 5 |
| CRNS | 111 | Advanced Projects | 5 |

Students must choose 10 credits from the electives list.

| ELECTIVES LIST | | | CREDITS |
|---|---|---|---|
| CRNS | 112 | Security Plus | 5 |
| CRNS | 120 | Employment Preparation | 5 |
| WIRE | 201 | Telecommunications Network Cabling | 5 |
| WIRE | 202 | Fiber Optics | 5 |
| CNST | 212 | Cisco LAN Switching and Wireless | 5 |
| CNST | 213 | Cisco-Accessing the WAN | 5 |

# Culinary Arts

Students prepare for a variety of careers in the culinary arts profession and for advanced education at other culinary institutions. Career paths include dinner cook, institutional cook, cook's helper, baker's helper, fry cook, and short order cook. Students work in all aspects of the dining facilities on campus, planning and preparing meals and catering banquet functions. Instruction includes food planning and preparation, and serving and cleanup. Graduates receive a broad base of skills and are well prepared for a variety of entry-level culinary jobs.

**FACULTY**

Roger Knapp, 253.680.7247, rknapp@bates.ctc.edu

JJ Meland, 253.680.7247, jmeland@bates.ctc.edu

## Associate of Technology Degree: 120 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARTS | 101 | Introduction to Culinary Arts | 2 |
| CARTS | 102 | Sanitation and Food Safety | 2 |
| CARTS | 103 | Product Identification | 2 |
| CARTS | 104 | Breakfast Service | 2 |
| CARTS | 105 | Basic Food Preparation | 4 |
| CARTS | 106 | Basic Cooking Techniques | 4 |
| CARTS | 107 | Fundamentals of Table Service I | 3 |
| CARTS | 108 | Garde Manger I | 1 |
| CARTS | 109 | Food Service Mathematics | 2 |
| CARTS | 110 | Soups and Sauces | 4 |
| CARTS | 111 | Vegetables, Starches, and Grains | 5 |
| CARTS | 112 | Customer Service | 3 |
| CARTS | 113 | Introduction to Baking | 5 |
| CARTS | 114 | Cost Control | 2 |
| CARTS | 115 | Food and Beverage Service | 3 |
| CARTS | 116 | Menu Development | 2 |
| CARTS | 117 | A la Carte Cooking | 5 |
| CARTS | 118 | Introduction to Catering and Banquets | 4 |
| CARTS | 201 | Meats and Seafood | 3 |
| CARTS | 202 | Global Food and Nutrition Issues | 2 |
| CARTS | 203 | Ice Carving | 1 |
| CARTS | 204 | Garde Manger II | 2 |
| CARTS | 205 | Restaurant Desserts | 5 |
| CARTS | 206 | Techniques of Restaurant Cooking | 4 |
| CARTS | 207 | Catering and Banquets | 4 |
| CARTS | 208 | Regional Cuisine Service | 3 |
| CARTS | 209 | International Cuisine Service | 3 |
| CARTS | 210 | Introduction to Management | 3 |
| CARTS | 211 | Classical Cuisine | 4 |
| CARTS | 212 | Chef's Table Service | 5 |
| CARTS | 213 | Advanced Culinary Applications | 5 |
| CARTS | 214 | Employment Preparation | 2 |
| CARTS | 215 | Wine/Spirits | 4 |

## Certificate of Competency: 66 Credits

CULINARY ARTS LINE COOK

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| CARTS | 101 | Introduction to Culinary Arts | 2 |
| CARTS | 102 | Sanitation and Food Safety | 2 |
| CARTS | 103 | Product Identification | 2 |
| CARTS | 104 | Breakfast Service | 2 |
| CARTS | 105 | Basic Food Preparation | 4 |
| CARTS | 106 | Basic Cooking Techniques | 4 |
| CARTS | 107 | Fundamentals of Table Service I | 3 |
| CARTS | 108 | Garde Manger I | 1 |
| CARTS | 109 | Food Service Mathematics | 2 |
| CARTS | 110 | Soups and Sauces | 4 |
| CARTS | 111 | Vegetables, Starches, and Grains | 5 |
| CARTS | 112 | Customer Service | 3 |
| CARTS | 113 | Introduction to Baking | 5 |
| CARTS | 114 | Cost Control | 2 |
| CARTS | 115 | Food and Beverage Service | 3 |
| CARTS | 116 | Menu Development | 2 |
| CARTS | 117 | A la Carte Cooking | 5 |

# Database Technology

From retail to financial services, healthcare to automotive, today's businesses are computer and information-driven, making database developers an important position in most industries. Database developers organize and manage information to corporations and organizations large and small. Students acquire computer and software development skills and prepare for high-demand Oracle certifications. Career opportunities can include data analyst, database administrator, database application developer, database resource specialist and help desk analyst. The program also provides extended learning opportunities for persons previously or currently employed in related professions.

**FACULTY**
Judith Graham, 253.680.7335, jagraham@bates.ctc.edu
www.bates.ctc.edu/Database

### Associate of Applied Science - Transfer Degree: 115 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| MATH | 104 | Statistical Analysis or equivalent | 5 |
| MATH | 105 | College Algebra or equivalent | 5 |
| ENGL& | 101 | College Composition | 5 |
| 100+ | Level | Social Sciences (Sociology or Psych) | 5 |
| 100+ | Level | Humanities (Am. Sign Language, Art, or History | 5 |

### Associate of Technology Degree: 110 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 10 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DATA | 101 | Data Modeling\Relational Database Design | 5 |
| DATA | 102 | SQL | 5 |
| DATA | 103 | Operating Systems | 5 |
| SOFT | 101 | Computer Concepts | 5 |
| SOFT | 102 | Programming Fundamentals | 5 |
| SOFT | 121 | C-Sharp I | 5 |
| SOFT | 122 | C-Sharp II | 5 |
| WEB | 101 | Microsoft Office Applications | 5 |
| WEB | 102 | HTML, XHTML and CSS | 5 |
| DATA | 201 | PL/SQL | 5 |
| DATA | 202 | Database Fundamentals I | 5 |
| DATA | 203 | Database Fundamentals II | 5 |
| DATA | 204 | Database Fundamentals III | 5 |
| DATA | 208 | SQL Server Admin | 5 |
| CS& | 141 | Computer Science I – JAVA | 5 |
| SOFT | 142 | Programming in JAVA II | 5 |
| SOFT | 207 | Dynamic Web Pages | 5 |
| DATA | 290 | Capstone Project | 5 |

### Certificate of Competency: 60 Credits

DATABASE TECHNICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DATA | 101 | Data Modeling\Relational Database Design | 5 |
| DATA | 102 | SQL | 5 |
| DATA | 103 | Operating Systems | 5 |
| DATA | 201 | PL/SQL | 5 |
| DATA | 202 | Database Fundamentals I | 5 |
| DATA | 203 | Database Fundamentals II | 5 |
| DATA | 204 | Database Fundamentals III | 5 |
| SOFT | 101 | Computer Concepts | 5 |
| WEB | 101 | Microsoft Office Applications | 5 |

# Dental Assisting

Students prepare for careers as chair side dental assistants, dental office managers, and infection control specialists. The program is designed in accordance with American Dental Association guidelines and is fully accredited by the Commission on Dental Accreditation. After completing industry-specific competencies, students may take the Dental Assisting national board examination to earn nationally recognized credentials as a certified dental assistant. Note: General education requirements must be taken 1) prior to entering the program or, 2) before or after the regularly schedule dental assisting coursework.

**Prerequisites:**
1. High School diploma or GED
2. Minimum age for program entry: 18 years of age
3. A Washington State Patrol background check clearance
4. Documentary evidence of current immunizations and medical insurance within one month of program start date
5. Documentary evidence of current Red Cross or American Heart Association approved First Aid/CPR card within one month of program start date
6. Must meet pre-determined COMPASS levels in reading and writing

**FACULTY**
Teri Amundsen, 253.680.7309, tamundsen@bates.ctc.edu
Flossie Hollie, 253.680.7308, fhollie@bates.ctc.edu
Patty Reno, 253.680.7307, preno@bates.ctc.edu
www.bates.ctc.edu/DentalAssisting

## Associate of Technology Degree: 93 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DNTA | 110 | Introduction to Dental Assisting | 2 |
| DNTA | 111 | Infection Control | 5 |
| DNTA | 112 | Biomedical Sciences | 5 |
| DNTA | 113 | Dental Sciences I | 3 |
| DNTA | 120 | Introduction to Chairside Assisting | 4 |
| DNTA | 121 | Chairside Assisting I | 4 |
| DNTA | 122 | Dental Materials I | 3 |
| DNTA | 124 | HIV/AIDS Training | 1 |
| DNTA | 129 | Dental Sciences II | 2 |
| DNTA | 130 | Dental Sciences III | 3 |
| DNTA | 131 | Chairside Assisting II | 3 |
| DNTA | 132 | Chairside Assisting III | 2 |
| DNTA | 133 | Chairside Assisting IV | 2 |
| DNTA | 140 | Restorative Services I | 3 |
| DNTA | 141 | Restorative Services II | 2 |
| DNTA | 142 | Restorative Services III | 2 |
| DNTA | 143 | Dental Materials II | 2 |
| DNTA | 144 | Dental Radiology | 5 |
| DNTA | 145 | Chairside Assisting V | 3 |
| DNTA | 150 | Dental Sciences IV | 3 |
| DNTA | 151 | Clinical Experience I | 5 |
| DNTA | 152 | Dental Materials III | 4 |
| DNTA | 160 | Clinical Experience II | 5 |
| DNTA | 161 | Dental Office Administration | 5 |

## Certificate of Competency: 88 Credits

DENTAL ASSISTANT

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DNTA | 110 | Introduction to Dental Assisting | 2 |
| DNTA | 111 | Infection Control | 5 |
| DNTA | 112 | Biomedical Sciences | 5 |
| DNTA | 113 | Dental Sciences I | 3 |
| DNTA | 120 | Introduction to Chairside Assisting | 4 |
| DNTA | 121 | Chairside Assisting I | 4 |
| DNTA | 122 | Dental Materials I | 3 |
| DNTA | 124 | HIV/AIDS Training | 1 |
| DNTA | 129 | Dental Sciences II | 2 |
| DNTA | 130 | Dental Sciences III | 3 |
| DNTA | 131 | Chairside Assisting II | 3 |
| DNTA | 132 | Chairside Assisting III | 2 |
| DNTA | 133 | Chairside Assisting IV | 2 |
| DNTA | 140 | Restorative Services I | 3 |
| DNTA | 141 | Restorative Services II | 2 |
| DNTA | 142 | Restorative Services III | 2 |
| DNTA | 143 | Dental Materials II | 2 |
| DNTA | 144 | Dental Radiology | 5 |
| DNTA | 145 | Chairside Assisting V | 3 |
| DNTA | 150 | Dental Sciences IV | 3 |
| DNTA | 151 | Clinical Experience I | 5 |
| DNTA | 152 | Dental Materials III | 4 |
| DNTA | 160 | Clinical Experience II | 5 |
| DNTA | 161 | Dental Office Administration | 5 |

# Dental Lab Technician

Students prepare for employment in dental laboratories, fabricating orthodontic appliances, complete and partial dentures, and gold or porcelain crowns and bridges. The curriculum complies with American Dental Association guidelines and is the only fully accredited ADA dental lab technician program in Washington State. Instructors of this program are certified dental technicians.

**Prerequisites:**
1. A high school diploma or GED.
2. Applicants must be fully ready to enter into general education courses. This entry requirement may be satisfied by providing the registrar with official transcripts showing completion of general education courses, or by satisfactory completion of placement tests that enable the student to enroll directly into required general education courses.
3. Applicants must take and pass an evaluation of hand-eye coordination techniques and demonstrate their ability to visualize three-dimensional forms.
4. Students must take and satisfactorily complete a hands-on wax carving test.

**FACULTY**
John Howard, 253.680.7313, jhoward@bates.ctc.edu
Kristina Merriman, 253.680.7312, kmerriman@bates.ctc.edu

## Associate of Technology Degree: 120 Credits

| GENERAL EDUCATION REQUIREMENTS | | CREDITS |
|---|---|---|
| 100+ Level | Human Relations | 5 |
| 100+ Level | Communications | 5 |
| 100+ Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DENLB | 101 | Introduction to Dental Lab Technology | 2 |
| DENLB | 102 | Health and Safety | 2 |
| DENLB | 103 | Dental Anatomy | 3 |
| DENLB | 104 | Dental Materials | 2 |
| DENLB | 105 | Dentures – Casts/Trays/Rims | 4 |
| DENLB | 106 | Denture Setup | 3 |
| DENLB | 107 | Denture Processes | 3 |
| DENLB | 108 | Immediate Dentures | 2 |
| DENLB | 109 | Denture Repair | 2 |
| DENLB | 110 | Esthetic Arrangement | 3 |
| DENLB | 111 | Introduction to Orthodontics | 2 |
| DENLB | 112 | Orthodontic Appliances – Fixed | 3 |
| DENLB | 113 | Orthodontic Appliances – Removable | 3 |
| DENLB | 114 | Introduction to Removable Prosthetic Devices (RPD) | 2 |
| DENLB | 120 | RPD Survey and Design | 2 |
| DENLB | 121 | Refractory Cast Production | 2 |
| DENLB | 122 | Wax Pattern Construction | 3 |
| DENLB | 123 | RPD Processes | 3 |
| DENLB | 124 | Frame Construction | 2 |
| DENLB | 201 | Plaster Carving | 5 |
| DENLB | 202 | Dental Materials II | 2 |
| DENLB | 203 | Coping Fabrication I | 5 |
| DENLB | 204 | Introduction to Gold Crowns | 2 |
| DENLB | 205 | Gold Crown Waxing | 5 |
| DENLB | 206 | Gold Crown Techniques | 5 |
| DENLB | 207 | Introduction to Porcelain | 5 |
| DENLB | 208 | Coping Fabrication II | 5 |
| DENLB | 209 | Stack Porcelain | 5 |
| DENLB | 211 | Porcelain Techniques | 4 |
| DENLB | 212 | Advanced Porcelain Techniques | 4 |
| DENLB | 213 | Advanced Technologies | 4 |
| | | or | |
| DENLB | 296 | Work-based Learning Seminar and | 1 |
| DENLB | 297 | Work-based Learning Experience | 3 |
| | | or | |
| DENLB | 298 | Work-based Learning Experience – No seminar | 4 |

Students may chose one of the following (3 credits):

| | | | |
|---|---|---|---|
| DENLB | 125 | Advanced Dentures or | 3 |
| DENLB | 126 | Advanced Orthodontics or | 3 |
| DENLB | 127 | Advanced RPDs | 3 |

Students may chose one of the following (3 credits):

| | | | |
|---|---|---|---|
| DENLB | 214 | Advanced Crown and Bridge or | 3 |
| DENLB | 215 | Advanced Dental Ceramics | 3 |

## Certificate of Competency: 63 Credits

DENTAL LAB TECH

| GENERAL EDUCATION REQUIREMENTS | | CREDITS |
|---|---|---|
| 90+ Level | Human Relations | 5 |
| 90+ Level | Communications | 5 |
| 90+ Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DENLB | 101 | Introduction to Dental Lab Technology | 2 |
| DENLB | 102 | Health and Safety | 2 |
| DENLB | 103 | Dental Anatomy | 3 |
| DENLB | 104 | Dental Materials | 2 |
| DENLB | 105 | Dentures – Casts/Trays/Rims | 4 |
| DENLB | 106 | Denture Setup | 3 |
| DENLB | 107 | Denture Processes | 3 |
| DENLB | 108 | Immediate Dentures | 2 |
| DENLB | 109 | Denture Repair | 2 |
| DENLB | 110 | Esthetic Arrangement | 3 |
| DENLB | 111 | Introduction to Orthodontics | 2 |
| DENLB | 112 | Orthodontic Appliances – Fixed | 3 |
| DENLB | 113 | Orthodontic Appliances – Removable | 3 |
| DENLB | 114 | Introduction to Removable Prosthetic Devices (RPD) | 2 |
| DENLB | 120 | RPD Survey and Design | 2 |
| DENLB | 121 | Refractory Cast Production | 2 |
| DENLB | 122 | Wax Pattern Construction | 3 |
| DENLB | 123 | RPD Processes | 3 |
| DENLB | 124 | Frame Construction | 2 |

# Denturist

Bates Technical College is the only college in Washington State to offer a denturist training program. Denturists are licensed specialists who make, fit, and repair complete and partial dentures. In order to meet the requirements of the denturist profession, candidates must obtain training at an accredited college to qualify to sit for the Washington, Oregon, Idaho, Montana, or Arizona denturist's license examination. Instruction includes anatomy, physiology, microbiology, ethics, medical emergencies, office management, and clinical/laboratory techniques as they apply to denture practices. Students receive clinical experience in the on-campus denturist clinic which provides services to the public. New students may enter the program at the beginning of fall and spring quarters.

**Prerequisites:**
1. A high school diploma or GED.
2. Applicants must be fully ready to enter into general education courses. This entry requirement may be satisfied by providing the registrar with official transcripts showing actual completion of general education courses, or by satisfactory completion of placement tests that enable the student to enroll directly into required general education courses.
3. Applicants must take and pass aptitude tests measuring dexterity and the ability to visualize three-dimensional forms.
4. Personal interview with instructor.

**FACULTY**
Mauricio Henriquez, 253.680.7314, mhenriquez@bates.ctc.edu
Kenneth Kais, 253.680.7314, kkais@bates.ctc.edu

**Associate of Technology Degree: 120 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DNTU | 101 | Asepsis, Infection, Hazard Control | 2 |
| DNTU | 102 | Biological Concepts | 3 |
| DNTU | 103 | Introduction to Complete Denture Prosthodontics | 3 |
| DNTU | 104 | Baseplates and Occlusion Rims | 2 |
| DNTU | 105 | Tooth Selection and Set I | 3 |
| DNTU | 106 | Dental Materials I | 2 |
| DNTU | 107 | Denture Techniques | 2 |
| DNTU | 108 | Complete Denture Fabrication I | 2 |
| DNTU | 109 | Dental Office Management I | 1 |
| DNTU | 110 | Head Anatomy and Physiology I | 2 |
| DNTU | 111 | Tooth Selection and Set II | 1 |
| DNTU | 112 | Medical Emergencies | 3 |
| DNTU | 113 | Denture Techniques II | 2 |
| DNTU | 114 | Complete Denture Fabrication II | 1 |
| DNTU | 115 | Partial Dental Casts | 2 |
| DNTU | 116 | Framework Design - RPD | 3 |
| DNTU | 117 | Dental Office Management II | 2 |
| DNTU | 118 | Clinical Denture Procedures I | 2 |
| DNTU | 119 | Dental Impressions Procedures I | 2 |
| DNTU | 120 | Head Anatomy and Physiology II | 3 |
| DNTU | 121 | Tooth Selection and Set III | 1 |
| DNTU | 122 | Complete Denture Fabrication III | 2 |
| DNTU | 123 | Complete Denture Repair I | 2 |
| DNTU | 124 | Casts - Partials | 2 |
| DNTU | 125 | Oral Pathology | 2 |
| DNTU | 126 | Clinical Denture Procedures II | 2 |
| DNTU | 127 | Dental Impressions Procedures II | 2 |
| DNTU | 128 | Fabrication Clinical I | 1 |
| DNTU | 129 | Polish Methods – RDP Frames | 1 |
| DNTU | 130 | Acrylic Prostheses Repair | 2 |
| DNTU | 131 | Wax Patterns - Partials | 4 |
| DNTU | 132 | Teeth Arrangement - RPD | 2 |
| DNTU | 133 | Finish Methods - RPD | 3 |
| DNTU | 134 | RPD Frames Fabrication | 2 |
| DNTU | 135 | Introduction to Oral Pathology | 3 |
| DNTU | 136 | Clinical Denture Procedures III | 2 |
| DNTU | 137 | Tooth Selection/Evaluation | 2 |
| DNTU | 138 | Fabrication Clinical II | 2 |
| DNTU | 201 | Complete Denture Repair II | 2 |
| DNTU | 202 | Dental Materials – RPD | 2 |
| DNTU | 203 | RPD Repair Methods | 3 |
| DNTU | 204 | Dental Office Management III | 2 |
| DNTU | 205 | Denture Adjustments | 1 |
| DNTU | 206 | Ethics and Jurisprudence | 1 |
| DNTU | 207 | Malocclusions | 2 |
| DNTU | 208 | Clinical Denture Procedures IV | 2 |
| DNTU | 209 | Dental Materials II | 2 |
| DNTU | 210 | Geriatric Patient Needs | 1 |
| DNTU | 211 | Fabrication Clinical III | 2 |
| DNTU | 212 | Alternative RPD Systems | 2 |
| DNTU | 213 | Implant and Precision Attachments | 1 |
| DNTU | 214 | Advanced Special Services | 1 |
| DNTU | 215 | Advanced Dental Appliances | 1 |

# Diesel & Heavy Equipment Mechanic

Students prepare for employment in the diesel and heavy equipment industry, diagnosing, repairing, and rebuilding components of diesel-powered vehicles in an on-campus shop setting. Local industry training partnerships provide practical experience that enhances student instruction. Graduates may find employment as technicians in diesel and heavy duty apprenticeships, working with on/off highway trucks, construction equipment, hydraulics, material handling equipment, agricultural equipment, marine, and utilities.

**FACULTY**

Gene Gablehouse, 253.680.7438, ggablehouse@bates.ctc.edu
Mick McGuire, 253.680.7436, mmcguire@bates.ctc.edu
Ray Shjerven, 253.680.7435, rshjerven@bates.ctc.edu

## Associate of Technology Degree: 106 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 103 | Introduction to Hydraulic Systems | 5 |
| DIESL | 104 | Diagnosis and Testing of Hydraulic Systems | 2 |
| DIESL | 105 | Introduction to Diesel Technology | 1 |
| DIESL | 106 | Engine Construction | 5 |
| DIESL | 107 | Engine Systems | 1 |
| DIESL | 108 | Engine Reassembly | 4 |
| DIESL | 109 | Fuel Systems | 2 |
| DIESL | 110 | Introduction to Air Brakes | 2 |
| DIESL | 111 | Introduction to Basic Electrical Systems | 4 |
| DIESL | 112 | Electrical Systems Application | 4 |
| DIESL | 113 | Electronic Engine Systems | 3 |
| DIESL | 114 | Mobile Air Conditioning Systems | 3 |
| DIESL | 115 | Introduction to Power Trains | 1 |
| DIESL | 116 | Manual Transmission Service | 3 |
| DIESL | 117 | Automated Manual Transmission Service | 2 |
| DIESL | 118 | Clutch Service | 2 |
| DIESL | 119 | Automatic Transmission Service | 2 |
| DIESL | 120 | Driveline Service | 1 |
| DIESL | 121 | Differentials/ Final Drive | 2 |
| DIESL | 122 | Wheel End Service | 1 |
| DIESL | 201 | Basic Vehicle Service | 11 |
| DIESL | 203 | Advanced Service Applications | 5 |
| DIESL | 204 | Employment Preparation | 2 |
| DIESL | 205 | Advanced Service Techniques * | 15 |
| WBAS | 101 | Welding Basics | 8 |

* This course may be substituted with a work-based learning component.

## Certificate of Competency: 45 Credits

DIESEL SERVICE HELPER

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 103 | Introduction to Hydraulic Systems | 5 |
| DIESL | 104 | Diagnosis and Testing of Hydraulic Systems | 2 |
| DIESL | 105 | Introduction to Diesel Technology | 1 |
| DIESL | 106 | Engine Construction | 5 |
| DIESL | 107 | Engine Systems | 1 |
| DIESL | 108 | Engine Reassembly | 4 |
| DIESL | 109 | Fuel Systems | 2 |
| DIESL | 110 | Introduction to Air Brakes | 2 |
| DIESL | 111 | Introduction to Basic Electrical Systems | 4 |
| DIESL | 112 | Electrical Systems Application | 4 |

## Certificate of Training: 14 Credits

ELECTRICAL

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 111 | Introduction to Basic Electrical Systems | 4 |
| DIESL | 112 | Electrical Systems Application | 4 |
| DIESL | 113 | Electronic Engine Systems | 3 |
| DIESL | 114 | Mobile Air Conditioning Systems | 3 |

## Certificate of Training: 15 Credits

ENGINES

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 105 | Introduction to Diesel Technology | 1 |
| DIESL | 106 | Engine Construction | 5 |
| DIESL | 107 | Engine Systems | 1 |
| DIESL | 108 | Engine Reassembly | 4 |
| DIESL | 109 | Fuel Systems | 2 |
| DIESL | 110 | Introduction to Air Brakes | 2 |

## Certificate of Training: 8 Credits

HYDRAULICS AND PNEUMATICS

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 103 | Introduction to Hydraulic Systems | 5 |
| DIESL | 104 | Diagnosis and Testing of Hydraulic Systems | 2 |
| DIESL | 105 | Introduction to Diesel Technology | 1 |

## Certificate of Training: 6 Credits

BRAKE SYSTEMS

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 110 | Introduction to Air Brakes | 2 |
| DIESL | 111 | Introduction to Basic Electrical Systems | 4 |

## Certificate of Training: 21 Credits

LUBE TECHNICIANS

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 103 | Introduction to Hydraulic Systems | 5 |
| DIESL | 201 | Basic Vehicle Service | 11 |
| DIESL | 203 | Advanced Service Applications | 5 |

## Certificate of Training: 15 Credits

POWER TRAINS

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIESL | 105 | Introduction to Diesel Technology | 1 |
| DIESL | 115 | Introduction to Power Trains | 1 |
| DIESL | 116 | Manual Transmission Service | 3 |
| DIESL | 117 | Automated Manual Transmission Service | 2 |
| DIESL | 118 | Clutch Service | 2 |
| DIESL | 119 | Automatic Transmission Service | 2 |
| DIESL | 120 | Driveline Service | 1 |
| DIESL | 121 | Differentials/ Final Drive | 2 |
| DIESL | 122 | Wheel End Service | 1 |

# Digital Media

Digital media is a key component in film, television, video and website production, and encompasses a variety of projects, from filming and editing to digital animation and computer games. The constant implementation of new technology makes this a fast-moving field, a good fit for the student who seeks a career in a visual medium with leading-edge technology. Instruction includes production and editing software and the opportunity to achieve practical experience working on a variety of studio projects. Employment opportunities for digital media professionals include work as creative services editors, video editors and graphics editors for production studios, film companies, web design companies, advertising and multimedia companies. The program also provides extended learning opportunities for persons previously or currently employed in the industry.

**FACULTY**

Brian Parker, 253.680.7746, bparker@bates.ctc.edu
www.bates.ctc.edu/DigitalMedia

**Certificate of Competency: 87 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| DIGIT | 101 | Digital Imaging | 2 |
| DIGIT | 102 | Image Editing | 5 |
| DIGIT | 103 | Graphic Generation I | 5 |
| DIGIT | 104 | Introduction to Computers | 5 |
| DIGIT | 120 | Introduction to Digital Media Concepts | 4 |
| DIGIT | 121 | Production Process I | 5 |
| DIGIT | 122 | Production Process II | 4 |
| DIGIT | 123 | Production Process III | 4 |
| DIGIT | 130 | Production Editing I | 3 |
| DIGIT | 131 | Production Editing II | 3 |
| DIGIT | 132 | Digital Media – Video | 5 |
| DIGIT | 133 | Advanced Editing Project | 5 |
| DIGIT | 140 | Copyright and Ethics | 2 |
| DIGIT | 141 | Desktop Presentations I | 5 |
| DIGIT | 142 | Desktop Presentations II | 5 |
| DIGIT | 143 | Digital Media – Animation | 5 |
| DIGIT | 145 | Digital Media – Audio | 5 |

# Early Childhood Education/ Child Care

The associate in applied science – transfer degree includes technical courses required for job preparation but also includes a college-level general education component so that students may prepare for employment or to transfer to a four-year university. Curriculum is based on core competencies outlined by the Washington State Child Care Coordinating Committee and the nationally-recognized Child Development Associate credential. First-year instruction provides students with skills to work as entry-level child care/early education teachers. Second-year students prepare to become lead teachers, program supervisors and directors. Note: In support of working child care professionals who already have a first-year certificate of training, Bates offers 200-level Child Care/Early Education during a convenient evening timeframe. Prospective students should contact the program instructor for current and upcoming course offerings and schedules throughout the year.

**FACULTY**

Laurie O'Neill, 253.680.7322, loneill@bates.ctc.edu
www.bates.ctc.edu/ChildCareEarlyEducation

**Associate of Applied Science - Transfer Degree: 105 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| CMST& | 220 | Public Speaking | 5 |
| ENGL& | 101 | English Composition I | 5 |
| MATH& | 141 | Pre-calculus I | 5 |
| PSYC& | 100 | General Psychology | 5 |
| | 100+ | Social Science/Humanities Elective | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ECE | 102 | Early Education | 3 |
| ECE | 103 | STARS | 2 |
| ECE | 104 | Learning Environments | 5 |
| ECE | 105 | Early Childhood Lab I* | 2 |
| ECE | 106 | Growth, Development and Learning | 4 |
| ECE | 107 | Physical Development | 4 |
| ECE | 108 | Emotional and Social Development | 5 |
| ECE | 109 | Child Guidance | 5 |
| ECE | 110 | Cognitive Development | 5 |
| ECE | 111 | Early Childhood Lab II* | 2 |
| ECE | 201 | Issues in Child Care / Early Education | 5 |
| ECE | 202 | Children with Special Needs | 5 |
| ECE | 203 | Observation and Assessment | 4 |
| ECE | 204 | Early Childhood Lab III* | 2 |
| ECE | 205 | Instructional Strategies | 5 |
| ECE | 206 | Curriculum Development | 5 |
| ECE | 207 | Professionalism | 5 |
| ECE | 208 | Family Dynamics | 5 |
| ECE | 209 | Program Management | 5 |
| ECE | 210 | Early Childhood Lab IV* | 2 |

**EARLY CHILDHOOD EDUCATION/CHILD CARE**

Students prepare for careers in child care and early education for such positions as child care director, child care teacher, and teacher assistants. Curriculum is based on core competencies outlined by the Washington State Child Care Coordinating Committee and the nationally-recognized Child Development Associate credential. First-year instruction provides students with skills to work as entry-level child care/early education teachers. Second-year students prepare to become lead teachers, program supervisors and directors.

**NOTE:** In support of working child care professionals who already have a Child Development Associate (CDA) or a first-year certificate of training, Bates offers 200-level Child Care/Early Education during a convenient evening timeframe. Prospective students should contact the program instructor for current and upcoming course offerings and schedules throughout the year.

**Associate of Technology Degree: 95 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ECE | 101 | Introduction to Child Care / Early Education | 5 |
| | | or | 0 |
| ECE | 102 | Early Education and | 3 |
| ECE | 103 | STARS | 2 |
| ECE | 104 | Learning Environments | 5 |
| ECE | 105 | Early Childhood Lab I | 2 |
| ECE | 106 | Growth, Development and Learning | 4 |
| ECE | 107 | Physical Development | 4 |
| ECE | 108 | Emotional and Social Development | 5 |
| ECE | 109 | Child Guidance | 5 |
| ECE | 110 | Cognitive Development | 5 |
| ECE | 111 | Early Childhood Lab II* | 2 |
| ECE | 201 | Issues in Child Care / Early Education | 5 |
| ECE | 202 | Children with Special Needs | 5 |
| ECE | 203 | Observation and Assessment | 4 |
| ECE | 204 | Early Childhood Lab III* | 2 |
| ECE | 205 | Instructional Strategies | 5 |
| ECE | 206 | Curriculum Development | 5 |
| ECE | 207 | Professionalism | 5 |
| ECE | 208 | Family Dynamics | 5 |
| ECE | 209 | Program Management | 5 |
| ECE | 210 | Early Childhood Lab IV* | 2 |

**Certificate of Competency: 55 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ECE | 101 | Introduction to Child Care / Early Education | 5 |
| | | or | |
| ECE | 102 | Early Education and | 3 |
| ECE | 103 | STARS | 2 |
| ECE | 104 | Learning Environments | 5 |
| ECE | 105 | Early Childhood Lab I* | 2 |
| ECE | 106 | Growth, Development and Learning | 4 |
| ECE | 107 | Physical Development | 4 |
| ECE | 108 | Emotional and Social Development | 5 |
| ECE | 109 | Child Guidance | 5 |
| ECE | 110 | Cognitive Development | 5 |
| ECE | 112 | Healthy Environments for Children | 5 |

# Electrical Construction

Full-time day and swing shift programs are available for students seeking to earn a degree or certificate in electrical construction for jobs in commercial and residential construction, public utility agencies, and industrial construction and maintenance. The program also provides extended learning opportunities for persons previously or currently employed in these and related occupations. Students interested in receiving an ELO1 license should consult with career advisors to ensure enrollment in the appropriate program.

**FACULTY**

Dave Leenhouts, 253.680.7433, dleenhouts@bates.ctc.edu
Jeff Llapitan, 253.680.7434, jllapitan@bates.ctc.edu

**Associate of Technology Degree: 120-158 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ELCON | 101 | Introduction to Electrical Construction | 3 |
| ELCON | 102 | Applied Physical Science | 5 |
| ELCON | 103 | Hand and Power Tools | 4 |
| ELCON | 104 | Electrical Service Installation | 4 |
| ELCON | 105 | Electrical Components | 4 |
| ELCON | 106 | Introduction to Residential Wiring | 3 |
| ELCON | 107 | National Electric Code | 4 |
| ELCON | 108 | NFPA 70E Standard | 4 |
| ELCON | 109 | Residential Design | 3 |
| ELCON | 110 | Residential Wiring Techniques | 3 |
| ELCON | 111 | Systems Troubleshooting | 3 |
| ELCON | 112 | Introduction to Blueprint Reading | 3 |
| ELCON | 113 | Blueprint Reading Applications | 5 |
| WBAS | 101 | Welding Basics | 8 |
| ELCON | 201 | Specialty Tools | 4 |
| ELCON | 202 | Commercial Wiring | 3 |
| ELCON | 203 | Commercial Codes and Regulations | 3 |
| ELCON | 204 | Commercial Material Identification | 3 |
| ELCON | 205 | Commercial Installation | 3 |
| ELCON | 206 | Industrial Wiring | 3 |
| ELCON | 207 | Industrial Material Identification | 3 |
| ELCON | 208 | Industrial Installation | 3 |
| ELCON | 209 | Industrial Hazards | 3 |
| ELCON | 210 | Motors and Controllers | 4 |
| ELCON | 211 | Project Estimation | 5 |
| ELCON | 212 | Control Circuits | 3 |
| ELCON | 213 | Motors and Controllers Applications | 3 |
| ELCON | 214 | Transformers | 3 |
| ELCON | 215 | Advanced Motor Controls | 3 |
| ELCON | 220 | Advanced Projects I * | 10 |
| ELCON | 221 | Advanced Projects II * | 10 |
| ELCON | 222 | Advanced Projects III * | 10 |
| ELCON | 223 | Advanced Project s IV* | 10 |

*These courses are available for students who need additional hours in order to meet licensing requirements.

**Certificate of Competency: 67 Credits**

RESIDENTIAL ELECTRICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ELCON | 101 | INTRODUCTION TO ELECTRICAL CONSTRUCTION | 3 |
| ELCON | 102 | APPLIED PHYSICAL SCIENCE | 5 |
| ELCON | 103 | HAND AND POWER TOOLS | 4 |
| ELCON | 104 | ELECTRICAL SERVICE INSTALLATION | 4 |
| ELCON | 105 | ELECTRICAL COMPONENTS | 4 |
| ELCON | 106 | INTRODUCTION TO RESIDENTIAL WIRING | 3 |
| ELCON | 107 | NATIONAL ELECTRIC CODE | 4 |
| ELCON | 108 | NFPA 70E STANDARD | 4 |
| ELCON | 109 | RESIDENTIAL DESIGN | 3 |
| ELCON | 110 | RESIDENTIAL WIRING TECHNIQUES | 3 |
| ELCON | 111 | SYSTEMS TROUBLESHOOTING | 3 |
| ELCON | 112 | INTRODUCTION TO BLUEPRINT READING | 3 |
| ELCON | 113 | BLUEPRINT READING APPLICATIONS | 5 |
| ELCON | 201 | SPECIALTY TOOLS | 4 |

**ELECTRICAL CONSTRUCTION - Licensure Eligibility**

This is a career training program that prepares students to apply to the Southwest Washington Electrical Joint Apprenticeship Training Committee, an organization affiliated with the International Brotherhood of Electrical Workers Local #76. Upon completion of the 3000 hours of instruction, students will be given 4000 hours that will apply toward the ELOA1 license.

# Electrical Engineering Technician

Bates offers the only program in the region in which students prepare for careers in electrical code application, interior and exterior lighting design, and all aspects of electrical design. Instruction includes all phases of electrical engineering, CAD drafting, and design for commercial buildings. Technician's design and draft electrical power, signal, interior, and exterior lighting systems. They also assist in specification writing and share in on-site construction supervision. Students in this program are encouraged to take the Natural Institute for Certification in Engineering Technologies (NICET) examinations and seek certification as electrical engineering technicians.

**FACULTY**

Stan Reed, 253.680.7342, sreed@bates.ctc.edu

**Associate of Technology Degree: 120 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ETRIC | 110 | Applied Communications | 3 |
| ETRIC | 111 | Fundamentals of Drafting | 2 |
| ETRIC | 112 | Electrical Math Fundamentals | 2 |
| ETRIC | 113 | Electrical Math | 3 |
| ETRIC | 114 | Fundamentals of Electricity | 2 |
| ETRIC | 115 | Applied Electrical Math | 5 |
| ETRIC | 124 | Drafting Applications | 3 |
| ETRIC | 125 | Engineering Drafting | 3 |
| ETRIC | 126 | Electrical Principles | 3 |
| ETRIC | 127 | Applied Electrical Principles | 5 |
| ETRIC | 130 | Technical Communications | 4 |
| ETRIC | 131 | Applied Physics | 2 |
| ETRIC | 132 | CAD Fundamentals | 2 |
| ETRIC | 134 | Elements of Physics | 2 |
| ETRIC | 140 | Intermediate CAD | 3 |
| ETRIC | 141 | National Electrical Code | 3 |
| ETRIC | 142 | Codes Applications I | 3 |
| ETRIC | 143 | Fundamentals of Power Systems | 3 |
| ETRIC | 201 | Fundamentals of Lighting Systems | 4 |
| ETRIC | 202 | Fundamentals of Low-Voltage Systems | 3 |
| ETRIC | 203 | Fundamentals of High-Voltage Systems | 4 |
| ETRIC | 204 | Essentials of Electrical Systems Design | 3 |
| ETRIC | 225 | Advanced CAD Operations | 3 |
| ETRIC | 226 | Electrical System Design Applications | 3 |
| ETRIC | 227 | Introduction to Commercial Electrical Systems | 4 |
| ETRIC | 234 | CAD Design Applications | 3 |
| ETRIC | 235 | Codes Applications II | 4 |
| ETRIC | 230 | Intermediate Electrical System Design | 4 |
| ETRIC | 240 | Commercial Electrical Design Applications | 4 |
| ETRIC | 241 | Advanced Electrical System Design | 4 |
| ETRIC | 242 | Fundamentals of Cost Estimating | 2 |
| ETRIC | 243 | Construction Cost Estimating | 3 |
| ETRIC | 244 | Construction Specifications | 4 |

# Electrical Power & Process Automation/Electronics Technician

The Electrical Power and Process Automation/Electronics Technician program prepares students for apprenticeships with electric utilities by offering both a one-year Electrical Technician certificate and a two-year Industrial Technology degree. The program features equipment and software from industry leaders such as Allen Bradley, Rockwell Automation, FANUC Robotics, Bosch, Siemens, Famic Technologies, and National Instruments. The automation portion of the program focuses on the intelligent control of machines and processes using programmable logic controllers (PLCs), embedded controllers, variable frequency drives (VFDs), industrial networks, sensors & transducers, instrumentation and robotics. The electrical curriculum is based on guidelines from the National Joint Apprenticeship Training Committee (NJATC) for electrical trades. The program also offers in-depth career training for those interested in becoming an electronics technician in the manufacturing, scientific, aerospace, or civilian military industries.

**FACULTY**
Tom Newman, 253.680.7350, tnewman@bates.ctc.edu

## Associate of Technology: 101-119 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| ELPP | 110 | Electricity and Magnetism | 2 |
| ELPP | 115 | DC Circuit Analysis | 5 |
| ELPP | 118 | Fluid Power | 5 |
| ELPP | 120 | Alternating Current | 2 |
| ELPP | 125 | AC Circuit Analysis | 5 |
| ELPP | 126 | Analog Electronics | 5 |
| ELPP | 128 | Polyphase AC Power Generation and Distribution | 5 |
| ELPP | 135 | Mechanics | 3 |
| ELPP | 140 | Motors and Control Systems | 5 |
| ELPP | 145 | Construction Practices, The NEC, and UL Guides | 5 |
| ELPP | 210 | Digital Logic | 4 |
| ELPP | 215 | Programmable Logic Controllers | 5 |
| ELPP | 220 | Allen Bradley SLC 500 Processors | 5 |
| ELPP | 225 | Sensors and Transducers | 3 |
| ELPP | 230 | Programming Methodologies | 2 |
| ELPP | 231 | PLC Programming Projects | 5 |
| ELPP | 255 | Instrumentation | 5 |
| ELPP | 254 | Supervisory Control and Data Acquisition (SCADA) | 3 |
| ELPP | 238 | Embedded Controllers | 5 |
| ELPP | 268 | Industrial Networks | 5 |
| Electives* | | Student must choose two items from the electives list. | 2-20 |

## Certificate of Competency: 57 Credits

ELECTRICAL TECHNICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| ELPP | 110 | Electricity and Magnetism | 2 |
| ELPP | 115 | DC Circuit Analysis | 5 |
| ELPP | 118 | Fluid Power | 5 |
| ELPP | 120 | Alternating Current | 2 |
| ELPP | 125 | AC Circuit Analysis | 5 |
| ELPP | 126 | Analog Electronics | 5 |
| ELPP | 128 | Polyphase AC Power Generation and Distribution | 5 |
| ELPP | 135 | Mechanics | 3 |
| ELPP | 140 | Motors and Control Systems | 5 |
| ELPP | 145 | Construction Practices, the NEC, and UL Guides | 5 |

| *ELECTIVES LIST | | | |
|---|---|---|---|
| CNST | 209 | Directory Services | 5 |
| CNST | 210 | Network Security | 5 |
| WIRE | 120 | Telecommunications Network Cable | 5 |
| WIRE | 121 | Fiber Optics | 5 |
| INFO | 104 | A+ Essentials1 | 4 |
| INFO | 105 | A+ Practical1 | 4 |
| ELPP | 101 | Introductory Industrial Robotics | 5 |
| ELPP | 126 | Analog Electronics | 5 |
| ELPP | 240 | Industrial Robotics2 | 5 |
| ELPP | 241 | FANUC Robotics Roboguide2 | 5 |
| ELPP | 250 | Independent Study4 | 5 |
| ELPP | 251 | Independent Study4 | 5 |
| ELPP | 256 | Alternative Energy4 | 5 |
| ELPP | 257 | AutoCAD Electrical4 | 5 |
| ELPP | 258 | Automation Studio4 | 5 |
| ELPP | 259 | Microsoft's Robotics Studio4 | 5 |
| ELPP | 260 | Lego NXT Robotics4 | 5 |
| ELPP | 261 | Embedded Programming in C4 | 5 |
| ELPP | 262 | Wireless Sensor Networks4 | 5 |
| ELPP | 291 | Practical Applications | 1-18 |
| ELPP | 292 | Independent Projects4 | 1-10 |
| ELPP | 293 | Independent Projects4 | 1-10 |
| ELPP | 294 | Independent Projects4 | 1-10 |
| ELPP | 296 | Work-based Learning Experience 3and | 3 |
| ELPP | 297 | Work-based Learning Seminar | 1 |

1. A+ Essentials and A+ Practical need to be taken as a pair of electives.
2. Industrial Robotics and FANUC Robotics Roboguide need to be taken as a pair of electives.
3. Work-based Learning 296/297 must be taken as a pair of electives if accepted into an apprenticeship with The Bonneville Power Administration (BPA). The BPA requires that students remain enrolled in their career-training program for a minimum of 640 hours during transition; the electives may otherwise be taken independently.
4.Instructor permission is required to enroll in this course.

# Electronic Equipment Service Technician

Students prepare for careers in the electronic equipment service profession as technicians in a wide range of high tech industries, including broadcast audio, broadcast video, car audio, electronic service, medical equipment repair, office automation and video tape. Employment opportunities may also include mobile electronics installer and electronic assembler. Students acquire and hone service technician skills through extensive practice with live equipment, and prepare for industry certification as Certified Electronics Technicians, Mobile Electronics Certified Professionals, and Certified Broadcast Technologists. This program also provides extended learning opportunities for persons previously or currently employed in these and related occupations.

**FACULTY**

Art Cutting, 253.680.7252, acutting@bates.ctc.edu
Keith Hawkins, 253.680.7212, khawkins@bates.ctc.edu
www.bates.ctc.edu/EEST

**Associate of Technology Degree: 91 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| EEST | 101 | Safety Principles | 3 |
| EEST | 102 | Applied Math | 5 |
| EEST | 103 | Electronics Principles I | 5 |
| EEST | 104 | DC Electronics | 4 |
| EEST | 105 | AC Electronics | 5 |
| EEST | 106 | Inductors and Capacitors | 4 |
| EEST | 107 | Electronics Principles II | 5 |
| EEST | 108 | Amplifiers and Transistors | 4 |
| EEST | 109 | Electronic Devices | 2 |
| EEST | 110 | Introduction to Programmable Logic Controllers | 5 |
| EEST | 201 | Electronic Principles - Automation | 5 |
| EEST | 202 | Antenna and Satellite Systems | 3 |
| EEST | 203 | Magnetic and Laser Media | 3 |
| EEST | 204 | RF Receivers and Audio Amps | 4 |
| EEST | 205 | Video Projection | 1 |
| EEST | 206 | Emerging Technologies | 3 |
| BMST | 105 | Testing Equipment | 5 |
| BMST | 106 | Soldering | 2 |
| BMST | 107 | Schematics | 3 |
| BMST | 109 | Applied Service I | 3 |
| BMST | 110 | Applied Service II | 2 |

# Electronics Engineering Technician

Students prepare for entry-level employment as technicians in the field of electronic engineering. Instruction includes computer-aided drafting (CAD), printed circuit board design, electronic packaging, solid state components, and digital and microprocessors. Students are encouraged to take the National Institute for Certification in Engineering Technologies (NICET) examinations and seek certification as electronic engineering technicians. Graduates are qualified to work with electronic engineers, consultants, manufacturers and research and development teams.

**FACULTY**
Stan Reed, 253.680.7342, sreed@bates.ctc.edu

**Associate of Technology Degree: 117 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ETRON | 110 | Applied Communications | 3 |
| ETRON | 111 | Fundamentals of Drafting | 4 |
| ETRON | 112 | Electronic Math Fundamentals | 3 |
| ETRON | 113 | Math for Electronics | 2 |
| ETRON | 114 | Fundamentals of Electricity | 2 |
| ETRON | 115 | Elements of Physics | 2 |
| ETRON | 116 | Electronic Principles | 3 |
| ETRON | 120 | Technical Communications | 4 |
| ETRON | 121 | Engineering Drafting | 3 |
| ETRON | 122 | Applied Electronic Math | 5 |
| ETRON | 123 | CAD Fundamentals | 2 |
| ETRON | 133 | Intermediate CAD | 3 |
| ETRON | 134 | Applied Physics | 2 |
| ETRON | 135 | Applied Electronic Principles | 5 |
| ETRON | 136 | Semiconductors, Diodes, and Transistors | 3 |
| ETRON | 143 | Advanced CAD Operations | 3 |
| ETRON | 144 | Amplifiers in Electronics | 4 |
| ETRON | 145 | Principles of FETs, JFETs, and MOSFETSs | 3 |
| ETRON | 146 | Thyristors, Frequency, Feedback, and Filters | 4 |
| ETRON | 210 | Oscillators, Timers, and Power Supplies | 4 |
| ETRON | 211 | Essentials of Number Systems | 2 |
| ETRON | 212 | Data Control, Flip-Flops, Counters, and Shift Registers | 4 |
| ETRON | 213 | Principles of Analog and Binary Interfacing | 4 |
| ETRON | 221 | Essentials of Drafting for Electronics | 3 |
| ETRON | 222 | Microprocessors, Memory, Software, and Hardware | 3 |
| ETRON | 223 | CAD Applications in Design | 3 |
| ETRON | 224 | Electronic Units, Materials, Computers, Components, and Standards | 3 |
| ETRON | 230 | Schematics and Diagrams | 4 |
| ETRON | 231 | Programmable Controllers | 4 |
| ETRON | 232 | Printed Circuit Boards | 5 |
| ETRON | 233 | Electronic Packaging | 3 |

# Electronics Technician

Successful completion of coursework  in the electronics technician program qualifies graduates to use precision test equipment and hand tools to install, maintain, test, and repair electronic equipment for a broad range of careers, including manufacturing, communications, information technologies and computers, electronic security, avionics, and defense. Students also prepare for Certified Electronic Technician (CET) testing. Note: Completion of electronics technician coursework is required before entering other advanced technologies programs at Bates. All credits earned in the electronics technician program may be applied to fulfill elective requirements for a degree in an advanced technology program at Bates Technical College.

**FACULTY**

David Skeen, 253.680.7352, dskeen@bates.ctc.edu

**Certificate of Training: 30 Credits**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ETECH | 101 | Introduction to Electronics | 2 |
| ETECH | 102 | DC Circuits | 5 |
| ETECH | 103 | AC Circuits | 5 |
| ETECH | 104 | Analog Circuits | 5 |
| ETECH | 105 | Digital Circuits | 5 |
| ETECH | 106 | Microcontrollers | 5 |
| ETECH | 107 | Employment Preparation | 3 |

# Facilities Maintenance Engineer

Students prepare for careers in the building care and maintenance industry, including boiler operator, building repairer, facilities maintenance engineer and custodian in industrial and office buildings, hotels, schools, and government agencies. Instruction includes electricity, welding, blueprint reading, machine maintenance, grounds keeping, boiler repair and operation, HVAC/R and advanced industry applications. Major elements of the program prepare students for Class V and Class IV boiler operator/fireman certification. This is a pre-apprenticeship program for the Western Washington Operating Engineers Facilities Custodial Services Apprenticeship Committee and the Western Washington Stationary Engineers Apprenticeship Committee. The program also provides extended learning opportunities for persons previously or currently employed in these or other related professions.

**FACULTY**
Dale Trombley, 253.680.7448, dtrombley@bates.ctc.edu

## Associate of Technology Degree: 120 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| FACM | 101 | Safety Principles | 2 |
| FACM | 102 | Fundamentals of Electricity | 3 |
| FACM | 103 | Electrical Service | 4 |
| FACM | 104 | Introduction to Blueprint Reading | 5 |
| FACM | 105 | Engineering Drawings | 4 |
| FACM | 106 | Introduction to Hydraulics/Pneumatics | 5 |
| FACM | 107 | Machine Components | 5 |
| FACM | 108 | Mechanical and Machine Maintenance | 5 |
| FACM | 109 | Tools and Equipment | 3 |
| FACM | 111 | Building Maintenance and Repair Methods | 5 |
| FACM | 112 | Basic Refrigeration | 4 |
| FACM | 113 | Introduction to Building Maintenance | 3 |
| FACM | 121 | Grounds Keeping | 5 |
| FACM | 122 | HVAC Systems | 4 |
| FACM | 222 | Introduction to Remodeling | 4 |
| FACM | 221 | Small Business Planning | 3 |
| FACM | 230 | Computers in Industry | 2 |
| FACM | 231 | Computer Applications | 4 |
| FACM | 140 | Boiler Operations and Certification | 12 |
| FACM | 144 | Advanced Boiler Operations | 5 |
| FACM | 143 | Advanced Projects | 10 |
| WBAS | 101 | Welding Basics | 8 |

## Certificate of Competency: 84-87 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| FACM | 101 | Safety Principles | 2 |
| FACM | 102 | Fundamentals of Electricity | 3 |
| FACM | 103 | Electrical Service | 4 |
| FACM | 104 | Introduction to Blueprint Reading | 5 |
| FACM | 105 | Engineering Drawings | 4 |
| FACM | 106 | Introduction to Hydraulics/Pneumatics | 5 |
| FACM | 107 | Machine Components | 5 |
| FACM | 108 | Mechanical and Machine Maintenance | 5 |
| FACM | 109 | Tools and Equipment | 3 |
| FACM | 111 | Building Maintenance and Repair Methods | 5 |
| FACM | 113 | Introduction to Building Maintenance | 3 |
| FACM | 121 | Grounds Keeping | 5 |
| FACM | 222 | Introduction to Remodeling | 4 |

**STUDENTS MUST CHOOSE ONE OF THE FOLLOWING OPTIONS:**

Option A:

| | | | |
|---|---|---|---|
| FACM | 112 | Basic Refrigeration | 4 |
| FACM | 123 | HVAC Systems II | 4 |
| FACM | 221 | Small Business Planning | 3 |
| FACM | 230 | Computers in Industry | 2 |
| FACM | 231 | Computer Applications | 4 |

Option B:

| | | | |
|---|---|---|---|
| FACM | 140 | Boiler Operations and Certification | 12 |
| FACM | 144 | Advanced Boiler Operations | 5 |

Option C: Work-based Learning

| | | | |
|---|---|---|---|
| FACM | 143 | Advanced Projects | 10 |
| WBAS | 101 | Welding Basics | 8 |

## BOILER OPERATIONS, Certificate of Training: 12 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FACM | 140 | Boiler Operations and Certification | 12 |

## BUILDING CARE AND MAINTENANCE I, Certificate of Training: 18 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FACM | 101 | Safety Principles | 2 |
| FACM | 102 | Fundamentals of Electricity | 3 |
| FACM | 103 | Electrical Service | 4 |
| FACM | 104 | Introduction to Blueprint Reading | 5 |
| FACM | 105 | Engineering Drawings | 4 |

## MAINTENANCE TECHNICIAN I, Certificate of Training: 18 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FACM | 106 | Introduction to Hydraulics/Pneumatics | 5 |
| FACM | 107 | Machine Components | 5 |
| FACM | 108 | Mechanical and Machine Maintenance | 5 |
| FACM | 109 | Tools and Equipment | 3 |

## BUILDING CARE AND MAINTENANCE II, Certificate of Training: 17 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FACM | 111 | Building Maintenance and Repair Methods | 5 |
| FACM | 113 | Introduction to Building Maintenance | 3 |
| FACM | 121 | Grounds Keeping | 5 |
| FACM | 222 | Introduction to Remodeling | 4 |

## MAINTENANCE TECHNICIAN II, Certificate of Training: 17 Credits

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FACM | 112 | Basic Refrigeration | 4 |
| FACM | 123 | HVAC Systems II | 4 |
| FACM | 221 | Small Business Planning | 3 |
| FACM | 230 | Computers in Industry | 2 |
| FACM | 231 | Computer Applications | 4 |

# Fire Protection Engineering Technology

Fire protection engineering technicians design and service fire sprinklers, fire alarms, and other types of in-place detection and suppression systems. The program is supplemented by preparation for NICET examinations, enabling students to choose from three career paths: Automatic Sprinkler Layout, Fire Alarm/Suppression Systems Layout, and Inspection, Testing, and Maintenance.

**FACULTY**

Ron Greenman, 253.680.7346, rgreenman@bates.ctc.edu

**Associate of Technology Degree: 109 Credits**
**Associate of Applied Science -Transfer Degree: 119 Credits**
**Certificate of Competency: 109 Credits**

| GENERAL EDUCATION REQUIREMENTS (AT DEGREE) | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| GENERAL EDUCATION REQUIREMENTS (Certificate of Competency) | | | |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| GENERAL EDUCATION REQUIREMENTS (AAS-T Degree) | | | |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 10 |
| 100+ | Level | Mathematics | 10 |

An AAS-T Degree is directly transferable by an articulation agreement with The Evergreen State College. A transferring student will enter The Evergreen State College as an upper classman but will primarily enroll in lower division, general education coursework. Upon completion the student will be eligible for a Bachelors of Technology Degree.

| REQUIRED COURSEWORK - CORE | | | CREDITS |
|---|---|---|---|
| FPET | 101 | Introduction to Fire Protection Engineering | 3 |
| FPET | 103 | Research Methods | 5 |
| FPET | 107 | Alarm and Suppression System Design | 5 |
| FPET | 112 | Sprinkler Design I | 5 |
| FPET | 114 | Inspection and Testing * | 3 |
| FPET | 117 | Fire Protection Project/Applications I | 3 |
| FPET | 118 | Applied Math and Fire Science II | 2 |
| FPET | 119 | Applied Math and Fire Science III | 2 |
| FPET | 120 | Fire Protection Project/Applications II | 3 |
| FPET | 122 | Building Construction | 4 |
| FPET | 123 | Applied Math and Fire Science I | 2 |
| FPET | 124 | Design Seminar | 5 |
| FPET | 125 | Drafting Fundamentals I | 5 |
| FPET | 126 | Codes and Standards | 4 |
| FPET | 127 | The Practice of Fire Protection | 4 |
| FPET | 128 | Drafting Fundamentals II | 5 |
| FPET | 129 | Calculations Seminar | 5 |
| FPET | 130 | Drafting Fundamentals III | 5 |
| FPET | 200 | Codes and Standards – Applications | 3 |
| FPET | 206 | Practical Applications II-Commissioning and Inspections * | 4 |
| FPET | 231 | Projects I | 3 |
| FPET | 232 | Projects II | 3 |
| FPET | 233 | Projects III | 3 |
| FPET | 234 | Projects IV | 3 |
| FPET | 235 | Practical Applications I-Design | 5 |

* Students may substitute any or all of these courses with a work-based learning component for a total of 7 credits.

**Certificate of Training : 43 Credits**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FPET | 101 | Introduction to Fire Protection Engineering | 3 |
| FPET | 107 | Alarm and Suppression System Design | 5 |
| FPET | 114 | Inspection and Testing * | 3 |
| FPET | 121 | Project Contracts | 2 |
| FPET | 126 | Codes and Standards | 4 |
| FPET | 200 | Codes and Standards – Applications | 3 |
| FPET | 206 | Practical Applications II-Commissioning and Inspections * | 4 |
| FPET | 210 | Notification Integration | 1 |
| FPET | 211 | Inspection and Testing – Advanced | 3 |
| FPET | 212 | Sprinkler Equipment and Systems | 3 |
| FPET | 214 | Special Systems and Equipment | 3 |
| FPET | 216 | Special Hazards Systems | 4 |
| FPET | 217 | Notification Appliance and Monitoring Applications | 2 |
| FPET | 218 | Detection Systems | 3 |

*This course may be substituted with a work-based learning component.

# Fire Service

Students prepare for careers as fire fighters, or in closely related occupations that require certification as a firefighter in this program that is accredited by the International Fire Service Accreditation Congress. Training incorporates all entry-level requirements according to nationally recognized standards.

**Prerequisites:**
1. Applicants must meet predetermined assessment test levels in writing, reading, algebra, mechanical reasoning, and space relations.
2. Applicants are to have good eyesight, normal color vision, and be able to pass a stringent physical examination.
3. Applicants must have a current Washington State driver's license, a good driving history, and no criminal record.
4. Students are required to maintain and show proof of medical/health insurance for the duration of Bates Fire Service educational career.

**FACULTY**
Jim Anderson, 253.680.7462, janderson@bates.ctc.edu
Pat Piper, 253.680.7463, ppiper@bates.ctc.edu
Darrell Taylor, 253.680.7465, dtaylor@bates.ctc.edu
www.bates.ctc.edu/FireFighter

**Associate of Technology Degree: 99 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FIRES | 101 | Orientation to Fire Service | 2 |
| FIRES | 102 | Firefighter Safety | 4 |
| FIRES | 103 | Fire Service Applications I | 5 |
| FIRES | 104 | Physical Fitness I | 1 |
| FIRES | 105 | Introduction to Fire Science | 3 |
| FIRES | 106 | Fire Hose and Appliances | 3 |
| FIRES | 107 | Fire Service Applications II | 5 |
| FIRES | 108 | Physical Fitness II | 1 |
| FIRES | 109 | Ladders | 5 |
| FIRES | 110 | Intermediate Fire Service | 2 |
| FIRES | 111 | Fire Service Applications III | 4 |
| FIRES | 112 | Physical Fitness III | 1 |
| FIRES | 121 | Wildland Firefighter | 2 |
| FIRES | 122 | Fire Vehicle Operations | 4 |
| FIRES | 123 | Fire Service Applications IV | 5 |
| FIRES | 124 | Physical Fitness IV | 1 |
| FIRES | 201 | Rescue Procedures | 3 |
| FIRES | 202 | Advanced Fire Service | 3 |
| FIRES | 203 | Fire Service Applications V | 5 |
| FIRES | 204 | Physical Fitness V | 1 |
| FIRES | 205 | Hazardous Materials | 3 |
| FIRES | 206 | Employment Preparation | 2 |
| FIRES | 207 | Strategy, Tactics, and Incident Management | 2 |
| FIRES | 208 | Fire Service Applications VI | 4 |
| FIRES | 209 | Healthcare Provider | 1 |
| FIRES | 210 | Confined Space Rescue | 1 |
| FIRES | 211 | Advanced Firefighter | 3 |

Students must choose either Option A or Option B:

| Option A: Advanced Firefighter | | | CREDITS |
|---|---|---|---|
| FIRES | 220 | Fire Service Applications VII | 4 |
| FIRES | 221 | Experiential Lab/Drill | 4 |

| Option B: Emergency Medical Technician | | | CREDITS |
|---|---|---|---|
| FIRES | 225 | Emergency Medical Technician (EMT) | 8 |

# Hearing Instrument Technology

To apply for a hearing instrument fitter/dispenser license in Washington State, applicants must successfully complete degree requirements from an approved two-year education program. Bates' Hearing Instrument Technology program is approved by the Washington State Board of Hearing and Speech for students to prepare for careers as hearing instrument fitters/dispensers. Instruction includes professional terminology, anatomy and physiology of the normal ear, common medical disorders that may affect hearing, patient/family education, ethics, basic acoustics, hearing aid electronics and sound processing schemes. In an on-campus hearing instrument study clinic, students perform hearing assessments, assist patients in the selection, procurement and fitting of hearing aids, troubleshoot hearing aid problems and perform minor repairs. Students are also introduced to business aspects of the industry.

**Prerequisites:**
1.Applicants must be fully ready to enter into general education courses. This entry requirement may be satisfied by providing the registrar with official transcripts showing actual completion of general education courses, or by satisfactory completion of placement tests the enable the student to enroll directly into required general education courses.
2.To meet Washington State residency requirements for program completion, students must be enrolled in the Hearing Instrument Technology career education program at Bates Technical College for their last 1,284 hours of training.

**FACULTY**
Marci Leong, 253.680.7319, mleong@bates.ctc.edu
www.bates.ctc.edu/Hearing

**Associate of Technology Degree: 109 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ Level | | Human Relations | 5 |
| 100+ Level | | Communications | 5 |
| 100+ Level | | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| HEAR | 110 | Introduction to Hearing Professions | 5 |
| HEAR | 111 | Safety Practices | 4 |
| HEAR | 112 | Acoustics | 5 |
| HEAR | 113 | Hearing Assessment I | 3 |
| HEAR | 120 | Anatomy and Physiology | 5 |
| HEAR | 121 | Instrumentation | 5 |
| HEAR | 122 | Hearing Assessment II | 3 |
| HEAR | 130 | Disorders of the Auditory System | 5 |
| HEAR | 131 | Hearing Aids | 5 |
| HEAR | 132 | Audiometric Interpretation I | 5 |
| HEAR | 210 | Hearing Assessment III | 3 |
| HEAR | 211 | Aural Rehabilitation I | 3 |
| HEAR | 212 | Business Aspects I | 5 |
| HEAR | 213 | Clinical I | 3 |
| HEAR | 220 | Hearing Aid Evaluation | 5 |
| HEAR | 221 | Audiometric Interpretation II | 5 |
| HEAR | 222 | Hearing Aids II | 5 |
| HEAR | 223 | Clinical II | 3 |
| HEAR | 230 | Hearing Aid Service and Repair | 5 |
| HEAR | 231 | Aural Rehabilitation II | 4 |
| HEAR | 232 | Business Aspects II | 4 |
| HEAR | 233 | Clinical III | 4 |

# Heating, Ventilation, Air Conditioning & Refrigeration Technician

Students prepare for certified entry-level employment in the heating, ventilation, air conditioning, and refrigeration industry. The technical skills acquired in this program may be applied in areas such as air conditioning, systems controls, energy management systems, heating and ventilation technicians, and sales. The program also provides extended learning opportunities for persons previously or currently employed in related professions.

Note: Students are required to pass the Air Conditioning and Refrigeration Institute industry competency exam to complete the program: Two examinations to obtain a degree; one exam to obtain a certificate. Sufficient training is provided to qualify students to take the Environmental Protection Agency CFC certification examination required to work in the industry. A total of 1,100 hours of credit is applied toward the Washington State 06A electrical certificate.

**FACULTY**
Mark Peila, 253.680.7255, mpeila@bates.ctc.edu

## Associate of Technology Degree: 103 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| HVAC | 101 | HVAC Fundamentals | 3 |
| HVAC | 102 | Safety | 2 |
| HVAC | 103 | HVAC/R Science | 2 |
| HVAC | 104 | Tools and Equipment | 4 |
| HVAC | 105 | Refrigerant and Refrigeration Systems I | 4 |
| HVAC | 106 | Refrigerant and Refrigeration Systems II | 3 |
| HVAC | 107 | Electrical Systems and Components | 5 |
| HVAC | 108 | Electrical Troubleshooting | 3 |
| HVAC | 109 | Soldering and Brazing Applications | 3 |
| HVAC | 110 | Residential Systems | 5 |
| HVAC | 111 | Light Commercial Systems | 5 |
| HVAC | 112 | Heat Pump Systems | 4 |
| HVAC | 201 | System Design, Sizing, and Layout | 4 |
| HVAC | 210 | Drafting and Blueprint Applications | 4 |
| HVAC | 211 | Commercial Environmental Systems | 5 |
| HVAC | 212 | Chilled Water Systems | 2 |
| HVAC | 213 | Hydronic Heating Systems | 2 |
| HVAC | 214 | Cooling Tower | 1 |
| HVAC | 215 | Thermal Storage | 2 |
| HVAC | 216 | CFC Exam Preparation | 1 |
| HVAC | 217 | Commercial Refrigeration | 3 |
| HVAC | 218 | Installation, Maintenance, and Troubleshooting | 2 |
| HVAC | 219 | AHRI Industry Competency Exam #1 | 3 |
| HVAC | 220 | AHRI Industry Competency Exam #2 | 3 |
| HVAC | 221 | Industry Math | 5 |

Students must choose one option:

| Option A: | | | CREDITS |
|---|---|---|---|
| HVAC | 202 | Welding Processes | 2 |
| HVAC | 203 | Hand-held Torch Burning Applications | 2 |
| HVAC | 204 | SMAW (ARC) Applications | 2 |
| HVAC | 205 | GMAW (MIG) applications | 2 |

| Option B: | | | CREDITS |
|---|---|---|---|
| HVAC | 206 | Basic Metalworking | 2 |
| HVAC | 207 | Basic Layout and Patterns | 2 |
| HVAC | 208 | Fabrication Practices | 2 |
| HVAC | 209 | Air Balance and Duct Sizing | 2 |

## Certificate of Competency: 99 Credits

HVAC/R SUPPORT TECHNICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| HVAC | 101 | HVAC Fundamentals | 3 |
| HVAC | 102 | Safety | 2 |
| HVAC | 103 | HVAC/R Science | 2 |
| HVAC | 104 | Tools and Equipment | 4 |
| HVAC | 105 | Refrigerant and Refrigeration Systems I | 4 |
| HVAC | 106 | Refrigerant and Refrigeration Systems II | 3 |
| HVAC | 107 | Electrical Systems and Components | 5 |
| HVAC | 108 | Electrical Troubleshooting | 3 |
| HVAC | 109 | Soldering and Brazing Applications | 3 |
| HVAC | 110 | Residential Systems | 5 |
| HVAC | 111 | Light Commercial Systems | 5 |
| HVAC | 112 | Heat Pump Systems | 4 |
| HVAC | 210 | Drafting and Blueprint Applications | 4 |
| HVAC | 211 | Commercial Environmental Systems | 5 |
| HVAC | 212 | Chilled Water Systems | 2 |
| HVAC | 213 | Hydronic Heating Systems | 2 |
| HVAC | 214 | Cooling Tower | 1 |
| HVAC | 215 | Thermal Storage | 2 |
| HVAC | 216 | CFC Exam Preparation | 1 |
| HVAC | 217 | Commercial Refrigeration | 3 |
| HVAC | 218 | Installation, Maintenance, and Troubleshooting | 2 |
| HVAC | 219 | AHRI Industry Competency Exam #1 | 3 |
| HVAC | 220 | AHRI Industry Competency Exam #2 | 3 |
| HVAC | 221 | Industry Math | 5 |

Students must choose one option:

| Option A: | | | |
|---|---|---|---|
| HVAC | 202 | Welding Processes | 2 |
| HVAC | 203 | Hand-held Torch Burning Applications | 2 |
| HVAC | 204 | SMAW (ARC) Applications | 2 |
| HVAC | 205 | GMAW (MIG) applications | 2 |

| Option B: | | | |
|---|---|---|---|
| HVAC | 206 | Basic Metalworking | 2 |
| HVAC | 207 | Basic Layout and Patterns | 2 |
| HVAC | 208 | Fabrication Practices | 2 |
| HVAC | 209 | Air Balance and Duct Sizing | 2 |

# Industrial Trades: I-BEST

The Industrial Trades I-BEST program prepares students for entry into the high demand, high wage industry of machining, manufacturing, and other related industries. Students receive skills training in industry-specific mathematics, welding, and employment success strategies.

**Certificate of Training: 19 Credits**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| AMATH | 101 | Trades Math | 3 |
| AMATH | 102 | Precision Measurement | 3 |
| IBEST | 105 | Success Strategies | 5 |
| WBAS | 101 | Welding Basics | 8 |

# Information Technology Specialist

Information technologies specialists are an integral part of nearly every industry in today's technology-dominated workplace. Students in this program prepare for careers that focus on PC and network support with emphasis on both practical experience and certification preparation, including LAN/WAN administrator, network system support specialist. Students are encouraged to obtain Microsoft, Cisco, and CompTIA, certifications. Possible certifications students can obtain include, A+, MCITP, MCP, MCDST, MCSE, and MCSA.

**Note:** Bates Technical College is an official Cisco Networking Academy.

**FACULTY**

Emmett Peterson, 253.680.7066, epeterson@bates.ctc.edu

**Associate of Technology Degree: 112 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| INFO | 101 | Computer Applications Essentials | 5 |
| INFO | 102 | Fundamentals of Information Technology | 4 |
| INFO | 103 | Internet Applications | 5 |
| INFO | 104 | A+ Essentials | 5 |
| INFO | 105 | A+ Practical | 5 |
| INFO | 106 | Electronics Basics | 5 |
| INFO | 107 | Structured Cabling | 3 |
| INFO | 110 | Emerging Technologies | 5 |
| INFO | 111 | Practical Applications | 5 |
| CNST | 206 | MS Client Operating Systems | 5 |
| CNST | 207 | Network Infrastructure | 5 |
| CNST | 209 | Directory Services | 5 |
| CNST | 210 | Network Security | 5 |
| CNST | 201 | Cisco Network Fundamentals | 5 |
| CNST | 202 | Cisco Routing Protocols and Concepts | 5 |
| CNST | 205 | Fundamentals of Linux | 5 |

Students must chose 20 credits from the electives list.

| ELECTIVES LIST | | | CREDITS |
|---|---|---|---|
| WIRE | 201 | Telecommunications Network Cabling | 5 |
| WIRE | 202 | Fiber Optics | 5 |
| CNST | 203 | Cisco LAN Switching and Wireless | 5 |
| CNST | 204 | Cisco-Accessing the WAN | 5 |
| INFO | 108 | Project Management | 5 |
| INFO | 109 | Employment Preparation | 5 |

# Land Survey

Students prepare for careers as survey technicians, using equipment and software that is standard in the industry. Classroom and laboratory settings closely resemble a small surveying firm to provide students with practice in all aspects of projects common to the profession including project definition, document research, computations, CAD drawing, field work (preliminary to final staking), and client presentations. This program provides extended learning for people previously or currently employed in this occupation as well as individuals just entering the field of surveying.

**FACULTY**

Richard Lang, 253.680.7345, rlang@bates.ctc.edu
www.bates.ctc.edu/LandSurveying

**Associate of Technology Degree: 120 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FIRST YEAR | | | |
| LAND | 101 | The Computer a Surveying Tool | 3 |
| LAND | 102 | Applied Surveying Math | 5 |
| LAND | 110 | Basic Surveying - CAD | 3 |
| LAND | 111 | First Aid/CPR | 1 |
| LAND | 112 | Flagger Certification | 1 |
| LAND | 113 | Introduction to Global Positioning Systems | 3 |
| LAND | 120 | Position Tolerance and Error | 3 |
| LAND | 121 | Schematics | 4 |
| LAND | 130 | Level Instruments | 6 |
| LAND | 131 | Total Station Instruments | 8 |
| LAND | 135 | Surveying Legal Guidelines | 3 |
| LAND | 140 | Intermediate Field Surveying | 6 |

| SECOND YEAR | | | CREDITS |
|---|---|---|---|
| LAND | 205 | Advanced Surveying Math | 5 |
| LAND | 210 | Utility CAD Applications | 5 |
| LAND | 211 | Subdivision Planning and Design | 5 |
| LAND | 212 | Roadway Design | 5 |
| LAND | 220 | Field Traverse – CAD | 5 |
| LAND | 221 | Global Positioning Systems (GPS) | 4 |
| LAND | 222 | Plan Review | 6 |
| LAND | 225 | Construction Surveying and Layout | 5 |
| LAND | 230 | Independent Projects | 4 |
| LAND | 231 | Survey Records – CAD | 5 |
| LAND | 240 | Legal Descriptions | 5 |
| LAND | 241 | LSAW Seminar | 3 |
| LAND | 242 | Independent Projects | 4 |

**Certificate of Competency: 58 Credits**

SURVEYOR'S AID

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| LAND | 101 | Computers As An Engineering Tool | 3 |
| LAND | 102 | Applied Surveying Math | 5 |
| LAND | 110 | Basic Surveying - CAD | 3 |
| LAND | 111 | First Aid/CPR | 1 |
| LAND | 112 | Flagger Certification | 1 |
| LAND | 113 | Introduction to Global Positioning Systems | 3 |
| LAND | 120 | Position Tolerance and Error | 3 |
| LAND | 121 | Schematics | 4 |
| LAND | 130 | Level Instruments | 6 |
| LAND | 131 | Total Station Instruments | 8 |
| LAND | 140 | Intermediate Field Surveying | 7 |

# Legal Assistant

Students in this program prepare for administrative support careers in the legal environment serving law firms, corporations and government agencies, as well as municipal, state and federal courts. The curriculum offers extensive hands-on training in the preparation of legal documents. Students are introduced to different areas of legal specialization through preparation of legal documents for mock cases, which provides exposure to many areas of the law. To enhance skills, students often participate in work-based learning opportunities with local law firms, government legal offices, and corporations. Students are prepared for the Accredited Legal Secretary certification (ALS) and are encouraged become members of NALS...the association for legal professionals.

**Prerequisite:** Minimum typing ability of 25 words per minute on keyboard.

**Recommended COMPASS Scores**

**Associate of Technology**
**Read:** 80 and above
**Write:** 40 and above
**Pre-Algebra:** 55 and above

**Associate of Applied Science-Transer**
**Read:** 85 and above
**Write:** 77 and above
**College Algebra:** 35 and above
**Differential Aptitude Test – Clerical Speed:** 45
**Differential Aptitude Test – Spelling:** 44
**Differential Aptitude Test – Language Usage:** 19

**Certificate of Competency**
**Read:** 80 and above
**Write:** 40 and above
**Pre-Algebra:** 35 and above

Students scoring below these levels often have difficulty successfully completing the program. Please consult with instructor.

Individuals with a criminal charge or any type of criminal background may find it exceeding difficult to find employment in the legal profession.

**Associate of Applied Science-Transfer: 111 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100&+ | Level | Humanities/ Social Science electives (See list.) | 15 |
| MATH& | 146 | Introduction to Statistics | 5 |
| ENGL& | 101 | English Composition | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| LEGAL | 103 | Legal Office Procedures | 5 |
| LEGAL | 104 | MS Outlook | 2 |
| LEGAL | 105 | Records Management | 4 |
| LEGAL | 108 | Legal Terminology | 5 |
| LEGAL | 109 | Legal Research | 2 |
| LEGAL | 111 | Introduction to MS Word | 5 |
| LEGAL | 112 | MS Word Applications | 5 |
| LEGAL | 113 | Criminal Law | 5 |
| LEGAL | 201 | Beginning Accounting | 5 |
| LEGAL | 202 | Legal Office Projects | 5 |
| LEGAL | 203 | Legal Billing Software | 1 |
| LEGAL | 205 | MS PowerPoint for Legal Assistants | 3 |
| LEGAL | 206 | MS Excel | 3 |
| LEGAL | 208 | Ethics | 2 |
| LEGAL | 209 | Civil Litigation | 5 |
| LEGAL | 211 | ALS Preparation I | 4 |
| LEGAL | 212 | ALS Preparation II | 2 |
| LEGAL | 213 | ALS Certification Exam | 1 |
| LEGAL | 215 | Keyboarding | 5 |
| LEGAL | 216 | Business Grammar | 5 |

Depending upon availability, students may choose work-based learning experiences/ seminars or LEGAL 281,282, and 283 or any combination of the courses listed below. (12 total credits)

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| LEGAL | 281 | Independent Project I | 4 |
| LEGAL | 282 | Independent Project II | 4 |
| LEGAL | 283 | Independent Project III | 4 |
| | or | | |
| LEGAL | 291 | Work-based Learning Experience I and | 3 |
| LEGAL | 294 | Work-based Learning Seminar | 1 |
| | | | |
| LEGAL | 292 | Work-based Learning Experience II and | 3 |
| LEGAL | 295 | Work-based Learning Seminar | 1 |
| | | | |
| LEGAL | 293 | Work-based Learning Experience III and | 3 |
| LEGAL | 296 | Work-based Learning Seminar | 1 |

**HUMANITIES/SOCIAL SCIENCES ELECTIVES LIST**

| | | | |
|---|---|---|---|
| ENG& | 235 | Technical Writing | 5 |
| CMST& | 220 | Public Speaking | 5 |
| CMST& | 210 | Interpersonal Communications | 5 |
| PSYC& | 100 | General Psychology | 5 |
| SOC& | 101 | Introduction to Sociology | 5 |

**Associate of Technology: 101 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Mathematics | 5 |
| ENGL& | 101 | English Composition I | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| LEGAL | 103 | Legal Office Procedures | 5 |
| LEGAL | 104 | MS Outlook | 2 |
| LEGAL | 105 | Records Management | 4 |
| LEGAL | 108 | Legal Terminology | 5 |
| LEGAL | 109 | Legal Research | 2 |
| LEGAL | 111 | Introduction to MS Word | 5 |
| LEGAL | 112 | MS Word Applications | 5 |
| LEGAL | 113 | Criminal Law | 5 |
| LEGAL | 201 | Beginning Accounting | 5 |
| LEGAL | 202 | Legal Office Projects | 5 |
| LEGAL | 203 | Legal Billing Software | 1 |
| LEGAL | 205 | MS PowerPoint for Legal Assistants | 3 |
| LEGAL | 206 | MS Excel | 3 |
| LEGAL | 208 | Ethics | 2 |
| LEGAL | 209 | Civil Litigation | 5 |
| LEGAL | 211 | ALS Preparation I | 4 |
| LEGAL | 212 | ALS Preparation II | 2 |
| LEGAL | 213 | ALS Certification Exam | 1 |
| LEGAL | 215 | Keyboarding | 5 |
| LEGAL | 216 | Business Grammar | 5 |

Depending upon availability, students may choose work-based learning experiences/ seminars or LEGAL 281,282, and 283 or any combination of the courses listed below. (12 total credits).

**Legal Assistant (continued)**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| LEGAL | 281 | Independent Project I | 4 |
| LEGAL | 282 | Independent Project II | 4 |
| LEGAL | 283 | Independent Project III | 4 |
| | or | | |
| LEGAL | 291 | Work-based Learning Experience I and | 3 |
| LEGAL | 294 | Work-based Learning Seminar | 1 |
| LEGAL | 292 | Work-based Learning Experience II and | 3 |
| LEGAL | 295 | Work-based Learning Seminar | 1 |
| LEGAL | 293 | Work-based Learning Experience III and | 3 |
| LEGAL | 296 | Work-based Learning Seminar | 1 |

**Certificate of Competency: 59 Credits**

LEGAL OFFICE SUPPORT

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Mathematics | 5 |
| 90+ | Level | Communications | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| LEGAL | 103 | Legal Office Procedures | 5 |
| LEGAL | 104 | MS Outlook | 2 |
| LEGAL | 105 | Records Management | 4 |
| LEGAL | 108 | Legal Terminology | 5 |
| LEGAL | 109 | Legal Research | 2 |
| LEGAL | 111 | Introduction to MS Word | 5 |
| LEGAL | 113 | Criminal Law | 5 |
| LEGAL | 203 | Legal Billing Software | 1 |
| LEGAL | 206 | MS Excel | 3 |
| LEGAL | 208 | Ethics | 2 |
| LEGAL | 209 | Civil Litigation | 5 |
| LEGAL | 216 | Business Grammar | 5 |

# Machinist

**Machinists produce precision parts, tools, and instruments utilizing both manual and computerized fabrication systems. Students prepare for apprenticeship with instruction that includes extensive hands-on experience in the use of traditional precision tooling and machining equipment, as well as sophisticated, state-of-the-art equipment including Haas lathes, the Visual Quick Code Probing System and CG Tech software. This is a pre-apprenticeship program for the Tacoma Machinists Joint Apprenticeship Training Committee. The program also provides extended learning opportunities for persons previously or currently employed in related professions.**

**FACULTY**

Bob Storrar, 253.680.7258, bstorrar@bates.ctc.edu
Barry Young, 253.680.7214, byoung@bates.ctc.edu
www.bates.ctc.edu/Machinist

### Associate of Technology Degree: 112 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |
| REQUIRED COURSEWORK | | | |
| MACH | 111 | Machine Shop Mathematics I | 2 |
| MACH | 112 | Industrial Safety I | 3 |
| MACH | 113 | Measurement Applications | 3 |
| MACH | 114 | Lathe Operations I | 4 |
| MACH | 115 | Machine Shop Mathematics II | 5 |
| MACH | 121 | Lathe Operations II | 4 |
| MACH | 122 | Grinding I | 2 |
| MACH | 123 | Machining I | 2 |
| MACH | 124 | Milling I | 2 |
| MACH | 125 | Statistical Process Control | 3 |
| MACH | 126 | Blueprint Reading I | 2 |
| MACH | 131 | Industrial Safety II | 2 |
| MACH | 132 | Geometric Dimensioning and Tolerancing | 3 |
| MACH | 133 | Milling II | 3 |
| MACH | 134 | Advanced Machining I | 4 |
| MACH | 135 | Advanced Machining II | 4 |
| MACH | 136 | First Aid/CPR | 1 |
| MACH | 142 | Advanced Machine Shop Applications | 8 |
| | | OR | |
| WBAS | 101 | Welding Basics | |
| MACH | 211 | Machining III | 1 |
| MACH | 212 | Manufacturing Support | 1 |
| MACH | 213 | Advanced Machining III | 5 |
| MACH | 216 | Blueprint Reading II | 5 |
| MACH | 217 | Blueprint Reading III | 2 |
| MACH | 221 | CNC Lathe I | 2 |
| MACH | 222 | CNC Lathe II | 5 |
| MACH | 223 | Machining IV | 2 |
| MACH | 224 | MasterCam/Solid Works | 5 |
| MACH | 231 | CNC Mill I | 2 |
| MACH | 232 | Advanced CNC Machining I | 5 |
| MACH | 233 | Advanced CNC Machining II | 5 |

### Certificate of Competency: 72 Credits

MANUAL MACHINING

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |
| REQUIRED COURSEWORK | | | |
| MACH | 111 | Machine Shop Mathematics I | 2 |
| MACH | 112 | Industrial Safety I | 3 |
| MACH | 113 | Measurement Applications | 3 |
| MACH | 114 | Lathe Operations I | 4 |
| MACH | 115 | Machine Shop Mathematics II | 5 |
| MACH | 121 | Lathe Operations II | 4 |
| MACH | 122 | Grinding I | 2 |
| MACH | 123 | Machining I | 2 |
| MACH | 124 | Milling I | 2 |
| MACH | 125 | Statistical Process Control | 3 |
| MACH | 126 | Blueprint Reading I | 2 |
| MACH | 131 | Industrial Safety II | 2 |
| MACH | 132 | Geometric Dimensioning and Tolerancing | 3 |
| MACH | 133 | Mill Operations II | 3 |
| MACH | 134 | Advanced Machining I | 4 |
| MACH | 135 | Advanced Machining II | 4 |
| MACH | 136 | First Aid/CPR | 1 |
| MACH | 142 | Advanced Machine Shop Applications | 8 |
| | | OR | |
| WBAS | 101 | Welding Basics | |

# Marketing & Business Management

Students prepare for careers in sales, advertising, merchandising, customer service, market research, business and management, and public relations. When available, work-based learning activities provide students with the opportunity to work in Puget Sound businesses. Major projects allow students to apply competencies such as preparing formal business plans, performing research studies, and developing advertising campaigns. This program also provides extended learning opportunities to persons previously or currently employed in these and related professions.

**FACULTY**

Kathy Brock, 253.680.7376, kbrock@bates.ctc.edu

**Associate of Technology Degree: 105 – 108 – 110 Credits**
**Associate of Applied Science - Transfer Degree: 110 – 113 – 115 Credits**

| GENERAL EDUCATION REQUIREMENTS (AT Degree) | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| GENERAL EDUCATION REQUIREMENTS (AAS-T Degree) | | | |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |
| 100+ | Level | Humanities/Social Sciences | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| MARK | 101 | Marketing Principles | 5 |
| MARK | 102 | Customer Service | 5 |
| MARK | 103 | Written Business Communication | 3 |
| MARK | 104 | Business Negotiations and Collaboration | 3 |
| MARK | 105 | Information Research and Acquisition | 1 |
| MARK | 106 | Business Concepts | 5 |
| MARK | 107 | Cross Cultural Communications | 5 |
| MARK | 108 | International Trade Practices | 5 |
| MARK | 109 | Economics: A Marketing Perspective | 5 |
| MARK | 110 | Principles of Management and Supervision | 5 |
| MARK | 111 | Cyber Marketing/E-Commerce | 5 |
| MARK | 112 | Business Law | 5 |
| MARK | 113 | Accounting Principles | 5 |

Students must choose one option:

**Option A - Marketing**

| | | | |
|---|---|---|---|
| MARK | 121 | Branding/Corporate Identity | 2 |
| MARK | 122 | Advertising: Creation and Planning | 4 |
| MARK | 123 | Business Software Applications | 3 |
| MARK | 124 | Sales Strategies and Consumer Psychology | 5 |
| MARK | 125 | Business and Marketing Presentation Skills | 3 |
| MARK | 126 | Planning and Leadership | 5 |
| MARK | 127 | Public Relations | 3 |
| MARK | 128 | Marketing Research and Forecasting | 3 |
| MARK | 129 | Advanced Marketing Projects | 5 |

**Option B: Business Management**

| | | | |
|---|---|---|---|
| MARK | 201 | Introduction To Leadership Skills and Ethics | 3 |
| MARK | 202 | Introduction To Strategic Marketing | 4 |
| MARK | 203 | Introduction To Business Accounting/Finance | 5 |
| MARK | 204 | Introduction To Presentation and Facilitation Skills | 3 |
| MARK | 205 | Advanced Business Projects | 5 |
| MARK | 206 | Teaming for Success | 3 |
| MARK | 207 | Introduction To Managing Change | 3 |
| MARK | 208 | Achieving Results Through Influence | 3 |
| MARK | 209 | Entrepreneurial Concepts | 5 |
| MARK | 210 | Introduction to Project Management | 4 |

**Option C: International Commerce**

| | | | |
|---|---|---|---|
| MARK | 221 | International Business Law | 2 |
| MARK | 222 | Supply Chain Operations | 5 |
| MARK | 223 | Supply Chain Risk Management | 2 |
| MARK | 224 | Supply Chain Intermediaries | 5 |
| MARK | 225 | International Marketing | 3 |
| MARK | 226 | Offshore Procurement Process | 2 |
| MARK | 227 | International Market Research and Planning | 3 |
| MARK | 228 | Global Trade Financing | 5 |
| MARK | 229 | International Payment, Credit, and Collections | 5 |
| MARK | 230 | Advanced Projects - Marketing Plan Implementation | 4 |

**Certificate of Competency: 54 Credits**

SALES AND CUSTOMER SERVICE

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |
| 100+ | Level | Business Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| MARK | 101 | Marketing Principles | 5 |
| MARK | 102 | Customer Service | 5 |
| MARK | 103 | Written Business Communication | 3 |
| MARK | 105 | Information Research and Acquisition | 1 |
| MARK | 106 | Business Concepts | 5 |
| MARK | 122 | Advertising: Creation and Planning | 4 |
| MARK | 123 | Business Software Applications | 3 |
| MARK | 124 | Sales Strategies and Consumer Psychology | 5 |
| MARK | 125 | Business and Marketing Presentation Skills | 3 |

# Mechanical Engineering

Students prepare for careers as engineering technicians with an emphasis on mechanical systems. Instruction focuses on computer-aided drafting and design (CADD). Students have opportunities to work on community and college projects that may include patent application drawings and detailed machine shop production drawings. Extended learning opportunities are available with industry partners.

**FACULTY**
Bob Ackein, 253.680.7344, backein@bates.ctc.edu

## Associate of Technology Degree: 113 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| MET | 101 | Computers As An Engineering Tool | 4 |
| MET | 103 | Drawing Sheet Standards | 4 |
| MET | 105 | Orthographic Projections | 7 |
| MET | 106 | Sectional Views | 5 |
| MET | 107 | Auxiliary Views | 5 |
| MET | 108 | Principles of Dimensioning | 4 |
| MET | 109 | Annotative Scaling in AutoCAD | 4 |
| MET | 110 | Dimensioning Practices | 7 |
| MET | 111 | Tolerancing | 5 |
| MET | 112 | Basic Geometric Constructions | 6 |
| MET | 114 | Introduction to Sketching | 5 |
| MET | 213 | Paper Space, Layout, and Viewports | 5 |
| MET | 214 | Engineering Projects I | 7 |
| MET | 215 | Axonometric Drawings | 5 |
| MET | 216 | Engineering Projects II | 7 |
| MET | 217 | Career Advancement Strategies | 3 |

Students must choose one of the following options:

**Option A – Machine Elements**

| | | | |
|---|---|---|---|
| MET | 201 | Machine Shop Drawings | 4 |
| MET | 202 | Threads, Fasteners, and Springs | 3 |
| MET | 203 | Gears | 4 |
| MET | 204 | Cams | 4 |

**Option B - Pneumatic/Hydraulic Systems**

| | | | |
|---|---|---|---|
| MET | 205 | Pneumatic/Hydraulic Symbols | 3 |
| MET | 206 | Piping and Instrumentation Drawings | 4 |
| MET | 207 | Valve Sections | 4 |
| MET | 208 | Pump Section | 4 |

**Option C - Sheet Metal Drawings**

| | | | |
|---|---|---|---|
| MET | 209 | Production Drawings | 4 |
| MET | 210 | Duct Fitting Symbols | 3 |
| MET | 211 | Flat Pattern Development | 5 |
| MET | 212 | Basic Air Flow Systems | 3 |

## Certificate of Competency: 90 Credits

MECHANICAL ENGINEERING

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| FIRST YEAR | | | |
| MET | 101 | Computers As An Engineering Tool | 4 |
| MET | 103 | Drawing Sheet Standards | 4 |
| MET | 105 | Orthographic Projections | 7 |
| MET | 106 | Sectional Views | 5 |
| MET | 107 | Auxiliary Views | 5 |
| MET | 108 | Principles of Dimensioning | 4 |
| MET | 109 | Annotative Scaling in AutoCAD | 4 |
| MET | 110 | Dimensioning Practices | 7 |
| MET | 111 | Tolerancing | 5 |
| MET | 112 | Basic Geometric Constructions | 6 |
| MET | 114 | Introduction to Sketching | 5 |
| MET | 201 | Machine Shop Drawings | 4 |
| MET | 213 | Paper Space, Layout, and Viewports | 5 |
| MET | 214 | Engineering Projects I | 7 |
| MET | 217 | Career Advancement Strategies | 3 |

## Certificate of Training: 52 Credits

BASIC AUTOCAD DRAFTING

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| MET | 101* | Computers As An Engineering Tool | 4 |
| MET | 103 | Drawing Sheet Standards | 4 |
| MET | 105 | Orthographic Projections | 7 |
| MET | 108* | Principles of Dimensioning | 4 |
| MET | 110* | Dimensioning Practices | 7 |
| MET | 112* | Basic Geometric Construction | 6 |
| MET | 114 | Introduction to Sketching | 5 |

*These courses are prerequisites to the Intermediate AutoCAD certificate program.

## Certificate of Training: 51 Credits

INTERMEDIATE AUTOCAD DRAFTING

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| MET | 106 | Sectional Views | 5 |
| MET | 107 | Auxiliary Views | 5 |
| MET | 109 | Annotative Scaling in AutoCAD | 4 |
| MET | 111 | Tolerancing | 5 |
| MET | 213 | Paper Space, Layout, and Viewports | 5 |
| MET | 214 | Engineering Projects I | 7 |
| MET | 215 | Axonometric Drawings | 5 |

# Occupational Therapy Assistant

Occupational therapy assistants work under the direction of occupational therapists to provide services to persons whose lives have been challenged due to injury, illness, developmental deficits or aging. Occupational therapy assistants view individuals in a holistic manner and help people prevent, lessen or overcome disabilities so they are able to function more independently in every aspect of daily living. Occupational therapy assistants use therapeutic activities and exercises to improve a client's skills for performing a variety of important everyday tasks safely and independently in their role at work, home, school, and in the community. Students in this program receive fundamental skills in occupational therapy and extensive clinical training. Successful completion of the program prepares students for careers as occupational therapist assistants in hospitals, out-patient clinics, rehabilitation centers, mental health centers, assisted living and nursing care facilities, and school systems.

**PROGRAM ENTRANCE REQUIREMENTS**
**Applicants must...**

1. Have a high school diploma or a GED, and be at least 18 years of age.
2. Provide documentation of at least 15 hours of either work, volunteer, or job shadow experience in an occupational therapy setting.
3. Provide a letter of recommendation from a healthcare practitioner, employer, or instructor attesting to the applicant's potential for success in the OT profession and OTA program.
4. Provide documented evidence of current immunizations and TB testing.
5. Provide documented evidence of medical and dental health clearance.
6. Provide documented evidence of personal health insurance.
7. Provide documented evidence of liability insurance coverage ($1 million).
8. Pass a national criminal background check.

**PROGRAM DIRECTOR:**
Denise Tremblay, 253.680.7108, dtremblay@bates.ctc.edu

**FACULTY:**
Aimee Sidhu, 253.680.7287, asidhu@bates.ctc.edu

**Associate of Technology Degree: 120 Credits**

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ENGL& | 101 | English Composition | 5 |
| MATH | 100+ | Mathematics | 5 |
| PSYC& | 200 | Lifespan Psychology | 5 |
| BIOL | 170 | Medical Terminology | 2 |
| BIOL& | 175 | Survey of A&P | 5 |

**(These courses must be completed with a minimum grade of 3.0 before enrolling in the OTA core coursework.)**

| REQUIRED CORE COURSEWORK | | | CREDITS |
|---|---|---|---|
| OTA | 102 | Health and Wellness and the OTA | 3 |
| OTA | 103 | Functional Movement | 5 |
| OTA | 104 | Therapeutic Use of Self | 5 |
| OTA | 105 | Nervous System Function | 4 |
| OTA | 106 | Therapeutic Activities and Performance I | 5 |
| OTA | 107 | Developmental Disabilities - Treatment and Applications | 5 |
| OTA | 108 | Applied Experience I-A | 1 |
| OTA | 109 | Adaptive Technologies | 5 |
| OTA | 110 | Documentation Skills | 3 |
| OTA | 111 | Introduction to Occupational Therapy | 5 |
| OTA | 201 | Therapeutic Activities and Performance II | 5 |
| OTA | 202 | Psychosocial Dysfunctions: Treatment and Applications | 8 |
| OTA | 203 | Applied Experience – I-B | 1 |
| OTA | 204 | Seminar – Applied Mental Health | 1 |
| OTA | 210 | Physical Disabilities: Treatment and Applications | 8 |
| OTA | 212 | Applied Experience – I-C | 1 |
| OTA | 213 | Seminar – Applied Physical Rehabilitation | 1 |
| OTA | 220 | Clinical Fieldwork Level II – Rotation A | 11 |
| OTA | 221 | Clinical Fieldwork Level II – Seminar A | 1 |
| OTA | 222 | Clinical Fieldwork Level II – Rotation B | 11 |
| OTA | 223 | Clinical Fieldwork Level II – Seminar B | 1 |
| OTA | 231 | OTA and Special Settings | 4 |
| OTA | 232 | Professional Issues for the OTA | 4 |

The Occupational Therapy Assistant program at Bates is accredited with the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA.

Our graduates are eligible to sit for the national certification examination for the occupational therapy assistant administered by the National Board for Certification in Occupational Therapy (NBCOT). After successful completion of this exam, the individual will be a certified occupational therapy assistant (COTA). In addition, most states require licensure in order to practice; however, state licenses are usually based on the results of the NBCOT Certificate Examination.

Note that a felony conviction may affect a graduate's ability to sit for the NBCOT certification examination or attain state licensure.

# Paraeducator Foundations

This distance learning program is designed to provide professional development opportunities for working paraeducators, those seeking employment as paraeducators, school employees, and parents and people working with children in the private sector. Instruction provides graduates with the Washington State core competencies for paraeducators. Graduates may find employment under a variety of job titles that may include teacher aide, teacher assistant, paraeducator, and paraprofessional.

**FACULTY**
Elaine Kurlinski, 253.680.7230, ekurlinski@bates.ctc.edu
www.bates.ctc.edu/Paraeducator

**Certificate of Training: 20 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| SOC | 111 | Understanding Diversity | 5 |
| PSYC& | 100 | General Psychology | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| EDU | 101 | Introduction to School Law | 3 |
| EDU | 103 | Child Growth and Development | 3 |
| EDU | 151 | Abuse and Neglect of Children | 1 |
| SPED | 101 | Educating Students with Disabilities | 3 |

# Power Sports & Equipment Technology

Students in the program prepare for careers in the power sports and power equipment industries. Technicians in these areas maintain and repair a variety of two- and four-cycle engines, power trains, and chassis.

Power Sports: Maintenance and repair of power sports vehicles such as motorcycles, sport utility vehicles, all-terrain vehicles, personal watercraft, and boats for employment in dealerships, independent repair shops, and self-employment.
Power Equipment: Maintenance and repair of outdoor power equipment, including lawn and garden equipment and light industrial/commercial equipment. Employment may be in lawn and garden stores, department stores, rental companies, landscaping companies, golf courses, fleet repair facilities, government agencies, and self-employment.

FACULTY
John Irish, 253.680.7476, jirish@bates.ctc.edu

## Associate of Technology Degree: 111 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| POW | 101 | Introduction to Power Sports | 5 |
| POW | 102 | Pre-Delivery Maintenance | 3 |
| POW | 103 | Seasonal Maintenance | 5 |
| POW | 104 | Periodic Maintenance | 5 |
| POW | 120 | Engines – Failure Analysis | 5 |
| POW | 121 | Engine Repair Methods | 5 |
| POW | 122 | Engines Installation Methods | 5 |
| POW | 130 | Exhaust Systems | 5 |
| POW | 131 | Lubrication/Cooling Systems | 5 |
| POW | 132 | Advanced Engine Service | 5 |
| POW | 140 | Fundamentals of Electricity | 3 |
| POW | 141 | Electrical Systems | 5 |
| POW | 142 | Electrical Systems - Diagnosis | 5 |
| POW | 143 | Brake Systems | 4 |
| POW | 150 | Introduction to Power Trains | 3 |
| POW | 151 | Power Train Service | 5 |
| POW | 152 | Introduction to Marine Propulsion | 3 |
| POW | 153 | Marine Propulsion Service | 5 |
| POW | 160 | Introduction to Chassis | 3 |
| POW | 161 | Chassis Service | 5 |
| POW | 162 | Advanced Projects* | 7 |

*This course may be substituted with a work-based learning component.

## Certificate of Competency: 80 Credits

POWER SPORTS AND EQUIPMENT TECHNICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| POW | 101 | Introduction to Power Sports | 5 |
| POW | 102 | Pre-Delivery Maintenance | 3 |
| POW | 103 | Seasonal Maintenance | 5 |
| POW | 104 | Periodic Maintenance | 5 |
| POW | 120 | Engines – Failure Analysis | 5 |
| POW | 121 | Engine Repair Methods | 5 |
| POW | 122 | Engines Installation Methods | 5 |
| POW | 130 | Exhaust Systems | 5 |
| POW | 131 | Lubrication/Cooling Systems | 5 |
| POW | 132 | Advanced Engine Service | 5 |
| POW | 140 | Fundamentals of Electricity | 3 |
| POW | 141 | Electrical Systems | 5 |
| POW | 142 | Electrical Systems - Diagnosis | 5 |
| POW | 143 | Brake Systems | 4 |

# Practical Nurse

Students prepare for careers as licensed practical nurses in a variety of healthcare settings. Clinical activities are an integral part of this program which is approved by the Washington Nursing Care Quality Assurance Commission. During the clinical phase, students demonstrate nursing competencies under supervision at clinical sites and improve skills by working with a healthcare professional in a preceptorship role. Graduates are required to pass the Washington State Practical Nursing licensing exam to practice as licensed practical nurses in Washington State. Prior to licensing exam, applicant will need to provide proof of high school graduation or equivalent.

**Prerequisites:**
Applicants must:
1. Pass a clear National Criminal background check covering Washington state.
2. Obtain medical and dental clearance.
3. Pass a drug screen.
4. Provide documentary evidence of current immunizations, medical insurance (illness and injury), Health Care Provider CPR.
5. Possess current liability insurance coverage in the amount of $1 million.
6. AIDS/HIV Training - seven hours.

**For more information, contact the Practical Nurse Program Technician:**
Brenda Alton, 253.680.7316, balton@bates.ctc.edu
www.bates.ctc.edu/LPN

**Associate of Technology Degree: 112-120 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| (These courses must be completed before enrolling in the PNUR coursework. ) | | | |
| BIOL& | 241 | Human A & P I | 5 |
| BIOL& | 242 | Human A & P 2 | 5 |
| BIOL& | 260 | Microbiology | 5 |
| CHEM& | 121 | Intro to Chemistry | 5 |
| CMST& | 210 | Interpersonal Communications | 5 |
| CTNA | 101 | Nursing Assistant Certified * | 8 |
| ENGL& | 101 | English Composition | 5 |
| PSYC& | 200 | Lifespan Psychology | 5 |
| 100+ | Level | Mathematics ** | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| MEDICAL SURGICAL NURSING I | | | |
| (All PNUR coursework must be completed with a 3.2 grade or better.) | | | |
| PNUR | 102 | Basic Nutrition | 4 |
| PNUR | 103 | Nursing Math/Pharmacology | 6 |
| PNUR | 105 | Personal Vocational Relationships I | 1 |
| PNUR | 106 | Nursing Fundamentals I | 7 |
| PNUR | 107 | Principles of Geriatric/Medical Surgical Nursing | 2 |

| MEDICAL SURGICAL NURSING II | | | CREDITS |
|---|---|---|---|
| PNUR | 122 | Personal Vocational Relationships II | 2 |
| PNUR | 123 | Respiratory Care | 3 |
| PNUR | 126 | Cardiovascular Disorders | 4 |
| PNUR | 127 | Nursing Fundamentals II | 4 |
| PNUR | 128 | Clinical I | 3 |
| PNUR | 220 | Endocrinology/Care of the Diabetic Patient | 3 |

| MEDICAL SURGICAL NURSING III | | | CREDITS |
|---|---|---|---|
| PNUR | 130 | Nursing Simulation Lab | 2 |
| PNUR | 131 | Mental Health Issues | 2 |
| PNUR | 136 | Gastrointestinal | 2 |
| PNUR | 137 | Genitourinary | 2 |
| PNUR | 138 | Clinical II | 5 |
| PNUR | 232 | Newborn/Maternal/Reproductive Nursing | 3 |
| PNUR | 233 | Orthopedics | 2 |

| MEDICAL SURGICAL NURSING IV | | | CREDITS |
|---|---|---|---|
| PNUR | 144 | Legal/Boundaries | 1 |
| PNUR | 145 | Clinical III | 2 |
| PNUR | 147 | Preceptorship | 4 |
| PNUR | 148 | Pediatrics | 3 |
| PNUR | 149 | Neurology/Ophthalmology/Audiology | 4 |
| PNUR | 150 | Perioperative Nursing | 1 |

* This course may be waived with active proof of NAC license or proof of completion of NAC Skills Set training.
**Students should consult with the program director for guidance in determining the appropriate math course.

# Professional-Technical Education

This program provides a structured degree pathway in education for secondary and post-secondary professional-technical educators, providing them with an educational continuum toward a baccalaureate in education. The degree structure provides leadership and technical skills beyond those required for teaching certification. The curriculum is competency-based and is designed as a series of discreet, modularized extended learning competencies. This program is not offered as a fulltime career education program.

**Prerequisites:**
1. Applicants must be employed as a secondary or post-secondary professional-technical educator on a 50 percent or greater basis.
2. Approval from the dean of the Educator Training Center at Bates Technical College.

**FACULTY**
Elaine Kurlinski, 253.680.7230, ekurlinski@bates.ctc.edu

**Associate of Applied Science-T Degree: 90 credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| ENGL& | 101 | English Composition I | 5 |
| 100+ | Level | Mathematics | 5 |
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Electives in Social Science/Humanities | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| EDU | 102 | Industrial Safety | 1 |
| EDU | 104 | Philosophy of Technical Education | 3 |
| EDU | 105 | Methods of Teaching | 3 |
| EDU | 106 | Occupational Analysis | 3 |
| EDU | 107 | Course Organization | 3 |
| EDU | 201 | Teaching Practicum I and | 12 |
| EDU | 202 | Teaching Practicum II | 12 |
| | | or | |
| EDU | 211 | Administration Practicum I and | 12 |
| EDU | 212 | Administration Practicum II | 12 |
| EDU | 220 | Professional/Technical Education Capstone | 5 |

Electives Students choose 28 credits from approved electives list. 28

| ELECTIVES LIST * | | | CREDITS |
|---|---|---|---|
| EDU | 101 | Introduction to School Law | 3 |
| EDU | 108 | Introduction to Professional/Technical Education | 3 |
| EDU | 109 | Information Literacy | 1 |
| EDU | 221 | Professional/Technical Specialization | 12 |
| EDU | 222 | Current Topics for Professional/Technical Educators | 2 |
| EDU | 223 | Industry-based Professional Development I | 2 |
| EDU | 224 | Industry-based Professional Development II | 3 |
| EDU | 226 | Student Development and Leadership Techniques | 3 |
| EDU | 151 | Abuse and Neglect of Children | 1 |
| EDU | 228 | Work-based Learning Coordination | 3 |
| EDU | 229 | Diverse Needs of Students | 3 |
| EDU | 230 | Career and Technical Education (CTE) Practicum | 1 |
| EDU | 231 | Advanced Teaching Methods | 3 |
| EDU | 232 | Portfolio Development | 1 |
| SOC | 111 | Understanding Diversity | 5 |
| PSYC& | 100 | General Psychology | 5 |

*Other courses approved by the instructional dean.

# Sheet Metal Technology

Bates offers the only program in the region that prepares students for apprenticeship employment in the sheet metal industry. Customer projects completed in the classroom, shop, and the field, provide students with the necessary foundational skills to succeed in this high demand and rewarding occupation. Instruction includes equipment operation, fabrication and installation of various ventilation systems, blueprint reading, computer-aided drafting, air distribution, and material handling. This is a pre-apprenticeship program for the Western Washington Sheet Metal Joint Apprenticeship Training Committee. Students who complete all required elements of the selected Sheet Metal Technology course offerings will be awarded direct entry into the Western Washington Sheet Metal JATC Local 66 building trades or residential apprenticeship program. Students will be placed at the end of the out of work list. Prior educational credits are recognized upon entrance into the apprenticeship.

**FACULTY**

Steve MacKay, 253.680.7254, smackay@bates.ctc.edu
www.bates.ctc.edu/SheetMetal

**Associate of Technology Degree: 118 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |
| **REQUIRED COURSEWORK** | | | |
| SHME | 101 | Introduction to Sheet Metal Technology | 3 |
| SHME | 102 | Metalworking Machines Technology | 4 |
| SHME | 103 | Fittings Fabrication I | 7 |
| SHME | 104 | Principles of Health and Safety | 5 |
| SHME | 105 | Materials Technology | 3 |
| SHME | 106 | Hand Tools and Equipment | 4 |
| SHME | 107 | Applied Math | 5 |
| SHME | 108 | Introduction to Drafting | 2 |
| SHME | 109 | Drafting Techniques | 5 |
| SHME | 110 | Layout Math | 3 |
| SHME | 111 | Technology of Seams and Locks | 3 |
| SHME | 112 | Fittings Fabrication II | 8 |
| SHME | 201 | Introduction to Architectural Sheet Metal | 3 |
| SHME | 202 | Introduction to Blueprint Reading | 3 |
| SHME | 203 | Blueprint Reading Applications | 5 |
| SHME | 204 | Layout Drafting II | 3 |
| SHME | 205 | Layout Drafting III | 3 |
| SHME | 206 | Complex Components Fabrication | 5 |
| SHME | 207 | Energy Codes | 3 |
| SHME | 208 | Duct Design and Air Balancing - Basics | 5 |
| SHME | 209 | Duct Design and Air Balancing - Advanced | 5 |
| SHME | 210 | Solar Heating | 2 |
| SHME | 211 | Commercial Projects | 6 |
| WBAS | 101 | Welding Basics | 8 |

**Certificate of Competency: 118 Credits**

SHEET METAL TECHNOLOGY

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |
| **REQUIRED COURSEWORK** | | | |
| SHME | 101 | Introduction to Sheet Metal Technology | 3 |
| SHME | 102 | Metalworking Machines Technology | 4 |
| SHME | 103 | Fittings Fabrication I | 7 |
| SHME | 104 | Principles of Health and Safety | 5 |
| SHME | 105 | Materials Technology | 3 |
| SHME | 106 | Hand Tools and Equipment | 4 |
| SHME | 107 | Applied Math | 5 |
| SHME | 108 | Introduction to Drafting | 2 |
| SHME | 109 | Drafting Techniques | 5 |
| SHME | 110 | Layout Math | 3 |
| SHME | 111 | Technology of Seams and Locks | 3 |
| SHME | 112 | Fittings Fabrication II | 8 |
| SHME | 201 | Introduction to Architectural Sheet Metal | 3 |
| SHME | 202 | Introduction to Blueprint Reading | 3 |
| SHME | 203 | Blueprint Reading Applications | 5 |
| SHME | 204 | Layout Drafting II | 3 |
| SHME | 205 | Layout Drafting III | 3 |
| SHME | 206 | Complex Components Fabrication | 5 |
| SHME | 207 | Energy Codes | 3 |
| SHME | 208 | Duct Design and Air Balancing - Basics | 5 |
| SHME | 209 | Duct Design and Air Balancing - Advanced | 5 |
| SHME | 210 | Solar Heating | 2 |
| SHME | 211 | Commercial Projects | 6 |
| WBAS | 101 | Welding Basics | 8 |

**Sheet Metal Technology (continued)**

### Certificate of Competency: 94 Credits

SHEET METAL TECHNICIAN

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | |
|---|---|---|---|
| SHME | 101 | Introduction to Sheet Metal Technology | 3 |
| SHME | 102 | Metalworking Machines Technology | 4 |
| SHME | 103 | Fittings Fabrication I | 7 |
| SHME | 104 | Principles of Health and Safety | 5 |
| SHME | 105 | Materials Technology | 3 |
| SHME | 106 | Hand Tools and Equipment | 4 |
| SHME | 107 | Applied Math | 5 |
| SHME | 108 | Introduction to Drafting | 2 |
| SHME | 109 | Drafting Techniques | 5 |
| SHME | 111 | Technology of Seams and Locks | 3 |
| SHME | 112 | Fittings Fabrication II | 8 |
| SHME | 202 | Introduction to Blueprint Reading | 3 |
| SHME | 203 | Blueprint Reading Applications | 5 |
| SHME | 204 | Layout Drafting II | 3 |
| SHME | 205 | Layout Drafting III | 3 |
| SHME | 207 | Energy Codes | 3 |
| SHME | 208 | Duct Design and Air Balancing - Basics | 5 |
| WBAS | 101 | Welding Basics | 8 |

### Certificate of Training: 42 Credits

SHEET METAL PRODUCTION SUPPORT

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| SHME | 102 | Metalworking Machines Technology | 4 |
| SHME | 103 | Fittings Fabrication I | 7 |
| SHME | 105 | Materials Technology | 3 |
| SHME | 106 | Hand Tools and Equipment | 4 |
| SHME | 107 | Applied Math | 5 |
| SHME | 111 | Technology of Seams and Locks | 3 |
| SHME | 112 | Fittings Fabrication II | 8 |
| WBAS | 101 | Welding Basics | 8 |

### Certificate of Training: 44 Credits

SHEET METAL RESIDENTIAL INSTALLATIONS

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| SHME | 120 | Introduction to Sheet Metal Technology | 3 |
| SHME | 121 | Principles of Health and Safety | 2 |
| SHME | 122 | Hand Tools and Equipment | 3 |
| SHME | 123 | Metalworking Machines Technology | 2 |
| SHME | 124 | Fittings Fabrication I | 4 |
| SHME | 125 | Applied Math | 3 |
| SHME | 126 | Technology of Seams and Locks | 2 |
| SHME | 127 | Prefabricated Components | 2 |
| SHME | 128 | Material Handling Technology | 2 |
| SHME | 129 | Wood Working Tools | 1 |
| SHME | 130 | Carpentry Installation | 3 |
| SHME | 131 | Air Properties Technology | 1 |
| SHME | 132 | Duct installation | 3 |
| SHME | 133 | Residential Venting Technology | 2 |
| SHME | 134 | Unit Operations | 2 |
| SHME | 135 | Code Principles | 2 |
| SHME | 136 | Gas Piping Technology | 2 |
| SHME | 137 | Duct Design Technology | 3 |
| SHME | 138 | Preventive Maintenance | 2 |

# Software Development

Instruction in the Software Development program includes designing, coding, and implementing software applications in a variety of programming languages: Unix, SQL, Java, C Sharp, C++. In addition, students build skills in problem-solving, attention to detail, communication and teamwork.

**FACULTY**

Dan Achman, 253.680.7336, dachman@bates.ctc.edu
Judith Graham, 253.680.7335, jagraham@bates.ctc.edu

## Associate of Technology Degree: 110 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 10 |
| REQUIRED COURSEWORK | | | |
| CS& | 141 | Computer Science I JAVA | 5 |
| DATA | 101 | Data Modeling\Relational Database Design | 5 |
| DATA | 102 | SQL I | 5 |
| SOFT | 101 | Computer Concepts | 5 |
| SOFT | 102 | Programming Fundamentals | 5 |
| SOFT | 103 | Operating Systems | 5 |
| SOFT | 121 | C-Sharp I | 5 |
| SOFT | 122 | C-Sharp II | 5 |
| SOFT | 132 | C++ | 5 |
| SOFT | 142 | Programming in JAVA II | 5 |
| SOFT | 204 | Open Source Programming | 5 |
| SOFT | 207 | Dynamic Web Pages | 5 |
| SOFT | 208 | Principles of Systems Analysis and Design | 5 |
| SOFT | 209 | Emerging Technologies | 5 |
| SOFT | 210 | Mobile Device Programming | 5 |
| WEB | 101 | Microsoft Office Applications | 5 |
| WEB | 102 | HTML, XHTML and CSS | 5 |
| STUDENTS MUST CHOOSE ONE OF THE FOLLOWING OPTIONS: | | | |
| OPTION A | | | |
| SOFT | 290 | Capstone Project | 5 |
| OPTION B | | | |
| SOFT | 291 | Lab-based Learning Experience | 5 |
| OPTION C | | | |
| SOFT | 296 | Work-based Learning Experience and | 4 |
| SOFT | 297 | Work-based Learning Seminar | 1 |
| | | or | |
| SOFT | 298 | Work-based Learning – No Seminar | 5 |

## Associate of Applied Science Degree: 115 Credits

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| MATH | 104 | Statistical Analysis or equivalent | 5 |
| MATH | 105 | College Algebra or equivalent | 5 |
| ENGL& | 101 | College Composition | 5 |
| 100+ | Level | Social Sciences (Sociology or Psych) | 5 |
| 100+ | Level | Humanities (Am. Sign Language, Art, or History | 5 |
| REQUIRED COURSEWORK | | | |
| CS& | 141 | Computer Science I JAVA | 5 |
| DATA | 101 | Data Modeling\Relational Database Design | 5 |
| DATA | 102 | SQL I | 5 |
| SOFT | 101 | Computer Concepts and Technologies | 5 |
| SOFT | 102 | Programming Fundamentals | 5 |
| SOFT | 103 | Operating Systems | 5 |
| SOFT | 121 | C-Sharp I | 5 |
| SOFT | 122 | C-Sharp II | 5 |
| SOFT | 132 | C++ | 5 |
| SOFT | 142 | Programming in JAVA II | 5 |
| SOFT | 204 | Open Source Programming | 5 |
| SOFT | 207 | Dynamic Web Pages | 5 |
| SOFT | 208 | Principles of Systems Analysis and Design | 5 |
| SOFT | 209 | Emerging Technologies | 5 |
| SOFT | 210 | Mobile Device Programming | 5 |
| WEB | 101 | Microsoft Office Applications | 5 |
| WEB | 102 | HTML, XHTML and CSS | 5 |
| STUDENTS MUST CHOOSE ONE OF THE FOLLOWING OPTIONS: | | | |
| OPTION A | | | |
| SOFT | 290 | Capstone Project | 5 |
| OPTION B | | | |
| SOFT | 291 | Lab-based Learning Experience | 5 |
| OPTION C | | | |
| SOFT | 296 | Work-based Learning Experience and | 4 |
| SOFT | 297 | Work-based Learning Seminar | 1 |
| | | or | |
| SOFT | 298 | Work-based Learning – No Seminar | 5 |

**Software Development (continued)**

**Certificate of Competency: 60-65 Credits**

BUSINESS APPLICATION DEVELOPMENT

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

REQUIRED COURSEWORK

| | | | |
|---|---|---|---|
| CS& | 141 | Computer Science I JAVA | 5 |
| DATA | 101 | Data Modeling\Relational Database Design | 5 |
| DATA | 102 | SQL I | 5 |
| DATA | 105 | Principles of System Analysis and Design | 5 |
| SOFT | 101 | Computer Concepts and Technologies | 5 |
| SOFT | 102 | Programming Fundamentals | 5 |
| WEB | 101 | Microsoft Office Applications | 5 |

PROGRAMMING LANGUAGE

STUDENTS MUST CHOOSE ONE OF THE FOLLOWING OPTIONS:

OPTION A

| | | | |
|---|---|---|---|
| SOFT | 121 | C-Sharp I | 5 |
| SOFT | 122 | C-Sharp II | 5 |

OPTION B

| | | | |
|---|---|---|---|
| SOFT | 132 | C++ | 5 |

OPTION C

| | | | |
|---|---|---|---|
| SOFT | 142 | Programming in JAVA II | 5 |

STUDENTS MUST CHOOSE AT LEAST ONE OF THE FOLLOWING OPTIONS:

OPTION D

| | | | |
|---|---|---|---|
| SOFT | 290 | Capstone Project | 5 |

OPTION E

| | | | |
|---|---|---|---|
| SOFT | 291 | Lab-based Learning Experience | 5 |

OPTION F

| | | | |
|---|---|---|---|
| SOFT | 296 | Work-based Learning Experience and | 4 |
| SOFT | 297 | Work-based Learning Seminar | 1 |
| | | or | |
| SOFT | 298 | Work-based Learning – No Seminar | 5 |

# Web Development

Instruction in this program combines a unique blend of design and development technologies using a hands-on approach. Students learn to use industry software and development tools to create, implement and maintain static and dynamic web sites. A web developer is responsible for the site design and functionality that make surfing the Internet fun and easy. Employment opportunities include positions as web designers, specialists, technicians, and developers.

**FACULTY**
Ingrid Smith, 253.680.7332, ismith@bates.ctc.edu
www.bates.ctc.edu/WebDeveloper

## Associate of Technology: 110 Credits

| GENERAL EDUCATION REQUIREMENTS | | CREDITS |
|---|---|---|
| 100+ Level | Human Relations | 5 |
| 100+ Level | Communications | 5 |
| 100+ Level | Mathematics | 10 |

REQUIRED COURSEWORK

| | | |
|---|---|---|
| DATA 101 | Data Modeling\Relational Database Design | 5 |
| DATA 102 | SQL | 5 |
| SOFT 101 | Computer Concepts | 5 |
| SOFT 102 | Programming Fundamentals | 5 |
| WEB 101 | Microsoft Office Applications | 5 |
| WEB 102 | HTML, XHTML, and CSS | 5 |
| WEB 103 | Operating Systems | 5 |
| WEB 201 | Internet Technologies | 5 |
| WEB 202 | Web Authoring Editor | 5 |
| WEB 203 | Photoshop for the Web | 5 |
| WEB 205 | Web Site Design | 5 |
| WEB 206 | Technology Topic | 5 |
| CS& 141 | Computer Science I-JAVA | 5 |
| SOFT 121 | C-Sharp I | 5 |
| SOFT 122 | C-Sharp II | 5 |
| SOFT 207 | Dynamic Web Pages | 5 |

Students must choose one of the following options, Option A or Option B.

**Option A**

| | | |
|---|---|---|
| WEB 290 | Capstone Project | 5 |

**Option B**

| | | |
|---|---|---|
| WEB 296 | Work-based Learning Experience and | 4 |
| WEB 297 | Work-based Learning Seminar | 1 |
| | or | |
| WEB 298 | Work-based Learning – No Seminar | 5 |

Students must choose one of the following options, Option C or Option D.

**Option C**

| | | |
|---|---|---|
| SOFT 204 | Open Source Programming | 5 |

**Option D**

| | | |
|---|---|---|
| WEB 204 | Web Site Animation using Flash | 5 |

## Associate of Applied Science-T Degree: 120 Credits

**WEB DEVELOPMENT**

| GENERAL EDUCATION REQUIREMENTS | | CREDITS |
|---|---|---|
| MATH 104 | Statistical Analysis or equivalent | 5 |
| MATH 105 | College Algebra or equivalent | 5 |
| ENGL&101 | College Composition | 5 |
| 100+ Level | Social Sciences (Sociology or Psych) | 5 |
| 100+ Level | Humanities (Am. Sign Language, Art, or History) | 5 |

REQUIRED COURSEWORK

| | | CREDITS |
|---|---|---|
| DATA 101 | Data Modeling\Relational Database Design | 5 |
| DATA 102 | SQL | 5 |
| SOFT 101 | Computer Concepts | 5 |
| SOFT 102 | Programming Fundamentals | 5 |
| CS& 141 | Computer Science I-JAVA | 5 |
| SOFT 142 | Programming in JAVA II | 5 |
| WEB 101 | Microsoft Office Applications | 5 |
| WEB 102 | HTML, XHTML, and CSS | 5 |
| WEB 103 | Operating Systems | 5 |
| WEB 201 | Internet Technologies | 5 |
| WEB 202 | Web Authoring Editor | 5 |
| WEB 203 | Photoshop for the Web | 5 |
| WEB 205 | Web Site Design | 5 |
| WEB 206 | Technology Topic | 5 |
| SOFT 121 | C-Sharp I | 5 |
| SOFT 122 | C-Sharp II | 5 |
| SOFT 207 | Dynamic Web Pages | 5 |

Students must choose one of the following options, Option A or Option B.

**Option A**

| | | |
|---|---|---|
| WEB 290 | Capstone Project | 5 |

**Option B**

| | | |
|---|---|---|
| WEB 296 | Work-based Learning Experience and | 4 |
| WEB 297 | Work-based Learning Seminar | 1 |
| | or | |
| WEB 298 | Work-based Learning – No Seminar | 5 |

Students must choose one of the following options, Option C, Option D, or Option E.

**Option C**

| | | |
|---|---|---|
| SOFT 204 | Open Source Programming | 5 |

**Option D**

| | | |
|---|---|---|
| WEB 204 | Web Site Animation using Flash | 5 |

**Option E**

| | | |
|---|---|---|
| SOFT 210 | Mobile Device Programming | 5 |

## Certificate of Competency: 90 Credits

**WEB TECHNICIAN**

| GENERAL EDUCATION REQUIREMENTS | | CREDITS |
|---|---|---|
| 90+ Level | Human Relations | 5 |
| 90+ Level | Communications | 5 |
| 90+ Level | Mathematics | 5 |

REQUIRED COURSEWORK

| | | |
|---|---|---|
| DATA 101 | Data Modeling\Relational Database Design | 5 |
| DATA 102 | SQL | 5 |
| SOFT 101 | Computer Concepts | 5 |
| SOFT 102 | Programming Fundamentals | 5 |
| WEB 101 | Microsoft Office Applications | 5 |
| WEB 102 | HTML, XHTML, and CSS | 5 |
| WEB 103 | Operating Systems | 5 |
| CS& 141 | Computer Science I-JAVA | 5 |
| WEB 201 | Internet Technologies | 5 |
| WEB 202 | Web Authoring Editor | 5 |
| WEB 203 | Photoshop for the Web | 5 |
| WEB 205 | Web Site Design | 5 |
| WEB 206 | Technology Topic | 5 |

Students must choose one of the following options, Option A or Option B.

**Option A**

| | | |
|---|---|---|
| WEB 290 | Capstone Project | 5 |

**Option B**

| | | |
|---|---|---|
| WEB 296 | Work-based Learning Experience and | 4 |
| WEB 297 | Work-based Learning Seminar | 1 |
| | or | |
| WEB 298 | Work-based Learning – No Seminar | 5 |

Students must choose one of the following options, Option C or Option D.

**Option C**

| | | |
|---|---|---|
| SOFT | Open Source Programming | 5 |

**Option D**

| | | |
|---|---|---|
| WEB 204 | Web Site Animation using Flash | 5 |

# Welding

Students prepare for apprenticeship employment as welders, filling positions in industries including shipbuilding, industrial construction, energy fields, sheet metal, and auto body. Extensive practical training in all aspects of welding is included as students work in the shop on a variety of welding projects. Upon completion of the welding competencies, students are encouraged to take the certification tests for the American Welding Society and the Washington Association of Building Officials. This program also provides extended learning for persons previously or currently employed in these professions. Note: Through an Opportunity Grant, special tuition and book funding is available to assist low-income adult students entering this program.

**FACULTY**

Clinton Griffee, 253.680.7456, cgriffee@bates.ctc.edu
Rick Huston, 253.680.7454, rhuston@bates.ctc.edu

### Associate of Technology Degree: 120 Credits

| GENERAL EDUCATION REQUIREMENTS | CREDITS |
|---|---|
| 100+ Level Human Relations | 5 |
| 100+ Level Communications | 5 |
| 100+ Level Mathematics | 5 |

| REQUIRED COURSEWORK | | CREDITS |
|---|---|---|
| WELD 101 | Safety Principles | 2 |
| WELD 102 | Fabrication Plans | 4 |
| WELD 103 | Pre and Post-welding Activities | 2 |
| WELD 104 | Oxyacetylene Cutting | 3 |
| WELD 105 | Introduction to Shielded Metal Arc Welding | 5 |
| WELD 107 | Brazing and Soldering | 1 |
| WELD 108 | Full Penetration Welds – Flat/Horizontal | 5 |
| WELD 109 | Full Penetration Welds – Vertical/Overhead | 5 |
| WELD 110 | Full Penetration Welds – Open Root | 5 |
| WELD 111 | Introduction to Gas Metal Arc Welding | 3 |
| WELD 112 | Gas Metal Arc Welding – Full Penetration | 4 |
| WELD 113 | Gas Metal Arc Welding – Aluminum | 5 |
| WELD 114 | Introduction to Flux Core Arc Welding | 4 |
| WELD 115 | Flux Core Arc Welding – Full Penetration | 5 |
| WELD 116 | Carbon Arc Cutting | 5 |
| WELD 117 | Welding Symbols | 5 |
| WELD 201 | Introduction to Gas Tungsten Arc Welding | 5 |
| WELD 202 | Gas Tungsten Arc Welding – Full Penetration | 5 |
| WELD 203 | Gas Tungsten Arc Welding – Aluminum | 5 |
| WELD 204 | Welding Certification Testing – SMAW | 5 |
| WELD 205 | Advanced Welding Applications – Pipe/SMAW | 5 |
| WELD 206 | Advanced Welding Applications – Pipe/GTAW | 5 |
| WELD 207 | Welding Certification Testing – Flux Core | 5 |
| WELD 208 | Non-Destructive Testing | 1 |
| WELD 209 | Forklift Training | 1 |
| WELD 210 | Advanced Welding Applications - Project | 5 |

### Certificate of Competency: 103 Credits

WELDER

| GENERAL EDUCATION REQUIREMENTS | CREDITS |
|---|---|
| 90+ Level Human Relations | 5 |
| 90+ Level Communications | 5 |
| 90+ Level Mathematics | 5 |

| REQUIRED COURSEWORK | | CREDITS |
|---|---|---|
| WELD 101 | Safety Principles | 2 |
| WELD 102 | Fabrication Plans | 4 |
| WELD 103 | Pre and Post-welding Activities | 2 |
| WELD 104 | Oxyacetylene Cutting | 3 |
| WELD 105 | Introduction to Shielded Metal Arc Welding | 5 |
| WELD 107 | Brazing and Soldering | 1 |
| WELD 108 | Full Penetration Welds – Flat/Horizontal | 5 |
| WELD 109 | Full Penetration Welds – Vertical/Overhead | 5 |
| WELD 110 | Full Penetration Welds – Open Root | 5 |
| WELD 111 | Introduction to Gas Metal Arc Welding | 3 |
| WELD 112 | Gas Metal Arc Welding – Full Penetration | 4 |
| WELD 113 | Gas Metal Arc Welding – Aluminum | 5 |
| WELD 114 | Introduction to Flux Core Arc Welding | 4 |
| WELD 115 | Flux Core Arc Welding – Full Penetration | 5 |
| WELD 116 | Carbon Arc Cutting | 5 |
| WELD 117 | Welding Symbols | 5 |
| WELD 201 | Introduction to Gas Tungsten Arc Welding | 5 |
| WELD 202 | Gas Tungsten Arc Welding – Full Penetration | 5 |
| WELD 203 | Gas Tungsten Arc Welding – Aluminum | 5 |
| WELD 204 | Welding Certification Testing – SMAW | 5 |
| WELD 205 | Advanced Welding Applications – Pipe/SMAW | 5 |

Courses may be substituted with a work-based learning component with instructor approval.

### Certificate of Training: 32 Credits

WELDER-LEVEL I

| REQUIRED COURSEWORK | | CREDITS |
|---|---|---|
| WELD 101 | Safety Principles | 2 |
| WELD 102 | Fabrication Plans | 4 |
| WELD 103 | Pre and Post-welding Activities | 2 |
| WELD 104 | Oxyacetylene Cutting | 3 |
| WELD 105 | Introduction to Shielded Metal Arc Welding | 5 |
| WELD 107 | Brazing and Soldering | 1 |
| WELD 108 | Full Penetration Welds – Flat/Horizontal | 5 |
| WELD 109 | Full Penetration Welds – Vertical/Overhead | 5 |
| WELD 117 | Welding Symbols | 5 |

Courses may be substituted with a work-based learning component with instructor approval.

### Certificate of Training: 31 Credits

WELDER-LEVEL II

| REQUIRED COURSEWORK | | CREDITS |
|---|---|---|
| WELD 110 | Full Penetration Welds – Open Root | 5 |
| WELD 111 | Introduction to Gas Metal Arc Welding | 3 |
| WELD 112 | Gas Metal Arc Welding – Full Penetration | 4 |
| WELD 113 | Gas Metal Arc Welding – Aluminum | 5 |
| WELD 114 | Introduction to Flux Core Arc Welding | 4 |
| WELD 115 | Flux Core Arc Welding – Full Penetration | 5 |
| WELD 116 | Carbon Arc Cutting | 5 |

Courses may be substituted with a work-based learning component with instructor approval.

# Wireless Voice & Data Communications

Students prepare for employment as technicians in the wireless communications industry. Few technologies have grown and evolved as quickly as wireless communications. Rapid growth combined with advances in technology creates excellent employment opportunities in this field. Students learn how high-speed, high-quality voice, data and video is exchanged among devices located anywhere in the world via optical fibers, telecommunications cabling, telephone, cellular and satellite equipment and broadcast and wireless networks. Students also prepare for industry certifications and federal licenses including the Federal Communications Commission, Cisco CCNA, Network Cabling Specialist and Certified Fiber Optic Technician.

**FACULTY**

Laura Robertson, 253.680.7358, lrobertson@bates.ctc.edu
www.bates.ctc.edu/WirelessTechnology

**Associate of Technology Degree: 110 Credits**

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 100+ | Level | Human Relations | 5 |
| 100+ | Level | Communications | 5 |
| 100+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ETECH | 101 | Introduction to Electronics | 2 |
| ETECH | 102 | DC Circuits | 5 |
| ETECH | 103 | AC Circuits | 5 |
| ETECH | 104 | Analog Circuits | 5 |
| ETECH | 105 | Digital Circuits | 5 |
| ETECH | 106 | Microcontrollers | 5 |
| INFO | 101 | Computer Applications Essentials | 5 |
| WIRE | 201 | Telecommunications Network Cabling Systems | 5 |
| WIRE | 202 | Fiber Optics | 5 |
| WIRE | 203 | FCC Licensure Prep I | 5 |
| WIRE | 204 | FCC Licensure Prep II | 5 |
| WIRE | 205 | Wireless/RF Communications | 4 |
| WIRE | 206 | Wireless Personal Area Networks | 2 |
| WIRE | 207 | Wireless Local Area Networks | 3 |
| WIRE | 208 | Wireless Broadband Networks | 4 |
| WIRE | 210 | Introduction to RF Communications | 2 |
| WIRE | 211 | Amplitude Modulation | 3 |
| WIRE | 212 | Single Sideband and Frequency Modulation | 4 |
| WIRE | 213 | Transmission Lines and Antennas | 2 |
| WIRE | 214 | Microwave, Telephony, and Cellular | 2 |
| WIRE | 215 | Data and Networking Fundamentals | 2 |
| WIRE | 216 | Advanced Communications Principles | 2 |

Students must chose 18 credits from the electives list.

**Certificate of Competency: 78 Credits**

WIRELESS VOICE AND DATA COMMUNICATIONS

| GENERAL EDUCATION REQUIREMENTS | | | CREDITS |
|---|---|---|---|
| 90+ | Level | Human Relations | 5 |
| 90+ | Level | Communications | 5 |
| 90+ | Level | Mathematics | 5 |

| REQUIRED COURSEWORK | | | CREDITS |
|---|---|---|---|
| ETECH | 101 | Introduction to Electronics | 2 |
| ETECH | 102 | DC Circuits | 5 |
| ETECH | 103 | AC Circuits | 5 |
| ETECH | 104 | Analog Circuits | 5 |
| ETECH | 105 | Digital Circuits | 5 |
| ETECH | 106 | Microcontrollers | 5 |
| INFO | 101 | Computer Applications Essentials | 5 |
| WIRE | 201 | Telecommunications Network Cabling Systems | 5 |
| WIRE | 202 | Fiber Optics | 5 |
| WIRE | 205 | Wireless/RF Communications | 4 |
| WIRE | 206 | Wireless Personal Area Networks | 2 |
| WIRE | 207 | Wireless Local Area Networks | 3 |
| WIRE | 208 | Wireless Broadband Networks | 4 |

Students must choose eight credits from the electives list.

| ELECTIVES LIST | | | CREDITS |
|---|---|---|---|
| INFO | 101 | Computer Applications Essentials | 5 |
| WIRE | 209 | Cisco Fundamentals of Wireless LANs | 5 |
| WIRE | 210 | Introduction to RF Communications | 2 |
| WIRE | 211 | Amplitude Modulation | 3 |
| WIRE | 212 | Single Sideband and Frequency Modulation | 4 |
| WIRE | 213 | Transmission Lines and Antennas | 2 |
| WIRE | 214 | Microwave, Telephony, and Cellular | 2 |
| WIRE | 215 | Data and Networking Fundamentals | 2 |
| WIRE | 216 | Advanced Communications Principles | 2 |
| WIRE | 236 | RF Communications Lab | 5 |
| WIRE | 237 | Telecommunications Lab | 5 |
| WIRE | 249 | Job Search and Preparation | 3 |
| WIRE | 290 | Independent Study I | 5 |
| WIRE | 291 | Independent Study II | 5 |
| WIRE | 296 | Work-based Learning Experience | 1-15 |
| WIRE | 297 | Work-based Learning Seminar | 1-2 |
| INFO | 111 | Introduction to Operating Systems (O/S) | 5 |
| INFO | 112 | O/S Applications | 5 |
| INFO | 109 | PC Hardware Maintenance | 3 |
| INFO | 110 | Hardware Applications | 3 |
| INFO | 201 | Cisco Network Fundamentals | 5 |
| INFO | 202 | Cisco Routing Protocols and Concepts | 5 |
| INFO | 203 | Cisco LAN Switching and Wireless | 5 |
| INFO | 204 | Cisco-Accessing the WAN | 5 |

CHAPTER 5

# Course Descriptions

# Degree & Certificate Course Descriptions

CREDITS

## ADMINISTRATIVE MEDICAL ASSISTANT

**ADMA 101 Introduction to the Health Care Profession 5**
This course is an introduction to the basic concepts of the administrative medical assistant profession with emphasis on professional behaviors as they relate to the patient-physician-medical assistant relationship. Students learn basic 10-key calculator skills. CPR and first aid certification is also included.

**ADMA 102 Introduction to Medical Terminology 4**
This course is an introduction to the first of a series of medical terminology courses associated with anatomy and understanding of disease. Students learn basic prefixes, suffixes, combining forms, and medical abbreviations.

**ADMA 103 Medical Transcription I 3**
Students are introduced to the processes used to transcribe a variety of medical correspondence and reports with emphasis on the development of proofreading and editing skills.

**ADMA 104 Medical Office Procedures I 3**
Students complete practical applications related to a variety of administrative medical tasks to include appointment scheduling, internet research, referral process for treatment, and records management.

**ADMA 105 Administrative Medical Procedures I 4**
Students are provided an introduction to the general duties of the medical assistant in the health care setting: ethical and legal issues, telephone and electronic communication use, and computer use in the medical office. Prerequisite required: ADMA 101

**ADMA 106 Medical Terminology II 4**
Students learn medical terminology with an emphasis on the integumentary, musculoskeletal, nervous, cardiovascular, and respiratory systems. Prerequisite required: ADMA 102

**ADMA 107 Medical Office Procedures II 3**
Students complete practical applications related to a variety of administrative medical tasks to include: generation of reports, creating CMS-1500 forms for billing, editing drafts of documents, message taking, completing incident report, and preparing orders for supplies. Prerequisite required: ADMA 101 AND ADMA 104

**ADMA 108 Medical Transcription II 4**
Students expand their research/reference skills, improve and apply proofreading and editing skills while transcribing progress notes, histories and physicals, operative reports, consultations, and discharge summaries. Prerequisite required: ADMA 102 AND ADMA 103

CREDITS

**ADMA 109 Administrative Medical Procedures II 4**
Students are provided training in the areas of patient reception, appointment scheduling, written communication, mail processing, handling medical records, and filing. Prerequisite required: ADMA 101, ADMA 102, AND ADMA 105

**ADMA 110 Medical Terminology III 4**
Students learn medical terminology with an emphasis on the digestive, urinary, female and male reproductive, and blood systems. Prerequisite required: ADMA 102

**ADMA 111 Medical Insurance 4**
Students learn medical insurance terminology and processes for billing a variety of insurance types. They learn specifics of Medicaid, Medicare, CHAMPUS, L & I, and commercial insurance and analyze agency payment vouchers. Secondary insurance billing requirement, rebilling, and electronic billing are also included. Prerequisite required: ADMA 101 AND ADMA 105

**ADMA 112 Medical Data Base 2**
Students learn to use a medical practice management data base and practice a variety of record maintenance functions common to a medical facility: scheduling, billing, account balancing, and financial report analysis. Prerequisite required: ADMA 101 AND ADMA 105

**ADMA 113 Administrative Medical Procedures III 4**
Students are introduced to administrative skills relating to: health information management, privacy issues (HIPAA), professional fees, banking procedures, and medical practice finances. Prerequisite required: ADMA 101, ADMA 105, AND ADMA 109

**ADMA 114 Medical Terminology IV 4**
Students learn medical terminology with an emphasis on the sense organs, endocrine, lymph and immune systems, and radiology, and pharmacology. Prerequisite required: ADMA 102

**ADMA 115 Coding 5**
This course is an introduction to the coding of diagnoses and procedures of health care records with emphasis on coding for insurance reimbursement. Students learn to use both CPT and ICD-9-CM classification manuals and reference materials. Prerequisite required: ADMA 102 AND either ADMA 106, ADMA 110, or ADMA 114

**ADMA 116 Medical Transcription III 4**
This course offers advanced study and practice in medical transcription with increased focus on complex reports. Prerequisite required: ADMA 102, ADMA 103, ADMA 106, ADMA 108, AND ADMA 110

CREDITS

**ADMA 117 Independent Study – Medical Terminology V 4**
This course offers advanced study in the medical terminology applicable to the structure, function, and diseases of the human body. Prerequisite required: ADMA 102, AND either ADMA 106, ADMA 110, or ADMA 114.

**ADMA 120 Practical Applications 3**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. This project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ADMA 296 Work-based Learning Experience 2**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ADMA 297 Work-based Learning Seminar 1**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ADMA 298 Work-based Learning – No Seminar 2**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ADMINISTRATIVE OFFICE ASSISTANT

**AOA 101 Professional Communications 1**
Students learn verbal and written communication skills that are required within the business and office environment.

**AOA 102 Professional Office Procedures 5**
This course is an introduction to duties and responsibilities found within the office administrative professions including the investigation of career paths, the development of career goals, and the exploration of customer service philosophies.

**AOA 103 Telecommunications 1**
Skills related to customer service, arrangement of business travel, operation of multiline phone systems and facsimile equipment are introduced.

CREDITS

**AOA 104 Office Lead 1**
Students develop skills in leadership and supervision. They learn to conduct timed writes, operate image processing devices, plan activities, schedule speakers, mentor new students, and organize and schedule cleaning of classroom areas.

**AOA 105 Keyboarding I 5**
This course is an introduction to basic typewriting and computer keypad data entry skills.

**AOA 106 MS Windows 3**
This course is an introduction to MS Windows where students learn to Identify computer system components, use Windows software, and manage digital files.

**AOA 108 Records Management 4**
Students learn to perform records management activities at the level required within the administrative office assistant industry.

**AOA 109 Business Ethics 2**
Concept of ethics and its role in business are presented with emphasis on the examination of ethical situation and the creation of steps to solve the issue.

**AOA 110 MS Word I 5**
This course is an introduction to basic word processing skills using MS Word.

**AOA 111 MS Outlook 2**
Students learn to manage calendars and utilize basic and advanced features of email systems.

**AOA 120 Keyboarding II 5**
Students continue to enhance typewriting/keyboarding and keypad data entry skills and increase their keyboarding speed and accuracy.

**AOA 121 MS Word II 3**
A continuation of the concepts introduced in AOA 110, students learn more advanced word processing skills.

**AOA 122 Business Grammar I 2**
This course is an introduction to basic grammar including parts of speech and writing grammatically correct sentences.

**AOA 123 Business Documentation 5**
Written communication skills required within the business and office environment are developed.

**AOA 124 Business Presentations 3**
Business meeting structure, conduct, and protocols, including meeting facilitator's responsibilities are emphasized.

**AOA 125 Accounting Software 2**
Students learn to use commercially available accounting software packages such as Quickbooks or timeslips to maintain books and business records.

CREDITS

**AOA 201 Beginning Accounting 5**
This course is an introduction to basic accounting and bookkeeping duties.

**AOA 203 MS Excel I 3**
Students learn to create, edit, maintain, and print spreadsheets and data sheets and create and edit macros.

**AOA 204 MS PowerPoint 3**
This course is an introduction to presentation software that is used to create computer-based based slide shows.

**AOA 205 MS Access I 3**
This course is an introduction to Microsoft Access with emphasis on the acquisition of database maintenance skills.

**AOA 206 Voice Recognition Software 2**
This course is an introduction to voice recognition software with emphasis on the skills required to use this software for word processing purposes.

**AOA 220 Keyboarding III 4**
Students learn enhance typewriting/keyboarding and keypad data entry skills and increase their keyboarding speed and accuracy.

**AOA 222 Business Grammar II 2**
Students learn more advanced concepts of writing business correspondence including the importance of spelling, punctuation, and editing skills.

**AOA 223 MS Excel II 3**
Students learn advanced functions such as graphing, working with multiple spreadsheets, and formatting and printing spreadsheets and data sheets.

**AOA 224 Desktop Publishing 3**
Students are introduced to popular desktop publishing software such as MS Publisher and MS FrontPage and acquire desktop publishing skills.

**AOA 225 MS Access II 3**
Students learn to design and create databases to meet data collection and reporting requirements normally associated with business operations.

**AOA 234 Employment Preparation 1**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**AOA 240 Independent AOA Project 2**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

CREDITS

**AOA 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AOA 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AOA 296 Work-Based Learning Experience 1**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**AOA 297 Work-Based Learning Seminar 1**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**AOA 298 Work-Based Learning Experience – No Seminar 2**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ARCHITECTURAL WOODWORKING/ CABINET MAKING TECHNOLOGY

**ARWC 101 Introduction to Cabinetmaking 3**
This course is an introduction to the basic fundamentals of the cabinetmaking trade including sources and products of cabinetmaking and different occupational opportunities.

**ARWC 102 Safety Principles 4**
This course is an introduction to the required safety and shop rules to be applied in the lab as well as the OSHA and WISHA rules and regulations that help maintain a safe and productive work environment.

**ARWC 103 Cabinetry Blueprints/Plans 4**
An introduction to the fundamental skills of show drawings and detail plans, students learn to read and interpret plans including material and cabinet take-offs. Basic sketching is also introduced.

CREDITS

**ARWC 104 Materials 2**
This course is an introduction to the materials used in the cabinetmaking trade including both natural-made and man-made materials: MDF, particle board, laminates, veneers, solid surfaces, and sustainable sourced woods.

**ARWC 105 Machine Tools I 4**
This course is an introduction to the proper use, maintenance and application of basic machines used for the building of cabinets and woodworking projects. Basic machines may include the jointer, planer, radial arm saw, wide belt sander, table saw, vertical panel saw, line boring machine, motorized miter saw, and drill presses.

**ARWC 106 Machine Tools II 4**
A continuation of the concepts introduced in ARWC 105, students learn the proper use, maintenance, and application of complex machine tools used for the building of cabinets and woodworking projects. Advanced machines may include edge banders, sliding table/table saw, spindle shapers, panel raising attachment, panel router, Euro hinge machines similar to Blum Mini press, and the hollow chisel mortiser.

**ARWC 107 Machine Tools \CNC 3**
This course is an introduction to the proper use, maintenance, and application of CNC machining used for the cutting/milling of cabinets, woodworking parts, templates, and projects. The use of basic layouts on the computer and software used for this application is emphasized.

**ARWC 108 Portable Power Tools 3**
This course is an introduction to the proper use, maintenance, and application of portable power tools. Common tool use and care of router and bits, the different types of routers and their application, biscuit cutter, pocket hole jigs, drills and drivers, and various joint-making tools and their set-up.

**ARWC 109 Hand Tools 3**
This course is an introduction to the proper use, maintenance, and application of hand tools used for the cutting/milling , assembly, and installation of cabinets. , woodworking parts, templates, and projects. Common hands tools include the block plane; measuring and marking tools; and cutting tools such as dovetail saws, back saws, and Japanese saws.

**ARWC 110 Basic Cabinet Joinery 4**
Students learn the proper use and application of joints used in the assembly and production of cabinets . Emphasis is on function, strength, ease of machining, and basic uses of various joints . Their application and suitability to different materials and production settings is also introduced.

CREDITS

**ARWC 111 Tool Maintenance/Sharpening 3**
This course is an introduction to the maintenance and sharpening of tools used in the shop including routine maintenance and minor tool repair/adjustments. Routine maintenance will be covered as well as some minor tool repair and adjustments. Students use assigned/instructor approved projects to replace knives, adjust cutting performance, and maintain machines .

**ARWC 112 Cabinetmaking/ Face I Frame Construction 4**
Students learn to cut, assemble, and complete traditional face frame cabinets. Design, layout and proper material use will be covered. Design, layout, and proper material use is introduced as well as carcass assembly, face frames and door and drawer construction.

**ARWC 113 Cabinetmaking/ Face II Frame Construction 4**
A continuation of the concepts introduced in ARWC 112, students learn to cut, assemble, and complete traditional face frame cabinets. Design, layout, and proper material use is introduced as well as carcass assembly, face frames and door and drawer construction. Students are assigned instructor- approved projects to develop more advanced knowledge and skills.

**ARWC 114 Cabinetmaking/32mm System 3**
Students acquire knowledge and skills in the use and application of the 32mm cabinet system. This includes the construction methods, materials, hardware, and assembly of frameless cabinets.

**ARWC 115 Finishing Methods I 3**
Students are introduced to the use and application of finishes used in a shop setting including a variety of techniques: wipe-on , spray, and brushing.

**ARWC 116 Drawers and Doors 2**
Students learn to assemble doors and drawers and design and manufacture different door/drawer styles to assigned/personal projects.

**ARWC 117 Laminates / Countertops / Solid Surface 3**
Students are introduce to the fabrication and assembly methods of various countertop materials including plastic laminates and solid surface materials.

**ARWC 118 Occupational Math 3**
This course is an introduction to mathematical computations as they relate to the architectural woodworking/cabinetry industry. Applied skills include material estimation and board, square, and linear footage calculations.

CREDITS

**ARWC 119 Jigs and Fixtures 2**
This course is an introduction to the use of jigs, templates, and fixture for doing machining processes when more than one part is required to be identical or parts need to be held for machining. Skills taught include material selection, measurements, and proper tooling and ease of use. Work is on shop projects and simulated mockups.

**ARWC 120 Cabinetmaking/ Commercial Construction 3**
Students learn to assemble commercial casework including assembly methods, construction standards, and materials.

**ARWC 121 Applied Communications 3**
This course is an introduction to written communication skills and their application to professional-technical studies. Development of writing skills necessary to write technically formatted documents is emphasized.

**ARWC 201 Wood Bending/ Lamination Techniques 3**
Students learn wood bending/laminating techniques including vacuum bagging and lamination bending. Types of forms, construction of forms, adhesives, and best materials for bending are included.

**ARWC 202 Architectural Millwork 3**
Students learn architectural millwork fabrication and design methods using projects and mockups. Molding selection, machining, material selection, and cutting are also included.

**ARWC 203 Beginning Furniture Projects 5**
Furniture design, styles and assembly methods are taught.

**ARWC 204 Cabinet Installation- Residential/ Commercial 4**
Students learn to install residential and commercial cabinets and fixtures. Layout, leveling, and fastening methods are also taught.

**ARWC 205 Advanced Joinery 4**
The selection and proper use of tools and materials in the creation of advanced joinery are emphasized.

**ARWC 206 Cabinetmaking Computer Technology 4**
This course is an introduction to the use of various industry software for design, layout, and manufacture of cabinets.

**ARWC 207 Veneering Technology 2**
Students learn to use a variety of methods of applying, fitting, and trimming veneers.

**ARWC 208 Employment Preparation 3**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

CREDITS

**ARWC 209 Advanced Projects 1-18**
With instructor approval, students select and complete an advanced project.

**ARCH 213 Practical Applications 3**
Students explore individual topics in depth relating to concepts introduced in previous coursework.

**ARWC 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ARWC 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ARWC 295 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ARWC 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ARWC 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ARWC 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## AUDIO/SOUND TECHNOLOGY

**AUDIO 109 Characteristics of Sound 2**
This course is an introduction to the physical nature of sound and how the ear translates it from a physical phenomenon to a sensory one. Topics include waveform characteristics, reflection, diffraction, frequency response, phase, loudness levels, sound-pressure levels, thresholds, and perceptions.

CREDITS

**AUDIO 110 Introduction to Digital Systems 2**
This course is an introduction to digital theory, concepts, and languages. Sampling rates, quantum levels and basic compression techniques, analyzing system hardware, and planning basic configurations is also included.

**AUDIO 111 Basic Maintenance and Troubleshooting 3**
Preventative maintenance methods and strategies are explored. Practical applications include the use of electronic measuring devices, meters, and scopes. Soldering, splicing, and making cable connections are also included.

**AUDIO 113 Studio Acoustics 2**
This course is an introduction to the design and construction of studios for a variety of applications, including audio project, music, audio-for-visual studios. Acoustics for control rooms is also examined.

**AUDIO 114 Microphones 3**
This course is an introduction to microphone types, characteristics, techniques, and placement. Students analyze and utilize a variety of microphones in differing situations and venues.

**AUDIO 201 Introduction to Digital Audio Recording 2**
Students receive training in the operation of digital audio workstations (DAW) as well as other digital recording devices.

**AUDIO 202 Digital Audio Recording Techniques 5**
A continuation of the concepts introduced in AUDIO 201, students learn to operate digital audio workstations.

**AUDIO 204 Studio Operations 4**
This course is an introduction principles and methods required to operate an audio studio. Topics include the purchase and operation of studio gear and budget planning.

**AUDIO 205 Synchronization 2**
In a multimedia production environment, students learn to use synchronization and time codes.

**AUDIO 206 Audio Processing 5**
This course is an introduction to types of equalization, equalization filters, dynamic range processing, signal processing, and noise reduction.

**AUDIO 208 Introduction to Audio Production Console 1**
The function of an audio production console for recording, playback, and mixing is emphasized. Other topics presented include dubbing, overdubbing, input, auxiliary sends, insert points, patching, and automation.

CREDITS

**AUDIO 210 Amplification 2**
The application of amplifiers to amplify, equalize, distribute, or isolate audio is emphasized. Types of amplifiers to be analyzed include equalization, distribution, and power.

**AUDIO 211 Production Audio Preparation 5**
Students learn to create scripts and work with project budgeting, prepare talent for production, practice voiceovers, and determine which sounds/music to use in productions.

**AUDIO 217 Monitoring 2**
In an audio environment, audio monitoring characteristics and types are compared. Speaker and room considerations, an introduction to surround sound, and live sound monitoring is also presented.

**AUDIO 218 Musical Instrumental Digital Interface (MIDI) 1**
This course is an introduction to musical instrumental digital interface (MIDI) connections, channels, electronic music instruments, and sequencers.

**AUDIO 219 Audio Production Console Techniques 4**
A continuation of the concepts introduced in AUDIO 208, students apply the techniques of recording, playback, and mixing on a production console.

**AUDIO 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUDIO 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUDIO 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUDIO 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

CREDITS

**AUDIO 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**AUDIO 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**AUDIO 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## AUTO BODY REBUILDING & REFINISHING

**AUTOB 101 Auto Body Math Applications 3**
This course is an introduction to mathematical theory and its application to the automotive refinishing industry. Topics include an overview of general mathematical concepts and how they are successfully utilized in practical situations.

**AUTOB 102 Safety Principles 3**
This course is an introduction to the safety practices and procedures common to the automotive refinishing industry.

**AUTOB 103 Materials Identification 3**
Students are introduced to the various types of automotive materials and finishes and the equipment used in their application. Emphasis is placed on identification of a variety of repair and refinishing materials, types of equipment, and proper safety precautions.

**AUTOB 104 Minor Body Repair Methods 5**
Students learn about materials used in minor body repair and how to use them to fill/smooth depressed areas in sheet metal. The removal and installation of bolt-on panels are also included. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 105 Major Panel Replacement 5**
Students learn the basic theory of major panel replacement and alignment/replacement methods, including welding. They are also introduced to automobile body construction types and their common mechanical components: energy absorbers, suspension and steering systems and CV joints. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

CREDITS

**AUTOB 106 Alignment – Sheet Metal 5**
This course includes practical applications in the adjustment/alignment of bolt-on sheet metal doors, hoods, fenders, and trunk lids. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 107 Alignment – Bumpers 3**
Students learn to align a variety of bumpers including impact-absorbing, fixed mounted and metal reinforced. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 108 Alignment – Head Lamps 1**
Students learn to align various types of headlamps in automobiles. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 109 Trim and Accessories 3**
Students learn to replace trim molding, hardware, locks and latches and repair/replace window adjustment mechanisms and restraint devices. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 110 Window Mechanisms 4**
Students learn to install mechanical and power window mechanisms. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 111 Introduction to Surface Preparation 2**
Basic principles of interior and exterior surface preparation are introduced. Students learn to analyze the components of primers, undercoats, and topcoats. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 112 Surface Preparation Applications 5**
This course introduces students to methods of surface preparation for automotive refinishing. Topics include sanding techniques, metal treatment, selection and use of undercoats, and proper masking procedures. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 113 Advanced Surface Preparations 5**
A continuation of the concepts introduced in AUTOB 111 and 112, students continue to learned advanced surface preparation techniques to restore cars to factory standards after collision damage. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and AUTOB 112.

**AUTOB 201 Topcoat Systems 5**
Students are introduced to the basic principles of topcoat systems with emphasis on the types of automotive topcoat systems and their application procedures. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

CREDITS

**AUTOB 202 Topcoat Systems Applications 5**
A continuation of the concepts introduced in AUTOB 201, students learn to apply a variety of automotive topcoats including single-stage, basecoat/clearcoat, and tri-coat finishes. Buffing, compounding, and detailing of newly painted vehicles for delivery is also presented. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and AUTOB 201.

**AUTOB 203 Shop Welding 5**
This course provides instruction in automotive metal inert gas (MIG) and oxyacetylene welding with emphasis on safety, set-up and operation of welding equipment. Students learn to successfully join automotive sheet metal using the MIG process. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and WBAS 101.

**AUTOB 204 Unibody Alignment 5**
Students learn the basic theory and application of major unibody and frame repair. Topics include methods of inspection, types of measuring equipment, and identifying types of structural damage. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 205 Body Over Frame Alignment 4**
Students learn to measure, align, and repair a unibody and body over frame vehicle. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 206 Glass Installation 4**
This course is an introduction to glass installation methods with emphasis on the removal and replacement of structural glass, non-structural glass, and auto trim. Cleanup of vehicle interior after breakage is also included. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 207 Introduction to Plastic Repair 2**
Students learn to identify the various types of plastics, their characteristics and locations, and which procedures to follow while repairing or refinishing the various types of plastics. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 208 Plastic Repair Methods 5**
A continuation of the concepts introduced in AUTOB 207, students repair or refinish various plastic surfaces. Prerequisite: Successful completion of AUTOB 102, AUTOB 103 and AUTOB 207.

**AUTOB 209 Shop Management 3**
Students are introduced to the basic principles of body shop management with emphasis on management structure, customer relations, and sound business practices. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

CREDITS

**AUTOB 210 Introduction to Estimating 4**
Students learn to estimate collision damage, auto body repair, and finishing costs. Traditional and computer-assisted methods used for determining cost involved in labor, parts, and materials are emphasized. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 211 Special Projects 4**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas. Prerequisite: Successful completion of AUTOB 102 and AUTOB 103.

**AUTOB 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOB 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOB 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOB 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOB 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**AUTOB 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

CREDITS

**AUTOB 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## AUTOMOTIVE MECHANIC

**AUTOM 101 Basic Engines 4**
Students are introduced to internal combustion engine theory, configuration operation and diagnosis.

**AUTOM 102 Engine Systems 4**
Students are introduced to the operation and diagnosis of engine subassemblies such as valve trains, timing components and short blocks.

**AUTOM 103 Basic Electrical Theory 4**
Students are introduced to electrical theory including ohms law, series and parallel circuits, and measuring devices.

**AUTOM 104 Engines/Electrical Applications 4**
Students are introduced to automotive electrical applications such as charging systems and starting systems and problem diagnosis.

**AUTOM 121 Basic Engine Performance 5**
Students are introduced to engine performance, diagnosis, and computer applications.

**AUTOM 122 Basic Ignition Systems 5**
Students are introduced to electronic and computer operated ignition systems including primary controls and secondary high voltage.

**AUTOM 123 Introduction to Fuel Systems 4**
Students are introduced to electrical and mechanical fuel delivery systems and test equipment.

**AUTOM 124 Introduction to Emissions Systems 2**
Students are introduced to EGR, evaporative and exhaust emission systems their requirements and operation.

**AUTOM 125 Introduction to Fuel Injection 2**
Students are introduced to electronic fuel injection, controls, and test equipment.

**AUTOM 130 Introduction to Lighting and Instruments 4**
Students are introduced to lighting types, switches and controls. Instrumentation theory and applications are examined.

**AUTOM 131 Introduction to Clutches and Manual Transmissions 4**
Students are introduced to gear trains and synchromesh transmission operation.

**AUTOM 132 Automatic Transmissions/ Transaxles 4**
Students are introduced to automatic transmission principles, hydraulics and planetary gear sets.

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**AUTOM 133 Four and All-wheel Drive 4**
Students are introduced to four wheel drive, transfer cases and differentials.

**AUTOM 140 Wheel Alignment and Steering Systems 4**
Students are introduced to wheel alignment, rack and pinion steering, and suspension systems.

**AUTOM 141 Brake Systems 4**
Students are introduced to hydraulics, system splitting, and power brakes.

**AUTOM 142 Disc and Drum Brakes 4**
Students are introduced to brake types and applications including anti-loc.

**AUTOM 143 Heating and Air Conditioning Systems 4**
Students are introduced to automatic and manual mobile HVAC systems. Principles of heat transfer and refrigerant are examined.

**AUTOM 201 Advanced Engine Repair 5**
In this advanced segment detailed engine diagnosis and repair is performed. Crankshaft measuring, plastic gauge and piston rings are all examined.

**AUTOM 202 Engine Assembly 3**
In this advanced course, engine subassemblies, cylinder heads, short blocks, and timing components are repaired to current standards.

**AUTOM 203 Automotive Electrical Systems 4**
In this advanced course, diagnostic testers and electrical troubleshooting are examined.

**AUTOM 204 Battery, Starters, and Charging Systems 4**
In this advanced course, battery, starting, and charging systems are diagnosed and repaired.

**AUTOM 220 Ignition Systems Service 4**
In this advanced course, computer and electronic ignition systems are diagnosed and repaired.

**AUTOM 221 Fuel Systems Service 4**
In this advanced course, pressurized fuel delivery systems are diagnosed and repaired.

**AUTOM 222 Emissions Systems Service 3**
In this advanced course, emissions are measured using modern test equipment and control systems adjusted and repaired.

**AUTOM 223 Fuel Injection 3**
In this advanced course, fuel injection is examined, adjusted and repaired using modern test equipment and diagnostic procedures.

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**AUTOM 230 Lighting and Instrument Service 3**
In this advanced course, lights, wiring and instrument are examined, adjusted and repaired using modern test equipment and diagnostic procedures.

**AUTOM 231 Clutches and Manual Transmission Service 5**
In this advanced course, clutches and transmissions are examined and repaired using modern repair procedures.

**AUTOM 232 Automatic Transmission and Transaxle Service 4**
In this advanced course, automatic transmissions and transaxles are examined and repaired using modern repair procedures.

**AUTOM 233 Four and All-Wheel Drive Service 4**
In this advanced course, multi wheel drive systems are diagnosed and repaired using modern repair procedures.

**AUTOM 240 Advanced Wheel Alignment and Steering Systems Service 4**
In this advanced course, steering and suspension systems are serviced and aligned using modern alignment equipment.

**AUTOM 241 Advanced Brake Service 4**
In this advanced course, brake hydraulic systems are serviced using modern brake service equipment.

**AUTOM 242 Advanced Disc and Drum Brake Service 4**
In this advanced course, disc and drum brake systems are serviced and repaired using modern brake service equipment.

**AUTOM 243 Applied HVAC Service 3**
In this advanced course, heating and air conditioning systems are serviced and repaired using modern AC service equipment.

**AUTOM 250 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOM 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOM 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

CREDITS

**AUTOM 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**AUTOM 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**AUTOM 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**AUTOM 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## AUTOMOTIVE PARTS/INVENTORY/WAREHOUSING

**VPM 101 Applied Math 4**
This course is an introduction to mathematical theory and its application to the vehicle parts marketing. Topics include an overview of general mathematical concepts and how they are successfully utilized in practical situations.

**VPM 106 Material Movement 2**
Students learn to move or transport material/stock and pallets using hand trucks and hand-powered hydraulic lifts.

**VPM 107 Storage and Distribution 5**
Students learn to locate, sort, place, and stack materials in a storage facility.

**VPM 108 Shipping and Receiving 5**
Warehousing documentation methods , including receiving documentation, overage, shortage, or damage are included.

**VPM 109 Introduction to Vehicle Parts Merchandising 5**
This course is an introduction to the warehouse/distribution industry. Students learn the fundamentals of environmental protection guidelines within warehouse/distribution centers and how to operate forklifts in a safe and professional manner. Safety practices and procedures common to the industry are also presented.

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**VPM 110 Principles of Inventory Control 5**
This course is an introduction to the principles of inventory control including fittings, valves, accessories, tubing and piping, sizing, and their application.

**VPM 112 Stock/Product Order 4**
Students learn to research product sources, analyze and select appropriate vendors, and order appropriate stock based on research.

**VPM 115 Principles of Salesmanship 5**
This course is an introduction to basic principles of salesmanship including the development of customer service skills, product knowledge, and related products for customer consideration.

**VPM 116 Retail Point of Sale 3**
Retail point of sale systems, how to complete sale transactions, and how to accept all types of monetary payment are emphasized.

**VPM 119 Principles of Management 5**
This course is an introduction to the principles of management with emphasis on the skills required of supervisory personnel within the vehicle parts sales environment.

**VPM 120 Employment Preparation 3**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**VPM 121 Retail Applications 3**
Students apply skills learned during activities of a retail parts distribution facility when interfacing customers and vendors.

**VPM 122 Warehouse Applications 3**
Students apply skills learned during activities of a warehouse distribution facility where products are stored and distributed.

**VPM 123 Stock Merchandising 3**
Students learn how the storage facility supports the retail or wholesale environment. The completion of warehouse forms, pulling stock, and pricing and building displays is also included.

**VPM 124 Automotive Parts Systems 4**
This course presents the various inventory control systems that are commonly used in automotive parts departments and stores. Determining inventory levels is an integral part of this course.

**VPM 125 Product Research Systems 4**
Students learn to use a variety of automotive parts catalogs, pricing sheets, and parts systems research techniques.

**VPM 126 Returns, Exchanges, and POs 2**
Students learn to handle merchandise being returned for refund, "core" returns, warranty returns, and defective merchandise.

CREDITS

**VPM 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**VPM 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**VPM 295 Work-based Learning Experience 5**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**VPM 296 Work-based Learning Experience 2**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**VPM 297 Work-based Learning Seminar 1**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**VPM 298 Work-based Learning – No Seminar 3**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

**VPM 299 Work-based Learning – No Seminar 6**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

CREDITS

## BARBER

**BARB 110 Barbering Theory 1**
This course provides an orientation to the basic science of barber-styling. Concepts of personal and professional aesthetics and future roles within the aesthetics industry are also included.

**BARB 111 Scalp and Hair Analysis 2**
Students are introduced to the techniques used to analyze hair as to texture, density, and growth and their application to the barbering process.

**BARB 112 Shampooing 3**
This course is an introduction to the basic methods of shampooing, rinsing, and conditioning of the hair.

**BARB 113 Decontamination and Infection Control 5**
This course is an introduction to the proper sanitation procedures relating to tools and equipment, station, and the shop. Additionally, students are trained in safety procedures for barber shops including special emphasis on the materials, equipment, and procedures used for the protection of staff and customers from infectious disease organisms.

**BARB 114 Introduction to Barbering 5**
This course is an introduction to the fundamentals of barber-styling including the use and care of a variety of barbering implements.

**BARB 115 Safety/First Aid 2**
Students learn about proper safety measures concerning the use of electrical equipment, chemicals, and blood-related injuries. Students will also learn and demonstrate shop safety procedures. Students will earn a CPR-First Aid card as a part of this major duty area.

**BARB 116 Basic Haircutting Techniques 4**
This course provides theory and practical experience in basic shear and clipper haircutting.

**BARB 117 Customer Service 4**
Students learn how to identify customers' needs and solve problems. Special emphasis is given to the development of interpersonal communication skills and examining how employees' actions can directly impact customers' impressions.

**BARB 118 Applied Communications 3**
Students learn effective communication skills and apply them in a practical setting.

**BARB 120 Math for Barbers 3**
Instructional emphasis is on acquiring mathematical and problem-solving skills that apply to the barbering industry.

CREDITS

**BARB 121 Facial Hair 5**
This course is an introduction to the methods used to prepare a client for shaving, including proper razor handling and stroking. The fourteen facial areas are also included.

**BARB 122 Barbering Applications 5**
This course provides practical application of barber-styling fundamentals with emphasis on the care of implements, shampooing, and basic haircutting methods.

**BARB 123 Intermediate Haircutting Techniques 3**
Students learn various types of hair styles and procedures to perform them.

**BARB 124 Haircutting Applications 5**
Students apply the techniques previously learned in BARB 110,111,113.

**BARB 125 Applied Human Relations 3**
Students learn such human relations skills as interpersonal communications, conflict management on- the-job, and team-building skills.

**BARB 131 Advanced Techniques 4**
Students are introduced to razor cutting techniques.

**BARB 132 Advanced Applications 5**
This course provides advanced techniques in all phases of hair cutting to ready the student for employment. Students are prepared for State Board licensing examination on theory and practical procedures.

**BARB 133 Cutting and Styling Methods 4**
Practical applications of cutting and styling are emphasized.

**BARB 134 Cutting and Styling Applications 5**
This course provides advanced techniques in all phases of hair styling to prepare the student for employment. Students are prepared for the State Board licensing Examination relating to both hair cutting and hairstyling.

**BARB 135 Hair Styling 2**
This course introduces the student to the art of hair style and design with emphasis on the selection of styles to complement facial features.

**BARB 136 Artificial Hair Services 2**
Students learn about hair replacement techniques.

**BARB 137 Practical Applications 2**
Students learn how measure, fit, cut and style hairpieces.

CREDITS

**BARB 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BARB 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BARB 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BARB 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BARB 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**BARB 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**BARB 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## BIOMEDICAL EQUIPMENT TECHNICIAN: CLINICAL ENGINEERING

**BMST 101 Safety Principles 4**
Students are provided training in general safety and industrial hygiene. This includes accident prevention, safety laws, safe handling and storing of materials, using tools and equipment safely and protection devices and clothing.

CREDITS

**BMST 102 Blood borne Pathogens 3**
Students learn to apply various methods to prepare and ensure a scientifically clean and sterile environment within the laboratory setting. Additional topics include biohazard awareness.

**BMST 103 HIPAA 2**
This course covers the uses and disclosures of identifiable health information that are allowed or permitted by the HIPAA Privacy Regulations.

**BMST 104 Applied Math 4**
This course is an introduction to math concepts as they relate to electronic circuits.

**BMST 105 Testing Equipment 5**
Students learn to safely use and operate a variety of ancillary test equipment. Students receive lab training as well as hands on experience with actual equipment.

**BMST 106 Soldering 2**
This course covers most aspects of soldering, a basic requirement in electronic assembly and repair. Types of solder and systems as well as application and removal of solder and good soldering practices are emphasized.

**BMST 107 Schematics 3**
Students learn how to draw schematics/block diagrams, read and plan diagnostic procedures, and use a five- step troubleshooting/servicing format.

**BMST 109 Applied Service I 3**
This course prepares students to manage and repair shop projects. Projects may include preventive maintenance, installation, testing, calibration, and repair of various types of equipment.

**BMST 110 Applied Service II 2**
This course prepares students to manage and repair shop projects. Projects may include preventive maintenance, installation, testing, calibration, and repair of various types of equipment.

**BMST 119 Medical Equipment Research I 1**
This is an independent research project meant to build research and presentation skills. Students are required to produce six research projects to an audience. Projects subjects may vary from medical equipment, companies or professional associations, among others. Prior project approval from the instructor is required.

**BMST 201 Imaging Systems 3**
This course covers several types of imaging processes and the associated physics behind those systems. The class is lecture and lab based, systems investigated may include ultrasound, X-ray, PET, MRI and CT scan among others.

CREDITS

**BMST 204 Basic A&P for Biomedical Technology 4**
The purpose of this course is to introduce students to the importance of the human body and its various organ systems. This course is designed for biomedical students and is a one quarter lecture course, The course will cover internal organ systems, such as cardiovascular, digestive, endocrine, lymphatic, respiratory, reproductive, and urinary. Students should come away with an understanding of the above systems, how they are anatomically structured, and how that structure aids in each system's functionality.

**BMST 215 Introduction to Medical Terminology 3**
This course covers some of the common terms, acronyms, roots and prefixes associated with the biomedical field. Instruction is delivered in three sections via the internet using Quia. Each section has multiple quizzes and is supplied with useful links for self study. Students complete each section pre final before moving to the next section. A final exam is given at the end of the course.

**BMST 217 Biomedical Instrumentation 5**
This course is an introduction to the more common medical test equipment used by practicing biomedical engineering technicians. Students learn the operating principle and use of this equipment.

**BMST 218 Biomedical Equipment 3**
This course covers several types of medical equipment: ECG, Pulse Oximeter, NIBP, and infusion pumps are some of the types of equipment. The history, use, theory of operation, and maintenance issues are also presented.

**BMST 219 Medical Equipment Research II 2**
This is an independent research project meant to build research and presentation skills. Students are required to produce six research projects to an audience. Projects subjects may vary from medical equipment, companies or professional associations, among others. Prior project approval from the instructor is required.

**BMST 220 Biomedical Engineering Applications 5**
During this course students are exposed to a lab setting meant to simulate an actual working environment. Student may intake, service, repair, or evaluate medical or other types of equipment. Equipment may be provided by the class or public; students perform as closely as possible to a daily BMET routine.

**BMST 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

CREDITS

**BMST 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BMST 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BMST 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BMST 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**BMST 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**BMST 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## BIOTECHNOLOGY LAB TECHNICIAN

**BTECH 110 Basic Laboratory Safety 2**
This course is an introduction to the fundamental safety skills necessary to work safely in a biotechnology laboratory including Introduction to a safe workplace, working safely in the laboratory: general considerations and physical hazards, working safely with chemicals and biological materials

**BTECH 111 Biohazard Abatement 2**
Students learn the various methods to prepare and ensure a scientifically clean and sterile environment within the lab setting.

CREDITS

**BTECH 112 Hazardous Chemicals 2**
Topics presented in this course include hazardous classes of chemicals and how to store them properly, handle them safely, and dispose of them in accordance with established procedures.

**BTECH 113 Introduction to Biotechnology I 5**
This course is an introduction to the fundamental laboratory methods and a foundation in theory with practical information, drawing material from many sources: analytical chemistry texts, molecular biology manuals, industry standards, government regulations, manufacturer and supplier information, as well as the technical skills needed for employment in a modern laboratory.

**BTECH 120 Introduction to Biotechnology II 5**
This course is a continuation of the concepts introduced in BTECH 113 including introduction to quality systems; regulation and documentation; quality laboratory measurements; tests and assays and instrumentation; basic math techniques; proportional relationships in preparation of laboratory solutions; and relationships and graphing using computers, and applications of the internet to biotechnology.

**BTECH 121 Media and Solutions 4**
Students learn correct preparation techniques of common media and solutions with the use of laboratory equipment, including the autoclave and laminar flow hood.

**BTECH 130 Employment Preparation 3**
Students learn job search techniques, scientific resume writing, and receive assistance in developing career goals and educational plans.

**BTECH 131 Laboratory Management 4**
Millions of dollars are wasted annually because of poor laboratory management; important discoveries and innovations are delayed. Students receive training in communication, innovation or day-to-day operational management of a scientific laboratory.

**BTECH 132 Ethics and Science 3**
This course emphasizes the ethical questions surrounding the biotech industry, its relationship to society, and future ethical issues yet to be resolved.

**BTECH 210 Journal Club 4**
Students critically evaluate recent articles in scientific literature, or the results of several papers, even if some of these results might first appear to contradict each other. Eemphasis on refining science and presentation skills.

**BTECH 211 Tissue and Cell Culture 5**
Topics include cell culture, media preparation, maintenance and cryopreservation of cultured cells, factors influencing the growth of cells during incubation, and operation of cell culture equipment.

CREDITS

**BTECH 212 Advanced Laboratory Management 3**
This course is a continuation of the concepts introduced in BTECH 131, exploring the management of people, money, time, material, projects, information and quality.

**BTECH 220 Introduction to Molecular Techniques 5**
Students learn modern molecular biology techniques including basic recombinant DNA techniques and nucleic acid analysis and purification are emphasized.

**BTECH 221 Protein Purification and Analysis I 5**
This course is an introduction to basic concepts of separation and purification of protein.

**BTECH 230 Biomanufacturing I: Regulatory Compliance 4**
Basic requirements of current Good Manufacturing Practice as delineated in 21 CFR 210 and 211 are presented.

**BTECH 231 Biomanufacturing II : Upstream Manufacturing Processes 4**
This course is an introduction to the engineering of cell lines to produce protein products and the maintenance and validation of master cell banks.

**BTECH 232 Biomanufacturing III: Downstream Manufacturing Processes 4**
Students learn the methods of isolating and purifying a protein product.

**BTECH 233 Principles of Biomolecule Isolation 3**
Students learn the techniques used for isolating and purifying biomolecules.

**BTECH 240 Plant Tissue Culture 5**
This course emphasizes aseptic technique, conifer seed and embryo structure, and media formulations for plant tissue culture.

**BTECH 241 Tissue and Cell Culture 5**
Students learn cell culture, media preparation, maintenance and cryopreservation of cultured cells, factors influencing the growth of cells during incubation, and operation of cell culture equipment.

**BTECH 242 Advanced Projects: Plant Tissue Culture 5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced techniques of methods of plant tissue culture.

**BTECH 250 Topics in Immunology 5**
This course is an introduction to the nonspecific/specific defense systems, humoral/cell-mediated immunity, applications of immunology, and disorders associated with the immune system.

CREDITS

**BTECH 251 Advanced Projects: Immunology 2**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced topics in immunology.

**BTECH 252 Flow Cytometry 5**
Students learn history and theory of flow fluidics, optics and electronics, hardware and software use, as well as introduction to immunophenotyping, cell sorting, DNA kinetics and cellular ploidy analysis.

**BTECH 253 Advanced Projects: Flow Cytometry**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced elements of flow cytometry.

**BTECH 260 Advanced Projects: Flow Cytometry**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced elements of flow cytometry.

**BTECH 261 Advanced Projects: 5**
**Advanced Molecular Techniques**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced elements of molecular techniques.

**BTECH 262 Advanced Projects: 5**
**Laboratory Management**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced laboratory management techniques.

**BTECH 263 Advanced Projects: Immunology 5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced topics in immunology.

**BTECH 264 Advanced Projects: Genetics 5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced topics in genetics.

**BTECH 265 Advanced Projects: 5**
**Mammalian Tissue Culture**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on advanced techniques of methods of mammalian tissue culture.

CREDITS

**BTECH 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BTECH 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BTECH 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**BTECH 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**BTECH 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meets with the students to provide support and assistance during the experience.

**BTECH 298 Work-based Learning – 1-18**
**No Seminar**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## BROADCASTING/AUDIO/VIDEO PRODUCTION

**BROAD 101 Safety Principles 1**
This course is an introduction to the safety practices common to the broadcast and video production environment.

**BROAD 102 Introduction to Broadcast 3**
**and Media Careers**
This course is an introduction to the business/broadcast industry with emphasis on recording studio technology, equipment, and terminology. Other topics presented include industry career paths, both management and non-management, and effective communication skills on the job. Students are introduced to the careers within the computer, film, and television Industries.

CREDITS

**BROAD 105 Broadcast Electronics Theory 5**
Students are introduced to the principles and applications of resonant circuits, power supplies, oscillators, and AF and RF amplifiers. This unit is taught concurrently with BROAD 109 so that basic system understanding may be tied to basic electronic principles.

**BROAD 106 Applied Electronics 3**
A continuation of the concepts introduced in BROAD 105, students learn how electronic theory is applied to broadcast circuits. This unit is taught concurrently with BROAD 110 so that basic system understanding may be tied to more advanced electronic principles.

**BROAD 107 Electronic Concepts 5**
Students are introduced to the study of modern electronics through a series of lectures and class discussions that are designed to be enjoyable, understandable, and practical. Topics covered range from beginning electro-static principles and Ohm's law to electromagnetic, inductive, and capacitive properties.

**BROAD 108 Electronic Principles 5**
Students apply their knowledge of electrostatic principles, Ohm's law, and electromagnetic, inductive, and capacitive properties to broadcast equipment and systems.

**BROAD 111 Master Control Operations I 3**
This course is an introduction to the operation on all signal delivery system components used to feed audio and video signals to the program feed. This includes operating video source machines and monitoring signal standards.

**BROAD 115 Record/ Playback Devices 3**
Students learn the basic theory and practice the operational skills necessary to adjust, set up and operate record and playback devices. The adjustment of system support equipment is also included.

**BROAD 117 Program Editing I 3**
Students are introduced to audio and video editing methods. Practical applications include correcting recorded flaws and timing errors while editing prerecorded material. Students perform to edit quality test standards.

**BROAD 118 Control Room Equipment I 3**
Students practice the operational skills necessary to set up, adjust, and operate various record and playback hardware under broadcast operational conditions. Students check program quality making adjustment as needed.

**BROAD 119 Basic Maintenance 3**
**and Troubleshooting**

CREDITS

Preventative maintenance methods and strategies are explored as students receive training in the use of electronic measuring devices, meters, and scopes. Soldering, splicing, and making cable connections are included in this unit.

**BROAD 121 Production Process Theory 3**
Students are introduced to the production process: theory, planning, and the application of sound project planning. Identification of the responsibilities of various jobs within the production unit is also included.

**BROAD 123 Introduction to Broadcast Systems 3**
Students are introduced to the fundamentals of the television signal, cable, microwave, satellite, and internet communication systems. The setup of basic video systems, along with audio and visual measuring equipment, is also covered.

**BROAD 125 Video Tape 3**
The use of video tape as a means of capturing audio and visual information are explored including the various format choices available. Students learn to set up and operate video tape to record and play back various production elements.

**BROAD 126 Elements of Audio I 3**
Students learn patching and routing, and the distribution of television audio signals. Practical applications include the operation of audio record, playback, and pick up devices for productions and the set-up of control systems.

**BROAD 127 Production Editing I 3**
Students are introduced to both linear and non-linear systems. The proper planning, execution, and monitoring of audio and video continuity through the use of various hardware driven editing systems is also included. Students edit projects in order to create commercial and program material.

**BROAD 128 Employment Preparation 3**
Using publications, interviews and internet research, students gather facts about wages, hours, and working conditions to develop career goals and educational plans to meet those goals. They also learn to write cover letters, resumes, and portfolios.

**BROAD 129 Audio Techniques 4**
While using audio record and playback equipment for productions, students develop audio editing, sweetening, and mixing technique. Advanced field audio techniques are also presented.

**BROAD 133 Communications Management 3**
Students plan budgets, write memos and reports, develop time lines and work schedules, write proposals and bid-specifications. Basic computer literacy skills and Internet research skills are also included.

CREDITS

**BROAD 201 Analog Systems I 3**
Basic analog linear systems, aural and visual along with the color encoding process, are analyzed and discussed. Heterdyne and component analog systems are also covered. Students apply analog system principles to broadcast systems.

**BROAD 202 Advanced Broadcast Formats 3**
Students learn Advanced Television Systems Committee (ATSC) system requirements and standards. They also contrast and compare analog and digital broadcast technologies.

**BROAD 203 Introduction to Digital Systems 2**
Students are introduced to digital theory, concepts, and languages as well as sampling rates, quantum levels, and basic compression techniques. Analyzing system hardware and planning basic configurations is also included.

**BROAD 204 Introduction to Operating Systems 3**
Computer platforms and operating systems are analyzed and studied as students study the Windows NT setup protocols and demonstrate basic system administration skills.

**BROAD 205 Receivers/Transmitters 5**
Students are introduced to the principles and applications of types of modulation, transmitters, receivers, power distribution systems, and grounding. BROAD 106 is a prerequisite for this unit which begins to prepare the student for the Society of Broadcast Engineers certification examination.

**BROAD 206 Power and Communication Systems 3**
A continuation of the concepts introduced in BROAD 205, students study the applications and principles of types of modulation, transmitters, receivers, power distribution systems, and grounding. BROAD 205 is a prerequisite for this course.. The additional topics of cable, microwave, satellite, and fiber optic communication will also be covered.

**BROAD 207 Advanced Editing Projects 5**
Students conduct and complete an advanced digital editing project for a datacast application.

**BROAD 209 AC/DC Circuits 5**
Students begin to study, analyze, and compare active devices in AC and DC circuits, solving circuit problems. Frequency, wavelength, and antenna systems are also be studied.

**BROAD 210 AC/DC Applications 4**
Students apply knowledge of active devices in AC and DC circuits, solving complex circuit problems. The interaction of frequency, wavelength, and antenna systems is further analyzed.

**BROAD 213 Digital Television Standards 3**

CREDITS

Students are introduced to the theory and application of local-area networks (LAN's), wide-area networks (WAN's), and analyze advanced compression techniques including: fractal, wavelets, FIF/STN, & MJPEG. The intranet, internet, TCP/IP, ISDN, ASDL, DSL, ATM, and DS3 is also included as well as the study of advanced system configuration protocols, CCIR-601.

**BROAD 215 ATSC Formats and Transcoding 2**
Topics for discussion and analysis include serial digital and component formats, transcoding, transport streams and data integration as well as possible artifact and "latency" anomalies.

**BROAD 217 Audio Engineering 5**
Students practice audio measurements and standards by testing audio equipment under broadcast conditions. Headroom and distortion parameters are discussed as well as designing, building, and installing audio impedance matching devices and 'pads'. Practical applications include an audio installation / set-up technician / sound engineer.

**BROAD 219 Video Engineering 4**
Students learn the limitations of human visual perception as it pertains to visual acuity. Practical applications include the analysis of video camera formats – 1V - 2V - 3V - 4V; light sources and color temperatures. Using manuals and test equipment, students learn to set up and align test equipment, monitors and camera systems.

**BROAD 221 Satellite Communications 2**
Students learn the theory of operation of satellite up-link and down-link equipment. Using down-link equipment, students perform satellite acquisition applications.

**BROAD 223 Systems Maintenance 5**
Students practice a variety of skills: testing equipment, soldering, interpreting block and schematic diagrams, repairing electronic equipment, troubleshooting, and non-specific servicing.

**BROAD 225 Installation and Maintenance Methods 4**
Students perform preventive and routine maintenance on broadcast equipment as well as performing as an installation/maintenance technician in a broadcast environment.

**BROAD 227 DTV Trans-Systems /8VSB 4**
Students analyze and discuss fundamentals of DTV transmission systems including data randomizer, forward error correction, Reed Solomon encoder, data interleaver, trellis encoder and data multiplexer. Fundamentals of SSB, 8-VSB modulator, pilot insertion, VSB filter and modulator, RF upconverter, 8-VSB spectrum, 8-VSB transmission measurements, and adjacent channel considerations are also be discussed.

**BROAD 229 Compression MPEG-II & AC-3 2**

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Students discuss and analyze 5.1/AC-3 video compression and image artifacts as well as digital transport system and 188 byte MPEG-II. Students compare contrast transport standards against transmission standards.

**BROAD 231 Broadcast Station Operations 5**
All aspects of operating a broadcast station are included: Federal Communications Commission rules and requirements; formats, programming and promotions; advertising; ratings and demographics; and traffic department and log-keeping.

**BROAD 237 Control Room Equipment II 5**
Students practice advanced control room operational skills as they learn the steps necessary to apply program material into computer-based server systems. This includes satellite, network, internet and other available program streams.

**BROAD 243 Master Control Operations II 5**
Students operate all signal delivery system components used to feed audio and video signals to the program feed. They also monitor and meet all television signal standards and perform as the master control operator.

**BROAD 245 Non-Linear Editing/Format and Systems 4**
This course is an introduction to linear and non-linear editing formats and systems where they learn to operate various non-linear editing systems, both audio and visual.

**BROAD 247 Program Editing II 5**
Practical applications include the editing of program and promotional material to meet station scheduling requirements. Students also develop EDL and edit decision lists to perform critical program continuity edits.

**BROAD 248 Network Storage and Control 4**
Students learn to operate various automation systems used in broadcasting including program interface systems such as 'Media Client 'and 'Air Client'. Automation of work stations is also included.

**BROAD 251 Introduction to the TV Process 3**
This course is an introduction to idea formation and development, scripting, and the use of story boarding and shot lists in the planning and completion of productions.

**BROAD 252 TV Production Applications 5**
A continuation of the concepts introduced using production models such as effect-to-cause and process message, students apply production process methods in a broadcast production environment. Other elements presented include writing program proposals, preparing budgets, writing scripts, developing facilities requests, creating schedules, completing permits and clearances, and writing publicity/promotional markets.

CREDITS

**BROAD 254 Principles of Lighting 5**
This course introduces students to lighting theory and techniques with emphasis on the most commonly used lighting instruments and accessories, light grids, dimmer boards, and control systems. Practical applications include light set up for productions.

**BROAD 255 Lighting Techniques 5**
This course introduces students to the advanced functions of lighting theory and technique with emphasis on fixture repair, special effect lighting, and the use of color correction, diffusion, reflection, and deflection. Students also practice computing and splitting loads and create lighting plans for field and studio productions.

**BROAD 260 Studio Camera Equipment 3**
This course is an introduction to studio camera equipment, accessories, and mounting equipment.

**BROAD 261 Studio Camera Operations 5**
In the second of two units on studio camera operation fundamentals, students learn to set studio cameras and camera systems, operate cameras, and learn how to use tele-prompt equipment.

**BROAD 262 Set Design 3**
This course introduces the student to set design techniques and methods, set properties, dressings, and various scene components. Practical applications including design, drawing, building, and repairing scene components.

**BROAD 265 Field Production 7**
This course is designed to develop advanced field production skills necessary to complete remote projects. Included are site surveying, planning, set up, and lighting of different venues which using single or multiple cameras.

**BROAD 267 Production Editing II 2**
Students complete assigned project using supplied element, evaluation will be based on meeting all applicable industry standards.

**BROAD 272 Introduction to Video Graphics 5**
Students learn to set up and operate various graphic generation devices, such as character generators, Paint Box, and Still Store devices. Basic graphic design principals and concepts are also presented.

**BROAD 273 Video Graphics Applications 5**
This course is an introduction to advanced graphic scenarios, 3-D, and animation techniques with emphasis on methods used to import and export various graphic formats and the development and creation of graphic packages.

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**BROAD 276 Technical Directing I 6**
This course introduces students to the video switchers, video routing systems, video manipulation devices, system timing, and video patching systems commonly used in production. Other areas of emphasis include the technical director duties and responsibilities, the use of keys, chroma keys, and other special effects.

**BROAD 277 Technical Systems Methods 6**
Student perform functions and duties of a technical director and act as a crew chief while setting up video switchers, routing and patching equipment, manipulation devices, special effects, keys, and chroma keys. Advanced timing adjustments and troubleshooting skills are also developed as needed during studio and remote productions.

**BROAD 281 Introduction to Digital TV 2**
The development of advanced television and its economic impact is introduced. Advanced analog and advanced digital formats will be compared and contrasted with NTSC and film.

**BROAD 282 Introduction to Video Formats 3**
This course introduces students to the video formats currently used and compares the advantages of composite, component, and digital formats. Advanced television (ATV) technology, both analog and digital, is also presented.

**BROAD 283 Emerging Technologies 3**
Advances in audio and visual imaging as well as emerging technologies include 'wavelet' and 'fracticle' compression, broadcast media interactivity, and other sensory delivery systems are presented.

**BROAD 285 Practicum I 5**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 286 Practicum II 5**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 287 Practicum III 5**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

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**BROAD 288 Practicum IV 5**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 289 Practicum V 5**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 290 Practicum VI 5**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 291 Practicum 3**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 292 Practicum 3**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 293 Practicum 3**
Faculty assists students in selecting an approved industry practicum. Student responsibilities include the submission of a formal written report of no less than 500 words. With the instructor's prior approval, this report may be substituted with a formal class presentation of no less than 15 minutes.

**BROAD 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**BROAD 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**BROAD 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**BROAD 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## CARPENTRY

**CARPT 101 Carpentry Math 3**
This course is an introduction to basic math concepts and their applications to the carpentry field. Linear, board, and square foot measurements and using formulas to calculate material requirement and costs is emphasized.

**CARPT 102 Safety Principles 3**
This course is an introduction to the safety concerns and procedures used in the construction field. Students apply approved construction site safety and health procedures, use personal protection gear, and safely use hand and power tools.

**CARPT 103 Prints and Plans 4**
This course is an introduction to residential blueprint reading with emphasis on plan types, dimension lines, scaling prints, and the symbols and abbreviations common to a variety of construction plans.

**CARPT 104 Construction Materials 2**
The selection and installation of various types of construction materials is emphasized. Students learn about the types and sizes of lumber , the use of fasteners in carpentry, and the installation of hardware.

**CARPT 105 Tools and Equipment 4**
The proper use and care of measuring, layout, and hand tools is emphasized.

**CARPT 106 Power Tools 5**
This course is an introduction to the proper use and care of portable, stationary, electric, and pneumatic equipment.

**CARPT 107 Optical Instruments 3**
The use various transits and levels used in the construction industry is presented.

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**CARPT 108 Plot Plans and Building Layout 3**
The interpretation of architectural plans and their application at the construction site is emphasized. Topics include the principles, equipment, and methods used to perform the site layout tasks. The process of distance measurement as well leveling for site layout is also presented.

**CARPT 109 Introduction to Framing 4**
This course is an introduction to the procedures used to lay out and frame walls and ceilings including roughing-in door and window openings, constructing corners and partition Ts, bracing walls and ceilings, and applying sheathing.

**CARPT 110 Foundation 3**
This course is an introduction to the materials and methods used to construct concrete forms and foundations including various reinforcement methods such as re-bar and welded-wire fabric.

**CARPT 111 Foundation Footings 3**
The correct and accurate placement of footings and piers are emphasized.

**CARPT 112 Foundation Walls 5**
This course is an introduction to the methods used to build, align, and establish concrete grades in forms. Materials calculation is also included.

**CARPT 201 Floor Systems 5**
This course is an introduction to the variety of floor types: requirements, assembly, and the advantages and disadvantages of each. Practical applications include the installation and finishing of hardwood floors, laminate/engineered floors, and tile.

**CARPT 202 Wall and Ceiling Construction 5**
Students learn to frame walls and ceilings according to federal, state, and local requirements.

**CARPT 203 Stairs 3**
This course is an introduction to the design and construction of residential and commercial stair systems. Topics include stair design factor, building code requirements, stair layout, cutting, installation, and various tread/riser installations.

**CARPT 204 Introduction to Roofing 3**
This course is an introduction to the types of roofs including the layout of rafters for a variety of roof types: gable, hip, valley intersections. Both stick-built and truss-built roofs are included.

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**CARPT 205 Roof Construction 5**
Practical applications using conventional methods of layout and sequence of assembly to erect a structure is emphasized.

**CARPT 206 Introduction to Exterior Finish Methods 4**
This course is an introduction to the materials and methods used for sheathing and exterior siding.

**CARPT 207 Exterior Doors and Windows 5**
This course is an introduction methods used to install a variety of windows, skylights, and exterior doors. The installation of weather-stripping and locks is also included.

**CARPT 208 Siding 5**
Types of exterior siding, surface covering systems, and the equipment used to apply them are emphasized.

**CARPT 209 Introduction to Interior Finish Methods 3**
This course is an introduction to the types of interior systems, materials, and hardware commonly used in residential and commercial construction. The development of estimating skills to determine the cost of materials is also introduced.

**CARPT 210 Interior Floors, Walls, and Ceilings 4**
Course emphasis is on surface preparation and applications methods that meet federal, state, and local requirements. Methods used to protect the interior of a structure against natural and man-made elements is also included.

**CARPT 211 Interior Doors and Windows 5**
The proper sequence used to set doors and install trim and hardware for both doors and windows is emphasized.

**CARPT 212 Moldings 4**
The installation of a variety of trim pieces is emphasized.

**CARPT 213 Employment Preparation 2**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**CARPT 215 Practical Applications 2**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARPT 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**CARPT 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**CARPT 296 Work-based Learning Experience 1-18**
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**CARPT 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CARPT 298 Work-based Learning – No Seminar 1-18**
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## CIVIL ENGINEERING TECHNOLOGY

**CET 101 Introduction to Civil Engineering 3**
This course is an introduction to the wide variety of projects tasked to civil engineers and how calculations are used. Typical calculations, fundamental dimensions, and units are introduced. The student learns the typical notations used and techniques to scale, format, and annotate calculation sheets.

**CET 103 Statics 3**
This course is an introduction to typical gravitational and lateral simple systems found in civil engineering. The concepts of reactions, Hooke's Law, elastic behavior of simple

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members under axial, bending, and torsion, forces are studied. The student learns about the coordinate systems required to properly model 3D vectors.

**CET 105 Structural Analysis 3**
This course is an introduction to the principles of the properties of typical structural section areas and volumes and covers basic structural types such as trusses, beams, columns, and footings. Basic material science and its structural properties are also covered.

**CET 107 CAD – 2Dimension 3**
This course is an introduction to AUTOCAD in two dimensions and covers drawing file types, templates, layers, and basic draw and modify commands. The student learns the Cartesian coordinate system and typical plate layout for a typical plan elevation and section drawing as well as annotation and plotting.

**CET 109 Introduction to Surveying 3**
This course is an introduction to surveying and how it relates to civil engineering with emphasis on the application of modern surveying equipment. The student learns the Public Land Survey System and horizontal and vertical datums. Spherical and Cartesian coordinate systems are also studied.

**CET 111 Civil 3D Surfaces and Points 3**
This is an introductory course on digital survey points and TIN surfaces in civil 3D. The student learns point file formats, data transfer, point styles, and labels. The creation and editing of surfaces are included along with manipulating styles and labels and includes the concepts of contours and surface profiles.

**CET 113 Hydrology 3**
This course is an introduction to hydrology and includes the study of regional rainfall events and how to calculate runoff from a project site. The student learns how to model a runoff basin, identify soil types and land, and to use different computer models common in the field.

**CET 115 Agency Requisites 3**
This course is an introduction to the different agencies and jurisdictions encountered when doing a typical civil engineering project. The student learns how to determine which agency, code, and design manual are applicable for a particular project.

**CET 117 GIS Resources 3**
This course is an introduction to the concepts and uses of the geographic information system (GIS) including include history of GIS; GIS data structures and sources of data; GIS tools, vendors, and software; applications; and resources. Practical applications include spatial data display and query, map generation, and simple spatial analysis using Autodesk Map.

**CET 121 Coordinate Geometry 3**

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This course is an introduction to how surveyors and engineers calculate points along lines and curves typically used in the field. The student learns how to draw problems to scale, the concept of bearings, and use trigonometry to solve right triangles. Horizontal and vertical curves are introduced.

**CET 123 Alignments and Profiles 3**
This course is an introduction to horizontal and vertical alignments. The student learns how design conditions affect the layout of works. Topics include how design speeds, sight distance, and maximum and minimum grades influence the design of roads. Also covered are how to model alignments and profiles in civil 3D.

**CET 125 Basic Corridors in Civil 3D 3**
This course is an introduction to typical cross sections used in civil engineering. The student learns how to create typical assemblies to model basic road corridors in civil 3D. The concepts of side slopes, daylights, and catch points are also covered.

**CET 127 Surveying - Control 3**
This course is an introduction to the concept of project control. Topics include site recon, control layout, datums and data collector set up. The student learns how to determine control point locations and set monuments and traverse in three dimensions to a required horizontal and vertical closure.

**CET 131 Construction Materials 3**
This course is an introduction to the typical materials used in a civil engineering project. The materials studied include concrete, asphalt, rock, PVC, steel, and soil. The student learns how to determine the required specifications, testing requirements, placement, measurement, and payment for a project.

**CET 133 Civil 3D Grading 3**
This course is an introduction to the concept of project control. Topics include site recon, control layout, datums and data collector set up. The student will learn how to determine control point locations, set monuments and traverse in three dimensions to a required horizontal and vertical closure.

**CET 135 Utilities Design 3**
This course is an introduction water, sanitary and storm sewer design. The student learns how to determine agency requirements, required details, calculations, size, and model in civil 3D pipe and structure networks. Topics also include pipe trenching, bedding, backfill, and layout for the various utilities.

**CET 137 Topographic Surveying 3**
This course is an introduction to design topographic surveys required for typical civil engineering projects. The student learns how to plan the control, datums, and limits of the survey. In addition, they set up job files and acquire the required data using robotic total station equipment.

**CET 202 Finite Element Models 3**
This course is an introduction to finite element computer modeling with emphasis on static models and how they are used to determine member stresses and deflections. The student learns how to create 2D and 3D models of beams, trusses, and frames using CadreLite.

**CET 204 3D Structural Modeling 3**
This course is an introduction to three dimensional modeling of structural elements in civil 3D. The student learns how to create and orient 3D elements such as cables, beams, and footings and how to connect various elements together.

**CET 208 Civil 3D Structural Sections 3**
This course is an introduction to drafting typical structural section details. The student learns how to plan the layout and scale to draft typical sections including retaining walls, beam/column connections, and footings.

**CET 210 Contract Documents 3**
This course is an introduction to contracts used in the civil engineering field with emphasis on the basic elements of a contract and the different types of documents that make up a project contract. The student learns how the plans and specifications are enforced in the construction process.

**CET 212 Open Channel Flow 3**
This course is an introduction to open channel flow. The student learns how calculated and computer model flow in various types of open channels use in civil engineering such as pipes, ditches, and trapezoidal channels.

**CET 214 Drainage Reports 3**
This course is an introduction to the preparation of typical drainage reports and analyses required for typical engineering projects. The student learns how to research agency requirements and design data and prepare the required elements to be included in the report.

**CET 216 Civil 3D Storm Plans 3**
This course is an introduction to the preparation of typical drainage plans used for construction. The student learns how to research agency requirements and incorporate them into a civil 3D model. The course focuses on the pipe network modeling and analysis functions in civil 3D.

**CET 218 Erosion Control 3**
This course is an introduction to the concepts of erosion control and the best management practices used to limit sediment runoff from construction sites. The student learns how to research agency requirements and prepare an erosion control plan and maintenance schedule.

**CET 220 Road Design 3**
This course is an introduction to road design in a specific jurisdiction and site with emphasis on the ability to determine the agency requirements and design data, procure required site topographic data, and prepare a proposed road design which will meet the jurisdiction's requirements.

**CET 222 Construction Documents 3**
This course is an introduction to the preparation of construction plans required for typical engineering projects. The student learns how to research agency requirements, prepare cover and detail sheets, format plan and profile sheets, and lay out required cross sections. Civil 3D's sheet set function is introduced.

**CET 224 Advanced Corridors in Civil3D 3**
This course covers advanced corridor design techniques in civil3D. The student learns how to model roundabouts, intersections, and cul-de-sacs. Additional topics include adding trenches, retaining walls and guard rails to basic corridors.

**CET 226 Construction Staking 3**
This course is an introduction to construction staking of typical engineering projects. The student learns how to create survey data for the different elements, export alignments, and profiles and design surfaces to the data collector. The student also learns the stakeout function in the field and how to write up guard stakes.

**CET 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CET 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CET 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CET 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student.

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The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CET 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CET 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CET 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## CNC MACHINIST

**CNCM 101 Introduction to Manufacturing Processes 3**
This course is an introduction to the safety practices and habits required when working in the machine shop environment. Topics presented include chemical safety, lifting and crane procedures, the safe use of ladders, and the necessity for personal protective equipment. Machine –specific safety procedures used around pneumatic and hydraulic equipment is emphasized

**CNCM 102 Machining Fundamentals 3**
This course is an introduction to the machines and techniques used in the machine shop industry. The history of machine tools and their development into the machines of today are included in this evaluation of current best practices including speed and feed calculations.

**CNCM 103 Engineering Drawing Interpretation 4**
This course is an introduction to the basic principles of blueprint reading as it relates to machine shop-CNC operations. The interpretation of information located on engineering drawings and parts list navigation is emphasized.

**CNCM 104 Geometric Dimensioning and Tolerancing 2**
This course is an introduction to the use of symbols used on modern engineering drawings as specified in ANSI standard Y14.5.

**CNCM 105 Secondary Operations, Benchwork 2**
This course is an introduction to deburring, filing, and the use of punches, chisels, hammers and other hand tools.

**CNCM 106 Precision Measurement 3**
This course introduces, provides practice in, and evaluates a student's ability to use precision measuring equipment.

**CNCM 109 Lathe I 4**
This course introduces the student to the conventional lathe. The student makes a simple turned project.

**CNCM 110 Mill I 2**
This course introduces the student to the conventional milling machine. The student makes a simple milled project.

**CNCM 111 Introduction to CNC Technology 2**
This course introduces the student to the many ways CNC technology is used today. Machining, science, the food industry and many other applications of CNC are examined.

**CNCM 112 CNC Controls 3**
This course introduces the student to the main differences between the most commonly available CNC controls in use by industry today.

**CNCM 113 CNC Programming 4**
This course introduces the student to programming using standard EIA code (G and M codes) The student will produce new programs and edit existing programs manually (without CAD/CAM).

**CNCM 114 CNC Troubleshooting 3**
This course presents program and hardware problems to the student. Included are ATC arm failures, program errors, coordinate system setting errors, tool setting errors and power system failures, and how to recover from them.

**CNCM 201 CNC Lathe I 4**
This course has the student run the CNC Lathe from power on to shut down using existing programs, and tooling.

**CNCM 202 CNC Lathe II 4**
This course has the student run the CNC Lathe from power on to shut down using student prepared programs.

**CNCM 203 CNC Milling I 5**
This course has the student set up and run the CNC machining center from power on to shut down using existing programs. The student will use tools from a common cutter package.

**CNCM 204 CNC Milling II 5**
This course has the student set up and run the CNC machining center from power on to shut down using student created programs. The student will program and run a part from a blueprint using existing work holding devices.

**CNCM 205 Computer-Aided Manufacturing 4**
In this course the student will learn to use CAM software to program parts from engineering drawings.

**CNCM 206 Introduction to Computer-Aided Drafting (CAD) 2**
Students are introduced to the fundamental skills involved in using CAD and CNC programs in the application of CAM (computerized-aided manufacturing) programs to machining operations.

**MFCNC 207 Advanced Projects I 5**
During this course the student will do a complete set up of the CNC Lathe and the CNC Mill. The student will choose and load tools, measure and enter tool offsets, load and dial in fixtures, set work coordinate systems, choose and download programs, run a fail-safe routine and use advanced techniques for first part runs.

**MFCNC 208 Advanced Projects II 5**
This course is a continuation of Advanced Projects 1 (CNCM 207)where the student is given more complicated parts to make, and will write their own programs.

**CNCM 209 Advanced Manufacturing Processes 3**
This course focuses on High Speed Machining, Flexible Manufacturing Systems (FMS), cell and pull systems.

**CNCM 210 Emerging Technologies 4**
This course examines technologies expected to continue to be dominant or to become dominant manufacturing methods within the next 25 years. Water jet, stereo lithography, nanotechnology, ultrasonic machining and liquid metal will be featured.

**CNCM 220 CAD I 4**
Students apply the fundamentals of drafting techniques to computer-based methodology. Emphasis is on how to set up drawing sheets, establish layers and line types, and create standard drawing geometry.

**CNCM 221 CAD II 5**
Students apply previously acquired skills and learn how to set sheet limits, construct and place viewports, scale viewports, and create and position ANSI standard title blocks.

**CNCM 222 CAD III 5**

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Students learn how to use viewing parameters, insert drawing text, modify existing geometry, and begin to create drawings for fundamental projects to meet client specifications.

**CNCM 223 Electronic Fundamentals 4**
Students receive training in the subjects that form the heart of basic electricity and electronics. From batteries, magnetism and resistors, through Ohm's Law, series and parallel circuits to networks, measurements, electronic devices, alternating current theory and the application of these fundamentals in systems used within a manufacturing process, such as programmable controllers and scanners.

**CNCM 224 Electronic Applications 3**
A continuation of the concepts introduced in CNCM 223, students apply the fundamentals in systems used within a manufacturing process.

**CNCM 225 Microcontrollers 3**
Students learn and demonstrate their knowledge of microcontrollers.

**CNCM 226 Hydraulics and Fluid Power 2**
This course introduces the student to hydraulic system fundamentals and to the use of hydraulics/pneumatics in manufacturing systems. Students learn hydraulic/pneumatic theory, component design for hydraulic valves and actuators, and system applications.

**CNCM 227 Sensors/Scanner Technology 3**
This course provides an introduction into industrial instrumentation as it pertains to manufacturing environments. Students acquire fundamentals of sensors/scanners and their applications within production control processes. Additionally, students learn how to design filter and conversion circuits.

**CNCM 228 Programmable Controllers 4**
Students learn operational fundamentals/ theory and applications associated with programmable controllers, particularly as they pertain to manufacturing processes.

**CNCM 229 Plastic Mold Manufacturing 2**
Students are introduced to processes and procedures used in the manufacture of thermoplastic molds, to include casting, punching, and injection molding.

**CNCM 230 Introduction to Mechatronics 3**
This course provides an introduction to the concept and practice of mechatronics –particularly with regard to manufacturing. It includes the interface of computers with physical devices (sensors, actuators), data acquisition, real time programming and real time control, human-machine interfaces, and design principles of mechatronics in manufacturing systems.

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**CNCM 231 Basic Robotics 2**
Students are introduced to robotic systems used in manufacturing. Here they apply their knowledge of fluid power systems and programmable controllers in manufacturing and production situations. In this basic course, they learn to determine end-efforts and set up robotic systems.

**CNCM 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNCM 292 Independent Projects 1-5**
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## COMMERCIAL TRUCK DRIVING-ENTRY LEVEL

**TRUCK 101 Safety/First Aid 3**
Students learn basic principles of safe driving principles and local and state driving laws with emphasis on the requirements of the Department of Transportation. CPR/first aid training is given.

**TRUCK 102 Introduction to the Trucking Industry 4**
This course is an introduction to the trucking industry including occupation terminology and signage; trucking company structure and its operation; and driver responsibilities on the road and at pickup/delivery points. The completion of inspection reports, daily/monthly logs, freight bills, waybills, manifests, and state accident reports is also included.

**TRUCK 103 Commercial Driver's License (CDL) 4**
Students are prepared to take the CDL tests and endorsements.

**TRUCK 104 Pre-Trip Requirements 3**
This course is an introduction to pre-trip inspection procedures used in the commercial truck driving industry. Students learn to read maps, plan destination and return trip s, acquaint themselves with emergency equipment.

**TRUCK 105 Close Quarters Operation 5**
Students learn to drive in a close quarter warehouse type facility: hooking, unhooking of trailers, backing up to docks, and maneuvering in close quarters.

**TRUCK 106 Materials/Cargo I 3**
Students learn preventive maintenance techniques , fork lift operation methods, loading and unloading of cargo, and selecting appropriate hazardous cargo placards.

**TRUCK 107 City/Town Driving 5**
Students learn to operate trucks in city situations: turns, lane changes, clutching and shifting, weather conditions, and parking.

**TRUCK 108 Freeway/Open Road I 5**
Students learn to operate trucks in open road situations: freeway driving entrance and exiting, passing vehicles safely, and open road parking techniques.

**TRUCK 110 City/Town Driving 4**
Students receive additional training and gain experience in short-haul operations: in-town driving techniques, environmental factors, and parking techniques.

**TRUCK 111 Materials/Cargo II 4**
Students learn preventive maintenance

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techniques , fork lift operation methods, loading and unloading of cargo, and selecting appropriate hazardous cargo placards.

**TRUCK 112 Freeway/Open Road II 4**
Students receive additional training and gain experience in long-haul operations.

**TRUCK 113 Advanced Commercial Driving 4**
Students complete commercial administrative documentation, perform pre-trip and post-trip duties, meet dispatch system requirements, and perform fleet operations area activities.

**TRUCK 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**TRUCK 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**TRUCK 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**TRUCK 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**TRUCK 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**TRUCK 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**TRUCK 298 Work-based Learning – 1-18**

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**No Seminar**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## COMPUTER NETWORKING SYSTEMS TECHNICIAN

**CNST 110 MS Client Operating Systems 5**
This course introduces the student to implementation, administration, and troubleshooting Windows® client operating systems on a networked desktop or mobile platform. This course prepares students for the Microsoft 70-270 Windows XP exam, or the Microsoft 70-680 Windows 7 exam.

**CNST 201 Cisco Network Fundamentals 5**
The Cisco Networking Academy consists of four blocks. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students are introduced to the basic internetworking fundamentals.

**CNST 202 Cisco Routing Protocols and Concepts 5**
This is the second block of the Cisco Networking Academy. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students are introduced to routing theory and router technologies.

**CNST 205 Fundamentals of Linux 5**
This is an introductory course to the Linux environment including file system navigation, file permissions, command line interface, text editor, command shells, and basic network use. This includes learning how to interface a Linux operating system to interact in a Microsoft Windows network.

**CNST 207 Network Infrastructure 5**
This course introduces the student to installation, managing, monitoring, configuring and troubleshooting DNS, DHCP, remote access, network protocols, IP routing, and WINS in a Windows® Network Infrastructure. This course prepares students for the Microsoft Windows Server 70-291 certification exam.

**CNST 209 Directory Services 5**
This course introduces the student to installation, configuring, and troubleshooting the Windows® Active Directory and components such as DNS, Active Directory Sites and Services as well as Active Directory replication and security principles. This course prepares students for the Microsoft Windows 70-294 certification exam.

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**CNST 210 Network Security 5**
This course introduces the student to implementing and administering security in a Microsoft Windows network. The student learns about security concepts such as encryption and authentication so that sensitive data may be safely sent across a wide or local area network. This course prepares a student for the Microsoft Windows 70-299 certification exam.

**CNST 212 Cisco LAN Switching and Wireless 5**
This is the third block of the Cisco Networking Academy. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students are introduced to advanced routing and switching.

**CNST 213 Cisco-Accessing the WAN 5**
This is the fourth block of the Cisco Networking Academy. The course is designed to introduce students to the skills and information needed to design, build, and maintain small to medium-size networks. Students will be introduced to the advanced Cisco networking utilizing project based learning.

**CNST 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CNST 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom

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to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CNST 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CNST 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## COMPUTER REPAIR & NETWORK SUPPORT

**CRNS 103 A+ Essentials 5**
This course prepares students for CompTIA A+ certification. This is an introduction to computer components, operating system software, computer hardware, wireless connectivity, security, safety, environmental concerns, diagnostic tools and communication skills. Virtual learning tools are integrated into the course and provide students with interactive learning experiences.

**CRNS 104 A+ Practical 5**
This course builds on the skills learned in the A+ Essentials course. Students learn using actual scenarios how to support PC hardware in a business setting, including installation, troubleshooting, component replacement, networking, and security. Students also learn to manage the Windows operating system. This course prepares students for A+ certification.

**CRNS 106 Cisco Networking Fundamentals 5**
Students develop an understanding needed to maintain small to medium- sized computer networks: IP addressing, Ethernet, and network cabling, and routed protocols. This course prepares students for the CCENT/CCNA Cisco certification.

**CRNS 107 Cisco Routing Protocols and Concepts 5**
Students learn routing principles and use the OSI model to examine protocols and services; build and support simple LAN topologies, apply basic principles of cabling and IP addressing, and configuration of basic network devices such as routers and switches. This course prepares students for the CCENT/CCNA Cisco certification.

**CRNS 109 MS Client Operating System 5**
This course introduces the student to implementation, administration, and troubleshooting Windows® client operating system as a desktop operating system in a networking environment.

**CRNS 110 MS Client Operating System Lab 4**
In this course students apply the principles of implementation, administration, and troubleshooting with the Windows® client operating system as a desktop operating system in a networking environment.

**CRNS 111 Advanced Projects 5**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**CRNS 112 Security Plus 5**
In this course, students learn strategies and techniques for protecting the integrity of computer networks using cryptography, access control, authentication, security baselines, system updates, intrusion detection and other techniques for limiting security risks. This course helps prepare students for CompTIA's "Security+" certification.

**CRNS 120 Employment Preparation 5**
Students are required to register with Job Service Center and develop career goals, create effective resumes, and use job search skills, methods and tools.

**CNST 212 LAN Switching 5**
Students learn how to select devices for an efficient network, configure a switch for basic functionality and how to implement Virtual LANs, VTP, and Inter-VLAN routing in a converged network. Students develop the knowledge and skills necessary to implement a Wireless LAN in a small-to-medium network. This series of course prepares students for the CCENT/CCNA Cisco certification.

**CNST 213 Accessing the WAN 5**
This course discusses WAN technologies required by large, enterprise networks. Students employ Cisco Network Architecture to implement and configure common protocols and how to apply WAN security concepts, principles of traffic, access control, and addressing services. Finally, students learn how to detect, troubleshoot, and correct common enterprise issues. This course prepares students for the CCENT/CCNA Cisco certification.

**CRNS 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CRNS 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CRNS 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CRNS 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## CULINARY ARTS

**CARTS 101 Introduction to Culinary Arts 2**
This course is an introduction to the social, historical, and cultural forces that have affected the culinary, baking, and pastry professions.

**CARTS 102 Sanitation and Food Safety 2**
Students learn food production practices that are governed by changing federal and state regulations. Content includes the prevention of food-borne illness, HACCP procedures, legal guidelines, kitchen safety, facility sanitation, and guidelines for safe food prepara-

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tion, storage, and reheating. Students take the National Restaurant Association ServSafe examination in this course.

**CARTS 103 Product Identification 2**
The identification and use of a variety of products includes vegetables, fruits, herbs, nuts, grains, dry goods, prepared goods, dairy products, and spices. Students also learn to identify, receive, store, and hold products.

**CARTS 104 Breakfast Service 2**
This course includes both theory and lab applications in breakfast preparation with emphasize on the organization and maintenance of a smooth workflow on the breakfast line. Food preparation areas include eggs, quick breads, meat and potatoes, grains, fruit plates, and breakfast beverages.

**CARTS 105 Basic Food Preparation 4**
This course is an introduction to fundamental cooking theory and techniques. Topics to be presented include tasting, kitchen equipment, knife skills, classic vegetable cuts, thickening agents, soup and sauce ingredients, timing, station organization, plate development, culinary French terms, and food costing.

**CARTS 106 Basic Cooking Techniques 4**
The application of basic cooking skills includes the preparation and production of a variety of soups, stocks, and grand sauces.

**CARTS 107 Fundamentals of Table Service I 3**
This course is an introduction to table service principles with emphasis on the physical aspects of table service: types of table service, table settings, and restaurant/dining room setup. Wine, beer, coffee, tea, and non-alcoholic beverage service is also presented.

**CARTS 108 Garde Manger I 1**
This course introduces students to the preparation methods of cold foods including salads and salad dressings, cold appetizers and buffet items, and vegetable and fruit decorations.

**CARTS 109 Food Service Mathematics 2**
Food service math focuses on mathematical concepts and their application in the culinary industry: ratios, percentages, the metric system, conversion factors, yield tests, and recipe costing. Students learn to develop projections and analyze costs in yield tests and recipe pre-costing.

**CARTS 110 Soups and Sauces 4**
A continuation of the concepts introduced in Fundamentals of Cooking I, this course includes both theory and cooking techniques in product tasting; stock production; stews, broths, and advanced soups; and starches such as potatoes, grains, rice, and pasta.

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Timing, station organization, and culinary French terminology is also presented.

**CARTS 111 Vegetables, Starches, and Grains 5**
The application of basic cooking skills includes vegetable cookery by color and family, the production of stews from vegetables and grains, and advanced soup cookery using broth and bouillon. Also included are practical applications used with starches and grains: potatoes, rice, fresh pasta, and dry legumes.

**CARTS 112 Customer Service 3**
Students learn how to interact professionally with customers and co-workers and to provide quality service in a variety of situations. Emphasis is on the meaning of service, the identification of customers' needs, and the development of strategies to solve customer problems.

**CARTS 113 Introduction to Baking 5**
This course is an introduction to quick doughs, yeast products, and the basic preparation methods used with pies and cookies.

**CARTS 114 Cost Control 2**
The course is an introduction to the principles and practices used to determine costs in a restaurant or food service organization. Topics to be presented include menu analysis and determining the cost of food, equipment, and supplies.

**CARTS 115 Food and Beverage Service 3**
This course is an introduction to all aspects of the food and beverage operation of a restaurant or food service organization. Students learn the procedures for purchasing foods and beverages in quantity and apply those skills when planning, budgeting, and managing inventory.

**CARTS 116 Menu Development 2**
The creation of menus from the perspective of concept, clarity, cost, price, and efficiency is the focus of this course. Topics to be introduce include menu descriptions, layout, design, and pricing.

**CARTS 117 A la Carte Cooking 5**
Students receive instruction and practice in advanced cooking methods used to simultaneously prepare vegetables, pastas, starches, proteins, and contemporary sauces. Protein cookery methods such as braising, stewing, roasting, sautéing, broiling, grilling, and poaching are presented. Also included are culinary French terminology, station organization, plate presentation, and product tasting and evaluation.

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**CARTS 118 Introduction to Catering and Banquets 4**
This course is an introduction to the catering and banquet industry with emphasis on the requirements needed to start an operation and manage its daily operations. Students develop an understanding of the organization and the equipment and responsibilities of the "cold kitchen."

**CARTS 201 Meats and Seafood 3**
This course is an introduction to a variety of meats, poultry, and seafood used in a food service operation. Students learn to identify, select, and prepare various types of meat, poultry, and fish/shellfish.

**CARTS 202 Global Food and Nutrition Issues 2**
This course gives students a global perspective of food and nutrition issues that impact our world. Contemporary topics include food production, world-wide food supply and demand, land and water availability for crops and livestock, genetically modified food, food radiation, and technological changes in agriculture.

**CARTS 203 Ice Carving 1**
Students learn to carve ice sculptures using a variety of stencils.

**CARTS 204 Garde Manger II 2**
A continuation of the concepts introduced in CARTS 108, students prepare cold foods including salads and salad dressings, cold appetizers and buffet items, and vegetable and fruit decorations.

**CARTS 205 Restaurant Desserts 5**
The preparation and service of a variety of hot and cold desserts is emphasized. Students learn to prepare frozen and individually plated deserts as well as desserts for functions and banquets. The development of a dessert menu emphasizing variety, cost, practicality, and compatibility with other menu items is also included.

**CARTS 206 Techniques of Restaurant Cooking 4**
Basic cooking principles of quantity food preparation is the focus of this course. Skills of efficiency, organization, speed, timing, and quality volume production are also stressed.

**CARTS 207 Catering and Banquets 4**
In a kitchen/banquet environment, emphasis is on volume food production including preparation, timing, and garnishing of food for banquets. Reception food, buffet arrangements, and plate arrangements are also included.

**CARTS 208 Regional Cuisine Service 3**
Regional cuisine explores the use of indigenous ingredients in the preparation of traditional and contemporary American specialties. Students prepare, taste, serve, and evaluate traditional regional dishes.

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**CARTS 209 International Cuisine Service 3**
With emphasis on ingredients, flavor profiles, preparation, and techniques, students learn to prepare, taste, serve, and evaluate traditional, regional dishes of the world. Also included is the pairing of wines, beers, and coffees to their perspective dishes.

**CARTS 210 Introduction to Management 3**
This course is an introduction to the various management topics as they relate to a food service establishment: leadership, training, motivation, delegation, problem-solving, decision-making, and conflict resolution will be included while operating the Barista and 1101 Bistro.

**CARTS 211 Classical Cuisine 4**
This course is an introduction to the techniques, ingredients, and spices unique to classical French cuisine. Timing, organization, mise en place, and plate presentation are stressed.

**CARTS 212 Chef's Table Service 5**
This course prepares students to provide formal service in a variety of elegant settings. Emphasis is on food preparation, service, and plate presentation that reflects artistry and style when preparing and completing their practical.

**CARTS 213 Advanced Culinary Applications 5**
The application of advanced cooking skills includes vegetable cookery by color and family, the production of stews from vegetables and grains, and advanced soup cookery using broth and bouillon. Also included are practical applications used with starches and grains: potatoes, rice, fresh pasta, and dry legumes.

**CARTS 214 Employment Preparation 2**
Students develop techniques and strategies for marketing themselves in their chosen fields while operating 1101 Bistro. Emphasis is on finding a job and then getting and keeping that job.

**CARTS 215 Wine/ Spirits 4**
This course is an introduction the serving of alcoholic beverages and their appropriate pairing with menu items. Students learn the procedures for purchasing alcoholic beverages and apply those skills when planning, budgeting, and managing bar service.

**CARTS 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**CARTS 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARTS 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARTS 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**CARTS 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**CARTS 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**CARTS 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## DATABASE TECHNOLOGY

**DATA 101 Data Modeling\ Relational Database Design 5**
Using Access, Visio, and other data modeling tools, students learn the concepts and theory of database management systems (DBMS), including the analysis and design of relational database systems, modeling business and scientific problems and normalizing relationships in tables. Prerequisite: DATA 102,

**DATA 102 SQL 5**
Students are introduced to Structured Query Language (SQL), the industry-standard language for storing, retrieving, displaying, and updating data in a relational database. They learn to create, update, and delete computer

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databases. Prerequisite: Program Logic

**DATA 103 Operating Systems 5**
Students are introduced to a variety of operating systems with major emphasis on LINUX in an Oracle database environment. Students learn to install and maintain the operating system.

**DATA 201 PL/SQL 5**
This is an advanced course in Structured Query Language (SQL) used to develop script files, stored procedures, and PL/SQL units in the Oracle DBMS (Database Management System). Skills the student obtain include designing Pl/SQL packages and program units and creating, executing, and maintaining procedures, packages, and database triggers. Prerequisite: DATA 102

**DATA 202 Database Fundamentals I 5**
Students learn the key tasks and functions required of a database administrator in a production environment. They learn to create implement a database, manage data, expand the size of the database, implement basic security and data integrity measures, and grant data access privileges. Prerequisite: All 100-level DATA courses or instructor permission

**DATA 203 Database Fundamentals II 5**
This is a project-oriented class with emphasis on system support, tuning, problem diagnosis, and problem resolution. Students learn to anticipate, diagnose, and resolve a variety of performance problems using real-world scenarios. Prerequisite: DATA 202

**DATA 204 Database Fundamentals III 5**
This is a project-oriented class with emphasis on integrating all of the database administration skills learned in the previous database courses. Database certification exams are emphasized during this course. Prerequisite: DATA 203

**DATA 208 SQL Server Administration 5**
This course is an overview course in creating, maintaining or administering an SQL server database. Prerequisite: DATA 101, DATA 102

**DATA 290 Capstone Project 5**
This course offers students an opportunity to work independently on a culminating project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DATA 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project

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should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DATA 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DATA 294 Independent Projects 20-100 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DATA 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**DATA 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**DATA 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## DENTAL ASSISTING

**DNTA 110 Introduction to Dental Assisting 2**
This course is an introduction to the dental assisting profession including the role of the dental assistant in the dental office, legal and ethical considerations, HIPPA regulations, and dental terminology. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 111 Infection Control 5**
This course is an introduction to the application of standard infection control practices including aseptic techniques in the dental office. Infection control, hazardous waste management and safety standards are emphasized. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 112 Biomedical Sciences 5**
This course is an introduction to the biomedical sciences and their application to the dental assisting industry: anatomy and physiology, microbiology, embryology, histology, and morphology. Prerequisite: Must be admitted into the Dental Assisting core program. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 113 Dental Sciences I 3**
Students are introduced to the fundamentals of oral pathology, pediatric dentistry, nutrition, and pharmacology. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 120 Introduction to Chairside Assisting 4**
Students are introduced to the fundamentals of chairside assisting including patient management, assessment of the patient's medical health history, medical emergencies, and the student's role in patient care. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 121 Chairside Assisting I 4**
Students are introduced to the fundamentals of chairside assisting including recording dental chart information, and the skills necessary to assist in the delivery of dental services to patients in a pre-clinical environment. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 122 Dental Materials I 3**
This course is an introduction to fixed and removable prosthodontics with instruction in the physical properties and manipulation of dental materials used in diagnostic and prosthetic procedures. Fabrication of study models and the manipulation of qypsum products are emphasized. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 124 HIV/AIDS Training 1**
Approved Washington State Department of Health mandated HIV/AIDS training course. Prerequisite: Must be admitted into the Dental Assisting core program.

**DNTA 129 Dental Sciences II 3**
This course is an introduction to various dental sciences including; dental radiography, preventative health care, selected specialty procedures, dental dam, and restorative procedures. Prerequisite: Successful completion of the first trimester.

**DNTA 130 Dental Sciences II 2**
This course is continuation of the various dental sciences to include; dental anesthesia, cavity classification, rotary instruments and restorative materials. Prerequisite: Successful completion of the first trimester.

**DNTA 131 Chairside Assisting II 3**
A continuation of the concepts introduced in DNTA 121, students learn to process new patients, chart information, and prepare rotary instruments. Prerequisite: Successful completion of the first trimester.

**DNTA 132 Chairside Assisting III 2**
Students learn more advanced chairside skills including identification of hand instruments and tray setups. Prerequisite: Successful completion of the first trimester.

**DNTA 133 Chairside Assisting IV 2**
Students learn to apply dental dams and prepare anesthetics. Prerequisite: Successful completion of the first trimester.

**DNTA 140 Restorative Services I 3**
This course is an introduction to the properties and techniques for the usage of common restorative materials. Prerequisite: Successful completion of the first trimester.

**DNTA 141 Restorative Services II 2**
This course is an introduction to the materials and techniques used to place temporary restorations. Prerequisite: Successful completion of the first trimester.

**DNTA 142 Restorative Services III 2**
Students learn to place and remove matrix and wedges. Prerequisite: Successful completion of the first trimester.

**DNTA 143 Dental Materials II 2**
Students learn advanced techniques in fixed and removable prosthodontics, including the manipulation of final impression materials, and the cementation of fixed appliances. Prerequisite: Successful completion of the first trimester.

**DNTA 144 Dental Radiology 5**
Students learn both theory and practical applications in the area of production radiation including the taking and processing of dental x-rays. Content also covers digital radiography, quality assessment, and technique errors. Students mount and evaluate radiographs using the paralleling and bisecting techniques. Radiographs are exposed on manikins and lab patients. Prerequisite: Successful completion of the first trimester.

**DNTA 145 Chairside Assisting V 3**
An advanced chairside assisting course related to restorative procedures, coronal polish and fluoride, and selected specialty procedures. Prerequisite: Successful completion of the first trimester.

**DNTA 150 Dental Sciences III 3**

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An introduction to the specialties of oral surgery and orthodontics. This course will include background, procedures and instrumentation. Prerequisite: Successful completion of the second trimester.

**DNTA 151 Clinical Experience I 5**
Students are assigned to off campus dental offices in the community or the Bates Dental Clinic. Clinical assignments are designed to enhance students' competence in performing dental assisting functions with emphasis on chairside assisting, radiograph technique, patient management skills, and professionalism. Students are assigned two clinical experiences. Prerequisite: Successful completion of the second trimester.

**DNTA 152 Dental Materials III 4**
This course has emphasis on the fabrication of a variety of provisional crowns as well as the fabrication of bleaching trays. Prerequisite: Successful completion of the second trimester.

**DNTA 160 Clinical Experience II 5**
A continuation of DNTA 151, students acquire clinical practice to perfect their skills in performing dental assisting functions including expanded functions. General dentistry is emphasized. Weekly seminars are held to evaluate and review clinical applications. Prerequisite: Successful completion of the second trimester as well as DNTA 151.

**DNTA 161 Dental Office Administration 5**
Students learn the basic business administration skills necessary to manage a dental office. Customer service, appointment scheduling, patient files, record management, maintaining an inventory system, and familiarization with dental software programs are included. The use of mathematics to maintain records and accounts is emphasized. Prerequisite: Successful completion of the second trimester.

**DNTA 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DNTA 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DNTA 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DNTA 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DNTA 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**DNTA 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**DNTA 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## DENTAL LAB TECHNICIAN

**DENLB 101 Introduction to Dental Lab Technology 2**
This course is an introduction to basic concepts of the dental laboratory industry: history, ethics, and jurisprudence; terminology, identification, safety practices, and the use of dental tools and machinery.

**DENLB 102 Health and Safety 2**
This course is an introduction to the safety practices used in the dental laboratory industry including OSHA/WISHA requirements and the sterilization and disinfection methods used to prevent disease.

**DENLB 103 Dental Anatomy 3**
This course is an introduction to skeletal, muscular, edentulous, and temperomandibular joint anatomy.

**DENLB 104 Dental Materials 2**
This course is an introduction to the various materials used in the first year of the dental laboratory program.

**DENLB 105 Dentures – Casts/Trays/Rims 4**
This course is an introduction to the preliminary steps involved in denture construction.

**DENLB 106 Denture Setup 3**
This course is an introduction to the articulation, tooth selection, and arrangement of denture teeth. Prerequisite: DENLB 105 or instructor permission.

**DENLB 107 Denture Processes 3**
This course introduces the student to festooning, flasking, boil-out, packing, processing, deflasking, selective grinding, finishing and polishing a denture. Prerequisite: DENLB 105 or instructor permission.

**DENLB 108 Immediate Dentures 2**
This course introduces the student in the fabrication of an immediate denture. The purpose of an immediate denture is to provide the patient with a denture upon extraction of the last remaining teeth. Prerequisite: DENLB 105 or instructor permission.

**DENLB 109 Denture Repair 2**
This course introduces the student to denture repair, reline, and rebase techniques. Prerequisite: DENLB 105 or instructor permission.

**DENLB 110 Esthetic Arrangement 3**
This course introduces the student to modification of the idealized setup so that the positions and relationships of the teeth enhance the age, sex, and personality of the individual. Prerequisite: DENLB 105 or instructor permission.

**DENLB 111 Introduction to Orthodontics 2**
This course is an introduction to the various mal-occlusion situations, the fundamentals of wire bending and soldering. Prerequisite: DENLB 106 and DENLB 110 or instructor permissions.

**DENLB 112 Orthodontic Appliances – Fixed 3**
This course introduces the student to pouring Orthodontic Study Models and Orthodontic Appliances that are fixed. Prerequisite: DENLB 106 and DENLB 110 or instructor permissions.

**DENLB 113 Orthodontic Appliances – Removable 3**
This course introduces the student to orthodontic appliances that are removable. Prerequisite: DENLB 106 and DENLB 110 or instructor permissions.

**DENLB 114 Introduction to Removable Prosthetic Devices (RPD) 3**

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This course is an introduction to removable partial dentures and its components. The student will learn how to survey, the principals of dentistry, physics, and the materials used to construct an RPD. Prerequisite: DENLB 106 and DENLB 110 or instructor permissions.

**DENLB 120 RPD Survey and Design 2**
This course assists the student in understanding RPD design, various lever systems, and the forces applied to the oral tissues. Prerequisite: DENLB 106 and DENLB 110 or instructor permissions.

**DENLB 121 Refractory Cast Production 2**
This course is an introduction to the step-by-step process in duplicating the master model in order to pour a refractory cast in a special investment material. Prerequisite: DENLB 120 or instructor permissions.

**DENLB 122 Wax Pattern Construction 3**
This course is an introduction transferring the design of the partial from the master cast to the refractory model, use of adhesive, and applying plastic patterns. Prerequisite: DENLB 120 or instructor permissions.

**DENLB 123 RPD Processes 3**
This course is assists the student in Spruing, Investing, Casting, Finishing and Polishing RPD Frameworks. Prerequisite: DENLB 120 or instructor permissions.

**DENLB 124 Frame Construction 2**
This course introduces the student to various RPD frame fabrication, designing, duplicating, waxing, spruing, investing, electropolishing, finishing, and polishing according to Kennedy Classifications. Student will fabricate one RPD entirely with tooth setting and processing. Prerequisite: DENLB 120 or instructor permissions.

**DENLB 125 Advanced Dentures 3**
Prerequisite: DENLB 110 or instructor permission

**DENLB 126 Advanced Orthodontics 3**
Prerequisite: DENLB 113 or instructor permission

**DENLB 127 Advanced RPDs 3**
Prerequisite: DENLB 120 or instructor permission

**DENLB 201 Plaster Carving 5**
This course is an introduction to forming the shapes and contours of a 3-dimensional tooth form. Prerequisite: DENLB 124 or instructor permission

**DENLB 202 Dental Materials II 2**
This course is an introduction to the many materials used in the second year of the dental laboratory program. Prerequisite: DENLB 124 or instructor permission

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**DENLB 203 Coping Fabrication 5**
This course is an introduction to the understructure design and fabrication of porcelain crowns. Prerequisite: DENLB 124 or instructor permission

**DENLB 204 Introduction to Gold Crowns 2**
This course is an introduction to the procedures in fabricating gold crowns and bridges. Prerequisite: DENLB 203 or instructor permission

**DENLB 205 Gold Crown Waxing 5**
This course is designed to provide the step-by-step procedures in waxing a full gold crown/bridge. Prerequisite: DENLB 203 or instructor permission

**DENLB 206 Gold Crown Techniques 5**
This course will assist the student in following the step- by- step processes of gold crown/bridge fabrication. Prerequisite: DENLB 203 or instructor permission

**DENLB 207 Introduction to Porcelain 5**
This course is an introduction to the understructure design for porcelain fused to metal crowns, waxing, investing, finishing, degassing, and application of opaque porcelain. The student will also learn about color in dentistry. Prerequisite: DENLB 206 or instructor permission

**DENLB 208 Coping Fabrication II 4**

**DENLB 209 Stack Porcelain 5**

**DENLB 211 Porcelain Techniques 4**

**DENLB 212 Advanced Porcelain Techniques 4**
Students learn and apply the step- by- step process of pressing all porcelain crowns and veneers. Prerequisite: DENLB 206 or instructor permission

**DENLB 213 Advanced Technologies 4**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Prerequisite: DENLB 209 or instructor permission

**DENLB 214 Advanced Crown and Bridge 3**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Prerequisite: DENLB 209 or instructor permission

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**DENLB 215 Advanced Dental Ceramics 3**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Prerequisite: DENLB 209 or instructor permission

**DENLB 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DENLB 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DENLB 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DENLB 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DENLB 296 Work-based Learning Seminar 1-18**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**DENLB 297 Work-based Learning Experience 1-2**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement

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with the participating training provider.

**DENLB 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## DENTURIST

**DNTU 101 Asepsis, Infection, Hazard Control 2**
Students train in safety procedures including OSHA/WSHA and infection control compliance for denturist's offices and laboratories. This includes a special emphasis on the materials, hazardous materials, interpreting MSDS's, equipment, and procedures mandated in the dental environment for protection of staff and patients from infection by infectious disease organisms.

**DNTU 102 Biological Concepts 3**
Students study cell biology, microbiology, developmental embryology, and histology with an emphasis on the oral cavity

**DNTU 103 Introduction to Complete Denture Prosthodontics 3**
This course covers the basic anatomy of the residual ridge as well as primary and final impressions of these ridges using the proper materials and trays. Impressions are poured and trimmed with proper materials and techniques.

**DNTU 104 Baseplates and Occlusion Rims 2**
Students fabricate base plates and rims using various materials in preparation for setting teeth.

**DNTU 105 Tooth Selection and Set I 3**
Students learn proper tooth selection and ordering techniques and then start their required lab setups.

**DNTU 106 Dental Materials I 2**
This course discusses the various acrylics and materials involved in the processing and finishing of patient appliances.

**DNTU 107 Denture Techniques I 2**
This course covers the wax up, processing , and other lab steps needed to supply a proper prosthesis for a patient.

**DNTU 108 Complete Denture Fabrication I 2**
Students complete waxups and flasking of practice cases in complete and partial dentures.

**DNTU 109 Dental Office Management I 1**
Students learn proper patient record keeping and individual policy and informational hand outs are completed in preparation for actual clinical cases.

**DNTU 110 Head Anatomy and Physiology I 2**
Students are introduced to the anatomy and physiology of the head, neck, temporomandibular joint, muscles, nerves, blood vessels, lymphatic system, skeletal system, digestive system, and dental anatomy related to sinuses, glands, teeth, periodontal structures, and other oral structures.

**DNTU 111 Tooth Selection and Set II 1**
A continuation of the concepts introduced in DNTU 105, students practice with further required lab setups.

**DNTU 112 Medical Emergencies 3**
Students demonstrate first aid and CPR procedures in simulated situations. This includes the provider CPR/first aid course. Health histories are taken and analyzed for information important patient care.

**DNTU 113 Denture Techniques II 2**
Students learn how to do relines and repairs and fabricate flippers. Students assist in actual patient cases when available.

**DNTU 114 Complete Denture Fabrication II 1**
Students learn to process denture and partials cases as well as pre-insertion procedures.

**DNTU 115 Partial Dental Casts 2**
Students are introduced to the area of removable partial dentures including theory, clinical classification, and evaluation.

**DNTU 116 Framework Design - RPD 3**
Students learn to survey study models and design practical cases.

**DNTU 117 Dental Office Management II 2**
Students learn proper scheduling , billing, and HIPPA privacy requirements.

**DNTU 118 Clinical Denture Procedures I 2**
Students learn proper room setup and teardown procedures for clinical cases along with clinical instrument processing.

**DNTU 119 Dental Impressions Procedures I 2**
Clinical impressions are performed on patient cases assigned by instructors.

**DNTU 120 Head Anatomy and Physiology II 3**
This course completes the remaining anatomical systems not covered in DNTU 110.

**DNTU 121 Tooth Selection and Set III 1**
Students complete their required practice lab setups.

**DNTU 122 Complete Denture Fabrication III 2**
Students learn how to break out and polish processed cases in preparation for insertion.

**DNTU 123 Complete Denture Repair I 2**
Students complete denture repairs on practical and clinical cases.

**DNTU 124 Casts - Partials 2**
After completing cast designs, students learn and perform proper block-out techniques in preparation for cast duplication of practical cases.

**DNTU 125 Oral Pathology 2**
Students get an introduction into pathologic disease processes with emphasis on those with oral signs and symptoms. Students learn to differentiate between normal and diseased tissues. Students complete the required state Aids Awareness course and test.

**DNTU 126 Clinical Denture Procedures II 2**
.Students perform the required lab and clinical work on assigned patient cases toward their program completion

**DNTU 127 Dental Impressions Procedures II 2**
Student perform impressions, bite registrations and proper mounting on clinical cases assigned during this semester

**DNTU 128 Fabrication Clinical I 1**
Students complete the required clinical cases assigned to them this semester.

**DNTU 129 Polish Methods – RDP Frames 1**
Students learn proper techniques to fit, adjust, and polish frameworks prior to processing.

**DNTU 130 Acrylic Prostheses Repair 2**
Repair techniques for acrylic prostheses are learned.

**DNTU 131 Wax Patterns - Partials 4**
Students perform framework waxups on assigned practical cases.

**DNTU 132 Teeth Arrangement - RPD 2**
Students learn to set teeth in partials opposing dentures, other RPDs or natural teeth.

**DNTU 133 Finish Methods - RPD 3**
Students learn to properly flask, process, and remount RPD cases in preparation for insertion.

**DNTU 134 RPD Frames Fabrication 2**
Students are given the option of casting their practical cases or studying flexible partial systems.

**DNTU 135 Introduction to Oral Pathology 3**
Students finish their study of various oral pathologies and learn how to do proper referrals and consultations.

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**DNTU 136 Clinical Denture Procedures III 2**
Students perform the required lab work on assigned patient cases.

**DNTU 137 Tooth Selection/Evaluation 2**
Students learn how to evaluate, select, and set teeth in RPDs opposing natural dentition.

**DNTU 138 Fabrication Clinical II 2**
Students complete the required clinical cases assigned them during this semester.

**DNTU 201 Complete Denture Repair II 2**
Students learn the proper techniques used to accomplish complex repairs on dentures.

**DNTU 202 Dental Materials – RPD 2**
Students study both heat and cold cure materials and methods in RPD construction.

**DNTU 203 RPD Repair Methods 3**
Students learn those techniques unique to partial dentures.

**DNTU 204 Dental Office Management III 2**
Students complete their record treatment documentation on their clinical cases and transfer any unfinished cases .

**DNTU 205 Denture Adjustments 1**
Students perform post –insertion adjustments of their clinical cases as needed.

**DNTU 206 Ethics and Jurisprudence 1**
In this course , federal and state laws are discussed as they relate to licensing. Ethics pertaining to a licensed healthcare professional are discussed.

**DNTU 207 Malocclusions 2**
Students study different occlusal schemes and perform face-bow remounts and occlusal corrections of clinical cases where needed.

**DNTU 208 Clinical Denture Procedures IV 2**
Students continue to complete their clinical cases and are given opportunities to practice unique, specialized technique found in industry.

**DNTU 209 Dental Materials II 2**
Students learn specialized materials and techniques required in the most demanding cases.

**DNTU 210 Geriatric Patient Needs 1**
Students learn the many unique requirements of the geriatric patient, both physically and psychologically.

**DNTU 211 Fabrication Clinical III 2**
Students complete their remaining clinical cases to reach the minimum required number.

**DNTU 212 Alternative RPD Systems 2**

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Alternatives to metal framework RPDs are discussed in the course.

**DNTU 213 Implant and Precision Attachments 1**
Students study the history of implants and the numerous systems available for use.

**DNTU 214 Advanced Special Services 1**
Students learn advanced concepts and techniques related to denture practices.

**DNTU 215 Advanced Dental Appliances 1**
Students discuss and when available work on advanced cases such as gasket retained dentures, swing –lock and dual-path RPDs.

**DNTU 290 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning and increased proficiency in the subject area chosen.

**DNTU 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning and increased proficiency in the subject area chosen.

**DNTU 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DNTU 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DNTU 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**DNTU 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**DNTU 298 Work-based Learning – No Seminar 1-18**

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This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## DIESEL/HEAVY EQUIPMENT MECHANIC

**DIESL 103 Introduction to Hydraulic Systems 5**
This course is an introduction to hydraulic/pneumatic theory, component design, and service practices for hydraulic systems. This includes instruction in pumps, motors, valves, safety, seals, cylinders, and filters. Concurrent enrollment: DIESL 104

**DIESL 104 Diagnosis and Testing of Hydraulic Systems 2**
A continuation of the concepts introduced in DIESL 103, students learn to diagnose and test a variety of hydraulic components and systems. Concurrent enrollment: DIESL 103

**DIESL 105 Introduction to Diesel Technology 1**
This course is an introduction to the diesel industry with emphasis on occupational safety principles and WISHA and Department of Ecology guidelines. Concurrent enrollment: DIESL 103, 104, 106, 107, 108, and 109 or instructor permission.

**DIESL 106 Engine Construction 5**
This course is an introduction to basic engine theory and operation and their application to the maintenance and repair of gasoline and diesel engine systems common to heavy equipment. Concurrent enrollment: DIESL 103, 104, 105, 107, 108, and 109 or instructor permission.

**DIESL 107 Engine Systems 1**
A continuation of the concepts introduced in DIESL 106, students learn to identify engine systems and their component parts. Concurrent enrollment: DIESL 103, 104, 105, 106, 108, and 109 or instructor permission.

**DIESL 108 Engine Reassembly 4**
Students perform procedures for overhauling heavy-duty diesel engine including disassembly, cleaning and inspection, adjustments, and reassembly. Concurrent enrollment: DIESL 103, 104, 105, 106, 107, and 109 or instructor permission.

**DIESL 109 Fuel Systems 2**
This course is an introduction to hydro-mechanical and electronic diesel fuel systems with emphasis on the analysis of fuel system components and system operational characteristics. Concurrent enrollment: DIESL 103, 104, 105, 106, and 107 or instructor permission.

**DIESL 110 Introduction to Air Brakes 2**

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The operating principles of pneumatic brakes including ABS, roll stability, and collision avoidance are presented.

**DIESL 111 Introduction to Basic Electrical Systems 4**
Students are introduced to the fundamentals of electricity and its application in the diesel and heavy equipment industry. The uses of specialty equipment to troubleshoot and repair are included with emphasis on industry safety requirements and the use of protective devices. Concurrent enrollment: DIESL 112 or instructor permission

**DIESL 112 Electrical Systems Application 4**
Practical applications include working with cranking circuits, type A & B charging circuits, conventional and electronic spark ignition, component operation, testing and industry-required repairs. Concurrent enrollment: DIESL 111 or instructor permission

**DIESL 113 Electronic Engine Systems 3**
Students are introduced testing of common input and output electronic components and to use specialty tools and equipment used for code retrieval; service processes and repair are introduced. Concurrent enrollment: DIESL 111 and 112 or instructor permission.

**DIESL 114 Mobile Air Conditioning Systems 3**
Students are introduced to the EPA 609 requirements with emphasis on the achievement of certification. Component identification, operation, testing, and repair methods to meet industry regulations are included. Concurrent enrollment: DIESL 111, 112, 113, or instructor permission.

**DIESL 115 Introduction to Power Trains 1**
This course is an introduction to the Power Trains Program. Emphasis is given to shop and tool safety, and the fundamentals of precision measurements and fasteners.

**DIESL 116 Manual Transmission Service 3**
Students provide fundamental transmission service on single and twin countershaft transmissions including disassembly, failure analysis, preventive remedies and reassembly to OEM specifications . Concurrent enrollment: DIESL 115, 117, 118, 119, 120, 121, 122 or instructor permission.

**DIESL 117 Automated Manual Transmission Service 2**
Students are introduced to design characteristics, operation and basic troubleshooting of automated manual transmissions. Concurrent enrollment: DIESL 115, 116, 118, 119, 120, 121, 122 or instructor permission.

**DIESL 118 Clutch Service 2**
Students learn the fundamentals of medium and heavy duty clutch operation, diagnosis

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of various symptoms and causes of clutch failures and provide remedies to prevent future failures. Concurrent enrollment: DIESL 115, 116, 117, 119, 120, 121, 122 or instructor permission.

**DIESL 119 Automatic Transmission Service 2**
Students gain a fundamental understanding of automatic and power shift transmissions and torque converters including the basics of operation, design characteristics and failure analysis of both hydro-mechanical and electronically controlled units.
Concurrent enrollment: Diesl 115, 116, 117, 118, 120, 121, 122 or instructor permission.

**DIESL 120 Driveline Service 1**
Students gain a fundamental understanding of the principles of operation, maintenance procedures, and analysis of vibrations for driveline systems. Concurrent enrollment: Diesl 115, 116, 117, 118, 119, 121, 122 or instructor permission.

**DIESL 121 Differentials/ Final Drive 2**
Students provide fundamental differential/ final drive system service including disassembly, failure analysis, and reassembly to O.E.M. specifications, . The various styles, applications, and operation of mechanical final drives used in construction and agricultural equipment are also included. Concurrent enrollment: Diesl 115, 116, 117, 118, 119, 120, 122 or instructor permission.

**DIESL 122 Wheel End Service 1**
Students learn the correct inspection and installation procedures for standard and unitized wheel ends used on heavy duty trucks Concurrent enrollment: Diesl 115, 116, 117, 118, 119, 120, 121 or instructor permission. NOTE: Students must complete 100-level coursework with a cumulative 2.0 GPA before continuing into the 200-level coursework.

**DIESL 201 Basic Vehicle Service 11**
Course emphasis is on the theory and practices for the tune up and troubleshooting of diesel engines including air, fuel, lube and cooling systems.

**DIESL 203 Advanced Service Applications 5**
Students apply their understanding of various systems, the relationship between systems, their components, and the procedures for providing service to engines and fuel systems, power trains, hydraulic systems, electrical systems, air conditioning and refrigeration systems, and the procedures for performing periodic maintenance.

**DIESL 204 Employment Preparation 2**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**DIESL 205 Advanced Service Techniques 15**

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Student demonstrate capabilities to inspect (troubleshoot, analyze/diagnose, test), remove and repair or replace components or systems to within manufacturer's specifications. Service and preventive maintenance techniques are applied to the following systems: engines and fuel systems, power trains, hydraulic systems, electrical systems, and air conditioning and refrigeration systems.

**DIESL 252 Special Projects 5**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**DIESL 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DIESL 292 Independent Projects 1-5**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**DIESL 293 Independent Projects 1-5**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**DIESL 294 Independent Projects 1-5**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**DIESL 296 Work-based Learning Experience 14**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**DIESL 297 Work-based Learning Seminar 1**
Students enroll in the work-based learning

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seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**DIESL 298 Work-based Learning – No Seminar 15**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## DIGITAL MEDIA

**DIGIT 101 Digital Imaging 2**
Students learn to create and enhance digital images using a scanner and digital imaging software.

**DIGIT 102 Image Editing 5**
Students learn to edit and manipulate digital images using several image-editing applications.

**DIGIT 103 Graphic Generation I 5**
This course is an introduction to the various techniques used to set up and operate various graphic generation devices: character generators, paint box generators, and still-store devices.

**DIGIT 104 Introduction to Computers 5**
Students are introduced to digital media concepts featuring digital media hardware and software tools and techniques, survey of digital media applications, and issues relating to the use of digital media. They learn to use text, graphics, audio, video, animation, and interactivity in a project.

**DIGIT 120 Introduction to Digital Media Concepts 4**
This course is an introduction to the methods used to communicate ideas through the use of computer-based interactive multimedia technology.

**DIGIT 121 Production Process I 5**
The production process and various program formats are presented. The computers and software used to develop storyboards, budgets, fact documents, time-lines, and schedules is also presented.

**DIGIT 122 Production Process II 4**
Students learn to create various forms of production materials from idea to the finished project: public service announcements (PSA), commercials, news stories, and music videos.

**DIGIT 123 Production Process III 4**
Students initiate and complete a variety of media project s (CD ROM, video, web) using advanced production process skills.

**DIGIT 130 Production Editing I 3**

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This course is an introduction to the methods used to set up editing and support equipment to edit on machine-to-machine systems as well as computer controlled "AB roll" systems.

**DIGIT 131 Production Editing II 3**
A continuation of the concepts introduced in DIGIT 131, students apply advanced editing skills to a variety of equipment and systems.

**DIGIT 132 Digital Media – Video 5**
This course is an introduction to the fundamentals of digital video, video recording, video processing, video delivery, and the incorporation of digital video into a computer-based media project.

**DIGIT 133 Advanced Editing Project 5**
Students conduct and complete an advanced digital editing project for a datacast application.

**DIGIT 140 Copyright and Ethics 2**
This course is an introduction the legal and ethical concepts of copyright issues as they pertain to the broadcast/datacast industry.

**DIGIT 141 Desktop Presentations I 5**
This course is an introduction to the methods used to apply visual elements, edit, and modify presentations.

**DIGIT 142 Desktop Presentations II 5**
A continuation of the concepts introduced in DIGIT 141, student apply advanced methods to create and modify presentations.

**DIGIT 143 Digital Media – Animation 5**
Students learn to add motion to digitally produced images to enhance the intent of a computer-based project.

**DIGIT 145 Digital Media – Audio 5**
This course is an introduction to the fundamentals of digital sound, sound recording, sound processing, sound delivery, and the incorporation of sound into a computer-based media project.

**DIGIT 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DIGIT 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**DIGIT 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DIGIT 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**DIGIT 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**DIGIT 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**DIGIT 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## EARLY CHILDHOOD EDUCATION/ CHILD CARE

**ECE 101 Introduction to Child Care / Early Education 5**
This course is an introduction to the personal and professional standards of ethical conduct, philosophies, and developmental theories related to the nurturing and teaching of young children.

**ECE 102 Early Education 3**
This course is an introduction to the developmental theories related to the nurturing and teaching of young children.

**ECE 103 STARS 2**
This course provides basic child care training for child care center teachers, program supervisors and directors. Its purpose it to provide entry-level employees with a basic core knowledge and motivation to see more early childhood education training.

**ECE 104 Learning Environments 5**
This course is an introduction to the methods used to develop developmentally appropriate learning environments. Students identify, demonstrate, and evaluate criteria for planning learning environments for young

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children including the selection of equipment, materials, and supplies and the best use of physical space.

**ECE 105 Early Childhood Lab I 2**
Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.

**ECE 106 Growth, Development and Learning 4**
This course is an introduction to the many stages of child growth and learning including, the concept of sequential stages of development, factors influencing growth and learning, the definition and application of developmental appropriateness, and an introductions to methods of observing and recording children's development.

**ECE 107 Physical Development 4**
The developmental sequence of children's physical skills introduced with emphasis on the equipment used to foster gross and fine motor skills and enhance sensory development.

**ECE 108 Emotional and Social Development 5**
This course is an introduction to the factors that affect the healthy emotional and social development of children: the support of children's self-concept, effects of an individual's temperament on adult/child and child/child relationships, social/emotional milestones, and activities that support pro-social behavior.

**ECE 109 Child Guidance 5**
This course is an introduction to the factors that affect the behavior of children with emphasis on positive guidance strategies. Topics include age-appropriate positive reinforcement, guidance, and discipline. The impact of family and cultural values on behavior and the effect of environment and activities on self-discipline is also included.

**ECE 110 Cognitive Development 5**
This course is an introduction to the theories of child development and the factors that influence children's cognitive development. Topics include the identification of milestones in the development of cognitive skills, recognition of the developmental sequence of communication skills, and the application of individual learning styles.

**ECE 111 Early Childhood Lab II 2**
Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.

**ECE 201 Issues in Child Care / Early Education 5**
This course provides an opportunity to discuss the issues in child care that impact children and their world: ethical, legal, political, professional, diversity, and family/cultural values.

**ECE 202 Children with Special Needs 5**
This course is an introduction to the characteristics and assessment of children with special needs and strategies for adapting the learning environment. Working with the child, family, and supportive community/educational agencies and the implications of the Americans with Disabilities Act (ADA) for Child Care/Early Education programs is also included.

**ECE 203 Observation and Assessment 4**
The primary domains of development (physical, social, emotional, cognitive and creative) and how they are integrated for each child are emphasized. Students develop skills in observing and recording children's growth, development, and learning and use observations as tools for obtaining information about individual children and their needs.

**ECE 204 Early Childhood Lab III 2**
Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.

**ECE 205 Instructional Strategies 5**
Methods of individual or group instruction and the role of the teacher/caregiver is emphasized. Students explore the theory of learning styles and their practical application in enhancing individual children's learning.

**ECE 206 Curriculum Development 5**
The creation of developmentally appropriate curriculum for early childhood programs is emphasized. This course looks at contemporary philosophies and current best practices in curriculum activities, methods, and materials appropriate for planning a program for young children.

**ECE 207 Professionalism 5**
The application of the profession's code of ethics and advocacy for children and families. is emphasized. Students also develop a professional portfolio and create a resource file of professional publications and organizations.

**ECE 208 Family Dynamics 5**
Emphasis is on the understanding of family structures and techniques of supportive interactions with families. Parent involvement, education, conferences, and referrals are also included.

**ECE 209 Program Management 5**
This course emphasizes the principles and skills needed to manage childcare and/or various early education programs: licensing regulations; food programs; community resources; budgeting; record keeping; and staff selection, support, supervision, and training. Practical applications include the research and development of a project that focuses on an appropriate topic for presentation.

**ECE 210 Early Childhood Lab IV 2**
Students spend time in a child care/early education setting, practicing and developing teaching skills, planning/implementing/evaluating children's activities, and participating in curriculum planning with their on-site supervising teacher/director. Students schedule and participate in conferences with their on-site supervisor and program instructor to evaluate their skill development and training progress.

**ECE 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ECE 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**ECE 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student.

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The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ECE 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ECE 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ECE 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ELECTRICAL CONSTRUCTION

**ELCON 101 Introduction to Electrical Construction 3**
This course is an introduction to the electrical construction field. OSHA, WISHA, and occupationally specific safety guidelines and standards are emphasized.

**ELCON 102 Applied Physical Science 5**
This course is an introduction to the physical sciences as they apply to the electrical field: electrical theory, Ohm's law, Watt's law, and the relation of current, resistance, and voltage.

**ELCON 103 Hand and Power Tools 4**
Students are introduced to tools, equipment, and processes common to the electrical industry. The safe operation and care of hand and power tools is emphasized.

**ELCON 104 Electrical Service Installation 4**
Students learn to install basic service components. Students will install load centers, over current protection devices and terminate wires.

**ELCON 105 Electrical Components 4**
Students will learn how to select the proper size load centers, conductor sizes for the load centers and select the proper size over current protective devices needed.

**ELCON 106 Introduction to Residential Wiring 3**
This part of the course is an introduction to the field of residential wiring methods, materials, and basic techniques needed for residential wiring.

**ELCON 107 National Electric Code 4**

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The National Electrical Code and its application to the safe installation of electrical conductors and equipment is presented.

**ELCON 108 NFPA 70E Standard 4**
This course offers a comprehensive study of NFPA 70E Standards and its safety application to the electrical field.

**ELCON 109 Residential Design 3**
Practical application of National and regional electrical codes as they apply to residential buildings.

**ELCON 110 Residential Wiring Techniques 3**
This is a continuation of ELCON 106 learned concepts. An advanced class on residential wiring techniques such as advanced planning, conductor sizing, special tool usage, the electrical bidding permitting process.

**ELCON 111 Systems Troubleshooting 3**
Students will learn the art of troubleshooting electrical systems using the proper testing equipment and techniques in a safe manner.

**ELCON 112 Introduction to Blueprint Reading 3**
This course introduces students to basic concepts of blueprint reading with emphasis on terminology, symbols, and lines commonly found on electrical schematics and plans.

**ELCON 113 Blueprint Reading Applications 5**
A continuation of the concepts introduced in ELCON 202, students learn to interpret prints found in a set of construction drawings and understand their relationship to various electrical installations.

**ELCON 200 Technical Math 5**
Students learn how to use math to solve electrical equations. Students will also learn to solve electrical problems or solve basic electrical functions using electrical math.

**ELCON 201 Specialty Tools 4**
Students learn to operate common electrical field specialty tools including a variety of power tools, testing and measurement equipment, and commercial and industrial equipment.

**ELCON 202 Introduction to Blueprint Reading 3**
This course introduces students to basic concepts of blueprint reading with emphasis on terminology, symbols, and lines commonly found on electrical schematics and plans.

**ELCON 204 Commercial Wiring 3**
This course is a basic introduction to the field of commercial wiring.

**ELCON 205 Commercial Codes and Regulations 3**
Students learn the basic national and local electrical codes pertaining to commercial buildings.

**ELCON 206 Commercial Material Identification 3**
Students are introduced to commercial specific construction materials.

**ELCON 207 Commercial Installation 3**
Students are introduced to installation standards specific to commercial buildings.

**ELCON 208 Industrial Wiring 3**
This course is a basic introduction to the field of industrial wiring.

**ELCON 209 Industrial Material Identification 3**
Students are introduced to industrial specific construction materials.

**ELCON 210 Industrial Installation 3**
Students are introduced to installation standards specific to industrial applications.

**ELCON 211 Industrial Hazards 3**
This course introduces students to industrial specific safety hazards and techniques to avoid them.

**ELCON 212 Motors and Controllers 4**
This course introduces the student to electrical motors and the various ways motors are started, stopped and controlled for electrical installations.

**ELCON 213 Project Estimation 5**
Students learn the basics of jobsite estimation, including material estimation, labor and time management.

**ELCON 214 Control Circuits 3**
Students learn how , why, and various ways motors can be controlled.

**ELCON 215 Motor Controls 3**
Students learn techniques to build, wire and troubleshoot various motor controllers.

**ELCON 216 Transformers 3**
This course offers students basic knowledge of electrical transformers, why they are needed, how to install them and basic working knowledge of electrical transformation.

**ELCON 217 Advanced Motor Controls 3**
This course builds on concepts learned in ELCON 212 and ELCON 215. Students learn advanced techniques to motor control such as

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variable frequency drives and Programmable logic.

**ELCON 220 Advanced Projects I 10**
Students participate in professional applications project.

**ELCON 221 Advanced Projects II 10**
Students participate in professional applications project.

**ELCON 222 Advanced Projects III 10**
Students participate in professional applications project.

**ELCON 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ELCON 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ELCON 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ELCON 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ELCON 298 Work-based Learning – No Seminar 1-18**

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This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ELECTRICAL ENGINEERING TECHNICIAN

**ETRIC 110 Applied Communications 3**
This course is an introduction to communication skills and their application to the electrical engineering field. Areas of emphasis include methods of improving communication, clarity, and graphic aids.

**ETRIC 111 Technical Communications 4**
Students learn written and oral communication techniques to express technical information in engineering. The development of writing skills necessary to plan and write technical formatted documents is emphasized. Students also develop resumes and cover letters.

**ETRIC 112 Electrical Math Fundamentals 2**
Mathematics specific to engineering is introduced including Ohm's Law, electronic units and measurements, application of fractions, decimals, percentage, and whole numbers. Calculations with negative numberings, squares, square roots, and exponents are emphasize, as well as series, parallel, and combination circuit.

**ETRIC 113 Electrical Math 3**
This course focuses on electronic formulas and solutions. Resistance of wires, types, and sizes are applied to voltage drop calculations, transformers, and meter movements.

**ETRIC 114 Fundamentals of Electricity 2**
This course provides an overview of atomic structure, electrical properties, and electrical theory. Parallel, series, and combination circuit are studied. Students are introduced to resistors, conductors, and problems are solved using Ohm's Law.

**ETRIC 115 Applied Electrical Math 5**
Application of math concepts to engineering problems in electrical circuits, power efficiency , wire sizing, and grounding is emphasized. Problems in inductance, capacitance, and impedance are solved. Transformers are studied and three-phase calculations are performed. Logic control concepts and solid state circuits are introduced.

**ETRIC 122 Construction Specifications 4**
This course is an introduction to the content, format, and basic principles of specification development and interpretation. Areas of emphasis include specifications as a legal and technical construction. Terms of design and construction, as well as the interrelationship of specifications in bidding are also included.

**ETRIC 124 Drafting Applications 3**
A continuation of the concepts introduced in ETRON 130, students apply such technical drafting practices as lettering, metric construction, technical sketching, orthographic projection, sections, and auxiliary views.

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**ETRIC 125 Engineering Drafting 3**
Students are introduced to the theory and application of dimensioning and tolerances, pictorial drawing, and preparation of construction drawings.

**ETRIC 126 Electrical Principles 3**
This course is an introduction to basic electronic principles including the vocabulary of electronics, processes, and principles. Magnetism, batteries, meters, and AC/DC principles are studied. Problems with conductors, insulators, and voltage drops are solve. Series, parallel, and combination circuits are explored.

**ETRIC 127 Applied Electrical Principles 5**
Principles of inductance, capacitance, and impedance are studied. Students are introduced to transformers and power supplies. Solid state circuits, devices, and logic are studied.

**ETRIC 130 Fundamentals of Drafting 2**
Students learn drafting terms and select and use drafting equipment, as well as lettering, line work, sheet layouts and scales.

**ETRIC 131 Applied Physics 2**
Students learn properties of light, sound, temperature, and heat transfer as they relate to the electronics industry. Principles of light, refraction, reflection, and color are studied in their relationship to light sources and luminaires.

**ETRIC 132 CAD Fundamentals 2**
This course is an introduction to the hardware, software, operation, and technical language of computer-aided drafting. Drawing setup, file management, and drawing aids are introduced as well as line and text commands.

**ETRIC 134 Elements of Physics 2**
This course is an introduction to the mechanics and properties of matter including magnetism, electricity, fiber optics, atomic structure and nuclear energy as they relate to engineering. Sound and wave motion, light and optics are applied to design of lighting, low voltage signal systems, and power circuits.

**ETRIC 140 Intermediate CAD 3**
A continuation of the concepts introduced in ETRIC 132, students use CAD systems to produce and edit drawings, Passwords, log on, and system security are introduced. Commands include text editing, drawing rotation, and mirror and cross hatching.

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**ETRIC 141 National Electrical Code 3**
The course is an introduction to the National Electric Code including terminology, definitions, format, and blueprint reading. Basic electrical code for various buildings classifications are covered. Wiring methods and materials, protective devices, selection, and sizing of conduit and conductors are also included.

**ETRIC 142 Codes Applications I 3**
Requirements of overload and fault current protection are studied. Branch circuits and feeders for motors and general power loads are selected in accordance with codes. Grounding and bonding requirements are covered.

**ETRIC 143 Fundamentals of Power Systems 3**
Students learn to draft one-line and riser diagrams. Emphasis is on the selection and application of wires, over current devices, raceways, and equipment.

**ETRIC 201 Fundamentals of Lighting Systems 4**
Lighting design, color rendition, visual comfort, efficiency of sources, aesthetic appeal and photometric performance of fixtures are emphasized.

**ETRIC 202 Fundamentals of Low-Voltage Systems 3**
Fire alarm, security, voice, and data components and layouts are reviewed.

**ETRIC 203 Fundamentals of High-Voltage Systems 4**
Transmission and distribution voltage systems and equipment are introduced. Load calculations are performed for primary voltage systems.

**ETRIC 204 Essentials of Electrical Systems Design 3**
This course is an introduction to the basic principles of electrical systems design including, project budgets, organization, and scheduling. Sheet layout and drawing order are determined. Preliminary lighting calculations are performed and preliminary electrical drawings are made.

**ETRIC 225 Advanced CAD Operations 3**
Students use CAD systems to produce engineering drawings using layers, masks, and groups. Symbols and x-reference are applied; drawings are printed and plotted.

**ETRIC 226 Electrical System Design Applications 3**
Design projects and apply skills to draft, select, specify equipment, lighting calculations/design, service and power distribution calculations/design, and systems design and layout. Prepare construction cost estimates and bids.

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**ETRIC 227 Introduction to Commercial Electrical Systems 4**
Commercial project development, design team concepts, timelines, and sequence of design are emphasized. Students learn layout and circuiting of basic power devices. Luminaires are compared and selected.

**ETRIC 230 Intermediate Electrical System Design 4**
The focus of this course is on three-phase loads: calculation and circuiting of heating equipment and motor loads. Students work in project design teams to select and draft lighting fixture and controls, power distribution equipment, and circuiting.

**ETRIC 234 CAD Design Applications 3**
Students use CAD to draw electrical diagrams and schedules. Floor plans, power, and lighting plans are drawn and edited; notes and legends are added.

**ETRIC 235 Codes Applications II 4**
THE NEC is studied in depth through student design projects. Code requirements are applied to the design of heating and motor circuits and feeders. Lighting and controls are specified in accordance with codes. Code compliant service entrance wires and equipment are selected. Codes for hazardous and specialized locations are interpreted and applied.

**ETRIC 240 Commercial Electrical Design Applications 4**
Students assist project design teams to design and draft electrical systems and power distribution equipment. Lighting is selected, final calculations are made and circuited, and fixture and panel schedules are developed.

**ETRIC 241 Advanced Electrical System Design 4**
Advanced students lead project design teams. The building service is designed and main panel selected. Circuits and panel loads are balanced, final load calculations are added as the drawings are completed. Dry-type transformers are introduced. Special design factors are incorporated for hazardous locations.

**ETRIC 242 Fundamentals of Cost Estimating 2**
The course is an introduction to concepts and current cost estimating practices. Emphasis on elements of electrical construction, competitive bidding, and complete and accurate time and material take-offs. Various forms and formats are introduced.

**ETRIC 243 Construction Cost Estimating 3**
This course is an introduction to the estimate and preparation of the electrical project bids. Impact of specifications, substitutions, prime and sub-contractors are stressed. Labor factors and materials cost data base are introduced.

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**ETRIC 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ETRIC 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**ETRIC 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ETRIC 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ETRIC 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ELECTRICAL POWER & PROCESS AUTOMATION/ELECTRONICS TECHNICIAN

**ELPP 110 Electricity and Magnetism 2**

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Between the years 1600 and 1800, mankind's knowledge of electricity was limited to observations of electrostatic and magnetic phenomena. This course follows those observations through the development of modern electrical theory and how a better understanding of that theory is being used to create intelligent and efficient energy delivery systems.

**ELPP 115 DC Circuit Analysis 5**
This course introduces electrical units of measure and how those units are interrelated. It also explores the five basic types of electrical circuits and the rules used to solve for electrical quantities throughout those circuits. All electrical devices and systems are built on a thorough understanding of these circuits.

**ELPP 118 Mathematics for Electrical Trades 5**
Fluid power covers both pneumatics and hydraulics, and fluid power circuits have many characteristics in common with electric circuits. This course introduces fluid power devices, circuits, and units of measure using a combination of interactive computer graphics and real world systems.

**ELPP 120 Alternating Current 2**
Alternating current (AC) forms the basis of electric power transmission and distribution throughout the world. Using computer graphics and active systems, this course explores the generation of single-phase AC and the specialized components that make it all possible.

**ELPP 125 AC Circuit Analysis 5**
Like DC, AC can be applied to five different types of circuits. AC circuits involve a broader range of components than DC circuits and require a more in-depth mathematical analysis to understand. This course visually and mathematically explores how constantly changing electrical values interact with each other over time.

**ELPP 126 Analog Electronics 5**
Analog electronics explores electronic devices and circuits that work with continuously variable physical quantities. This includes semiconductor materials, sensors, transducers, diodes, transistors, thyristors, Op-amps and other linear integrated circuits. Circuits include power supplies, regulators, DC-to-DC converters, amplifiers, oscillators, signal conditioners, phase-locked loops, modulators and mixers.

**ELPP 128 Polyphase AC Power Generation &Distribution 5**
Virtually all of the world's electrical power generation comes from three-phase generators. Having voltages and currents displaced in time requires a more complex circuit analysis than single-phase involving vectors. This course explores polyphase generators, transformers, and power distribution systems

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using mathematical and graphical analysis, along with specialized test equipment.

**ELPP 135 Mechanics 5**
Mechanical systems are an integral part of automation, where materials must be moved as part of the manufacturing process. The physics of classical mechanics are explored in this course along with units of measure and simple machines. A mixture of computer animations and practical experiments bring this subject to life.

**ELPP 140 Motors and Control Systems 5**
Motors are the backbone of material handling systems. This course examines the operating principles of common DC and AC motors, how they are wired into electrical systems, and common electromechanical control circuits. It then moves on to more sophisticated electronic control using smart motor controllers and VFDs (variable frequency drives).

**ELPP 145 Construction Practices and Print Reading 5**
Control panels and systems are built to standards established by the NEC (National Electrical Code) and UL (Underwriters Laboratories). This course explores the techniques of good panel building for control systems ranging from simple electromechanical motor starters to advanced control using PLCs (Programmable Logic Controllers).

**ELPP 210 Digital Logic 5**
Digital control is at the heart of virtually all modern automated systems. This course looks at digital from within the mind of the machine and prepares students for programming PLCs, microcontrollers, intelligent sensors, and industrial networks. Bitwise logic functions, Boolean algebra, Karnaugh maps, and truth tables are explored in detail.

**ELPP 215 Programmable Logic Controllers (PLCs) 5**
Programmable logic controllers are industrial computers designed to replace hard-wired circuits used in past years. This course focuses on Allen Bradley's popular SLC 500 and MicroLogix controllers using LogixPro and RSLogix 500 software. A smooth transition from ladder diagrams to ladder logic establishes the basis for more sophisticated programming models.

**ELPP 220 Allen Bradley SLC 500 Processors 5**
This course focuses on the Allen Bradley's SLC 500 processor family using RSLinx, RSLogix 500, and FactoryTalk software. The venerable SLC 500 family is explored by examining the complete instruction set and hardware interfaces. Students learn to install and configure the software tools necessary for communication, licensing, and programming.

**ELPP 225 Sensors and Transducers 4**
Process variables, like temperature, pressure, flow, depth, rotational speed, and object

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detection depend on sensors and transducers to provide information to the control system. This course explores the operating principles of these devices and how they are implemented in practical control systems.

**ELPP 230 Programming Methodologies 5**
Programming is a structured science that requires discipline and planning. This course introduces Statement Lists, Flowcharting, Finite State Machines, and Venn diagrams as methods of developing efficient, effective programs in a timely manner. Once the program flow is determined, it is translated to the appropriate development software.

**ELPP 231 PLC Programming Projects 5**
The RSLogix 500 simulator used in class, LogixPro, comes with seven real world interactive programming projects: Door Simulator, Silo Simulator, Traffic Simulator, Batch Simulator, Dual Compressor Simulator, Bottle Line Simulator, and Elevator Simulator. In addition, multiple labs using RSLogix and RSLinx from Rockwell Automation finalize the programming projects.

**ELPP 238 Embedded Controllers 5**
Microcontrollers embedded in dedicated systems number in the billions. This course focuses on the two main architectures in use today: Harvard and von Neumann. Development boards from Microchip and Freescale Semiconductor provide opportunities to explore brushless DC motor control, touch sensing, LCD displays, Digital Signal Processing, wireless data, and robotics.

**ELPP 240 Industrial Robots using the Fanuc Robotics 200iC 4**
This course centers on a FANUC Robotics 200iC industrial robot and covers safety, moving the robot in 3D space, collision detection, Teach Pendant Programming (TPP), and end-of-arm tooling. Students gain an understanding of the controller's internal data and file structures. Concurrent Enrollment: ELPP 241

**ELPP 241 FANUC Robotics Roboguide 3**
Roboguide is a program development environment for FANUC robots that consists of a virtual 3D world where robot operations are simulated via the user program using avatars. Other 3D objects can be added for the robot to interact with. Concurrent Enrollment: ELPP 240

**ELPP 250 Independent Study 5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ELPP 251 Independent Study 5**
This course offers students an opportunity to work independently on a project that is deter-

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mined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ELPP 254 Supervisory Control & Data Acquisition (SCADA) 5**
SCADA is a technology that is used to monitor and control large processes, such as power generation, that may cover thousands of square miles. This course presents the nomenclature and architecture, the system's building blocks, wireless communications between sensors and control, monitoring software, and data base development.

**ELPP 255 Instrumentation 5**
Process control requires the precise monitoring of process variables. This course examines the measurement and control of temperature, liquid level, flow rate, pressure, pH, and weight. Process control diagrams, equipment maintenance, smart instrument calibration, documentation, and loop tuning with PID control are offered using equipment from major manufactures.

**ELPP 256 Alternative Energy 5**
Alternative energy is a rapidly expanding field where modern innovation has allowed older technologies to evolve at an exponential rate. This course explores electric power generation using wind power, solar power, and fuel cells. Embedded control of servo mechanism, inverters, buck-boost regulators, and power management are all key components.

**ELPP 257 AutoCAD Electrical 5**
AutoCad Electrical is CAD software developed specifically for Industrial Controls. As part of the Autodesk community, this course gives EPPA students an opportunity to work with a first-rate design program while learning to adhere to standards developed by UL, NFPA (NEC), and the IEC.

**ELPP 258 Automation Studio 5**
Automation Studio is a powerful software package from Famic Technologies used to design and test Allen Bradley RSLogix 500 programs with electrical, pneumatic, and hydraulic circuits. The resulting animations visually mimic the actions of the circuits they represent and can be used with confidence to understand equipment operation.

**ELPP 259 Microsoft's Robotics Studio 5**
Robotics Studio is an integrated development environment for creating robotics control programs and 3D simulations. Novice developers start programming with VPL (Visual Programming Language) and then advance to higher level languages using Visual Studio. An exciting mixture of gamming and industrial technologies, this product serves hobbyist, scientist, and industrial professionals.

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**ELPP 260 Programming in Alice 5**
NXT Robots sport a powerful 32-bit microcontroller. Entry-level users develop programs for their mechanical creations using an object oriented development environment from LabView. This course employs a variety of challenging robotic designs. Fully supported by Microsoft's Robotics Studio, NXT robots can also be programmed in C or assembly.

**ELPP 261 Microchip's MPLAB IDE 5**
This course centers on programming Microchip's DSPs and high-end microcontrollers using MPLAB C. Projects cover Brushless DC motor control, Mechatronics, Touch Sensing, Speech Processing, Interactive Process Simulations, and Video Simulations. Completion of ELPP 230 and ELPP 238 is highly recommended as a prerequisite for this course.

**ELPP 262 Wireless Sensor Networks 5**
Wireless sensors are becoming increasingly popular in industrial networks; smart buildings, security, access control, inventory control, RFID, SCADA, and robotics. This course explores various data formats and topologies employing ZigBee and other data protocols to create reliable and secure wireless networks that move data from a variety of sensors.

**ELPP 268 Industrial Networks 5**
Industrial process control requires that equipment be located over large areas. The controlling equipment needs to communicate with sensors and distributed control racks. This is accomplished using industrial data networks, such as Modbus, Device Net, ControlNet, ProfiBus, Fieldbus, and Industrial Ethernet. ZigBee wireless and short distance protocols are also covered.

**ELPP 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ELPP 292 Independent Projects 1-10**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**ELPP 294 Independent Projects 1-10**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ELPP 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ELPP 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ELPP 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ELECTRONIC EQUIPMENT SERVICE TECHNOLOGY

**EEST 101 Safety Principles 3**
This course is an introduction to safety practices required when working in the electronic equipment
environment.

**EEST 102 Applied Math 5**
This course is an introduction to mathematical theory and applications as they relate to the electronic circuits and the electronic equipment field.

**EEST 103 Electronics Principles I 5**
This course is an introduction to the theory and fundamentals of basic DC electronic circuits.

**EEST 104 DC Electronics 4**
This course is an introduction to the theory and fundamentals Ohm's law, series, and parallel circuits

**EEST 105 AC Electronics 5**
This course is an introduction to the theory and fundamentals of the sine wave, wave-

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length, and the frequency of the AC circuit.

**EEST 106 Inductors and Capacitors 4**
This course is an introduction to the theory and fundamentals of the reactance of the inductor and the capacitor in the AC circuit.

**EEST 107 Electronics Principles II 5**
This course is an introduction to the theory and fundamentals of basic AC electronic circuits.

**EEST 108 Amplifiers and Transistors 4**
This course is an introduction to the theory and fundamentals of basic amplifiers and transistors.

**EEST 109 Electronic Devices 2**
This course is an introduction to the theory and fundamentals of basic electronic devices: such as diodes, transistors, SCR, triac, and FET.

**EEST 110 Introduction to Programmable Logic Controllers 5**
This course is an introduction to the theory and fundamentals of programmable logic controllers with emphasis on applying and using ladder logic programming.

**EEST 201 Electronic Principles - Automation 5**
This course is an introduction to the theory and fundamentals of basic Ladder logic programming.

**EEST 202 Antenna and Satellite Systems 3**
This course is an introduction to the theory and fundamentals of basic antenna and satellite systems.

**EEST 203 Magnetic and Laser Media 3**
This course is an introduction to the theory and fundamentals of basic magnetic and laser median including magnetic tape players and CD players.

**EEST 204 RF Receivers and Audio Amps 4**
This course is an introduction to the theory and fundamentals of basic RF receivers and audio amplifiers including synthetic and conventional receivers, audio amplifier circuits, conventional tube type, transistor, and FET circuits.

**EEST 205 Video Projection 1**
This course is an introduction to the theory and fundamentals of basic video projection and Raster
Scan.

**EEST 206 Emerging Technologies 3**
Students learn about such current technologies as RFID, laser technology, IT applications

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in the medical field, security systems, and smart home technology. Course content may vary depending upon technological advances.

**EEST 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**EEST 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**EEST 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**EEST 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**EEST 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**EEST 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**EEST 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ELECTRONICS ENGINEERING TECHNICIAN

**ETRON 110 Applied Communications 3**
This course is an introduction to communication skills and their application to the elec-

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tronic engineering field. Areas of emphasis include methods of improving communication, clarity, and graphic aids.

**ETRON 121 Technical Communications 4**
Students learn written and oral communication techniques to express technical information in engineering. The development of writing skills necessary to plan and write technical formatted documents is emphasized. Students also develop resumes and cover letters.

**ETRON 130 Fundamentals of Drafting 2**
Students learn drafting terms and select and use drafting equipment, as well as lettering, line work, sheet layouts and scales.

**ETRON 131 Drafting Applications 3**
A continuation of the concepts introduced in ETRON 130, students apply such technical drafting practices as lettering, metric construction, technical sketching, orthographic projection, sections, and auxiliary views.

**ETRON 132 Engineering Drafting 3**
Students are introduced to dimensioning and tolerances, pictorial drawing, and preparation of production and assembly drawings.

**ETRON 140 Electronic Math Fundamentals 3**
Mathematics specific to engineering is introduced including Ohm's Law, electronic units and measurements, application of fractions, decimals, percentage, and whole numbers. Calculations with negative numberings, squares, square roots, and exponents are emphasize, as well as series, parallel, and combination circuit.

**ETRON 141 Math for Electronics 2**
This course focuses on electronic formulas and solutions. Resistance of wires, types, and sizes are applied to voltage drop calculations, transformers, and meter movements .

**ETRON 142 Applied Electronic Math 5**
Application of math concepts to engineering problems is emphasized. Inductance, capacitance, and impedance problems are solved. Students are introduced to Kirchoff's, Venini, and Norton Theorems, and logic control problems are solved.

**ETRON 150 Fundamentals of Electricity 2**
This course provides an overview of atomic structure, electrical properties, and electrical theory. Parallel, series, and combination circuit are studied. Students are introduced to resistors, conductors, and problems are solved using Ohm's Law.

**ETRON 151 Electronic Principles 3**

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This course is an introduction to basic electronic principles including the vocabulary of electronics, processes, and principles. Magnetism, batteries, meters, and AC/DC principles are studied. Problems with conductors, insulators, and voltage drops are solve. Series, parallel, and combination circuits are explored.

**ETRON 152 Applied Electronic Principles 5**
Principles of inductance, capacitance, and impedance are studied. Students are introduced to transformers and power supplies. Kirchoff, Venini, and Norton's laws and theorems are applied. Solid state circuits, devices, and logic are studied.

**ETRON 160 Elements of Physics 2**
This course is an introduction to the mechanics and properties of matter including magnetism, electricity, fiber optics, atomic structure and nuclear energy as they relate to engineering. Electrical units, physical properties, energy, and measurement are emphasized.

**ETRON 161 Applied Physics 2**
Students learn properties of light, sound, temperature, and heat transfer as they relate to the electronics industry.

**ETRON 210 CAD Fundamentals 2**
This course is an introduction to the hardware, software, operation, and technical language of computer-aided drafting. Drawing setup, file management, and drawing aids are introduced as well as line and text commands.

**ETRON 211 Intermediate CAD 3**
A continuation of the concepts introduced in ETRON 210, students use CAD systems to produce and edit drawings, Passwords, log on, and system security are introduced. Commands include text editing, drawing rotation, and mirror and cross hatching.

**ETRON 212 Advanced CAD Operations 3**
Students use CAD systems to produce engineering drawings using layers, masks, and groups. Symbols and x-reference are applied; drawings are printed and plotted.

**ETRON 213 CAD Applications in Design 3**
Students use CAD systems to draft electronic diagrams and schematics. Printed circuit boards are drawn and notes, schedules, and legends are applied.

**ETRON 220 Semiconductors, Diodes and Transistors 3**
Students are introduced to solid state devices and semiconductors. Principles of special purpose diodes, diode theory, and circuits are explored. Transistor fundamentals, biasing circuits, and bi polar transistors are analyzed.

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**ETRON 221 Amplifiers in Electronics 4**
Voltage, AC, power, and operational amplifier functions are presented. Principles of differential amplifier circuits and emitter followers are studied.

**ETRON 222 Principles of FETs JFETs and MOSFETSs 3**
Free electron and hole charges and majority and minority carriers are studied. Principles of FETs and JFET applications and switching are introduced. Principles of MOSFET depletion, enhancement and discrete and integrated circuits are applied.

**ETRON 223 Thyristors, Frequency Feedback, and Filters 4**
Filters terminology, types, and responses are introduced. Thyristor types, principles, and frequency effect are studied along with negative feedback.

**ETRON 224 Oscillators, Timers, and Power Supplies 4**
Students are introduced to oscillation theory, loop gain, and phase relations. Timer IC, RC, and LC operations and applications, regulator types, displays, and basic topologies are emphasized. Switching regulator principles are applied to improve power efficiency .

**ETRON 230 Essentials of Number Systems 2**
Decimal, binary, and hexadecimal numbering systems are introduced. Types and operations of logic gates are described. Boolean and Demorgan's theorums are applied to logic circuits and Karnaugh mapping is used to reduce equations.

**ETRON 231 Data Control, Flip-Flops, Counters, and Shift Registers 3**
Decoder/encoder, multiplexer/demultiplexer ICs and Schmitt Triger principles are applied. Flip-flops are studied and counter and shift register circuits are analyzed. Data sheets are used to determine IC chip applications and specializations.

**ETRON 232 Principles of Analog and Binary Interfacing 3**
Analog and binary systems are studied with the principles of converter ICs and JFET applications. Operation and uses of analog transducers are introduced and problems are solved using interfacing principles.

**ETRON 233 Microprocessors, Memory, Software, and Hardware 3**
Practical application of microprocessor principles, applications, and principles of microprocessor architecture, memory programming, and hardware are studied. Principles of comparators, storage, RAM language, and displays are covered.

**ETRON 240 Essentials of Drafting for Electronics 3**
Graphic representation of electronic components, functions, and data is introduced. Views, hole charts, tolerances, tabular dimensioning, materials, and methods are applied.

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**ETRON 241 Electronic Units, Materials, Computers, Components, and Standards 3**
Standards, codes, designations, CAD technology, and software are applied to electronic design and drafting.

**ETRON 242 Schematics and Diagrams 4**
This course is an introduction to the types of schematic diagrams, and symbols used in electronics. Line types, harnesses, cables, wires, and insulation types and sizes are studied. Logic rules area applied and truth tables are constructed.

**ETRON 243 Programmable Controllers 4**
This course is an introduction to programmable controllers, transducers, and digital logic to relay logic principles. Systems with programmable controllers and robotics are designed and drafted.

**ETRON 244 Printed Circuit Boards 5**
Printed circuit board terminology, design techniques and processes, documentation, and materials are introduced. Board geometry, component placement, routing, and specifications are studied. Computers and CAD are used to design and draft printed circuits and boards.

**ETRON 245 Electronic Packaging 3**
Techniques of sheet metal layout, dimensioning, fasteners, and connection processes are introduced. Interior and exterior parts , chassis marking, and panels are studied.

**ETRIC 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ETRIC 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ETRIC 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ETRIC 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**ETRIC 296 Work-based Learning Experience 1-18**

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Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**ETRIC 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**ETRIC 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## ELECTRONICS TECHNICIAN

**ETECH 101 Introduction to Electronics 2**
This course is an overview of electronics including terminology, general safety, and applied math principles specific to the industry.

**ETECH 102 DC Circuits 5**
This course is an introduction to the theory and practical applications of DC circuits including resistors and resistive circuits, series and parallel circuits, meter movements, ammeters, voltmeters, VOMs, DMMs and Wheatstone Bridges.

**ETECH 103 AC Circuits 5**
This course is an introduction to the theory and applications of AC circuits, capacitors, coils, transformers, oscilloscopes, signal generators, and component checkers. Prerequisite: ELECT 111, 112, 113 or department chair approval.

**ETECH 104 Analog Circuits 5**
This course is an introduction to analog circuits. Topics include devices, diodes, transistors, power supplies, simple amplifiers, operational amplifiers, and thyristors. Voltage and current mode techniques are also introduced.

**ETECH 105 Digital Circuits 5**
This course is an introduction to the basic concepts of numbering systems and digital devices such as gates, counters and flip-flops. Microprocessors, memory circuits, and microprocessor applications are also included.

**ETECH 106 Microcontrollers 5**
The course is an introduction to the fundamentals of microcontroller-based systems, including applications, architecture, number systems, and languages.

**ETECH 107 Employment Preparation 3**
This course is an introduction to communication concepts that emphasize resume writing and the development of job search skills.

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**ETECH 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

## FACILITIES MAINTENANCE ENGINEER

**FACM 101 Safety Principles 2**
This course is an introduction to the safety practices and procedures as required by state and federal standards for building maintenance. Individual workplace and tool safety are emphasized.

**FACM 102 Fundamentals of Electricity 3**
This course is an introduction to the fundamentals of electricity and their application to the building maintenance industry: Ohm's law, basic circuitry fundamentals, electrical troubleshooting and the National Electrical Codes are studied.

**FACM 103 Electrical Service 4**
Students learn to troubleshoot, test, maintain, and repair electrical services within a building. Electric motors, controls, PLCs, and test equipment are studied.

**FACM 104 Introduction to Blueprint Reading 5**
Students learn to read, interpret, and create graphic drawings including building and machine blueprints, technical sketching, and working drawings. Trade math is also studied.

**FACM 105 Engineering Drawings 4**
A continuation of the concepts introduced in FACM 104, students learn to create commercial plans: plot, floor, elevation, sections, and plan details.

**FACM 106 Introduction to Hydraulics/Pneumatics 5**
This course is an introduction to basic fluid power, and the application of hydraulic principles to the building maintenance field. Hydraulic systems, circuits, and efficiency are studied.

**FACM 107 Machine Components 5**
This course is an introduction to industrial maintenance of machine components including predictive and preventive maintenance, lubrication requirements, vibration analysis, and close tolerance dimensioning.

**FACM 108 Mechanical and Machine Maintenance 5**
Students learn the processes used to maintain centrifugal, rotary, and reciprocating pumps, gears, and compressors, and other mechanical devices. Maintenance scheduling, computerized maintenance management systems, and computer-generated repair strategies are studied.

**FACM 109 Tools and Equipment 3**

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This course is an introduction to the tools and equipment used in the building maintenance occupation. The safe use, maintenance, and storage of a variety of tools and equipment are emphasized. Stationary, hand, and power tools are used.

**FACM 110 Introduction to Building Maintenance 3**
Students are introduced to the basic maintenance and repair methods used in the building maintenance profession.

**FACM 111 Building Maintenance and Repair Methods 5**
The maintenance, repair, and minor remodeling techniques to structures and the non-mechanical elements of a building complex are emphasized. Doors, windows, stairs, walls, siding, roofing and all other aspects of building maintenance are discussed.

**FACM 112 Basic Refrigeration 4**
This course is an introduction to basic refrigeration cycles and components. Mechanical compression systems, absorption systems and troubleshooting techniques are discussed.

**FACM 121 Grounds Keeping 5**
Students learn to select and use proper equipment for maintaining turf, shrubs, and plants. Irrigation system design, installation and repair, basic asphalt and concrete maintenance are studied.

**FACM 123 HVAC Systems 4**
This course is an introduction to the fundamentals of heating and air conditioning systems with emphasis on the adjustment of air flow, indoor air quality, troubleshooting of minor problems, and preventive maintenance methods are studied.

**FACM 140 Boiler Operations and Certification 12**
This course is an introduction to the basic principles of low and high-pressure steam boiler systems with emphasis on routine operation, maintenance, and emergency procedures. Upon successful completion of the coursework, students may test for certification as a Class V Boiler Operator/Fireman.

**FACM 142 Advanced Industry Application 10**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

**FACM 144 Advanced Boiler Operations 5**
Students learn advanced boiler methods of low and high-pressure steam boiler systems

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with emphasis on routine operation, maintenance, and emergency procedures. Upon successful completion of the coursework, students may test for certification as a Class IV Boiler Operator/Fireman.

**FACM 220 Introduction to Remodeling 4**
Students learn light residential and commercial design and remodeling methods including the bidding process. Energy auditing, building code requirements, retrofit, and updating the built environment are researched.

**FACM 221 Small Business Planning 3**
Students learn light residential and commercial design and remodeling methods including the bidding process. Energy auditing, building code requirements, deconstruction, sustainable retrofit and updates to the building environment are researched.

**FACM 230 Computers in Industry 2**
Students are introduced to the use of computers in maintenance management with the use of basic computer programs.

**FACM 231 Computer Applications 4**
Students learnt to create preventive maintenance schedules using a spreadsheet application with mainstream applications utilized by maintenance technicians. Students use common programs for research, cost analysis, scheduling, tracking and reporting. They also learn to use common computer applications to communicate, build, and share maintenance-related coursework.

**FACM 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work, be industry / program related, and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course. This coursework should directly apply concepts learned in a particular training area.

**FACM 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work, be industry / program related, and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

**FACM 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work, be industry / program related and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

**FACM 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work, be industry / program related and should result in the achievement of advanced learning in the subject area chosen. Instructor permission is required before enrolling in this course.

**FACM 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are training. They apply the skills they have learned in the classroom, lab, and coursework to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider. Instructor permission is required before enrolling in this course.

**FACM 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance before and during the WBL experience. Instructor permission is required before enrolling in this course.

**FACM 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area. Instructor permission is required before enrolling in this course.

## FIRE PROTECTION ENGINEERING TECHNOLOGY

**FPET 101 Introduction to Fire Protection Engineering 3**
This course is an introduction to the fire protection engineering industry and its role in the protection of building. Policies and requirements of the Bates' program is also presented.

**FPET 102 Building Construction 5**
This course is an introduction to the building design principles and how the application of fire protection systems and methods are used to protect individual buildings. Students learn the various parts of buildings and how those are graphically depicted and verbally described on construction documents.

**FPET 103 Research Methods 5**
Students explore various methods of accessing pertinent information relative to fire protection engineering technology including general and special library collections, Internet resources, and governmental holdings.

**FPET 104 History of Fire Protection 1**
This course presents a brief history of fire protection, early attempts at regulating behaviors, and using technological solutions to the fire problem, from ancient time to present day practices.

**FPET 105 Occupational Safety 1**
This course is an introduction to the hazards of personal safety associated with the fire protection industry.

**FPET 106 Applied Math and Science 4**
This course is an introduction to math and science and their application to the fire protection engineering technology industry including basic mechanics, applied plane and solid geometry, basic principles of college level physics, and the concepts of statics and dynamics.

**FPET 107 Alarm and Suppression System Design I 5**
This course is an introduction to the design of fire alarm and suppression systems.

**FPET 108 Design Seminar 2**
This course provides students with the opportunity to explore in depth some of the specific principles of design introduced in FPET 107 and 112.

**FPET 109 Drafting Fundamentals I 4**
Students learn to use basic computer-aided drafting (CAD) from the setup of the workspace to the printing of the finished product.

**FPET 110 Codes and Standards 5**
Students learn what codes and standards are applicable to buildings with emphasis on particular model codes and standards adopted as the building and fire codes of Washington State applicable to fire protection, including those developed by the International Codes Council (ICC) and the National Fire Protection Association (NFPA).

**FPET 111 The Practice of Fire Protection 5**
This course introduces students to certain business concepts such as contracts and certifications, and additionally includes job hunt and career advancement strategies.

**FPET 112 Sprinkler Design I 5**
Student learn the fundamentals of hydraulics, basic sprinkler system layout, and the principles of mathematically designing and calculating these systems

**FPET 113 Drafting Fundamentals II 3**
A continuation of the concepts introduced in FPET 109, students practice more intermediate aspects of computer- aided drafting

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(CAD). Prerequisite: FPET 109.

**FPET 114 Introduction to Inspection and Testing 3**
Students are introduced to the concept of the inspection and testing of emergency, stand-by fire protection equipment and why regularly scheduled inspections and tests are critical.

**FPET 115 Calculation Seminar 2**
This course is a continuation of the mathematical calculations for design as introduced in FPET 107 and112.

**FPET 116 Drafting Fundamentals III 3**
Students are introduced to universal drafting fundamentals that are applicable to both hand drafting and CAD and their application to architectural drawings: scaling, title blocks, legends, schedules, and line weights, etc. Sketching and the concept of the engineer's notebook are also explored. Prerequisite: FPET 113

**FPET 117 Fire Protection Project/ Applications 3**
Students are given the opportunity to explore any fire protection application of interest to the individual student. The instructor and the student will negotiate the parameters of the independent project.

**FPET 200 Advanced Codes 3**
This course provides a forum where advanced students can explore aspects of codes and standards in a small group, informal discussion format. The topics of discussion are chosen by the students, either from instructor suggestions or from their own interests.

**FPET 201 Projects I 4**
Course emphasis is on single-family residences. Students design sprinkler and smoke alarm systems in two single-family dwellings, duplexes, or townhouses to include street connections and a partial submittal package. Students specializing in sprinkler design are particularly encouraged to complete the entire four projects courses series and FPET 205.

**FPET 202 Projects II 4**
A continuation of the FPET 201, course emphasis is on other than single-family residential occupancies. Students design sprinkler and fire alarm systems for a multi-family dwelling and another residential occupancy such as a small hotel or dormitory building to include street connections and a partial submittal package.

**FPET 203 Projects III 4**

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A continuation of FPET 201 and 202, course emphasis is on commercial and industrial occupancies. Students design sprinkler and fire alarm systems for two small commercial or industrial occupancies such as a restaurant, warehouse, and strip malls to include street connections and a full submittal package.

**FPET 204 Projects IV 4**
A continuation of FPET 201, 202, and 203, students design a sprinkler, a standpipe, and a fire alarm system for a mixed-use occupancy. The mixed use includes a parking garage, a mercantile floor, at least one level of business occupancy, and at least two residential floors.

**FPET 205 Practical Applications I - Design 4**
Students explore individual design topics in depth with topics relating to special considerations of overall design.

**FPET 206 Practical Applications II – Commissioning and Inspections 3**
Students explore specific topics relating to commissioning and inspections
individual design topics in depth with topics relating to special considerations of overall design. Typical topics may include NFPA 3 and the process of building commissioning or the limits and responsibilities of the inspector under an NFPA 25 contract.

**FPET 207 Practical Applications III – Water Supplies 4**
In this small group seminar style course students will take a detailed look at water supplies. Students will present an oral or written report/presentation on their conclusions. Topics and conclusions may be addressed individually or by students in groups.

**FPET 208 Practical Applications IV – Risk Management 3**
In this small group seminar style course students will explore general topics of risk management. Typical topics might include cost/benefit analysis, approaches to risk, cost and diminishing returns, the role of actuaries, etc. Students will participate in determining the topic(s) to be explored and will present an oral or written report/presentation on their conclusions. Topics and conclusions may be addressed individually or by students in groups.

**FPET 210 Notification Integration 1**
Fire suppression, fire resistance (compartmentalization), and fire detection and notification is all important in an overall fire

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protection strategy. This course will focus on the integration of those systems and how they work together to provide a full strategy of property protection and life safety.

**FPET 211 Applied Chemistry and Physics 2**
This course is an introduction to fundamentals of chemistry and physics as they apply to the fire protection industry.

**FPET 212 Sprinkler Equipment and Systems 3**
Students explore in detail the actual equipment and systems used in basic fire protection: wet and dry sprinkler risers and systems; fire pumps; basic alarms utilizing smoke and heat detectors for initiation; and horns and strobes for notification.

**FPET 214 Special Systems and Equipment 3**
This course investigate the more specialized actual systems and equipment applications found in water- based fire control and suppression such as pre-action and deluge systems, special application sprinklers, and the various types of standpipes.

**FPET 216 Special Hazards Systems 4**
This course covers other suppression systems and strategies that are neither sprinklers nor water-based.

**FPET 217 Notification Appliance and Monitoring Applications 2**
This course explores the equipment and methodologies used to notify and evacuate when danger is present.

**FPET 218 Detection Systems 3**
This course explores the equipment and methodologies used to detect and determine that a danger exists.

**FPET 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**FPET 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**FPET 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**FPET 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**FPET 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**FPET 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**FPET 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## FIRE SERVICE

**FIRES 101 Orientation to Fire Service 2**
This course is an introduction to the history, evolution, organization , and traditions of the fire service.

**FIRES 102 Firefighter Safety 4**
This course provides a foundation of knowledge regarding the significant risks associated with the fire service and a look at the common causes of injuries and death faced by today's firefighter.

**FIRES 103 Fire Service Applications I 5**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 104 Physical Fitness I 1**
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.

**FIRES 105 Introduction to Fire Science 3**
This course introduces students to the science of fire: the exothermic oxidation of a combustible substance. Additional topics include fire behavior and suppression methods and how ventilation affects the growth of fire.

**FIRES 106 Fire Hose and Appliances 3**
This course introduces students to the care, maintenance, and use of fire hose, hose tools, and associated appliances. Students also learn to identify key components of municipal and rural water supply systems.

**FIRES 107 Fire Service Applications II 5**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 108 Physical Fitness II 1**
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.

**FIRES 109 Ladders 5**
This course covers the various types of portable and mounted ladders used in the fire service. Students learn the uses of ladders on the fire scene, various methods for placement, and maintenance of ladders while suppression operations are in progress.

**FIRES 110 Intermediate Fire Service 2**
During this course, students learn about the different types of extinguishers available for extinguishment of different classes of fires. The operation of the tools and equipment necessary to perform salvage and overhaul operations successfully on the fire ground is also presented. Additionally, students are exposed to basic fundamentals of fire investigations.

**FIRES 111 Fire Service Applications III 4**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 112 Physical Fitness III 1**
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.

**FIRES 121 Wildland Firefighter 2**
This course introduces students to wild land fire behavior, tactics, the 10 standard fire-fighting orders, and the 18 "watch out" situations found in wild-land situations. The course includes elements of S-130 and S-190, and includes an arduous Pack Test and fire shelter deployment which leads to wild-land Red-Card certification.

**FIRES 122 Fire Vehicle Operations 4**
This course provides the skills required by the Washington State Fire Protection Policy Board pertaining to the safe operation of emergency vehicles. The proper operation/ maintenance of fire pumps, the roles and responsibilities of the driver/operator, and the theory and principles behind water flow and calculations are included.

**FIRES 123 Fire Service Applications IV 5**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 124 Physical Fitness IV 1**
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student.

**FIRES 201 Rescue Procedures 3**
Students learn the techniques used to rescue civilians and fire service personnel in various rescue situations: vehicle extrication, trench rescue, confined space rescues, and high-angle rescues.

**FIRES 202 Advanced Fire Service 3**
This course emphasizes the dangers of building construction to the firefighter and ways to prevent injury and death including the use of protective systems, detection systems, and suppression systems and proper understanding of these systems, how they operate, and how to use them correctly.

**FIRES 203 Fire Service Applications V 5**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 204 Physical Fitness V 1**
Throughout their training, students acquire the physical strength and stamina required of the profession. Each physical fitness course builds upon the levels previously achieved by the student

**FIRES 205 Hazardous Materials 3**
This course emphasizes the knowledge required to operate at NFPA 472 entry-level standards for the first responders to hazardous materials incidents. Student also learn operations techniques as described in national standards for responders to hazardous materials incidents.

**FIRES 206 Employment Preparation 2**
Students are introduced to emergency service professionals' career ladder structures. They also learn a variety of job search skills necessary to gain employment in the fire service.

**FIRES 207 Strategy, Tactics, and Incident Management 2**
Students are introduced to the National Fire Protection Association Incident Management System at the intermediate level (NIMS). Fire Ground Tactics and Strategies is also

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included.

**FIRES 208 Fire Service Applications VI 4**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 209 Healthcare Provider 1**
The course is designed to provide a wide variety of healthcare professionals the ability to recognize several life-threatening emergencies, provide CPR, use an AED, and relieve choking in a safe, timely, and effective manner. The course is intended for certified or noncertified, licensed or non licensed healthcare professionals.

**FIRES 210 Confined Space Rescue 1**
Students are introduced to confined space rescue standards as determined by the National Fire Protection Association (awareness level).

**FIRES 211 Advanced Firefighter 3**
Students are introduced to the minimum requirements established by the National Fire Protection Association for Firefighter II certification. Topics to be presented include IMS, foam ops, and auto extrication.

**FIRES 220 Fire Service Applications VII 4**
Students apply the theory presented in lecture/lab and demonstrate performance standards.

**FIRES 221 Experiential Lab/Drill 4**
During this advanced phase of training, students are assigned to, and drill with, organized emergency services organizations. This may include a variety of organized units such as fire engine companies, hazardous-mat operations companies, crash/slash/fire rescue companies, an advanced life support company, or a confined space rescue company.

**FIRES 225 Emergency Medical Technician (EMT) 8**
This course prepares students to meet the requirements for employment as an EMT-B. It adheres to the U.S. Department of Transportation guidelines and the Washington State Department of Social and Health Services standards.

**FIRES 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**FIRES 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**FIRES 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**FIRES 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**FIRES 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**FIRES 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**FIRES 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## HEARING INSTRUMENT TECHNOLOGY

**HEAR 110 Introduction to Hearing Professions 5**
This course focuses on the role of professionals dealing with hearing healthcare and the role of the hearing aid fitter/dispenser within the healthcare model. Students investigate the different work settings and delivery models that are available in their desired work community.

**HEAR 111 Safety Practices 4**
This course introduces universal and personal safety hygiene in the hearing clinic as well as state required 4 hours of AIDS/HIV training.

**HEAR 112 Acoustics 5**
Students learn the basics of sound production and sound amplification as it applies to human hearing and the manipulation of sound to improve hearing.

**HEAR 113 Hearing Assessment I 3**
Students identify key components of patient centered case history and practice in the classroom setting. Basics of otoscopy and

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standard pure tone testing are demonstrated and practiced in the classroom setting.

**HEAR 120 Anatomy and Physiology 5**
Normal anatomy and physiology of the human ear and related structures are discussed as it pertains to hearing.

**HEAR 121 Instrumentation 5**
This course is designed to introduce the student to the different equipment that is used in the industry and state requirements for maintenance and calibration.

**HEAR 122 Hearing Assessment II 3**
Continuation of Hearing Assessment I, the student practices obtaining case histories, performs otoscopy and standard pure tone audiometry in the classroom setting. Speech audiometry and special testing are introduced.

**HEAR 130 Disorders of the Auditory System 5**
Common medical pathologies that affect the ear and hearing are described and discussed with emphasis on otologic conditions that require medical referral by state and federal law.

**HEAR 131 Hearing Aids I 5**
The history of hearing aids and the development of technology and hearing aid components are discussed. Students learn how different hearing aid technologies can affect patient outcomes. Techniques for making impressions for custom ear molds and hearing aid shells are introduced and practiced in the classroom.

**HEAR 132 Audiometric Interpretation I 5**
Students practice how to read, record, and explain results of audiometric testing in both professional and lay language. The emphasis is on degree, nature and configuration of hearing thresholds as they appear on the audiogram. The Initial process of patient specific recommendations to solve communication difficulties are introduced in this course.

**HEAR 210 Hearing Assessment III 3**
A continuation of the concepts introduced in Hearing Assessment II, this course is a comprehensive analysis of the decision making process used to choose appropriate test protocols.

**HEAR 211 Aural Rehabilitation I 3**
This course introduces the concepts of hearing impairment, hearing handicap, and hearing disability. Individual variables such as co-existing medical conditions, psychological adjustment, cultural values, socio-economic status, and disability are presented.

**HEAR 222 Hearing Aids II 5**
A continuation of Hearing Aids I, this course focuses on the electro-acoustic testing of

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hearing aids, basic programming of hearing aids and acoustic modification of coupling systems to obtain desired amplification results.

**HEAR 223 Clinical II 3**
All testing performed In Clinical I are continued with the addition of speech audiometry, tympanometry, and impressions.

**HEAR 230 Hearing Aid Service and Repair 5**
This course concentrates on the maintenance of a functioning hearing aid as well as troubleshooting a non-functioning or distorted hearing aid Minor office repairs are demonstrated and practiced both in the classroom setting and in the clinical setting.

**HEAR 231 Aural Rehabilitation II 4**
This class focuses on different verification strategies and counseling tools for the hearing aid user. Topics such as current trends, Deaf Culture, cochlear implants, and assistive listening devices are investigated.

**HEAR 232 Business Aspects II 4**
Current industry trends are identified and discussed in this course. The student has the opportunity to create a business plan or produce a professional resume..

**HEAR 233 Clinical III 4**
Clinical III is a continuation of Clinical II. All skills are applied in a full service hearing aid clinic with minimal supervision.

**HEAR 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**HEAR 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**HEAR 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**HEAR 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**HEAR 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**HEAR 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**HEAR 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## HEATING, VENTILATION, AIR CONDITIONING, REFRIGERATION TECHNICIAN

**HVAC 101 HVAC/R Fundamentals 3**
This course is an introduction to the HVAC industry. It will introduce the student to HVAC history, environmental heating and cooling, food preservation, industry opportunities, professional organizations, useful publications, available certifications and what is required of an employee.

**HVAC 102 Safety 2**
OSHA and WISHA procedures and regulations are presented. Students complete the Washing ton State Industrial First Aid / CPR program. The use of personal protection equipment, and safe work practices.

**HVAC 103 HVAC/R Science 2**
This course will cover the importance of the properties of matter, laws of conservation of energy, common forms of energy, energy conversion and electrical distribution. Temperature measurement and conversion, thermodynamics, pressures and vacuums.

**HVAC 104 HVAC/R Tools and Equipment 4**
Students learn the proper use of hand tools, fasteners, electrical, refrigeration and heating test instrument and servicing equipment.

**HVAC 105 Refrigerant and Refrigeration Systems Sections A 4**
Students learn refrigeration system components and operation, refrigeration cycle, compressors, condenser, metering devices and evaporators.

**HVAC 106 Refrigerant and Refrigeration Systems Sections B 3**

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A continuation of the concepts introduced in HVAC 105, students learn refrigerant properties, system piping, accessing sealed systems, refrigerant management, system evacuation and charging.

**HVAC 107 HVAC/R Electrical Systems and Components 5**
Students learn basic electricity, power, circuits, electric motors, electrical components, diagrams and controls.

**HVAC 108 Soldering and Brazing Applications 3**
Students learn techniques of heat bonding copper tubing and dissimilar materials using soft solder and brazing alloys common to the HVAC industry.

**HVAC 109 Basic HVAC/R Math Applications 3**
This course is an introduction to the basic mathematic calculation used in the HVAC/R industry.

**HVAC 110 Residential HVAC/R Systems 5**
This course is an introduction to unitary systems, split systems, and the arrangement, placement, and matching of equipment. Students learn to troubleshoot residential cooling and heating equipment.

**HVAC 111 Light Commercial HVAC Systems 5**
A continuation of the concepts introduced in HVAC 110, students learn about unitary and split air conditioning and heating equipment used in light commercial applications. Oil heating equipment is also presented.

**HVAC 112 Heat Pump Systems 4**
A continuation of the concepts introduced in HVAC 110 and HVAC 111. This course is an introduction electric heating equipment, heat pump components, applications and troubleshooting.

**HVAC 201 HVAC/R System Design, Sizing, and Layout 4**
Students are introduced to basic building construction, fans, airflow, duct design, installation, zone controls, test and balancing air systems, psychrometrics, indoor air quality, filters, humidifiers, and residential load calculations.

**HVAC 202 Welding Processes (SMAW/GMAW) 2**
This course is an introduction to basic oxyacetylene welding including flat and vertical bead on plate. A general overview of terminology and general safety is also include.

**HVAC 203 Hand Held Torch 2**
Basic oxyacetylene cutting and burning is presented.

**HVAC 204 SMAW (ARC) Applications 2**
Basic arc welding in the horizontal, vertical, and overhead positions is presented.

**HVAC 205 GMAW (MIG) Applications 2**
Basic steel and aluminum MIG welding in the

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horizontal, vertical and overhead positions are presented.

**HVAC 206 Basic Metalworking 2**
Students learn to identify the components, equipment, and operation for sheet metal layout and fabrication.

**HVAC 207 Basic Layout and Patterns 2**
A continuation of the concepts introduced in HVAC 213, students fabricate patterns and join them in a line of fittings.

**HVAC 208 Fabrication Practices 2**
Students learn the procedures used in the installation of a complete residential central heating, ventilation, and air conditioners.

**HVAC 209 Air Balance and Duct Sizing 2**
This course is an introduction to the techniques and procedures used in the residential construction industry to determine proper sizing of HVAC equipment and ducts to meet the requirements for a high-quality, comfortable climate in terms of heating, cooling, humidifying, dehumidifying, ventilation and air cleaning or filtering.

**HVAC 210 Drafting/Blueprint Reading 4**
Students learn basics of preparing plans and orthographic and isometric drawings used to create building blueprints. The identification and application of plumbing, electrical, air conditioning, and refrigeration symbols found on mechanical drawings is emphasized.

**HVAC 211 Commercial Environmental Systems 5**
This course provide the students with the knowledge commercial air conditioning systems, air handlers, accessories, package units, and controls

**HVAC 212 Chilled Water Systems 2**
This course is an introduction to types of chilled water units, purge recovery, compressor arrangement, chiller economizers, oil return systems, and absorption chiller operation.

**HVAC 213 Hydronic Heating Systems 2**
Students learn the uses of common terminal units, types of piping, configuration of multiple systems, motorized controls valves, radiant heating, mixing valves, and the circulators used.

**HVAC 214 Cooling Towers Basics 1**
Students learn the basics types of cooling towers and cooling tower operation and maintenance.

**HVAC 215 Introduction to Thermal Storage 2**
Students are introduced to the theory of thermal storage including mode of operation.

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**HVAC 216 EPA Section 608 Exam 1**
This course is a precursor to taking the EPA Section 608 exam. Employee must be certified by the EPA to handle refrigerant under penalty of law. Three types of exams are available: Type I, Type II, and Type III. All three types require that a core exam also be passed. The minimum requirement for HVAC/R technicians is a Type II.

**HVAC 217 Commercial Refrigeration 3**
Students learn to identify high temperature, medium temperature and low temperature refrigeration systems, food preservation, various type of systems used, and basic principles of operation.

**HVAC 218 Installation, Maintenance, and Troubleshooting 2**
This course is an introduction to installation standards, equipment placement, piping procedures, determining the correct charge, planned maintenance, and troubleshooting procedures.

**HVAC 219 AHRI Industry Competency Exam #1 (ICE) 2**
This course is a precursor to taking industry recognized national AHRI Industry Competency Exam (ICE Exam). The three test areas include: Residential Heating and AC, Light Commercial Heating and AC, and Commercial Refrigeration. Completion of one exam of the three exams is required for Support Technician credential and AT Degree.

**HVAC 220 AHRI Industry Competency Exam #2 (ICE) 2**
This course is a precursor to taking industry recognized national AHRI Industry Competency Exam (ICE Exam). The three test areas include: Residential Heating and AC, Light Commercial Heating and AC, and Commercial Refrigeration. Completion of an additional exam is required for AT Degree.

**HVAC 221 HVAC/R Industry Math 5**
This course is an introduction to the math calculations common to the industry, including algebraic formulas; calculation of angles, areas, and volumes of various geometric shapes; and system load calculations.

**HVAC 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**HVAC 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**HVAC 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**HVAC 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**HVAC 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**HVAC 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**HVAC 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## INFORMATION TECHNOLOGY SPECIALIST

**INFO 101 Computer Applications Essentials 5**
This course is an introduction to the effective use of the computer at home or on the job including such topics as an introduction to application software for document processing, presentation graphics, electronic spreadsheet, and database management software using Microsoft Office.

**INFO 102 Fundamentals of Information Technology 14**
This course provides an introduction of Information Systems principles to help students understand the relationship of advanced courses to the curriculum as a whole and to present the changing role of the information systems professional.

**INFO 103 Internet Applications 5**
This course is a combination of three popular internet applications: e-mail, XHTML, and web authoring. Topics also include web search skills, Mash up, social networking , and online multimedia.

**INFO 104 A+ Essentials 4**

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In this course, students acquire the essential skills and information needed to install, upgrade, repair, configure, troubleshoot, optimize, and perform preventative maintenance of basic personal computer hardware and operating systems. This course also prepares students for current A+ Essentials certification.

**INFO 105 A+ Practical 4**
Students learn to support PC hardware in a business setting, including installation, troubleshooting, component replacement, networking, and security. They also learn to manage the Windows operating system and are prepared for current A+ Essentials certification.

**INFO 106 Electronics Basics 5**
This course introduces the student to the fundamentals of electricity and electronics required to understand computer and network operations. Topics include AC theory, DC theory, electronic circuits, and other related fundamentals.

**INFO 107 Structured Cabling 3**
This course introduces students to standardized cabling practices and skills needed to install standards-compliant, scalable networks.

**INFO 108 Project Management 5**
This course is designed to introduce students to project management concepts and terminology. Students gain skills within a hands-on environment using project management software.

**INFO 109 Employment Preparation 5**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**INFO 110 Emerging Technologies 5**
Discover and explore emerging technologies used in today's computing environments. Students learn about these technologies and how these trends will impact computing and society.

**INFO 111 Practical Applications 5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**INFO 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**INFO 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student.

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The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**INFO 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**INFO 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**INFO 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**INFO 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**INFO 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

## LEGAL ASSISTANT

**LEGAL 103 Legal Office Procedures 5**
This course is an introduction to legal concepts and the various fields of law, including document preparation commonly used in these fields.

**LEGAL 104 MS Outlook 2**
Students learn to manage calendars and use basic and advanced features of email, scheduling, and other functions.

**LEGAL 105 Records Management 4**
Students learn to apply alphabetic indexing rules in a simulated business environment.

**LEGAL 108 Legal Terminology 5**

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This course is a basis for all legal sections by understanding and using legal vocabulary, analyzing court structures, and learning the types of law classifications.

**LEGAL 109 Legal Research 2**
This course is an introduction to basic legal research skills with emphasis on the use of technology-based sources. Students learn research techniques and sources needed in legal environments.

**LEGAL 111 Introduction to MS Word 5**
This course is an introduction to basic word processing skills using MS Word including the use of graphics and special formats and styles.

**LEGAL 112 MS Word Applications 5**
Students learn more advanced word processing skills, including document merge, table creation, and column formatting.

**LEGAL 113 Criminal Law 5**
This course provides the paralegal students with an applied approach to criminal law. Students are introduced to the sources and constitutional requirements to criminal law and the various crimes and defenses. Procedures leading up to the trial, how a criminal trial works, and the sentencing and post trial procedures are emphasized.

**LEGAL 201 Beginning Accounting 5**
Students learn to use commercial software packages such as Quickbooks to maintain books and business records.

**LEGAL 202 Legal Office Projects 5**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**LEGAL 203 Legal Billing Software 1**
This course is an introduction to specialized legal software where students learn to input clients' billable hours.

**LEGAL 205 MS PowerPoint for Legal Assistants 3**
Students learn to create, edit, and modify slide presentations and customize presentations using tables, graphics, objects, colors, and special effects.

**LEGAL 206 MS Excel 3**
Students learn to create, edit, maintain, and print spreadsheets and data sheets. The use of macros is also introduced.

**LEGAL 208 Ethics 2**
Students learn about ethical practices, procedures, and fundamentals using the Canons of Responsibility from the National Association of Legal Assistant's Code of Ethics and National Association of Legal Secretary's

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Code of Ethics.

**LEGAL 209 Civil Litigation 5**
Students learn to assemble and work from case information, commence and serve a civil lawsuit based on court rules and statutes, and prepare documents in case progression.

**LEGAL 211 ALS Preparation I 4**
This course is a preparation for the ALS, the basic certification exam for legal professionals in written communications, office procedures, and legal knowledge study areas.

**LEGAL 212 ALS Preparation II 4**
This course is a preparation for the ALS, the basic certification exam for legal professionals in written communications, office procedures, and legal knowledge study areas.

**LEGAL 213 ALS Certification Exam 1**
This course is a preparation for the ALS, the basic certification exam for legal professionals in written communications, office procedures, and legal knowledge study areas.

**LEGAL 215 Keyboarding 5**
Students learn to document Initial typewriting and computer keypad data entry skills including document creation, editing and correction on a PC keyboard. Improvement of speed in typewriting and keypad data entry skills.

**LEGAL 216 Business Grammar 5**
Advanced concepts of writing business correspondence including the importance of spelling, punctuation, and editing skills are also included.

**LEGAL 281 Independent Project I 1-4**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**LEGAL 282 Independent Project II 1-4**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**LEGAL 283 Independent Project III 1-4**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**LEGAL 291 Work-based Learning Experience I 1-4**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**LEGAL 292 Work-based Learning Experience II 1-4**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**LEGAL 293 Work-based Learning Experience III 1-4**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**LEGAL 297 Work-based Learning Seminar 1**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculties meet with the students to provide support and assistance during the experience.

## MACHINIST

**MACH 111 Machine Shop Mathematics I 2**
This self paced course is an introduction to math concepts to solve problems common to the machining/manufacturing industry. Pre

**MACH 112 Industrial Safety I 3**
This course is an introduction to the occupational safety practices common to the machining/manufacturing industry. Emphasis is placed on the application of OSHA and WISHA standards within the lab setting.

**MACH 113 Measurement Applications 3**
Students learn to use precision measuring tools such as micrometers, height gages, calipers, gage blocks, and indicators.

**MACH 114 Lathe Operations I 4**
Students learn to set up and run conventional lathes for facing and turning operations and to perform basic machining skills.

**MACH 115 Machine Shop Mathematics II 5**
A continuation of the concepts introduced in MACH 111, students learn elementary , geometry, and trigonometry as they apply to the machine shop.

**MACH 121 Lathe Operations II 4**
A continuation of the concepts introduced in MACH 114, students learn more advanced turning skills using taper attachment, single point threading, knurling, boring head, bandsaw blade welding and drill grinding.

**MACH 122 Grinding I 2**
Students learn to set up and use a surface grinder.

**MACH 123 Machining I 2**
This course is an introduction to basic machining tools and processes including mechanical forces and metal removal.

**MACH 124 Milling I 2**
Students learn conventional milling machine techniques

**MACH 125 Statistical Process Control 3**
Introduction to the theory and applications of statistical process control as used in a machining/manufacturing/ production environment.

**MACH 126 Blueprint Reading I 2**
Introduction to blueprint reading including part specifications, views, ANSI, and SI metric drafting symbols.

**MACH 131 Industrial Safety II 2**
Students learn common occupational safety practices within the lab setting.

**MACH 132 Geometric Dimensioning and Tolerancing 3**
This course is an introduction to the symbolic language used on engineering drawings.

**MACH 133 Milling II 3**
Students are introduced to basic metallurgy, including physical and mechanical properties of metal..

**MACH 134 Advanced Machining 4**
Students learn complex lathe operations.

**MACH 135 Advanced Machining II 4**
A continuation of the concepts introduced in MACH 134, students learn advanced grinding techniques.

**MACH 136 First Aid/CPR 1**
Students receive training in first aid and CPR.

**MACH 142 Advanced Machine Shop Applications 8**
Students plan and produce an advanced project of their own design with the permission of the instructor. This course may only be used as a substitution for WBAS 101for students with documented health issues.

**MACH 211 Machining III 1**
This course is an introduction to cutter terminology and applications.

**MACH 212 Manufacturing Support 1**

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This course is an introduction to lean manufacturing, ISO standards, and measuring systems analysis.

**MACH 213 Advanced Machining III 5**
Student learns to machine and assemble complex components .

**MACH 216 Blueprint Reading II 5**
Students learn advanced dimensioning, tolerancing, practices, and multiple views

**MACH 217 Blueprint Reading III 2**
Students learn to interpret complex engineering drawings.

**MACH 221 CNC Lathe I 2**
Students learn to set up and use a computerized numerical control (CNC) lathe.

**MACH 222 CNC Lathe II 5**
Students learn advanced practices using the CNC lathe.

**MACH 223 Machining IV 2**
Students expand knowledge of advanced manual machining concepts

**MACH 224 MasterCam/Solid Works 5**
Students learn CAD/CAM, and verification software.

**MACH 231 CNC Mill I 2**
Students learn to write CNC Milling programs.

**MACH 232 Advanced CNC Machining I 5**
This course provides the student with advanced practice associated with CNC machine programs.

**MACH 233 Advanced CNC Machining II 5**
A continuation of the concepts introduced in MACH 232, students work on advanced CNC machining projects.

**MACH 289 Independent Projects 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 290 Independent Projects 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 291 Independent Projects 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 295 Independent Projects 1-5**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen. PREREQUISITE: Instructor permission is required to enroll in this course.

**MACH 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**MACH 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**MACH 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## MARKETING AND BUSINESS MANAGEMENT

**MARK 101 Marketing Principles 5**
This course introduces the student to the basic components of marketing goods and services with a focus on the following subject matter: basic consumer needs, creating and implementing a marketing strategy and the study of general marketing principles.

**MARK 102 Customer Service 5**
This course examines the techniques and processes to create a company wide customer service environment. Students will sharpen their skills in the areas of critical thinking, acquiring and retaining customers, and developing a service-oriented mindset, ensuring customer satisfaction, diffusing unsatisfactory situations and excelling in communication.

**MARK 103 Written Business Communication 3**
This class focuses on expressing plans, ideas and other business-based communication in written form. Students will demonstrate the ability to communicate through writing to clients, customers and co-workers at all levels.

**MARK 104 Business Negotiations and Collaboration 3**
This course presents a perspective of how to respond and resolve conflict through collaborative negotiations with positive results. Included are a variety of methods to establish rapport, trust and reliability, manage conflict in the negotiation process, and how to handle difficult power tactics.

**MARK 105 Information Research and Acquisition 1**
The ability to successfully research and acquire relevant information is very important in the competitive world of marketing. This class teaches how to utilize resources and sources to obtain and utilize that information.

**MARK 106 Business Concepts 5**
A wide array of business concepts are explored in this class including entrepreneurship, organizational systems, finance, marketing, management and international business.

**MARK 107 Cross Cultural Communications 5**
Students study the concepts of culture and its impact on organizations as they conduct business globally. Topics explored include: intercultural and cross-gender communication, political and economic philosophy, social structure, religion, language and education.

**MARK 108 International Trade Practices 5**
This course is an introduction to the key

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business concepts that individuals and businesses must understand to enhance results in international trade.

**MARK 109 Economics: A Marketing Perspective 5**
A study of economics, economic environments, and analysis of the economic factors involving the essentials of demand and supply; competition and monopoly; labor; public policy towards business; and the distribution of income.

**MARK 110 Principles of Management and Supervision 5**
Basic principles of management and supervision are studied and practiced. Students learn leadership skills related to working styles, coaching skills and working effectively with coworkers and subordinates.

**MARK 111 Cyber Marketing/E-Commerce 5**
This class researches business organizations that market and sell on the Internet and assesses the impact of e-commerce on business and consumers.

**MARK 112 Business Law 5**
This class is designed as an introduction to the legal system and its impact and functions within the business world. Students will study legal reasoning, the process of resolving disputes and contractual agreements in the business community.

**MARK 113 Accounting Principles 5**
This course is an introduction to financial accounting principles and management accounting.

**MARK 121 Branding/Corporate Identity 2**
Students study the importance and impact of branding techniques and the creation of corporate identity in marketing products and services.

**MARK 122 Advertising: Creation and Planning 4**
This course explores planning aspects of promotional efforts and creation of effective advertising campaigns including student development of flyers, brochures, newsletters, direct mail packages and media releases

**MARK 123 Business Software Applications 3**
Students learn to expedite projects and planning efforts utilizing business software applications. This will help them in efficiency, time management and organization.

**MARK 124 Sales Strategies and Consumer Psychology 5**
This course examines the psychology of consumer behavior and use of sales strategies created to enhance consumer behavior in purchasing.

**MARK 125 Business and Marketing Presentation Skills 3**
Students develop the skills to create and deliver presentations that influence colleagues, clients and other audiences.

**MARK 126 Planning and Leadership 5**
This course is a general course for developing planning and personnel management skills required for successful sales, marketing, and managerial professionals.

**MARK 127 Public Relations 3**
This course examines how a firm gains audience exposure through the strategic placement of topics of public interest and news items that do not require direct payment. Students explore the role of public relations in marketing, how it differs from advertising, and the steps to develop a public relations campaign.

**MARK 128 Marketing Research and Forecasting 3**
This is an introductory course to the purposes, methods, and techniques of marketing research and the principles on which they are based.

**MARK 129 Advanced Marketing Projects 5**
Students complete independent marketing projects, such as business or marketing plan development, advertising project development, international marketing project development, advanced project risk analysis assessment, or international marketing research. Requires instructor approval prior to registration.

**MARK 201 Introduction To Leadership Skills and Ethics 3**
This course is an introduction to the various skills necessary to become an effective leader whether that role is as a member of a group, team leader, department head, supervisor or manager. This class also explores moral principle, decision making, community standards, corporate, community and personal responsibility.

**MARK 202 Introduction To Strategic Marketing 4**
This course delves deeper into marketing strategies enabling students to identify and minimize the effect of competitive forces. Organizational strategic planning efforts to communicate products and services are explored.

**MARK 203 Introduction To Business Accounting/Finance 5**
This course is designed for non-financial managers and introduces the accounting process, key financial documents, ratios and profit analysis.

**MARK 204 Introduction To Presentation and Facilitation Skills 3**
In this course, students enhance personal presentation skills in a variety of settings, from large groups to small business meetings. Meeting facilitation tactics are introduced and practiced as a part of this course.

**MARK 205 Advanced Business Projects 5**
Students complete independent marketing projects, such as business or marketing plan development, advertising project development, international marketing project development, advanced project risk analysis assessment, or international marketing research. Requires instructor approval prior to registration.

**MARK 206 Teaming for Success 3**
Students learn to apply successful leadership models, analyze personal leadership styles, understand and synergize the dynamics of a team and appropriately empower people to make correct team and organizational decisions.

**MARK 207 Introduction To Managing Change 3**
This course presents information on how leaders seek out, initiate, support, and manage needed change. Concepts explored included the process of change, communication, and building commitment to bring about change within an organization.

**MARK 208 Achieving Results Through Influence 3**
This course explores how effective leaders achieve results through and with others. Students learn how effective leaders persistently go after goals and measure success in terms of results achieved.

**MARK 209 Entrepreneurial Concepts 5**
A relevant course looking at ways to start and sustain a small business, students learn techniques on how to maximize limited resources, plan for growth, and remain profitable in today's economy. A detailed business plan as an individual project is completed.

**MARK 210 Introduction to Project Management 4**
This course is an exploration of practical skills that will enable students to better gain control of, and manage all aspects of business-oriented projects and increase team performance.

**MARK 221 International Business Law 2**
This course examines legal aspects of conducting business in a global environment, including U.S., foreign, and international legal systems and their affect on companies conducting global business; identifies customs, taxation and global employment regulations.

**MARK 222 Supply Chain Operations 5**
This course introduces the student to concepts of managing a supply chain on a global level including supply chain operational options such as transportation modes, inventory, time management, landed costs and customs requirements are studied.

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**MARK 223 Supply Chain Risk Management 2**
This course provides an overview to risk management activities including aspects of the operation, marine insurance, transportation, international conventions, international conditions and cargo protection.

**MARK 224 Supply Chain Intermediaries 5**
This course introduces students to various types of supply intermediaries such as carriers, third party logistics providers, freight forwarders and brokers, U.S. customs regulations and foreign import requirements.

**MARK 225 International Marketing 3**
This course offers an introduction to international marketing strategies and decisions, including the evaluation of environments to determine viability of global market entry.

**MARK 226 Offshore Procurement Process 2**
Instruction introduces students to offshore procurements and the logistical elements involved with importing.

**MARK 227 International Market Research and Planning 3**
This course focuses on methods used to conduct viable market research appropriate to international environments and cultures.

**MARK 228 Global Trade Financing 5**
Students explore various options for financing international trade including financial policies

**MARK 229 International Payment, Credit, and Collections 5**
This course examines methods and terms of payment for goods and services associated with global/multinational trade.

**MARK 230 Advertising Project-Marketing Implementation 1-5**
Complete independent marketing projects, such as business or marketing plan development, advertising project development, international marketing project development, advanced project risk analysis assessment, or international marketing research. Requires instructor approval prior to registration.

**MARK 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MARK 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.



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**MARK 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MARK 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MARK 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**MARK 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**MARK 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## MECHANICAL ENGINEERING

**MET 101 Computers As An Engineering Tool 4**
Students learn how to navigate through the college's network, intranet and to utilize the Internet for program-related research. Folder and file creation and maintenance will also be taught.

**MET 103 Drawing Sheet Standards 4**
Using computer-aided-drafting (CAD) software, students learn how to create electronic drawing templates with requisite layers, line types and text styles. Drawing sheet attributes are also be addressed as students customize relevant settings.

**MET 105 Orthographic Projections 7**
Working with the "glass box" concept of orthogonally projecting an object to the six planes of view, students learn the necessity of strict adherence to the American Standard Arrangement of Views. First angle projection, used primarily in Europe and Asia are also discussed.

**MET 106 Sectional Views 5**
Students learn to develop an acceptable drawing of section views and to crosshatch the areas sectioned with sectioning lines appropriate to the material in use.

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**MET 107 Auxiliary Views 5**
Proper dimensioning practice dictates that the drafter dimension features (surfaces and angles) only in those views where they are true shapes. Using projection techniques students learn how to "normalize" features found in orthogonal views.

**MET 109 Annotative Scaling in AutoCAD 4**
Students study the standards set for dimensioning set by the American National Standards Institute (ANSI) and the American Society of Mechanical Engineers (ASME) in order to understand the principals of proper dimensioning practices. They then apply those practices to the dimensioning of drawing previously created.

**MET 110 Dimensioning Practices 7**
This course is essentially the lab portion of MET 108 in that students dimension all orthogonal, sectional, and auxiliary drawings that were developed in earlier courses. Particular attention is paid to strict adherence to industry standards.

**MET 111 Tolerancing 5**
Tolerance dimensions allow the specification of a range of accuracy for the shape, size and/or position of features of a product. Students learn how to apply tolerances as they consider fit between mated parts, how features will be inspected, and how to place tolerance symbols on a drawing using CAD software.

**MET 112 Basic Geometric Constructions 6**
Using computer-aided-drafting (CAD) software, students learn how to generate all standard geometric and conic forms. Extensive work is required in the development of tangent arcs and planes.

**MET 114 Introduction to Sketching 5**
Engineering technicians, working in the field, are often required to hand draw parts, features of parts, and assemblies. This course teaches students to develop basic sketching skills so that they will be able to develop accurate and readable sketches.

**MET 201 Machine Shop Drawings 4**
Students learn how to draw and dimension working/production drawings necessary for machining, fabrication and/or assembly. The ability to fully annotate production drawings (general and specific notes, parts lists, and revision notes) is also an instructional objective of this course.

**MET 202 Threads, Fasteners, and Springs 3**
Students learn how to draw detailed, schematic and simplified threads for all thread forms common to industry. Thread specifications are examined thoroughly as are standard and specialized screw/bolt head types. Helical springs (compression, extension and torsion) are also be examined.

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**MET 203 Gears 4**
Students study the characteristics of spur, worm and bevel gears and learn to calculate the gear ratio and rpm of two mating spur gears. Given the pitch diameters, these gears, and their respective tooth forms, a detailed drawing is created.

**MET 204 Cams 4**
This course provides students with the ability to develop displacement profiles for cams based upon given specifications and follower motions. A series of cams will then be drawn from these profiles.

**MET 205 Pneumatic/Hydraulic Symbols 3**
Students study common pneumatic and hydraulic symbols and develop computer-aided-drafting (CAD) symbols appropriate for industry applications.

**MET 206 Piping and Instrumentation Drawings 4**
Using the symbols developed in MET 205, students replicate industrial piping/process and instrumentation drawings (P&IDs).

**MET 207 Valve Sections 4**
Students develop sectional views of gate, globe, and check valves displaying details of all components. Addition study of valve applications may be provided through independent work in the Fire Protection Engineering program.

**MET 208 Pump Section 4**
The application of various pump classes and types is examined in order to determine how they add hydraulic energy to the movement of water. As with valves in MET 207, sectional views of a variety of pumps are developed in order to facilitate the students' understanding of their function.

**MET 209 Production Drawings 4**
Given duct system characteristics for airflow requirements, students develop detailed drawings of ventilation systems. Students complete these drafting projects in cooperation with the Sheet Metal Technology program.

**MET 210 Duct Fitting Symbols 3**
Students study common sheet metal duct fittings and develop computer-aided-drafting (CAD) symbols appropriate for industry applications.

**MET 211 Flat Pattern Development 5**
Using the principles of triangulation and radial line development, students develop flat patterns for such common types of sheet metal fittings as elbows and transitions.

**MET 212 Basic Air Flow Systems 3**
Students study the means by which air is distributed in mechanically ventilated spaces by means of fans, ductwork, and diffusers.

**MET 213 Paper Space, Layout, and Viewports 5**
Students learn to use space, layout, and viewports when working on CAD projects.

**MET 214 Engineering Projects I 7**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**MET 215 Axonometric Drawings 5**
Students learn to differentiate between types of axonometrics and to draw axonometric drawings including plan obliques and isometrics.

**MET 216 Engineering Projects II 7**
This course is an independent study in special projects to give students additional training in a specific area selected by the instructor. Emphasis is on individual student needs to improve or expand skills in a variety of areas.

**MET 217 Career Advancement Strategies 3**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**MET 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MET 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MET 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MET 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**MET 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**MET 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**MET 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## OCCUPATIONAL THERAPY ASSISTANT

**OTA 101 Introduction to Occupational Therapy 4**
This course provides an overview of the OTA program and the profession and the roles and responsibilities of OT practitioners in health care, community-based settings and school systems. Basic terminology, principles, philosophies and ethics are introduced for a better understanding of occupational therapy, the clients serv ed, and other health care professionals working in the settings. Students gain computer literacy skills and library skills for accessing information about professional issues.

**OTA 102 Health and Wellness and the OTA 3**
Principles and strategies for managing health and promoting wellness are practiced. Importance of balancing areas of occupation for success in occupational roles are examined and applied.

**OTA 103 Functional Movement 5**
This course covers basic principles of kinesiology, biomechanics, and associated biological systems related to daily living activities. Techniques for body mechanics, safety and mobility, energy conservation, task simplification are covered. Upper extremity functions for everyday tasks are emphasized.

**OTA 104 Therapeutic Use of Self 5**
Students in this course explore personal values and cultural attitudes that relate to individual performance and group interactions. Group roles, learning styles, leadership, and communication styles will be examined. Students develop basic skills for observation, interviewing, communication and documentation. Personality, insights, perceptions and judgments as part of the therapeutic process are covered.

**OTA 105 Nervous System Functioning 4**
Basic principles of neurology and associated sensory and cognitive systems related to daily living activities. Deficits in sensory, perceptual

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and cognitive functioning and effects on occupational performance are examined.

**OTA 106 Therapeutic Activities and Performance I 5**
This course covers areas of human occupation through analysis of activities of daily living-work, leisure, play and self-care. Students develop an understanding of the nature and value of occupation to support client participation and performance through therapeutic crafts and daily living activities.

**OTA 107 Developmental Disabilities and OT 5**
Congenital conditions, diseases, and disabilities are covered and their effects on the psychological, physiological, and social domains of occupational behavior. Students develop observation and assessment skills, and teaching and grading self-care, work, leisure and play occupations for individuals with developmental challenges.

**OTA 108 Applied Experience – Developmental Settings 1**
Students participate in observations and guided practice opportunities for applying OT principles in settings serving individuals with developmental challenges.

**OTA 109 Adaptive Technologies 5**
Adaptive technology used in occupational therapy setting is explored through laboratory practice and field site visits. Low technology such as prosthetics, positioning equipment and adaptive aides for daily living to more advanced computer technology utilized for environmental control and augmentative communication are covered.

**OTA 110 Documentation Skills 3**
Students learn about record keeping, progress note writing, and assisting the OT with functional goals and objectives for various OT settings. Overview of terminology of assessment results and treatment plans covered.

**OTA 201 Therapeutic Activities and Performance II 5**
More advanced course to develop creative problem-solving, clinical reasoning, and documentation skills through exposure to barriers for safety and independence. Models and theories of occupation are applied and the effects on performance are examined. Students examine universal design principles and environmental modifications for work, home and the community.

**OTA 202 Psychosocial Dysfunctions: Treatment Principles and Applications 8**
Conditions that lead to psychiatric and social-emotional challenges are examined. Clinical features, medical management and issues impacting OT are covered. This course focuses on the further development of observation, assessment skills, task analysis and interventions for individuals with psychosocial challenges. Quality of life and meaningful occupations are emphasized.

**OTA 203 Applied Experience – Mental Health Settings 1**
Students participate in observations and guided practice opportunities for applying OT principles in community mental health settings serving individuals with psychosocial challenges.

**OTA 204 Seminar – Applied Mental Health 1**
Discussion and problem-solving of fieldwork experiences are emphasized.

**OTA 210 Physical Disabilities: Treatment Principles and Applications 8**
Trauma, illness, and other conditions that lead to physical dysfunction are examined. Therapy modalities to maximize independence, safety and participation in meaningful occupation are practiced. This course focuses on the further development of the student's skills in clinical reasoning carrying out the treatment plan.

**OTA 211 OTA and Special Settings 3**
Some settings require the OT assistant to be an independent self-starter. Occupational therapy practice with elderly clients in long term care, assisted living and home health care, pediatric clients in school settings, and injured workers in work condition programs are covered.

**OTA 212 Applied Experience – Physical Rehabilitation Settings 1**
Students participate in observations and guided practice opportunities for applying OT principles in settings serving individuals with physical disabilities.

**OTA 213 Seminar – Applied Physical Rehabilitation 1**
Discussion and problem-solving of fieldwork experiences are emphasized.

**OTA 218 Professional Issues for the OTA 3**
Preparation for fieldwork, certification and employment of the OTA, as well as, workplace issues and job-related responsibilities of OTA are covered. The OTA as a manager, contractor, private practitioner and advocate of occupational therapy services are presented.

**OTA 220 Clinical Fieldwork Level II – Rotation A 11**
The first of two eight-week off-campus work experiences in a clinical setting under the supervision of a licensed occupational therapist or a certified occupational therapy assistant. This forty-hour per week rotation is to further develop and practice the skills of an entry-level OTA and must be successfully completed before student is eligible for the national certification examination.

**OTA 221 Clinical Fieldwork Level II – Seminar A 1**
Discussion and problem-solving of fieldwork experiences and preparation for the national board exam are emphasized.

**OTA 222 Clinical Fieldwork Level II – Rotation B 11**
The second of two eight-week career experiences working in a clinical setting under the supervision of a licensed occupational therapist or a certified occupational therapy assistant. This 40-hour per week rotation is to further develop and practice the skills of an entry-level OTA and must be successfully completed before student is eligible for the national certification examination.

**OTA 223 Clinical Fieldwork Level II – Seminar B 1**
Discussion and problem-solving of fieldwork experiences and preparation for the national board exam are emphasized.

**OTA 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**OTA 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**OTA 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**OTA 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**OTA 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learn-

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ing activity is based on a written agreement with the participating training provider.

**OTA 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**OTA 298 Work-based Learning Seminar – No Seminar 1-19**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## PARAEDUCATOR FOUNDATIONS

**SOC 111 Understanding Diversity 5**
This course focuses on helping students recognize and appreciate diversity in a multicultural society.

**PSYC& 100 General Psychology 5**
This course is an introduction to psychology for people with an interest in all that influences human behavior.

**EDU 101 Introduction to School Law 3**
This course is an introduction to the history, political structure, and legal framework of the public school system with emphasis on the basics of school law and how it applies to employees, students, and parents.

**EDU 103 Child Growth and Development 3**
Students explore the unfolding of human development from the prenatal period through adolescence and the transition to adulthood. They learn how children grow physically, cognitively, and emotionally through all developmental stages.

**EDU 151 Abuse and Neglect of Children 1**
This course is an introduction to the causes, extent, and dynamics of child abuse and neglect along with mandatory reporting guidelines for educators.

**SPED 101 Educating Students with Disabilities 3**
This course is an introduction to the various disabilities with implications for learning and life. Individuals working with students with disabilities in general or special education classrooms will directly benefit from this course.

## POWER SPORTS & EQUIPMENT TECHNOLOGY

**POW 101 Introduction to Power Sports 5**
This course provides students with training in workplace human relations, communications, shop safety environmental awareness,

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tools and equipment, measuring, fasteners, and mechanical and mathematical principles required within the occupation.

**POW 102 Pre-Delivery Maintenance 3**
Students learn to prepare new equipment for delivery to the consumer.

**POW 103 Seasonal Maintenance 5**
Students learn to prepare equipment for the recreational/work season and provide the service necessary at the end of the work/recreational season.

**POW 104 Periodic Maintenance 5**
Students learn to build their skills in maintaining optimum equipment/vehicle performance during the work/recreational season.

**POW 120 Engines – Failure Analysis 5**
Students are introduced to the theory of internal combustion engines and learn how to diagnosis problematic engines and analyze failed engines.

**POW 121 Engine Repair Methods 5**
Students learn to correctly disassemble, inspect, and machine engines to return to service. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines.

**POW 122 Engines Installation Methods 5**
Students learn to correctly assemble, perform the necessary adjustments, and correctly install engines in vehicles. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines.

**POW 130 Exhaust Systems 5**
This course is an introduction to the theories of induction. Students learn to identify, diagnosis, repair, and maintain carburetor, electronic fuel injection, and direction injection systems.

**POW 131 Lubrication/Cooling Systems 5**
Students are introduced to the theories of cooling and lubrication and learn to identify, diagnosis, repair, and maintain lubrication and cooling systems. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines.

**POW 132 Advanced Engine Service 5**
Students focus on engine performance and drivability and learn to identify, diagnosis, and repair engine performance problems. Special emphasis is placed upon the utilization of service manuals and manufacturers' guidelines

**POW 140 Fundamentals of Electricity 3**
This course is an introduction to electrical systems. Students receive electrical and electronic theory, learn to use electrical test equipment, and provide basic electrical systems inspections and service.

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**POW 141 Electrical Systems 90 5**
Students are introduced to the electrical systems encountered in various types of motorized vehicles. Special emphasis is placed upon the utilization of service manuals and electrical schematics.

**POW 142 Electrical Systems - Diagnosis 5**
Students receive training and practice in servicing and repairing the electrical systems of various types of motorized vehicles. This includes problem identification, diagnostic testing, repair, and maintenance of batteries, starting, charging, ignition, and accessory systems.

**POW 143 Brake Systems 4**
Students are introduced to brake theory, identification, diagnosis of problematic brake systems and the repair and maintenance of various brake systems.

**POW 150 Introduction to Power Trains 3**
Students are introduced to power train theory, gear ratios, diagnosis of problematic power trains, and analysis of failed power trains.

**POW 151 Power Train Service 5**
Students receive training in the servicing and repairing of the various modes of transmitting engine power. This includes clutches, gear drive, belt/chain drive systems, and manual starters.

**POW 152 Introduction to Marine Propulsion 3**
Students are introduced to marine propulsion theory, gear ratios, diagnosis of problematic propulsion systems, and analysis of failed propulsion systems.

**POW 153 Marine Propulsion Service 5**
Students receive training in servicing and repairing the various modes of transmitting engine power to the water. This includes marine gear drive systems and jet pumps.

**POW 160 Introduction to Chassis 3**
Students are introduced to chassis theory, design, diagnosis of problematic chassis, and chassis service/repair methods.

**POW 161 Chassis Service 5**
Service/technician students receive shop experience in maintaining or repairing frame and suspension systems including steering systems, wheels/tire assemblies, and suspension systems.

**POW 162 Advanced Projects 7**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced

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learning in the subject area chosen.

**POW 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**POW 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**POW 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**POW 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**POW 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**POW 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**POW 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## PRACTICAL NURSE

**PNUR 102 Basic Nutrition 4**
The students learn basic nutrition concepts and their modification for life cycle, culture, and illness. The course highlights ways they can integrate good nutrition into their lifestyles. Principles of digestion and absorption, the function of nutrients, lifecycle nutritive needs, disease prevention, diet modifications, and weight controls are covered.

**PNUR 103 Nursing Math/Pharmacology 6**
This course focus is on the practical nurse's role in medication administration to persons of all ages. Basic concepts, various medication delivery systems, dosage calculation, drug classifications, and nursing implications are presented for the various bodily systems. Safe administration and documentation of medications are presented in the laboratory setting.

**PNUR 105 Personal Vocational Relationships I 1**
Students receive an overview of the health professions and the healthcare delivery systems with emphasis on the LPN's role in the health care working environment. Topics include nursing history, trends, disease prevention and wellness promotion, and guidelines for legal and ethical practice.

**PNUR 106 Nursing Fundamentals I 7**
This course provides the beginning nursing core upon which all subsequent nursing courses are built with emphasis on man as a holistic being with basic human needs. Included are specific nursing care principles common to all clients. Discussion focuses on identifying the needs of individuals within a family and community environment.

**PNUR 107 Principles of Geriatric/ Medical-Surgical Nursing 2**
Students receive theory/ application skills regarding the developmental stage of late adulthood with emphasis on principles of nursing for the aging client, enhancement of self-care, and an introduction to responsibilities of assisting clients and families dealing with grief and loss. Discussion focuses on causes and nursing treatment of diseases as they relate to physiological stress and individual differences in the need for rest, activity, solitude, social interaction, pain response and relief.

**PNUR 122 Personal Vocational Relationships II 2**
This course focuses on the nursing process and basic therapeutic communications skills. Basic human needs and healthy adjustments are also discussed with an emphasis on cultural, ethnical, and religious needs.

**PNUR 123 Respiratory Care 3**
This course provides an overview of care and management of patients with respiratory diseases with emphasis on etiology, pathophysiology, clinical signs, and medical management. Discussions integrate principles of pharmacology/medication administration, diagnostic testing, and nursing interventions to assist the clients' return to a maximum level of function.

**PNUR 126 Cardiovascular Disorders 4**
This course provides an overview of the care and management of patients with cardiovascular disorders. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management. Discussions integrate principles of pharmacology/ medication administration, diagnostic testing, and nursing interventions to assist the client 's return to maximum levels of function.

**PNUR 127 Nursing Fundamentals II 4**
This course provides advanced nursing skills necessary for successful transition into clinical settings. Included are special nursing care principles common to all clients. Discussion focuses on identifying the needs of individuals within a family and community environment.

**PNUR 128 Clinical I 3**
Within a variety of clinical settings, students begin to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory learned in the classroom.

**PNUR 130 Nursing Simulation Lab 2**
This course allows students to practice emergency situations in a controlled setting. The student nurse, using the nursing process as the focus will demonstrate nursing interventions and discuss the pharmacology/medication administration and diagnostic testing use in a variety of emergency scenarios.

**PNUR 131 Mental Health Issues 2**
Students receive an overview of mental health care, laws and regulations, classification and prevention of mental illness, services available, and examines the impact of mental illness on the individual, the family, and the community. The diseases are studied in relation to etiology, pathophysiology, clinical signs and symptoms and medical management.

**PNUR 136 Gastrointestinal 2**
This course provides an overview of the care and management of the patients with gastrointestinal disorders. The diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management. Discussions integrate principles of pharmacology/ medication administration, diagnostic testing, and nursing interventions to assist client s' return to maximum levels of function.

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**PNUR 137 Genitourinary 2**
This course provides an overview of the care and management of the patients with genitourinary disorders. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management. Discussions integrate principles of pharmacology/medication administration, diagnostic testing, and nursing interventions to assist client s' return to maximum levels of function.

**PNUR 138 Clinical II 5**
Within a variety of clinical settings, using the experience gained in PNUR 128, students continue to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory to practice.

**PNUR 220 Endocrinology/Care of the Diabetic Patient 3**
This course provides an overview of the care and management of patients with endocrine disorders. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management. Discussions integrate principles of pharmacology/medication administration, diagnostic testing, and nursing interventions to assist client to return to maximum levels of function.

**PNUR 232 Newborn/Maternal/ Reproductive Nursing 3**
Students apply practical nursing concepts the care of women and newborns. Emphasis is on health promotion through antepartum, intrapartum, and postpartum stages of pregnancy as well as complications that may occur during pregnancy including complications of pregnancy. Discussions integrate holistic and self-care principles to assist women in general and the family as a whole. Included will be an overview of the care and management of patients with disorders of the breast and reproductive system. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management.

**PNUR 233 Orthopedics 2**
This course applies nursing process and health sciences foundations to the assessment, care, and teaching of persons with acute and chronic conditions of the musculoskeletal system. Emphasis is on nursing interventions which prevent complications, strengthens the client capacity for self-care, and assist the client in achieving optimum levels of functioning.

**PNUR 144 Legal/Boundaries 1**
Students review legal requirements for licensure as a practical nurse. Liability issues related to practice, as well as ethical issues are discussed. Students view the Washington

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Administrative Code for the practical nurse and discuss scenarios of how to work within professional boundaries.

**PNUR 145 Clinical III 2**
Within a variety of clinical settings, using the experience gained in PNUR 138, students continue to utilize the nursing process to give comprehensive care to diverse population of clients. Clinical experience is correlated with theory under the guidance of faculty and enables student to implement skills and apply theory to practice.

**PNUR 147 Preceptor Experience 4**
This course includes an experience with a staff licensed practical nurse as a mentor or preceptor in a selected clinical area for the student's final clinical experience.

**PNUR 148 Pediatrics 3**
The course provides an overview of the care and management of children with healthcare problems. Discussions integrate principles of nutrition therapy and pharmacology/medication administration, cultural diversity, legal/ethical issues, and health teaching which are utilized as a framework to integrate holistic and self-care capabilities for the family.

**PNUR 149 Neurology/Ophthalmology/ Audiology 4**
This course provides an overview of the care and management of patients with disorders of the nervous system. Diseases are studied in relation to etiology, pathophysiology, clinical signs, and medical management. Discussions integrate principles of pharmacology/medication administration, diagnostic testing, and nursing interventions to assist client s' return to maximum levels of function. Special consideration will be given to the care and management of patients with disorders of the eye and ear.

**PNUR 150 Perioperative Nursing 1**
This course provides an overview of the care and management of perioperative patients. Using the nursing process as the focus and supporting the client's self-care capability, students discuss nursing interventions, principles of pharmacology/medication administration, diagnostic testing, and nursing interventions that will assist the client in achieving optimal levels of functioning.

**PNUR 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**PNUR 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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## PROFESSIONAL-TECHNICAL EDUCATION

**EDU 102 Industrial Safety 1**
This course focuses on establishing and maintaining a safe working environment as well as teaching students about general safety and industrial hygiene.

**EDU 104 Philosophy of Technical Education 3**
This course explores the evolution, philosophy, and framework of career and technical education.

**EDU 105 Methods of Teaching 3**
This course provides tools and strategies for effective teaching in a career and technical education classroom or lab setting, including facilitating and evaluating learning.

**EDU 106 Occupational Analysis 3**
Students learn skills for performing an occupational analysis of a specific job as the basis for creating a competency-based curriculum.

**EDU 107 Course Organization 3**
This course focuses on essential skills for developing and organizing a course in a career and technical education setting, including lesson planning, student assessment, and developing a syllabus.

**EDU 201 Teaching Practicum I 12**
Students enhance professional skills and work toward attainment of the skills required of a fully-qualified professional-technical educator. Prerequisite: Approval by Dean, Educator Training Center.

**EDU 202 Teaching Practicum II 12**
Students enhance professional skills and work toward attainment of the skills required of a fully-qualified professional-technical educator. Prerequisite: EDU 201.

**EDU 211 Administration Practicum I 12**
Students enhance professional skills and work toward attainment of the skills required of a fully-qualified instruction administrator. Prerequisite: Approval by Dean, Educator Training Center.

**EDU 212 Administration Practicum II 12**
Students enhance professional skills and work toward attainment of the skills required of a fully-qualified instruction administrator. Prerequisite: EDU 201 or EDU 211.

**EDU 220 Professional/Technical Education Capstone 5**
Students document professional skills and attainment of the skills required of a fully-qualified professional-technical educator. Prerequisites: EDU 202 and a minimum of five

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regular quarters of teaching experience.

## ELECTIVES LIST *

**EDU 101 Introduction to School Law 3**
This course is an introduction to the history, political structure, and legal framework of the public school system with emphasis on the basics of school law and how it applies to employees, students, and parents.

**EDU 108 Introduction to Professional/Technical Education 3**
This course provides an introduction to professional/technical education and the fundamentals of competency-based education models.

**EDU 109 Information Literacy 1**
This course focuses on enhancing research skills and integrating information literacy into the curricula.

**EDU 221 Professional/Technical Specialization 12**
Students document professional skills and experience acquired prior to obtaining their position as an instructor to enhance their ability to accurately assess their present skills against the Washington State Skills Standards for Professional-Technical Educators. Prerequisites: Initial certification as a professional-technical instructor and approval by Dean, Educator Training Center.

**EDU 222 Current Topics for Professional/Technical Educators 2**
Students document research/learning acquired at professional conferences which are a minimum of two days in duration, with an emphasis on strategies that can be used to support students within professional-technical oriented programs of study. Prerequisites: Current professional-technical instructor and approval by Dean, Educator Training Center.

**EDU 223 Industry-Based Professional Development I 2**
Students document skills-enhancement activities conducted during return-to-industry endeavors which are at least five days in duration and directly related to one's teaching assignment. Prerequisites: Approval by Dean, Educator Training Center.

**EDU 224 Industry-Based Professional Development II 3**
Students document skills-enhancement activities conducted during return-to-industry endeavors which are at least ten days in duration and directly related to one's teaching assignment. Prerequisite: Approval by Dean, Educator Training Center.

**EDU 226 Student Development and Leadership 3**
This course focuses on integrating student leadership activities into career and technical education classrooms as well as operating student leadership organizations.

**EDU 151 Abuse and Neglect of Children 1**
This course is an introduction to the causes, extent, and dynamics of child abuse and neglect along with mandatory reporting guidelines for educators.

**EDU 228 Work-Based Learning Coordination 3**
This course focuses on building a functional framework to coordinate a work-based learning program. It meets the state requirement for a work-based learning endorsement.

**EDU 229 Diverse Needs of Students 3**
Students learn about meeting the diverse needs of today's students with an emphasis on adolescent development, cultural diversity, and students with disabilities.

**EDU 230 Teaching Practicum – CTE 1**
Students perform a practical teaching experience in a career and technical education setting. Prerequisites: (1) Successful completion of all other CTE teacher preparation courses; (2) First aid/CPR/blood-borne pathogens certification; and (3) fingerprint and background check.

**EDU 231 Advanced Teaching Methods 3**
This course offers advanced teaching strategies for individuals with experience teaching in a career and technical education setting. Prerequisite: EDU 105

**EDU 232 Portfolio Development 1**
Students document professional skills, activities, and education as a culminating activity for teaching certification or tenure process.

**SOC 111 Understanding Diversity 5**
This course focuses on helping students recognize and appreciate diversity in a multicultural society.

**PSYC& 100 General Psychology 5**
This course is an introduction to psychology for people with an interest in all that influences human behavior.

## SHEET METAL TECHNOLOGY

**SHME 101 Introduction to Sheet Metal Technology 3**
Students are introduced to basic hand tools and machines that are used within the sheet metal shop atmosphere. Students are provided instruction and training in workplace human behaviors and interpersonal skills required within the sheet metal occupation. Attendance, punctuality, self-management skills, classroom, shop participation and employer expectations are emphasized.

**SHME 102 Metalworking Machines Technology 4**
Students learn how to use various specialty hand and power operated metalworking machines in the shop atmosphere that were introduced in SHME 101. These include metal cutting shears, bending machines, forming machines, and common power tools.

**SHME 103 Fittings Fabrication I 7**
Students learn how to fabricate a variety of commonly used heating and air conditioning (HVAC) elbows, "Y" branches, and transitional fittings. Students assemble fabricated fittings to form a maze and fabricate custom fittings to complete final assembly. This area of the program begins developing student's technical reading skills.

**SHME 104 Principles of Health and Safety 5**
Students are introduced to the principles of safety and health and hazardous communications as they relate to construction. An introduction to the OSHA/WISHA guidelines, occupational standards are included. Students complete written assignments on these subjects. Students apply various principles in the shop area and as they proceed through the program.

**SHME 105 Materials Technology 3**
Students are introduced to and learn how to apply various elements of material handling and transporting goods used in the sheet metal industry. The subjects covered are tying knots, crane signals, creating travel plans and becoming certified for a straight mast forklift operator.

**SHME 106 Hand Tools and Equipment 4**
Students learn how to properly use various specialty hand tools in the shop atmosphere and are instructed on the proper use of circumference rulers, framing squares, numerous marking tools, metal cutting shears and joining tools.

**SHME 107 Applied Math 5**
Students are introduced to and develop the skills to understand and solve mathematical problems that have direct application to the fabrication and cost estimation of sheet metal components. These assignments include the foundational principals of basic mathematics with equations involving fractions, decimals, percentages, practical geometry construction and trigonometry.

**SHME 108 Introduction to Drafting 2**
Students are introduced to basic terminology, drafting lines, labeling and object projection. Using the proper techniques, students create by hand drafting assignments that develop basic, orthographic and isometric views of shapes and sheet metal components.

**SHME 109 Drafting Techniques 5**
Students develop the skills necessary to visualize, draft and understand common and complex sheet metal components. Students apply triangulation principles and are introduced to parallel line development techniques. Pre-

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requisite: SHME 108

**SHME 110 Layout Math 3**
Students learn how to apply additional mathematical functions to perform pattern and line development for assorted arch lengths, squares, rectangles, and round fittings commonly used in the sheet metal industry. Pre-requisite: SHME 107

**SHME 111 Technology of Seams and Locks 3**
Students use a variety of machines to form complex seams, cleats, kinks and locks used in the fabrication and assembly of ventilation fittings. Pre-requisite: SHME 102

**SHME 112 Fittings Fabrication II 8**
Students' mastery of fabrication and layout skills are applied with the completion of the thirty fittings exam. Thirty commonly used components are produced within thirty hours. Students exercise their critical thinking skills as well as the production techniques that they have learned to this point in the program.

**SHME 120 Introduction to Sheet Metal Technology 3**
Students are introduced to basic hand tools and machines that are used within the sheet metal shop atmosphere. Students are provided instruction and training in workplace human behaviors
and interpersonal skills required within the sheet metal occupation. Attendance, punctuality, self-management skills, classroom, shop participation and employer expectations are emphasized.

**SHME 121 Principles of Health and Safety 2**
Students are introduced to the principles of safety and health and hazardous communications as they relate to construction. Students complete written assignments on these subjects. They apply various principles in the shop area and as they proceed through the program.

**SHME 122 Hand Tools and Equipment 3**
Students learn how to properly use various specialty hand tools in the shop atmosphere and are instructed on the proper use of circumference rulers, framing squares, numerous marking tools, metal cutting shears and joining tools. Pre-requisite: SHME 120

**SHME 123 Metalworking Machines Technology 2**
Students learn how to use power operated metalworking machines in the shop atmosphere. These include metal cutting shears, bending machines, forming machines, and common power tools. Pre-requisite: SHME 120

**SHME 124 Fittings Fabrication I 4**
Students learn how to fabricate a variety of commonly used heating and air conditioning (HVAC) elbows, "Y" branches, and transitional fittings. Students practice assembling a portion of these fittings. Students fabricate several additional custom fittings. This area of the program begins developing student's technical reading skills.

**SHME 125 Applied Math 3**
Students are introduced to and develop the skills to understand and solve mathematical problems that have direct application to the fabrication and cost estimation of sheet metal components. These assignments include the foundational principals of basic mathematics with equations involving fractions, decimals, areas and an introduction to trigonometry.

**SHME 126 Technology of Seams and Locks 2**
Students use a variety of machines to form complex seams, cleats, kinks used in the fabrication and assembly of ventilation fittings. Pre-requisite: SHME 123

**SHME 127 Prefabricated Components 2**
The sheet metal (HVAC) production industry makes available to contractors a variety of installation components, thus saving the sheet metal worker considerable fabrication time. During this course, students learn to identify these system components and applications.

**SHME 128 Material Handling Technology 2**
Students are introduced to and learn how to apply various elements of material handling and transporting goods used in the sheet metal industry. The subjects covered are tying knots, crane signals, creating travel plans.

**SHME 129 Wood Working Tools 1**
Students learn how to safely use carpentry power tools used for modifying wooden structures to accept HVAC and ducting installations.

**SHME 130 Carpentry Installation 3**
Students learn to measure, lay out and cut wooden elements of the residential structure using these openings to allow for the installation of HVAC systems and ductwork. Pre-requisite: SHME 129

**SHME 131 Air Properties Technology 1**
This course is an introduction to the properties of air, air handling principles, and HVAC system requirements.

**SHME 132 Duct installation 3**
Student learn how to install ducting systems, to include main supply ducts, return ducts, wall stacks, and lateral ducts. Pre-requisite: SHME 124

**SHME 133 Residential Venting Technology 2**
Students learn how to determine proper size and install a variety of venting examples for home heating and exhaust systems.

**SHME 134 Unit Operations 2**
Students learn about the operational components of various HVAC systems used in residential installations. Systems include electric furnaces, heat pumps, and gas furnaces. Pre-requisite: SHME 131

**SHME 135 Code Principles 2**
Students learn how to research, follow, and apply local residential and uniform building codes and guidelines as they pertain to the installation of HVAC systems, ducting, and venting.

**SHME 136 Gas Piping Technology 2**
Students learn to select appropriate size pipe, how to cut pipe, and how to use a pipe machine to allow for appropriate fittings.

**SHME 137 Duct Design Technology 3**
Students are introduced to, and learn how to use a Ductulator® to determine duct sizing. Pre-requisite: SHME 131

**SHME 138 Preventive Maintenance 2**
Students learn how to perform basic preventive maintenance procedures on a variety of furnaces and heat pumps. Pre-requisite: SHME 134

**SHME 201 Introduction to Architectural Sheet Metal 3**
Advanced students are introduced to principles and applications of architectural flashings, coping, gutters, downspouts, louver and conductor heads. Tasks involve design, fabrication and installation of these items.

**SHME 202 Introduction to Blueprint Reading 3**
Advanced students are introduced to blueprint organization, terminology, sketching techniques, symbols, and lines. Using the proper techniques, students hand sketch assignments that develop oblique, perspective, isometric and orthographic projections. Students are introduced to different scales of measurements and construction materials.

**SHME 203 Blueprint Reading Applications 5**
Advanced students research information from numerous types of blueprints dealing with all aspects of the construction process. Students are assigned plans and answer questions pertaining to the computer aided designs of highly detailed ventilation systems that are installed in current applications. Pre-requisite: SHME 202

**SHME 204 Layout Drafting II 3**
Advanced sheet metal students continue to develop the spatial thinking skills necessary to visualize and understand more complex sheet metal components. Students apply principles dealing with parallel line and radial

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line development. Pre-requisite: SHME 109

**SHME 205 Layout Drafting III 3**
Advanced sheet metal students apply principles dealing with parallel line, radial line, triangulation and/or combinations of all three areas of layout. Pre-requisite: SHME 204

**SHME 206 Complex Components Fabrication 5**
Advanced sheet metal students are challenged to apply advanced principles to design, layout, and efficiently fabricate complex HVAC ducting elbows, branches, offsets, tapers and transitions. Pre-requisite: SHME 204 and 205

**SHME 207 Energy Codes 3**
Advanced students are introduced to versions of the Washington State Energy Codes, Uniform Mechanical Codes and International Residential Codes. Research is conducted to answer numerous questions about items that directly apply or are associated with the installation or fabrication practices of various sheet metal applications.

**SHME 208 Duct Design and Air Balancing - Basics 5**
Advanced students are introduced to terminology pertaining to this important area of the sheet metal industry. Using mathematical formulas, elements such as friction loss, dynamic loss, cubic feet per minute, feet per minute, cross sectional area, fan pulley sizes, BTUs, duct sizes and round substitutions are calculated for numerous applications.

**SHME 209 Duct Design and Air Balancing - Advanced 5**
Advanced students use computer programs to determine proper heating and cooling loads, friction loss, dynamic loss, cubic feet per minute, feet per minute, cross sectional area, BTUs, duct sizes, critical paths and round substitutions for numerous applications. Pre-requisite: SHME 208

**SHME 210 Solar Heating 2**
Advanced students are introduced to terminology and principals and component identification of solar energy systems. Using mathematical formulas, they determine the operating effects and missing data for simulated applications.

**SHME 211 Commercial Projects 6**
Advanced sheet metal students apply their knowledge of design, lay out, and fabrication to real world, client projects. This includes handling the project from inception from client's requirements, through estimation of materials and shop costs, to completion of finished product.

**SHME 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SHME 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SHME 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SHME 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SHME 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**SHME 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**SHME 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## SOFTWARE DEVELOPMENT

**SOFT 101 Computer Concepts 5**
This course provides an overview of basic computer concepts as they apply to MIS professionals. Emphasis is on basic machine architecture including data storage, manipulation, the human-machine interface including the basics of operating systems, algorithms and programming languages.

**SOFT 102 Programming Fundamentals 5**
In this course, students are provided with the fundamental skills needed for designing computer programs. Focus is on problem analysis and developing algorithms for the step by step solutions to problems

**SOFT 103 Operating Systems 5**
This course is designed to introduce the student to an operating system environment. Instruction includes installation and configuration; learn your way around the desktop, as well as building skills using commands.

**SOFT 121 C-Sharp I 5**
This hands-on course is ideal for learning programming in a Windows environment. Topics include: introduction to C#, controls, variables, constants, dialog boxes, menus, lists, loops and arrays. This class incorporates basic concepts of programming, problem solving, and programming logic and design techniques. PREREQUISITE: Programming Fundamentals

**SOFT 122 C-Sharp -II 5**
This in-depth course will explore intermediate and advanced technologies using the .NET framework. Topics include conditional statements, objects, structures, classes, properties, inheritance, exception handling, string formatting, file handling, and language fundamentals. PREREQUISITE: SOFT 121

**SOFT 132 C++ II 3**
This course includes object-oriented design in the C++ language. Topics covered include inheritance, Dynamic memory allocation, namespaces and code reuse. Prerequisite: JAVA I

**SOFT 142 Programming in JAVA II 5**
Develops fundamental concepts and techniques for analysis, design, and implementation of computer programs using an object-oriented language. Includes graphical user interfaces, event driven programming, recursive techniques, and simple data structures. Prerequisite: Java I

**SOFT 204 Open Source Programming 5**
This course leverages the knowledge gained in previous courses in do development in an open source environment. Students will work in a Linux environment and utilize an open source programming language and open

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source database software. Prerequisites SQL, Operating System and JAVA II.

**SOFT 205 Visual Basic I 5**
This course introduces event-driven computer programming using the Visual BASIC programming language. Topics include input/output operations, syntax, program structure, data types, arithmetical operations, functions, loops, conditional Statements and other related topics. Prerequisite: SOFT 102

**SOFT 206 Visual Basic II 5**
This is an advanced course for Visual Basic. NET, an object-oriented, event-driven language that is a subset of the Visual Studio. NET environment. It is designed to provide programmers familiar with the basic concepts and functionality of Visual Basic.NET with the tools to create more robust application programs. Prerequisite: SOFT 205

**SOFT 207 Dynamic Web Pages 5**
Students design and implement an interactive, data-driven Website using C# and ASP. net. Topics include objects and inheritance; debugging and error handling; managing state and a database server and users; security; and best practices. Prerequisite: SOFT 122

**SOFT 208 Principles of System Analysis and Design 5**
This course examines the spectrum of requirements for the design, planning, and implementation of computer systems. Through case studies, students will analyze existing situations in order to propose new systems solutions

**SOFT 209 Emerging Technologies 5**
This course offers students an opportunity to independently research a technology that is determined by both the instructor and the student. Students will use the acquired skills to create a project or presentation.

**SOFT 210 Mobile Device Programming 5**
Students in this course will be introduced to the development process for creating applications for mobile devices. The course will utilize the JAVA programming language and work with device emulators. Prerequisite: JAVA II

**SOFT 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SOFT 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

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**SOFT 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SOFT 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**SOFT 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**SOFT 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**SOFT 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## WEB DEVELOPMENT

**WEB 101 Microsoft Office Applications 5**
This course focuses on developing essential skills using Word, Excel, PowerPoint, and Outlook. Topics include creating and editing Word documents, and an introduction to Excel worksheets, charts, formulas and basic functions. PowerPoint focuses on enhancing presentations with illustrations and shapes. Outlook introduces essential E-mail and contact management skills. Prerequisite: Keyboarding.

**WEB 102 HTML, XHTML and CSS 5**
Using a text editor, this course builds a strong foundation in HTML, XHTML, and Cascading Style Sheets (CSS) so students can migrate to HTML editors. Students write code integrating CSS right from the start to reinforce concepts

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and skills learned. Prerequisite: Keyboarding.

**WEB 103 Operating Systems 5**
This course is designed to introduce the student to an operating system environment. Instruction includes installation and configuration; learn your way around the desktop, as well as building skills using commands.

**WEB 201 Internet Technologies 5**
From browsing and searching to the latest in emerging Web technologies, this course covers essential to comprehensive topics understanding and using the Internet. Discover the technical concepts and services that make the Internet work. Current Internet trends are identified and discussed in this course. Prerequisite: Computer Concepts.

**WEB 202 Web Authoring Editor 5**
This course focuses on how to design and maintain Web Pages using an industry-standard Web editor. Students practice setup of site configuration, creating and editing web pages using tables, forms, templates, Cascading Style Sheets (CSS), positioning, and media objects. Prerequisite: HTML, XHTML and CSS.

**WEB 203 Photoshop for the Web 5**
Students practice how to edit, manipulate, enhance, and optimize digital images using industry-standard software. Skills covered include selection techniques, working with layers, drawing and painting, enhancing photos, applying filters, creating actions, drawing vector graphics, and creating web pages and animations.

**WEB 204 Web Site Animation using Flash 5**
Students practice hands-on using Flash's drawing, image, text, animation and sound capabilities and build interactive content that can be shared over the Internet. Students will create a Flash web site, integrate Flash components and use basic ActionScript. Prerequisite: Photoshop.

**WEB 205 Web Site Design 5**
This course focuses on Web page planning, basic design, layout and construction of a Web site. Theories related to visual communication and design of online material will be discussed. Prerequisite: Web Authoring Editor, Photoshop for the Web and Site Animation using Flash.

**WEB 206 Technology Topic 5**
This course offers students an opportunity to independently research a technology that is determined by both the instructor and the student. Students will use the acquired skills to create a project or presentation.

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**WEB 290 Capstone Project 5**
This course offers students an opportunity to work on a project researching and applying skills and technologies learned. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WEB 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WEB 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WEB 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WEB 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WEB 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**WEB 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meets with the students to provide support and assistance during the experience.

**WEB 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## WELDING

**WELD 101 Safety Principles 2**
This course is an introduction to the safety practices and procedures common to the welding industry

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**WELD 102 Fabrication Plans 4**
Students learn to read, interpret and create graphic drawings to complete welding projects.

**WELD 103 Pre and Post-welding Activities 2**
This course is an introduction to the tools, equipment, and materials used in the layout and fabrication of welding projects.

**WELD 104 Oxy/acetylene Cutting 3**
This course is an introduction to the use of oxy/acetylene welding and cutting equipment.

**WELD 105 Introduction to Shielded Metal Arc Welding (SMAW) 5**
This course is an introduction to the SMAW process with emphasis safety and theory. This class is the beginning in developing eye - hand coordination using fast fill SMAW electrodes on different grove designs and weld positions.

**WELD 106 Welding Math 5**
Students learn and apply various math concepts to solve problems common to the welding industry. Applications include project estimates including both material and labor costs and layout and fabrication operations. Applied functions range from English/metric conversions to area and volume calculations.

**WELD 107 Torch Brazing and Soldering 1**
Students learn to perform brazing and soldering techniques with emphasis on the changes in the process encountered at various temperatures.

**WELD 108 Full Penetration Welds – Flat/Horizontal 5**
This course is an extension of weld 107, using more advanced welding techniques in the flat and horizontal positions.

**WELD 109 Full Penetration Welds – Vertical/Overhead 5**
This course is an extension of weld 107, using more advances welding techniques in the vertical and overhead positions.

**WELD 110 Full Penetration Welds – Open Root 5**
This course is an advanced SMAW class using fast freeze electrodes in preparation for pipe welding.

**WELD 111 Introduction to Gas Metal Arc Welding (GMAW) 3**
Students receive instruction on the GMAW process learning theory, safety, and equipment set up.

**WELD 112 Gas Metal Arc Welding – Full Penetration 5**

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In this course the students learn the hands-on application of the different transfer modes of GMAW on mild steel in all positions.

**WELD 113 Gas Metal Arc Welding – Aluminum 5**
In this course the students learn the hands-on application of the different transfer modes of GMAW on aluminum in all positions.

**WELD 114 Introduction to Flux Core Arc Welding (FCAW) 5**
Students receive instruction on the FCAW process learning theory, safety and equipment set up.

**WELD 115 Flux Core Arc Welding – Full Penetration 5**
Students learn the hands-on application skill of FCAW in all positions, on mild steel.

**WELD 116 Carbon Arc Cutting (CAC) and Plasma Arc Cutting (PAC) 5**
Students learn how to safely use plasma arc and carbon arc cutting cutting techniques.

**WELD 201 Introduction to Gas Tungsten Arc Welding (GTAW) 5**
This course is an introduction to the gas tungsten arc GTAW welding process. Topics include correct selection of tungsten, polarity, gas, and proper filler rod with emphasis placed on safety, equipment setup, and welding techniques.

**WELD 202 Gas Tungsten Arc Welding – Full Penetration 5**
Students receive instruction on the GTAW process performing fillet and groove welds with various electrodes and filler materials on steel and stainless steel.

**WELD 203 Gas Tungsten Arc Welding – Aluminum 100 5**
Students learn to perform GTAW fillet and groove welds on aluminum.

**WELD 204 Welding Certification Testing – (SMAW) 5**
This course gives the student certification testing time in SMAW.

**WELD 205 Advanced Welding Applications – Pipe/SMAW 5**
This course covers the knowledge and skills that apply to welding pipe. Topics include pipe positions, joint geometry, and preparation with emphasis placed on bead application, profile, and weld discontinuities. Students learn to perform SMAW welds to applicable codes on carbon steel pipe with prescribed electrodes in various positions.

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**WELD 206 Advanced Welding Applications – Pipe/GTAW 5**
This course is designed to enhance skills with the GTAW welding process. Topics include setup, joint preparation, and electrode selection with an emphasis on manipulative skills in all welding positions on pipe.

**WELD 207 Welding Certification Testing – (FCAW) 5**
This course gives the student certification testing time in ((FCAW

**WELD 208 Non-Destructive Testing (NDT) 1**
This course is an introduction to non-destructive testing methods used to detect discontinuities to help assure standards of quality in welding. Emphasis is placed on safety, types and methods of testing, and the use of testing equipment and materials.

**WELD 209 Forklift Training 1**
Students learn to operate forklifts in a safe and professional manner. Important aspects of Forklift operation including safety considerations and center of balance guidelines are emphasized.

**WELD 210 Advanced Welding Applications – Project 5**
This course offers the student the opportunity to use the knowledge and skills learned in class and apply then to actual projects or in the work based learning program with no lecture.

**WELD 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WELD 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WELD 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WELD 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of

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advanced learning in the subject area chosen.

**WELD 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

**WELD 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**WELD 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

## WIRELESS VOICE & DATA COMMUNICATIONS

**WIRE 201 Telecommunications Network Cabling Systems 5**
This course provides students with the skills necessary to take and pass industry certification exam for Network Cabling Specialist. Students train in termination, testing and troubleshooting copper based network to include twisted pair and coaxial cabling systems. Instruction includes lecture and lab on various pin, jack and termination block configurations. All construction and testing will conform to industry standards and specifications.

**WIRE 202 Fiber Optics 5**
Applications of fiber optics, including telecommunications, CATV and computer networks, focusing on the technology, the components and their installation are covered in this course. Students utilize fiber specific equipment to learn and apply the fiber technology and perform fiber termination and testing.

**WIRE 203 FCC Licensure Prep I 5**
Students prepare for Element 1 of the General Radiotelephone Operator License as issued through the Federal Communications Commission. Element 1 exam consists primarily of basic radio law and operating practices questions. Student s who pass Element 1 will receive their Marine Radio Operators Permit.

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**WIRE 204 FCC Licensure Prep II 5**
Students prepare for Element 3 of the General Radiotelephone Operators License as issued through the Federal Communications Commission. This exam consists of radio, electronic circuits, signals and emissions questions. Student s who pass Elements 1 and 3 will receive the GROL License. Students must have knowledge in electronics and electronic communications as a prerequisite to the class.

**WIRE 205 Wireless/RF Communications 4**
This course provides overview of wireless applications, advantages and disadvantages of wireless systems. Introduction to wireless data transmission techniques and standards overview. Simplified, but in-depth look at antennas and their role in successful implementation of a wireless data communications system.

**WIRE 206 Wireless Personal Area Networks 2**
Personal, short distance area wireless networks for interconnecting devices centered around a workspace or home is explored. WPANs address wireless networking and mobile computing devices such as PC's, PDA's, peripherals, cell phones, pagers and consumer electronics. Short range wireless data communications technologies including, infrared, Bluetooth, and ZigBee, RFid, WiMedia and Ultra wide band are introduced.

**WIRE 207 Wireless Local Area Networks 3**
This course examines the fundamentals of various 802.11 wireless standards including frequency bands, bandwidth, data rate, and applications. Topics include WLAN components such as NICs, access points, standards, operations and modulation technologies used to enable communication between devices in a limited area.

**WIRE 208 Wireless Broadband Networks 4**
The fundamentals of medium and long range wireless communications from infrared free-space optics to WiMax, cellular and satellite technologies are covered in this class. Additional technologies studied include local multipoint and multichannel multipoint distribution services used in high speed Internet access, multimedia file transfer, remote access to local area networks and telephone services.

**WIRE 210 Introduction to RF Communications 2**
Students are introduced to wireless RF communications concepts such as radio wave propagation, wavelength, frequency, bandwidth, and signal analysis.

**WIRE 211 Amplitude Modulation 3**
Amplitude modulation principles are introduced to RF communications systems. Stud-

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ies focus on fundamentals of AM transmitters and receivers including measurements with oscilloscope and spectrum analyzer.

**WIRE 212 Single Sideband and Frequency Modulation 4**
Single sideband and frequency modulation principles are introduced to RF communications systems. Studies include principles of modulation, demodulation, transmitters and receivers.

**WIRE 213 Transmission Lines and Antennas 2**
No communications system is complete without a media to transmit information. Types of transmission lines discussed are twisted pair, coaxial, ladder line, and waveguides. Curriculum includes principles of electromagnetic propagation, antenna theory, RF radiation and safety.

**WIRE 214 Microwave, Telephony, and Cellular 2**
This course focus is on microwave, radar communications systems, circuits and transmission methods. Students learn how land line telephone and cell phone systems work. Additional wireless telephony operations to include AMPS, PCS, CDMA, GSM and TDMA.

**WIRE 215 Data and Networking Fundamentals 2**
Studies include basics of data communications and networking fundamentals and topologies, networking hardware and media, LAN's, MAN's and WANs, the seven- layer OSI model and its application, Internet protocol (IP) and MAC addressing concepts, and additional protocols such as TCP, UDP, DHCP and ARP.

**WIRE 216 Advanced Communications Principles 2**
Communications technologies change and advance to meet the desires of an information hungry society. Technologies such as global positioning systems (GPS), fiber optic and laser technology are just some of the methods used to deliver information such as data, video and more which are introduced in this course.

**WIRE 236 RF Communications Lab 5**
Students work with amplitude and frequency modulation transceivers, performing alignments, tests and measurements, with a focus on troubleshooting. Students learn about transceivers, while interfacing with communication equipment such as signal generators, frequency counters, oscilloscopes, and communication systems analyzers.

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**WIRE 237 Telecommunications Lab 5**
This course includes a comprehensive computer interactive training system with complete courseware, supported by lab and experimentation. Lessons include advanced modulation and signal processing techniques such as pulse code modulation , frequency and phase shift keying, and multiplexing schemes such as time and frequency division multiplexing. Students train on microwave communication systems and set up wireless transmit/receive links. In addition, students acquire the skills needed to understand basic telephone, telecommunications and fiber optic systems.

**WIRE 249 Job Search and Preparation 3**
Students learn job search techniques, resume writing, and receive assistance in developing career goals and educational plans.

**WIRE 291 Practical Applications 1-18**
This course offers students an opportunity to work on a lab-based project instead of a work-based learning component. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WIRE 292 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WIRE 293 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WIRE 294 Independent Projects 1-5**
This course offers students an opportunity to work independently on a project that is determined by both the instructor and the student. The project should be based on prior course work and should result in the achievement of advanced learning in the subject area chosen.

**WIRE 296 Work-based Learning Experience 1-18**
Work-based learning (WBL) allows students to participate in on-the-job training in the field in which they are studying. They apply the skills they have learned in the classroom to specific areas of employment in a variety of businesses/industries in the area. The learning activity is based on a written agreement with the participating training provider.

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**WIRE 297 Work-based Learning Seminar 1-2**
Students enroll in the work-based learning seminar in order to receive an orientation to the work-based learning experience. Faculty meet with the students to provide support and assistance during the experience.

**WIRE 298 Work-based Learning – No Seminar 1-18**
This course is provided for students who participate in a work-based learning experience but cannot meet for the weekly seminar. This usually applies to specialized areas where the worksite is outside of the geographical area.

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## Adult Basic Education (ABE) Course Descriptions

For adults seeking to improve skills in reading, writing and math. The following courses prepare students for more advanced courses, to improve COMPASS scores, GED testing, and workplace and life situations.

**AIPS 081 Applied Integrated Problem Solving**
An integrated basic studies and career training course for students with CASAS read/math scores above 235. Students are concurrently enrolled in workforce training programs and address foundational computations and communications skills in the context of the workplace competencies being addressed in their program. Instruction takes place in both classroom and career training laboratory environments. Students transition to developmental general education courses in math and English when ready.

**ABE 050 Beginning Basic Education**
ABE Level 2 course designed to teach reading, writing, and computational skills to individuals who have a goal to improve basic skills and, at intake, score 201-210 on a CASAS test.

**ABE 060 Low Intermediate Basic Education**
ABE Level 3 course designed to teach reading, writing, and computational skills to individuals who have a goal to improve basic skills and, at intake, score 211-220 on a CASAS test.

**ABE 070 High Intermediate Basic Education**
ABE Level 4 course designed to teach reading, writing, and computational skills to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.

**BSEP 046 Basic Studies Educational Planning-Basic Skills**
Course for adult students in all basic studies competency levels with a goal of improving literacy and/or attaining a GED as a means to gain or progress in employment. Course outcomes include assessment of current student abilities, orientation to college resources and services, readiness to learn; student's personal, educational, and employment background and interests; orientation to the GED exams, barrier identification with strategies, recommendations, and interventions, long-term and short-term goal setting, and an education plan of action.

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**BSEP 070 Basic Studies Educational Planning – Vocational**
Course for adult students in all basic studies competency levels with a goal or interest in transition to post secondary education or training. Course outcomes include assessment of current student abilities, orientation to college resources and services, readiness to learn; student's personal, educational, and employment background and interests; student's skill gaps, learning deficiencies, and difficulties; barrier identification with strategies, recommendations, and interventions for improvement; student's long-term and short-term goals; identification of the skills needed to reach those goal, and an education plan of action for the student to transition to post secondary studies

**BSEP 080 BSEP Mental Toughness**
This is a 30-Hour program consisting of skills assessment, goal setting, learning styles and strategies and barrier identification and mitigation planning to prepare students to be successful in selecting and participating in integrated GED preparation and professional technical skills training. Students may take this class only once per academic year.

**ENGL 050 Writing Development III**
Writing simple narrative descriptions and short essays on familiar topics such as customs in native country, has consistent use of basic punctuation, but makes grammatical errors with complex structures. Core Competency Level 3.

**ENGL 070 High Intermediate Basic Writing**
ABE Level 4 course designed to teach writing skills to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.

**ENGL 080 GED Writing**
Basic GED preparation writing course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.

**ESL 057 Low Beginning ESL Listening and Speaking**
ESL Level 2 courses in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 181-190 on a CASAS test.

**ESL 058 Low Beginning ESL Reading and Writing**
ESL Level 2 course in reading, and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 181-190 on a CASAS test.

**ESL 067 High Beginning ESL Listening and Speaking**
ESL Level 3 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 191-200 on a CASAS test.

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**ESL 057 Low Beginning ESL Listening and Speaking**
ESL Level 2 courses in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 181-190 on a CASAS test.

**ESL 058 Low Beginning ESL Reading and Writing**
ESL Level 2 course in reading, and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 181-190 on a CASAS test.

**ESL 067 High Beginning ESL Listening and Speaking**
ESL Level 3 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 191-200 on a CASAS test.

**ESL 068 High Beginning ESL Reading and Writing**
ESL Level 3 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 191-200 on a CASAS test.

**ESL 077 Low Intermediate ESL Listening and Speaking**
ESL Level 4 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 201-210 on a CASAS test.

**ESL 078 Low Intermediate ESL Reading and Writing**
ESL Level 4 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 201-210 on a CASAS test.

**ESL 081 ESL - Success Strategies**
Students learn applied techniques for increasing personal effectiveness and productivity through goal setting, self-reflection, self-evaluation, and positive interactions. This course provides a basis for success in the community and workplace environments by incorporating cultural awareness and adjustment skills.

**Adult Basic Education/ABE**
Adult basic education (ABE) classes help students who may or may not have a high school diploma, improve mathematics, reading and writing skills. Students enroll in adult basic education to prepare for further general education courses, to complement career education, to prepare for General Education Development (GED) testing, and for personal improvement. Students take assessment tests and are then placed in appropriate classes for their skill level and personal educational goals. (See page 14.)

**ESL 068 High Beginning ESL Reading and Writing**
ESL Level 3 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 191-200 on a CASAS test.

**ESL 077 Low Intermediate ESL Listening and Speaking**
ESL Level 4 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 201-210 on a CASAS test.

**ESL 078 Low Intermediate ESL Reading and Writing**
ESL Level 4 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 201-210 on a CASAS test.

**ESL 081 ESL - Success Strategies**
Students learn applied techniques for increasing personal effectiveness and productivity through goal setting, self-reflection, self-evaluation, and positive interactions. This course provides a basis for success in the community and workplace environments by incorporating cultural awareness and adjustment skills.

**ESL 087 High Intermediate ESL Listening and Speaking**
ESL Level 5 course in listening and speaking for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 211-220 on a CASAS test.

**ESL 088 High Intermediate ESL Reading and Writing**
ESL Level 5 course in reading and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 211-220 on a CASAS test.

**ESL 089 Low Advanced ESL**
ESL Level 6 course in listening, speaking, reading, and writing for limited English-proficient adults with a goal to improve their English literacy who, at intake, score 221-235 on a CASAS test.

**GED 080 GED Test Preparation**
Basic GED preparation course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.

**MATH 060 Low Intermediate Basic Math**
ABE Level 3 course designed to teach computational skills to individuals who have a goal to improve basic skills and, at intake, score 211-220 on a CASAS test.

**MATH 070 High Intermediate Basic Math**
ABE Level 4 course designed to teach computational skills to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.

**MATH 080 GED Math Preparation**
Basic GED preparation math course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.

**MATH 086 Pre-Algebra I**
Basic mathmatical and computational concepts for students with a vocational education goal who, at intake, score 236-244 on a CASAS test. Text: Martin-Gay, PreAlgebra, 5th Edition

**MATH 087 Pre-Algebra II**
Basic mathmatical and computational concepts for students with a vocational education goal who at intake score 245 or higher on a CASAS test. Text: Martin-Gay, PreAlgebra, 5th Edition

**READ 050 Beginning Basic Education Reading**
ABE Level 2 course designed to teach reading to individuals who have a goal to improve basic skills and, at intake, score 201-210 on a CASAS test.

**READ 060 Low intermediate Basic Reading**
ABE Level 3 course designed to teach reading to individuals who have a goal to improve basic skills and, at intake, score 211-220 on a CASAS test

**READ 070 High intermediate Basic Reading**
ABE Level 4 reading course designed to teach reading to individuals who have a goal to improve basic skills and, at intake, score 221-235 on a CASAS test.

**READ 080 GED Reading**
Basic GED preparation reading course for students with a goal of earning the General Educational Development (GED) equivalency certificate who, at intake, score 236 or higher on a CASAS test.

**READ 089 Transitional Reading**
Reading skills course for students with a vocational education goal who, at intake, score 236 or higher on a CASAS Reading test. Students progress to READ 090, WRIT 085, ENGL 090 or ENGL 091 based upon instructor recommendation.

**WRIT 085 Writing Transition Lab I**
Competency based small cohort writing instruction for students with CASAS scores 221-259 at entry as an alternative contextual pathway to prepare students for enrollment and success in a specified related instruction course required for a specific professional technical credential. This course may be continued for multiple quarters

## Adult High School Completion Course Descriptions

* CU = Carnegie Units

### ART

**ART 091 Appreciation Public Art .5cu***
Understanding and appreciating public art, past and present. Students trace the heritage of the public art form from cave paintings to modern works in Tacoma. Students address the ideas behind public art and the issues around the vision for public art and the governmental processes by which it is designed, approved and installed.

**Art 092 History of Modern Art .5cu**
The study of the history of the development of modern art, beginning with the 19th Century and concluding with an emphasis on contemporary art and architecture. Students critically examine and assess the esthetics of art styles and ideologies.

**ART 093 Performance Art .5cu**
Students demonstrate thinking skills during the process to develop and perform an artistic work(s) for others.

**ART 095 Visual Arts Portfolio .5cu**
Students demonstrate the ability to apply arts concepts through creation of a visual arts portfolio in one or more arts genre.

**Art 097 Three Dimensional Design .5cu**
Students focus on gaining skills to create 3-dimensional works of art. Students design and construct projects exploring linear, planar, and solid forms through the use of wire, cardboard, wood, and wax.

### ENGLISH

**ENGH 073 Writing Development IV .5cu**
Composing connected paragraphs using correct punctuation, capitalization, usage, spelling, and complex sentence structures. Using computer technology for composition, editing and proofreading.

**ENGH 093 Senior Culminating Project .5cu**
Students attend a series of workshops and complete either a technical or community service project, work with a mentor in school or in the community, develop a personal portfolio of work, write a paper reflecting on their learning and present a multi-media presentation to a community or peer panel.

**ENGH 096 American Literature & Composition .5cu**
The study of a variety of American Literature short stories and novels. Students examine the of the elements of theme, plot, character, setting, point of view, and tone and use a computer to complete online reading and writing assignments.

**READ 073 Reading Development IV .5cu**
Evaluating, comprehending and making inferences from a variety of reading materials including textbooks, technical manuals and works of fiction. High school student placement is after the completion of Basic Studies Educational Planning (BSEP).

### HEALTH

**HLTH 091 Nutrition and Fitness I .5cu**
Nutrition and fitness play a crucial role in maintaining a healthy lifestyle. Study the fundamentals and roles of nutrition and participation in fitness activities. (13 hours lecture; 37 hours lab) Instructor will specify schedule of required lectures.

# General Education (Academics) Course Descriptions

**HLTH 093 Fitness II .5cu**
Learn the importance of establishing individualized fitness goals and safety through classroom presentations and participation in fitness activities. (5 hours lecture; 45 hours lab) Instructor will specify schedule of required lectures.

**HLTH 095 Health I .5cu**
Acquire knowledge and skills necessary to maintain a healthy life and evaluate the impact of real-life influences on health.

## HISTORY/SOCIAL STUDIES

**GEOG 093 World Geography .5cu**
Survey of world geography and its interrelationship with specific areas. Classes are presented in seminar format with lecture and discussion. Students conduct library research to complete an individual research project relating to the world's physical and political geography.

**GLOB 095 Current Global Issues .5cu**
The study of world history, geography and current events, intertwined to show links between past and present with particular attention to current events.

**GOVT 095 Civics .5cu**
A study on how local, state and federal governments work. Extensive study of the U.S. Constitution. The development of the nation from colonization through the Civil War. Explores the American Revolution, formation of the U.S. Constitution, consolidation of the states, early economic growth, slavery, westward expansion and other causes of the Civil War.

**HIST 092 US History II .5cu**
A study of the development of the United States from Reconstruction through present times. Covers the industrial era, Indian affairs, populism, progressivism, various wars, civil rights, the Cold War and its end.

**HIST 096 Washington State History .5cu**
**HIST 096OL Washington State History (Online)**
History of the Pacific Northwest, with emphasis on the political and economic development of Washington State.

**SOC 095 Current Social Issues Through the Media .5cu**
A study of various social issue themes as presented through cinema. Students will view a series of films that pertain to a particular genre and then analyze the symbolism, historical relevance and popular appeal of each work. Students will be required to make informed critiques of the works.

## MATHEMATICS

**MTHH 073 Math Fundamentals .5cu**
Using fractions, decimals, percents, ratios and proportions with life skill application. Combines group instruction with independent assignments. Placement is after completion of Basic Studies Educational Planning (BSEP).

**MTHH 074 Integrated Math .5cu**
Preparation for 90-level MATH classes. Reviews fractions, decimals, percents, and ratios/proportions. Introduction to order of operations, sign numbers, geometry, and math terminology. Group projects with individual assignments. Placement is after completion of BSEP or MTHH 073.

## SCIENCE

**HSCI 091 Human Life Processes .5cu**
Applied biology and chemistry focusing on the life processes of human beings. Includes structure and movement, nutrients and digestion, circulation, respiration and excretion, control and coordination, regulation and reproduction, and immunity and disease. Requires use of a microscope and scientific calculator.

**SCI 093 Continuity of Life .5cu**
Analyze and evaluate the influence of science upon man and technology, focusing on plant and animal cells, reproduction, genetic inheritance, genetic engineering, and biotechnology and how these concepts apply to occupational and social problem solving. Students conduct library and online research to complete projects relating course material to the student's occupational area of interest.

**SCI 094 Introduction to Physics .5cu**
Application of physics in everyday life with emphasis on the conceptual understanding of the underlying principles of motion, friction, gravity, energy, fluids, electricity, and magnetic fields.

**SCI 095 Plant Growth and Reproduction .5cu**
Lab science that includes the study of plant physiology, reproduction, care and treatment, and uses of plants as food and products. Includes the study of current occupational uses of plants and social issues related to controlling plant growth.

**SCI 096 Water .5cu**
The study of water as a compound and as an essential for all life forms. Group seminars are combined with labs. Acid and base solutions and water quality will be studied. Issues related to water rights and responsibilities will be discussed. In addition to group seminars, students will be expected to conduct library and on-line research and complete projects that relate this course material to the student's occupational area of interest.

**SCI 097 Micro-organisms .5cu**
Analyze and evaluate the influence of science upon man and technology with focus on the study of fungi, protists, bacteria, and viruses. Students explore the roles microorganisms play in daily life. Current issues related to biotechnology and genetic manipulation will be discussed. In addition to group seminars, students are expected to conduct library and on-line research to complete projects that relate course material to the student's occupational area of interest.

**SCI 098 Atmospheric Science .5cu**
The application of the science of meteorology for commercial and industrial uses, including meteorological codes used in weather observing and forecasting; types and applications of weather satellite pictures; impact of severe weather (floods, high winds, tornadoes, hurricanes, etc.) on life and the economy; presentation of weather for the media; types and formations of clouds; interpretation of weather radar data; analysis of weather charts; and a practical weather forecasting lab. Elements of the sciences of geography, oceanography, topography, and climatology will be incorporated.

## ART

**ART& 100 Art Appreciation (WAOL) 5**
Prerequisite: ENGL 091
Introduction to the diversity of the art world from ancient civilizations to contemporary society. Art terminology and methods are covered in an overview of artists' materials and techniques. Virtual online access available one week prior to the class start date.

## BIOLOGY

**BIOL 170 Medical Terminology – Basic 1**
Prerequisite: ENGL 091
This course teaches students the basic design of medical terminology and provides a foundation of knowledge for the language of medicine used in allied health fields.

**BIOL 171 Human Anatomy and Physiology 4**
In depth study of human body systems emphasizing the relationship between structure and functions as an introductory course for students beginning study in health sciences and related fields. Includes laboratory activities.

**BIOL 171L Human Anatomy and Physiology Lab 1**
Co-requisite: BIOL 171
Laboratory activities to in this course reinforce understanding of human body systems emphasizing the relationship between structure and functions. Instruction is coordinated with BIOL 171 Human Anatomy and Physiology.

# General Education Course Descriptions

**QTS = Qualifying Test Scores**

**BIOL& 222 Molecular, Cellular and Developmental Biology 5**
Prerequisite: MATH 098 and co-enrollment in Biomedical Laboratory Tech courses
cell structure and function, biological molecules, cellular organelles, metabolism, genetics and embryonic development. Emphasis is placed on using the scientific method and proper experimental design. Includes laboratory activities.

**BIOL& 260 Microbiology 5**
Prerequisite: MATH 098 and Co-enrollment in Biomedical Laboratory Tech courses
Study of microbe structure and classification, organelle function, cellular processes and biochemical reactions, culture requirements and use by humans. In the lab, students learn proper aseptic technique, maintenance of stock bacterial cultures, staining techniques and the use of biochemical tests to identify bacterial unknowns

## BUSINESS

**BA 217 Business Communications (WAOL) 5**
Prerequisite: ENGL 091
Basic writing skills for business applications including grammar, punctuation, spelling and vocabulary with emphasis on business terminology and usage. Practice skills by writing e-mails, memoranda, various kinds of business letters, and a to-file report. Virtual online access available one week prior to the class start date.

## CHEMISTRY

**CHEM& 110 Chemical concepts w/Lab 5**
An introduction to the fundamental principles of chemistry and the predictive power chemistry provides. Topics include elements, compounds, and mixtures; periodic properties of the elements; atomic theory and structure; molecular structure and chemical bonding; chemical notation and nomenclature; mass and molar relations; chemical reactions and the mass and energy changes accompanying them; simple thermodynamics; equilibrium, equilibrium constants and kinetics; properties of gases, liquids, solids, and solutions; properties of acids, bases, and pH; connections between chemistry and daily life. (This course in generally transferable and meets general education requirements for a laboratory science course in an AAS-T degree. (This is an adopted WAOL shared course; start date will be determined by WAOL which may be different than the start of the Bates quarter.)

**CHEM& 141 Introduction to Chemistry 5**
Prerequisite: MATH 098
This course covers the fundamental concepts of inorganic chemistry; principles of atomic and molecular structure, ionic and covalent bonds, chemical reactions, acid/base chemistry, oxidation and reduction reactions, and gas laws.

## COMMUNICATIONS

**ASL& 121 American Sign Language I 5**
An interactive telecourse with VHS tapes exchanged between instructor and student. includes a brief history of ASL, its development, grammatical principles, and vocabulary rules. Vocabulary, finger spelling and sentence structure are developed.

**CMST& 210 Interpersonal Communications 5**
Prerequisite: ENGL 091
Explores human relations including interpersonal communication effectiveness, giving and receiving criticism non-defensively, building empathy, listening effectively, improving nonverbal awareness, and interviewing successfully.

**CMST& 220 Public Speaking 5**
Prerequisite: ENGL 091
Introduction to the rhetoric of speech and the preparation and delivery of speech in an extemporaneous style, including ethical research methods, basic rhetoric and critical analysis, and organization of various types of presentations. Two to four speaking assignments are required, plus regular quizzes, peer review, and written examination. Online resources will be integrated.

**CMST& 230 Small Group Communications 5**
Prerequisite: ENGL 091
Explores human relations including team leadership, conflict management, team dynamics, decision-making, problem solving, and assertiveness strategies. Apply concepts by working in a variety of self-directed problem-solving groups.

## ENGLISH

**EIS 081 Intensive Grammar I/S 5**
For intermediate students of English as a second or foreign language with an emphasis on practical usage and application to prepare students for further developmental general education courses.

**EIS 083 Intensive Reading & Writing for International Students 5**
An intermediate ESL expository written communication course emphasizing critical thought, reflective reading, and information literacy, with attention to grammar and conventions of standard American English.

**EIS 085 Intensive Oral/Aural Skills for International Students 5**
Oral and aural abilities emphasizing peer review discussions, notetaking, lecture comprehension and presentation skills to prepare students for further career education or developmental general education courses.

**EIS 091 Grammar International Students 5**
Prerequisite: EIS 081
For advanced students of English as a second or foreign language with an emphasis on practical usage and application.

**EIS 093 Reading and Writing for International Students 5**
Prerequisite: EIS 083
An expository written communication course emphasizing critical thought, reflective reading, and information literacy, with attention to grammar and conventions of standard American English.

**EIS 095 Oral/Aural for International Students 5**
Prerequisite: EIS 085
Oral and aural abilities designed to prepare students for college-level English courses emphasizing peer review discussions, notetaking, lecture comprehension and presentation skills.

**ENGL 090 Writing for College 5**
Prerequisite: QTS
Critical thinking and composition skills; writing connected paragraphs using correct punctuation, capitalization, usage, spelling, and complex sentence structures.

**ENGL 091 Integrated Reading & Writing II 5**
Prerequisite: ENGL 090
Competency-based communications course to prepare students for college-level general education. Refinement of reading and critical thinking abilities and development of writing skills for specific purposes and audiences.

**ENGL 099 Workplace Communications 5**
Prerequisite: AIPS 081 or ENGL 089
Reading, writing and research assignments pertaining to career education program workplace issues. Students use reading and research skills and complete oral and written communications competency. Sections of this course may be restricted to students in a specific cluster of career education programs. This course satisfies the general education communications requirement for a certificate of competency.

### General Education Courses

General education (academic) courses are designed to provide competence in a variety of learning areas related to career education, and to ensure that all students have a broad, basic education. Areas of study include human relations/leadership, communications and mathematics.

General education courses are required as part of degree and certificate achievement, and are necessary for pursuit of higher-level degrees. (See page 12.)

CREDITS

**ENGL& 101 English Composition I 5**
Prerequisite: ENGL 091
An expository written communication course emphasizing critical thought, reflective reading, and information literacy, with attention to rules and conventions of standard American English.

**ENGL& 235 Technical Writing 5**
Prerequisite: ENGL& 101
Advanced written communication for technical and business purposes based on higher level researching of technical information, organizing data, and writing abstracts, studies and detailed business communications. Requires a formal report using prescribed guidelines, including front and back matter.

## HISTORY

**HIST 101 History of Science and Technology 5**
Prerequisite: ENGL 089
Traces the development of western science technology, examines the roles of philosophers, the church, universities, and scientists. Students become aware of the emergence and expanded role of knowledge seeking that occurred as civilizations expanded and became more complex. Focus is on the contributions of common artisans and craftsmen/women whose activities led to important discoveries that became the basis for numerous scientific theories and technological advancements.

## HUMAN RELATIONS

**HREL 093 Success Strategies - ELL 5**
Applied techniques for increasing personal effectiveness and productivity through goal setting, self-reflection, and positive interactions. Provides a basis for success in educational and workplace environments by incorporating cultural awareness and adjustment skills. Credits may be applied toward meeting certificate of competency human relations requirements.

**HREL 111 Emp. Interviewing/ Self Promotion 5**
Prerequisite: ENGL 089
Students are introduced to the principles of communication in the context of successfully interviewing for a job, learning self-promotion with effective reasoning and evidence, to prepare for interviews, to maximize a positive impression through nonverbal communication, the value of building personal credibility, and how to leave a lasting positive impression. Students practice learned skills by participating in interview situations where their performance is critiqued by classmates and the instructor.

CREDITS

## MATHEMATICS

**MATH 090 Math for Transportation Maintenance Professionals (Automotive Mechanic) 5**
Fundamental computational skills required for transportation maintenance career education programs. Includes basic math operations, conversion of American and metric linear, weight and volume measures, basic geometric shapes and formulas, operations with fractions and decimals, and application of ratio and proportion in solving computational problems.

**MATH 092 Elementary Algebra 5**
Prerequisites: Math 087 or QTS
Review of numerical relationship; introduction to elementary algebra concepts, including real numbers, exponents, the order of operations, algebraic expressions, solving algebraic equations, formulas, problem solving, graphing linear equations, rates of change, slopes of lines, functions, scientific notation, and polynomial functions.

**MATH 093 Business Math I 5**
Prerequisites: MATH 087 or QTS
Basic business math topics: bank records, payroll, taxes, statistical tables and graphs, simple interest and discount, consumer credit, formulas and equations.

**MATH 094 Merchandising Math 5**
Prerequisites: CASAS Math Score of 240 or concurrent enrollment in AIPS 081; or enrollment in the career training program identified for the specific section of this course.
Students learn applied computational skills related to the documentation and conduct of business activities in specific occupations. Focus is on the computational relationships within business forms, daily transactions, and records and the mathematical foundations required to understand and use them. This course is taught in an integrated format within select career training environments.

**MATH 095 Geometry I 5**
Prerequisites: Completion of Algebra in high school; completion of, MATH 092 (Elementary Algebra)with a grade of 2.0 or higher; or a COMPASS Algebra score of 30.

**MATH 096 Business Math II 5**
Prerequisite: MATH 093 or QTS
Advanced business math topics: compound interest, future and present value, annuities and sinking funds, consumer credit, depreciation, inventory and overhead, financial statements, insurance premiums, taxes, stocks and bonds, and a review of algebra.

**MATH 098 Intermediate Algebra 5**
Prerequisite: MATH 092 or QTS
Variables, equations, formulas, algebraic expressions, polynomials, exponents, roots, factoring, quadratic equations, algebraic fractions, graphing of linear and quadratic equations, problem solving, and practical exercises using the scientific calculator.

CREDITS

**MATH& 141 Pre-calculus I 5**
Prerequisite: MATH 098 or QTS
Functions, function operations, rational, polynomial, exponential, logarithmic and linear functions and equation solving, function graphs, matrices and determinants, sequences and series.

**MATH& 142 EH Pre-calculus II 5**
Prerequisite: MATH 098 or QTS
Right and oblique triangle trigonometry, circular functions, graphs of trigonometric functions, identities, inverse trig functions, vectors and polar coordinates, and parametric equations. TI83 Graphing Calculator required.

**MATH& 146 Intro to Stats 5**
Prerequisites: MATH 098 or MATH 174 or QTS
Counting rules, probability, mean and standard deviation, graphing, confidence intervals, hypothesis testing and regression analysis. Application in business and technology.

**MATH& 151 Calculus I (SG/IS) 5**
Prerequisite: MATH& 141 and MATH& 142 or QTS
Limits and limit laws, continuity, tangents and rates of change, derivatives using definition and differentiation rules for polynomial, exponential, trigonometric, logarithmic and transcendental functions, max/min problems, L'Hospital's rule, Newton's method and antidifferentiation.

**MATH 171 Technical Mathematics**
Application of linear and quadratic equations, systems of equations, geometry and trigonometry, and vectors and their applications in the technical workplace. Prerequisites: MATH 092 with a grade of 2.0 or higher or COMPASS algebra score of 55. T183 graphing calculator required. This is an applied course applicable to specific AT degrees and certificates of competency. It is not generally transferable.

**MATH 172 Applied Math Business Focus 5**
Prerequisite: MATH 096 or 098 or QTS
Equation solving, exponents, markup, income tax, compound interest, logarithms and finding time, annuities, amortization and business statistics.

**MATH 173 Mathematic Concepts Child Care/Early Education 5**
Prerequisite: MATH 098 or QTS
The conceptual understanding, connections between and the application of math concepts, including number systems and computation, geometry, measurement, data analysis, probability and statistics, and problem solving in ways appropriate for young children.

**MATH 174 Math for Allied Health 3**
Prerequisites: Completion of Elementary Algebra (MATH 092) with a 2.0 or better or COMPASS Algebra score of 35 or higher. Mathematical concepts for allied health fields including systems of measurement, use of formulas, ratios and proportions in health applications; and basic statistics

CREDITS

## PSYCHOLOGY

**PSYC& 100 General Psychology 5**
Prerequisite: ENGL 091
Introductory psychology for people with an interest in all that influences human behavior. Whether planning a career in psychology or gaining insights about yourself and others, you will find this a useful and interesting open enrollment course of study.

## SOCIOLOGY

**SOC& 101 Introduction to Sociology (WAOL) 5**
Prerequisite: ENGL 091
Study of social groups and their structures, processes, institutions, and interactions. Understanding and applying the sociological perspective, stressing the importance of the impact of social forces external to the individual in shaping people's lives and experiences. Virtual online access available one week prior to class start date.

**SOC 111 Understanding Diversity 5**
Differences and similarities between diverse groups and individuals in our multicultural society and among children, youth, and families. By observing the dynamics of diversity in real life settings, students focus on understanding how cultural differences affect how people interact and communicate and the importance of respecting cultural differences.

**Adult High School Completion**
Students 18 years of age and older may earn a high school diploma at Bates Technical College by completing high school general education courses, continuing education courses, career education programs, and by receiving credit for work-based and community learning experiences. (See page 14.)

# Reference Guide

# Reference Guide

**Bates Technical College faculty** are required to hold a Washington State Professional Technical certificate as outlined in the Washington Administrative Code and rules of the State Board for Community and Technical Colleges.

## Board of Trustees

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BA, Pacific Lutheran University
BS, Montana State University
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AAS, Tacoma Community College
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Certificate, Microcomputer Manager, University of Washington

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ADN, Yakima Valley College

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BS, City University

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AA, Seattle Central Community College
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AAS-T, Bates Technical College

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BA, Western Washington University

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Certificate, Diesel Mechanic; Bates Technical College, Heavy Duty Journeyman Mechanic
ASE Master Heavy Duty Truck Technician
ASE Refrigerant and Recovery
Certifications: Washington State Dept of Ecology: Emission
Cummins National Overhaul Warranty; Caterpillar 3400
Series Engine Technician & Electronic Engine: Federal DOT Inspector

**GORACKE, DIANE**
**Instructor, Administrative Medical Assistant**
AS, Olympic College
Diploma, Medical Records Technician, St. Joseph Hospital
Certified Medical Assistant, AAMA
Certified Medical Transcriptionist, AHDI

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**Instructor, ABE WorkFirst**
BA, Central Washington University

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AA, Pierce College
AAS, Pierce College
Certifications: OCA, Oracle Software

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BA, San Jose State University
Certifications: National Institute for the Certification of Engineering Technicians: NICET level III – Water-Based Fire Protection Systems; NICET level III – Inspection, Testing & Maintenance; NICET level II – Fire Alarms; NICET level II – Suppression Systems; NICET level I – Special Hazards; Washington state Certificate of Competency – Water-based Fire Protection Systems – Level III; Washington state Certificate of Competency – Inspection & Testing Technician – Level III

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Certificate, Welding, Colorado Mesa University; Certifications: AWS Certified Welding Instructor; WABO Weld Examiner; WABO Certified Welder

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AA, Pierce College

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Certificate, Daycare Specialist, Clover Park Technical College

**PEILA, MARK**
**Instructor, Heating, Ventilation, Air Conditioning & Refrigeration**
Technician Journeyman Steamfitter
Certifications: EPA, CFC; NATE (A/C, ACE Service Technician); ARI/ GAMA ICE (Residential A/C and Heating, Light Commercial, Commercial Refrigeration)

**PETERSON, EMMETT**
**Instructor, Computer Networking Systems Technician**
Certifications: A+, CompTIA; PC Pro, TestOut; MOUS, Microsoft

**PIPER, PATRICK**
**Instructor, Fire Service**
BA, Western Oregon University
BA, University of Puget Sound
Certifications: Hazmat Technician; Fire Officer 1; Instructor 1; Rope Rescue Technician; Rescue Systems 1 Instructor; EVAP Instructor; NFPA Incident Safety Officer; Wildland Firefighting Instructor

**PREVO, BETH**
**Instructor, Basic Studies/ESL**
MEd, Seattle University
BA, Lynchburg College

**RAPKOCH, JOAN**
**Instructor, Home & Family Life**
MS, University of Oregon
BS, Western Oregon State College

**REED, STAN**
**Instructor, Electrical Engineering Technician & Electronics Engineering Technician**
AT, Tacoma Community College
Certifications: Certified Engineering Technician, NICET; Electrical Engineering Technician Certification, Bates Technical College; Residential Electrician Trainee Certificate; Radio/Telephone Communications School with Cryptology and Security Clearance, USMC

**RENO, PATTY**
**Instructor, Dental Assisting**
Certified Dental Assistant

**ROBERTSON, LAURA**
**Instructor, Wireless Voice & Data Communications**
AT, Pierce College
Certifications: FCC, IBEW Journeyman Technician; Advanced Fiber Optic (CFOT/ AFOT); Multiple Telecommunications/ Cabling Certifications

**ROBINSON, ROLAND**
**Instructor, Broadcasting and Video Production**
BA, Eastern Washington University
Certified Television Operator, SBE

**ROGEL, SHERYL**
**Instructor, English**
BA, Central Washington University
K-12 Washington State Teaching Certificate

**SAXTON, RACHEL**
**Instructor, Home & Family Life**
AA, Tacoma Community College
Certificate, Early Childhood Education, Bates Technical College

**SCHAEFER, KURT**
**Instructor, History/Social Studies**
Doctoral Candidate, University of Washington
MA, Michigan State University
BA, Albion College
4-12 Washington State Teaching Certificate

**SCHERMAN, ELIZABETH**
**Instructor, Communications**
MA, University of Washington
MAT, University of Puget Sound
BA, Pacific Lutheran University
4-12 Washington State Teaching Certificate

**SCHUB, HELEN SUE**
**Instructor, Librarian**
MS, Pratt Institute
MA, New York University
BA, Queens College

**SCOTT, MICHAEL PAUL**
**Instructor, Broadcasting and Video Production**
AT, Bates Technical College
Certifications: Professional Broadcast Engineer, SBE; Professional Broadcast Engineer with ME, NARTE; Society of Motion Picture & Television Engineers; General Radio Telephone with Ship Radar, FCC

**SHJERVEN, RAY**
**Instructor, Diesel & Heavy Equipment Mechanic**
Certificate, Auto Mechanic, Bates Technical College; Heavy Duty Journeyman Mechanic
Certifications: Deere, Caterpillar Electronic Engine; Eaton Electronic Transmission; Washington State Department of Ecology Emission; ASE Refrigerant and Recovery; Cummins Engine ISC Electronics

**SIDHU, AIMEE**
**Instructor, Occupational Therapy Assistant**
MA, Texas Woman's University
BS, Pacific University
Licensed Occupational Therapist, Wash. state; Educational Staff Associate, School Occupational Therapist, OSPI

**SKEEN, DAVID**
**Instructor, Electronics Technician**
AT, Bates Technical College
Certified Electronics Technician
ISCET Certification Administrator

**SMITH-KLAHN, CHRISTINA**
**Instructor, Home & Family Life**
BA, Southern Illinois University
AA, Fort Steilacoom Community College
AAS, Fort Steilacoom Community College
Child Development Associate Representative

**SMITH, INGRID**
**Instructor, Wed Development**
Certifications: Comp TIA A+; Network+; CIW Site Designer; CIW Certified Instructor; MOS

**STANTON, ROBIN**
**Counselor, Technical High School**
BA, Central Washington University

**STONE, DIANA**
**Instructor, Home & Family Life**
MEd, Lesley College
BS, City University
AA, Pierce College

**STORRAR, ROBERT**
**Instructor, Machinist**
AT (3), Bates Technical College
Certificate, Tool and Die Apprenticeship, Bates Technical College

**TAYLOR, DARRELL**
**Instructor, Fire Service**
Certifications: Fire Officer I; Fire Instructor I; Fire Inspector I; HazMat Technician; HazMat Incident Commander; EVAP Instructor; Fire Department Pumper Operations Instructor; State Fire Fighter I Evaluator

**THOMPSON, KENNETH**
**Instructor, Commercial Truck Driving-Entry Level**
Certifications: Forklift Instructor, Washington State CDL Examiner

**TIGER, ALAN STEELE**
**Instructor, Human Relations and Communications Studies**
MS, University of Oregon
BS, University of Oregon

**TORRES, LEXINE**
**Counselor, Technical High School**
BA, Eastern Washington University

**TOTH, JOSEPH**
**Instructor, Computer Sciences & Network Repair**
BA, Northern Arizona University

**TRAUFLER, ROBERT**
**Career Advisor**
BA, Washington State University

**TROMBLEY, DALE**
**Instructor, Facilities Maintenance Engineer**
MEd, Educational Leadership, City University
BA, University of Washington
AT, Bates Technical College
Certifications: Steam Engineer Grade 1, City of Seattle; Class 1 Chief Operating Engineer, City of Tacoma

**TRUSSLER, TIM**
**Coordinator, Business and Management**
BA, Seattle Pacific University
AAS-T, Bates Technical College
Master Certification, Microsoft Office 2000, 2003

**VANO, JENNIE**
**Instructor, Librarian**
MLIS, University of Texas
BA, Gustavus Adolphus College

**WARD, MARY**
**Instructor, Basic Studies**
BA, University of Puget Sound

**WESTPHAL, WADE**
**Instructor, Commercial Truck Driving-Entry Level**
Certifications: Commercial Vehicle Safety Alliance; Federal Motor Carrier Safety Administrator; Washington Safety Council; Traffic Safety; Driver Training for Public Services; CDL Examiner; American Association of Motor Vehicle Administrators

**WILLIAMS, LEE**
**Coordinator, Business & Management**
MS, University of Arkansas
BS, Embry Riddle Aeronautical University
Certified Project Manager, George Washington University; Microsoft Certified Systems Engineer

**YARBROUGH, WILLIAM DOUG**
**Instructor, Auto Body Rebuilding & Refinishing**
ASE Collision Repair Technician
ASE Refinishing Technician

**YOUNG, BARRY**
**Instructor, Machinist**
Puget Sound Chapter National Tooling & Machining Association
Advanced Locksmithing, Foley-Belsaw Institute, Comp TIA, Lightpoint Learning Solutions, Journeyman Certification, Machinist Certificate of Training US Air Force

**YOUNG, EDWARD**
**Instructor, Mathematics/Science/Social Studies**
BS, Embry Riddle Aeronautical University
Teaching Certificate; History, Government, Mathematics, Computers, University of Washington

**ZYLSTRA-MYTON, KARRIE**
**Instructor, Basic Studies/ESL**
MEd, Seattle University
BA, Western Washington University
TESOL Certification, Western Washington University