

# Facilities Maintenance Engineer

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## Program Description:

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.

For program costs and fees refer to the catalog TUITION AND FEES PAGE.

## Program Learning Outcomes:

1. Maintain, diagnose and repair conventional building technologies and systems: wiring, heating, cooling, plumbing and ventilation systems
2. Repair and maintain basic electrical fixtures
3. Operate common hand tools, electrical test equipment and power tools used in the maintenance trade in a safe and efficient manner
4. Identify National Electrical Code standards, recommended practices and guides for commercial and industrial building electrical distribution
5. Perform basic welding repairs
6. Measure, calculate and estimate needed supplies and costs
7. Read and interpret basic blueprints, shop drawings and electrical schematics
8. Apply safety procedures when using maintenance tools
9. Follow fire prevention practices

**Facilities Maintenance Engineer AAS (120-124 credits) previously listed as 117 credits**

## Required Courses

|           |         |                                       |                            |
|-----------|---------|---------------------------------------|----------------------------|
| Quarter 1 | FACM101 | Safety Principles                     | 2 (changed from 3 credits) |
|           | FACM102 | Fundamentals of Electricity           | 3                          |
|           | FACM103 | Electrical Service                    | 4                          |
|           | FACM104 | Introduction to Blueprint Reading     | 5                          |
|           | FACM105 | Engineering Drawings                  | 4                          |
| Quarter 2 | FACM106 | Introduction to Hydraulics/Pneumatics | 5                          |
|           | FACM107 | Machine Components                    | 5                          |

|           |         |                                      |                                   |
|-----------|---------|--------------------------------------|-----------------------------------|
|           | FACM108 | Mechanical and Machine Maintenance   | 5                                 |
|           | FACM109 | Tools and Equipment                  | <del>5</del> should be 3 cr.      |
| Quarter 3 | FACM111 | Building Maint. and Repair Methods   | 5                                 |
|           | FACM113 | Introduction to Building Maintenance | 3                                 |
|           | FACM121 | Grounds Keeping                      | 5                                 |
|           | FACM222 | Introduction to Remodeling           | 4                                 |
| Quarter 4 | FACM112 | Basic Refrigeration                  | 4 (not previously listed)         |
|           |         | <b>or</b>                            |                                   |
|           | FACM292 | Independent Project I                | 5 (previously listed as elective) |
|           |         | <b>or</b>                            |                                   |
|           | FACM293 | Independent Project II               | 5 (previously listed as elective) |
|           | FACM122 | HVAC Systems                         | 4                                 |
|           | FACM221 | Small Business Planning              | 3                                 |
|           | FACM230 | Computers in Industry                | 2                                 |
|           | FACM231 | Computer Applications                | 4                                 |
| Quarter 5 | FACM140 | Boiler Operations and Certifications | 12                                |
|           | FACM144 | Advanced Boiler Operations           | 5                                 |
| Quarter 6 | FACM143 | Advanced Projects                    | <del>3</del> should be 10 cr.     |
|           | WBAS101 | Welding Basics                       | 8                                 |

FACM296 & 297 deleted as required. They should be electives

### General Education Requirements

Communications 5 credits required

ENGL175

ENGL&101 ENGLISH COMPOSITION I

Humanities/Social Sciences/Natural Sciences/Other 5 credits required

BIOL&160 GENERAL BIOLOGY

BIOL&175 HUMAN BIOLOGY WITH LAB

BIOL&241 ANATOMY & PHYSIOLOGY I

BIOL&242 HUMAN A&P II

|          |                                      |
|----------|--------------------------------------|
| BIOL&260 | MICROBIOLOGY                         |
| CHEM&121 | INTRODUCTION CHEMISTRY               |
| CHEM&131 | INTRODUCTION TO ORGANIC/BIOCHEMISTRY |
| CMST&102 | INTRO TO MASS MEDIA                  |
| CMST&152 | INTERCULTURAL COMMUNICATION          |
| CMST&210 | INTERPERSONAL COMMUNICATION          |
| CMST&220 | PUBLIC SPEAKING                      |
| ECON&201 | MICROECONOMICS                       |
| NUTR&101 | INTRO TO NUTRITION                   |
| POLS&101 | INTRO TO POLITICAL SCIENCE           |
| PSYC&100 | GENERAL PSYCHOLOGY                   |
| PSYC&200 | LIFESPAN PSYCHOLOGY                  |
| SOC&101  | INTRO TO SOCIOLOGY                   |

Quantitative

5 credits required

|          |                            |
|----------|----------------------------|
| MATH172  | APPLIED BUSINESS MATH      |
| MATH&141 | PRECALCULUS I              |
| MATH&142 | PRECALCULUS II             |
| MATH&146 | INTRODUCTION TO STATISTICS |
| MATH&151 | CALUCLUS I                 |
| MATH&152 | CALCULUS II                |

Note: See a Career Advisor prior to choosing courses that meet general education requirements.

**Building/Care Maintenance Certificate of Competence (68 credits)  
previously listed as 69 credits**

**Required Courses**

|           |         |                             |                            |
|-----------|---------|-----------------------------|----------------------------|
| Quarter 1 | FACM101 | Safety Principles           | 2 (changed from 3 credits) |
|           | FACM102 | Fundamentals of Electricity | 3                          |
|           | FACM103 | Electrical Service          | 4                          |

|           |         |                                       |   |
|-----------|---------|---------------------------------------|---|
|           | FACM104 | Introduction to Blueprint Reading     | 5 |
|           | FACM105 | Engineering Drawings                  | 4 |
| Quarter 2 | FACM106 | Introduction to Hydraulics/Pneumatics | 5 |
|           | FACM107 | Machine Components                    | 5 |
|           | FACM108 | Mechanical and Machine Maintenance    | 5 |
|           | FACM109 | Tools and Equipment                   | 3 |
| Quarter 3 | FACM111 | Building Maint and Repair Methods     | 5 |
|           | FACM113 | Introduction to Building Maintenance  | 3 |
|           | FACM121 | Grounds Keeping                       | 5 |
|           | FACM222 | Introduction to Remodeling            | 4 |

### General Education Requirements

Communications 5 credits required

ENGL175

ENGL&101 ENGLISH COMPOSITION I

Humanities/Social Sciences/Natural Sciences/Other 5 credits required

BIOL&160 GENERAL BIOLOGY

BIOL&175 HUMAN BIOLOGY WITH LAB

BIOL&241 ANATOMY & PHYSIOLOGY I

BIOL&242 HUMAN A&P II

BIOL&260 MICROBIOLOGY

CHEM&121 INTRODUCTION CHEMISTRY

CHEM&131 INTRODUCTION TO ORGANIC/BIOCHEMISTRY

CMST&102 INTRO TO MASS MEDIA

CMST&152 INTERCULTURAL COMMUNICATION

CMST&210 INTERPERSONAL COMMUNICATION

CMST&220 PUBLIC SPEAKING

ECON&201 MICROECONOMICS

NUTR&101 INTRO TO NUTRITION

POLS&101 INTRO TO POLITICAL SCIENCE

|          |                     |
|----------|---------------------|
| PSYC&100 | GENERAL PSYCHOLOGY  |
| PSYC&200 | LIFESPAN PSYCHOLOGY |
| SOC&101  | INTRO TO SOCIOLOGY  |

Quantitative

5 credits required

|          |                            |
|----------|----------------------------|
| MATH172  | APPLIED BUSINESS MATH      |
| MATH&141 | PRECALCULUS I              |
| MATH&142 | PRECALCULUS II             |
| MATH&146 | INTRODUCTION TO STATISTICS |
| MATH&151 | CALUCLUS I                 |
| MATH&152 | CALCULUS II                |

Note: See a Career Advisor prior to choosing courses that meet general education requirements.

### **Building/Care Maintenance I Certificate of Training (18 credits) previously listed as 19 credits**

#### **Required Courses**

|         |                                   |                            |
|---------|-----------------------------------|----------------------------|
| FACM101 | Safety Principles                 | 2 (changed from 3 credits) |
| FACM102 | Fundamentals of Electricity       | 3                          |
| FACM103 | Electrical Service                | 4                          |
| FACM104 | Introduction to Blueprint Reading | 5                          |
| FACM105 | Engineering Drawings              | 4                          |

### **Maintenance Technician I Certificate of Training (18 credits)**

#### **Required Courses**

|         |                                       |   |
|---------|---------------------------------------|---|
| FACM106 | Introduction to Hydraulics/Pneumatics | 5 |
| FACM107 | Machine Components                    | 5 |
| FACM108 | Mechanical and Machine Maintenance    | 5 |
| FACM109 | Tools and Equipment                   | 3 |

### **Building/Care Maintenance II Certificate of Training (17 credits)**

#### **Required Courses**

|         |                                   |   |
|---------|-----------------------------------|---|
| FACM111 | Building Maint and Repair Methods | 5 |
|---------|-----------------------------------|---|

|         |                                      |   |
|---------|--------------------------------------|---|
| FACM113 | Introduction to Building Maintenance | 3 |
| FACM121 | Grounds Keeping                      | 5 |
| FACM222 | Introduction to Remodeling           | 4 |

## Maintenance Technician II Certificate of Training (17 credits)

### Required Courses

|         |                         |   |
|---------|-------------------------|---|
| FACM112 | Basic Refrigeration     | 4 |
| FACM122 | HVAC Systems            | 4 |
| FACM221 | Small Business Planning | 3 |
| FACM230 | Computers in Industry   | 2 |
| FACM231 | Computer Applications   | 4 |

## Boiler Operations Certificate of Training (17 credits)

### Required Courses

|         |                                      |    |
|---------|--------------------------------------|----|
| FACM140 | Boiler Operations and Certifications | 12 |
| FACM144 | Advanced Boiler Operations           | 5  |