College of Micronesia – FSM
P.O. Box 159
Kolonia, Pohnpei

Course Outline Cover Page

Building Maintenance III — Course Title
VBM 103 — Department and Number

Course Description:
Provides the students with practical opportunities to service and maintain plumbing and drainage systems using a variety of hand and power tools. This course will also provide the student with knowledge and hands-on experience in general servicing and maintenance of air-conditioning units.

Prepared by: Jeff Steel **State:** Pohnpei Campus

	Hours per Week	No. Of Weeks	Total Hours	Semester Credits
Lecture	3/6	16/8	48	3
Laboratory	3/6	16/8	48	1
		Total Semester Credits:		4

Purpose of Course

Degree Requirement	
Degree Elective	XX
Advanced Certificate	
Certificate	XX
Apprenticeship	XX
Other (Workshop)	

Prerequisite Course(s): VSP 153a Industrial Safety
VBM 102 Building Maintenance II

_____ _____
Signature, Chairman, Curriculum Committee **Date Approved by Committee**

_____ _____
Signature, President, COM-FSM **Date Approved by the President**

COURSE TITLE **BUILDING MAINTENANCE III**

Nominal Duration **96Hours/4 Credits**

Course Code **VBM 103**

General Objective Provides the students with practical opportunities to service and maintain plumbing and drainage systems using a variety of hand and power tools. This course will also provide the student with knowledge and hands-on experience in general servicing and maintenance of air-conditioning units.

Prerequisites VSP 153a Industrial Safety & VBM 102 Building Maintenance II
A student may seek recognition for competencies already held.

Specific Objectives: Upon successful completion of this course the student will be able to:

1. **Explain the meaning of terms commonly used in the building maintenance plumbing trade.**
2. **Describe the safety precautions to be observed when performing plumbing and drainage work.**
3. **Identify, select, use, maintain and store hand tools and equipment used in building maintenance plumbing.**
4. **List and describe the application of various materials and supplies used in plumbing maintenance**
5. **Select, fit and correctly install the water supply and drainage system to various fixtures.**
6. **Interpret plumbing installation plans from various architectural drawings and draw an isometric sketch of a water supply and drainage system.**
7. **Perform selected maintenance and repair on plumbing systems.**
8. **Describe the basic fundamentals of an air-conditioning unit.**

9. **Correctly identify, use, maintain and store tools used in the maintenance of air-conditioning units.**

10. **Identify different types of air-conditioning systems and their major parts.**

11. **Identify all parts on an electrical plan for an air-conditioning unit and explain their function.**

12. **Demonstrate the correct method of determining leaks in gas lines.**

13. **Demonstrate correct servicing procedure for both box and split type air-conditioning units.**

14. **Demonstrate the correct procedure for re-charging an existing air-conditioning unit.**

Delivery Delivery methods must provide for the demonstration of competence in skills specified in all learning outcomes.

Assessment More than one learning outcome may be assessed at once, by observing the learners ability to apply both specified skills and knowledge.

STUDENTS SHOULD BE MADE AWARE OF OCCUPATIONAL HEALTH AND SAFETY ISSUES IN ALL SITUATIONS AND BE EXPECTED TO DEMONSTRATE SAFE WORKING PRACTICES AT ALL TIMES.

LEARNING OUTCOME 1 **Industry Terminology**

VBM 103.1

Explain the meaning of terms commonly used in the building maintenance plumbing trade.

Assessment Criteria

103.1.1 State clearly the meaning of terms commonly used to identify plumbing fixtures and components used for plumbing.

103.1.2 Identify the roles of specified personnel and professions in the industry such as

- Architects
- Engineers
- Project Managers
- Sub-contractors

All work practices must ensure that safe practices are adopted.

Conditions

Working in groups given:

- **Resources**
- **Verbal presentation to the group of learners**

Assessment Method

Assessment may involve any of the following methods

- **Oral questioning**
- **Written tests**
- **Computer managed testing**
- **Individual written assignments**
- **Active participation in group activity**

LEARNING OUTCOME 2 **Plumbing and Drainage Safety**

VBM 103.2

Describe the safety precautions to be observed when performing plumbing and drainage work.

Assessment Criteria

103.2.1 List the general safety rules and procedures relating to:

- Shop Safety
- Fire Safety
- Individual safety
- Trenches

103.2.2 Explain the necessity to develop safe working practices.

All work practices must ensure that safe practices are adopted.

Conditions

Working in groups given:

- **Resources**
- **Verbal presentation to the group of learners**
- **Demonstration of procedure**

Assessment Method

Assessment may involve any of the following methods

- **Oral questioning**
- **Written tests**
- **Computer managed testing**
- **Practical exercisers**
- **Active participation in group activity**

LEARNING OUTCOME 3 **Equipment and Tools used in Plumbing Maintenance**

VBM 103.3

Identify, select, use, maintain and store hand tools and equipment used in building maintenance plumbing.

Assessment Criteria

103.1.1	Identify hand tools commonly used in building maintenance plumbing.
103.1.2	Select hand tools and equipment for specified plumbing maintenance tasks.
103.1.3	Demonstrate the safe use of hand tools and equipment in the workplace when completing specified tasks.
103.1.4	Demonstrate the safe cleaning and maintenance of tools and equipment specified.
103.1.5	Select and fit relevant personal protective equipment required to be worn when operating and handling basic hand tools and equipment.

All work practices must ensure that safe practices are adopted.

Conditions

- **Verbal presentation to the group of learners**
- **Workplace visits to various sectors of Industry**

Assessment Method **Assessment may involve any of the following:**

- **Oral questioning**
- **Written testing**
- **Computer managed testing**
- **Practical Exercisers**
- **Active participation in group activity**

LEARNING OUTCOME 4 **Materials**

VBM 103.4

List and describe the application of various materials and supplies used in plumbing maintenance

Assessment Criteria

103.4.1 List various supplies and components used in plumbing maintenance.

103.4.2 Identify different materials used in the manufacture of the above components.

103.4.3 Describe the application of the various pipes and fittings.

All work practices must ensure that safe practices are adopted.

Conditions

- **Verbal presentation to the group of learners.**
- **Resources**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written testing**
- **Computer managed testing**
- **Practical Exercisers**
- **Active participation in group activity**

LEARNING OUTCOME 5 **Installation of Water Supply**

VBM 103.5

Select, fit and correctly install the water supply and drainage system to various fixtures.

Assessment Criteria

103.5.1 List the various types of fixtures such as:
- Hand Basin
- Toilet Cistern
- Hot Water Heater

103.5.2 Demonstrate the proper installation procedures for each fixture.

103.5.3 Demonstrate the correct procedure for installing water supply and drainage connection for each fixture.

All work practices must ensure that safe practices are adopted.

Conditions

- **Verbal presentation to the group of learners.**
- **Resources**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Computer managed testing**
- **Practical Exercisers**
- **Active participation in group activity.**

LEARNING OUTCOME 6 **Plan Interpretation**

VBM 103.6

Interpret plumbing installation plans from various architectural drawings and draw an isometric sketch of a water supply and drainage system.

Assessment Criteria

103.6.1 Recognize plumbing symbols and abbreviation used in architectural drawings.

103.6.2 List the different types of plans and their use.

103.6.3 Draw an isometric sketch of a water supply and drainage system to a specified fixture.

All work practices must ensure that safe practices are adopted.

Conditions

- **Verbal presentation to the group of learners.**
- **Resources**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Computer managed testing**
- **Active participation in group activity**

LEARNING OUTCOME 7 **Maintenance & Repair of Damaged Systems**

VBM 103.7

Perform selected maintenance and repair on plumbing systems.

Assessment Criteria

103.7.1 Locate and repair leaks on a water supply system.

103.7.2 Locate and repair leaks on a drain-waste-system (DMV).

103.7.3 Repair or replace leaking water faucets or valves.

103.7.4 Repair and/or replace flush valves on water closets.

103.7.5 Locate and remove an obstruction in drain lines using a manual or electric snake.

103.7.6 Replace electric water heater element.

All work practices must ensure that safe practices are adopted.

Conditions

- **Examples of defects supplied**
- **All tools and equipment required to remove defects supplied**

Assessment Method **Assessment may involve any of the following methods**

- **Oral questioning**
- **Written tests**
- **Computer managed testing**
- **Practical exercisers**
- **Active participation in group activity**

LEARNING OUTCOME 8 **Basic Fundamentals**

VBM 103.8

Describe the basic fundamentals of an air-conditioning unit.

Assessment Criteria

103.8.1 Describe the function of air-conditioning units

103.8.2 Explain terms used in air-conditioning industry**.**

103.8.3 List the different types of air-conditioning units and their application.

All work practices must ensure that safe practices are adopted.

Conditions

- **Resources**
- **Examples of air-conditioning units supplied**

Assessment Method

Assessment may involve any of the following:

- **Oral questioning**
- **Written testing**
- **Computer managed testing**
- **Practical exercisers**
- **Active participation in group activity**

LEARNING OUTCOME 9 **Equipment and Tools used for Air-conditioning Units**

VBM 103.9

Correctly identify, use, maintain and store tools used in the maintenance of air-conditioning units

Assessment Criteria

103.9.1	Identify hand tools in common use in air-conditioning maintenance.
103.9.2	Select hand tools and equipment for specified maintenance tasks.
103.9.3	Demonstrate the safe use of hand tools and equipment in the workplace when maintaining air-conditioning units**.**
103.9.4	Demonstrate the safe cleaning and maintenance of tools and equipment specified.
103.9.5	Select and fit relevant personal protective equipment that is to be worn when operating and handling basic hand tools and equipment.

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All work practices must ensure that safe practices are adopted.

Conditions

- **Demonstration to the group of learners.**
- **Examples of materials supplied**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Practical exercisers.**
- **Active participation in group activity**

LEARNING OUTCOME 10 **Air-conditioners Systems**

VBM 103.10

Identify different types of air-conditioning systems and their major parts

Assessment Criteria

103.10.1 List the different types of air-conditioning systems.

103.10.2 Identify the major parts of an air-conditioning unit.

103.10.3 Describe the function of these parts.

103.10.4 Explain the main fault that can occur with each part and it's effect.

All work practices must ensure that safe practices are adopted.

Conditions

- **Demonstration to the group of learners.**
- **Examples of materials supplied**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Practical exercisers.**
- **Active participation in group activity**

LEARNING OUTCOME 11 **Electrical Parts and Faults**

VBM 103.11

Identify all parts on an electrical plan for an air-conditioning unit and explain their function.

Assessment Criteria

103.11.1 Identify from a drawing all major electrical and mechanical components of an air-conditioning unit.

103.11.2 Explain the function of each major electrical component.

103.11.3 Explain the main fault that can occur with each component and it's effect.

103.11.4 Demonstrate the correct procedure in rectifying a faulty electrical component.

103.11.5 Explain the function of each mechanical component of an air-conditioning system.

All work practices must ensure that safe practices are adopted.

Conditions

- **Demonstration to the group of learners.**
- **Examples of materials supplied**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Practical exercisers.**
- **Active participation in group activity**

LEARNING OUTCOME 12 **Identifying Gas Leaks**

VBM 103.12

Demonstrate the correct method of determining leaks in gas lines.

Assessment Criteria

103.12.1 Identify the tools needed to test gas lines

103.12.2 Demonstrate correct use of a vacuum pump.

103.12.3 Demonstrate the correct procedure to isolate leaking gas lines.

103.12.4 Explain the procedure for repairing leaks.

All work practices must ensure that safe practices are adopted.

Conditions

- **Demonstration to the group of learners.**
- **Examples of materials supplied**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Practical exercisers.**
- **Active participation in group activity**

LEARNING OUTCOME 13 **Servicing Air-Conditioning Units**

VBM 103.13

Demonstrate correct servicing procedure for both box and split type air-conditioning units.

Assessment Criteria

103.13.1	Explain the benefits of regular servicing.
103.13.2	Describe the correct procedure to service a split-type air-conditioning unit.
103.13.3	Demonstrate the correct procedure to service a split-type air-conditioning unit.
103.13.4	Describe the correct procedure to service a box-type air-conditioning unit.
103.13.5	Demonstrate the procedure to service a box-type air-conditioning unit.
103.13.6	Demonstrate the correct method of cleaning up after servicing air-conditioning units.

All work practices must ensure that safe practices are adopted.

Conditions

- **Demonstration to the group of learners.**
- **Examples of materials supplied**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Practical exercisers.**
- **Active participation in group activity**

LEARNING OUTCOME 14 **Recharging Air-conditioning Units**

VBM 103.14

Demonstrate the correct procedure for re-charging an existing air-conditioning unit.

Assessment Criteria

103.14.1	Identify the correct tools needed to recharge Air-conditioning units
103.14.2	Demonstrate correct use of a vacuum pump.
103.14.3	Describe the correct procedure to recharge with appropriate gas.
103.14.4	Demonstrate the correct procedure for recharging air-conditioning units with appropriate gas.

All work practices must ensure that safe practices are adopted.

Conditions

- **Demonstration to the group of learners.**
- **Examples of materials supplied**

Assessment Method

Assessment methods may involve any of the following methods:

- **Oral questioning**
- **Written tests**
- **Practical exercisers.**
- **Active participation in group activity**

SUGGESTED REFERENCE MATERIALS

- **Manufacturers Service Manuals**
- ***Principles of Electric Circuits*, Sixth Edition, Thomas l Floyd.**
- **Carpentry and Building Construction, Fifth Edition. (Glencoe, McGraw-Hill)**
- ***Modern Refrigeration and Airconditioning* by Andrew D. Althouse, B.S., (M.E.) M.A.**

RESOURCES

- **Workshop Facilities**
- **Demonstration Units**
- **Appropriate Materials and Supplies**

GRADES

Final Grades for this course will be assessed based on COM-FSM policy and course requirements at the following percentage rates:

90% - 100%	**A – Superior**
80% - 89%	**B – Above Average**
70% - 79%	**C – Average**
60% - 69%	**D – Below Average**
0 - 59%	**F - Failure**

ATTENDANCE

The COM-FSM attendance policy will apply.