

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

## Course Outline Cover Page

**Fuel, Engine Cooling, & Standard Power Train Systems**  
Course Title

**VTM 102**  
Department and Number

**Course Description:** This course introduces students to the design, function and operation of automotive fuel systems, engine cooling and standard power train systems. Students will have a basic understanding about the function and operation of carbureted fuel system, basic fuel injection, fuel pumps, fuel lines, air and water-cooled engines, basic operating principles of clutches, standard transmissions, drive lines, and rear axles. They will be introduced to the basic repair and maintenance of the above mentioned systems. Use of service manuals and publications will also be covered in the course.

**Prepared by:** Pablo H. Lamsis, Jr.

**State:** Pohnpei Campus

	Hours per Week	No. Of Weeks	Total Hours	Semester Credits
<b>Lecture</b>	3	16	48	3
<b>Laboratory</b>	3	16	48	1
<b>Total Semester Credits:</b>				4

**Purpose of Course**

Degree Requirement \_\_\_\_\_  
Degree Elective \_\_\_\_\_  
Advanced Certificate \_\_\_\_\_  
Certificate \_\_\_\_\_  
Remedial \_\_\_\_\_  
Other (Workshop) \_\_\_\_\_

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**Prerequisite Course(s):** VTM 101 or concurrently.

\_\_\_\_\_  
**Signature, Chairman, Curriculum Committee**

\_\_\_\_\_  
**Date Approved by Committee**

\_\_\_\_\_  
**Signature, President, COM-FSM**

\_\_\_\_\_  
**Date Approved by the President**

**I. LEARNING OUTCOMES:**

**A. General Learning Outcomes:** Upon successful completion of this course, students will competently be able to:

1. Explain the design, function, and operation of carburetors and basic fuel injection systems.
2. Differentiate engine cooling systems types, identify their major components, and explain their functions.
3. Identify major parts of the standard power train systems and explain their operation and function.
4. Demonstrate the ability to access and understand instructions from service manuals and publications.
5. Demonstrate basic maintenance of the fuel, engine cooling and power train systems.

**B. Specific Learning Outcomes: Learning Outcomes:** On completion of this course students will be able to:

**Learning Outcome 1: Explain the design, function and operation carburetors and basic fuel injection systems.**

- Assessment Criteria:
- a. Explain the principles of carburetion.
  - b. Trace fuel system layout and explain function of related components.
  - c. Define fuel injection and explain function of related parts.

Assessment Method: Multiple choice questions  
Short answer questions  
Practical exercises/tests

**Learning Outcome 2: Differentiate engine cooling systems types, identify their major components, and explain their functions.**

- Assessment Criteria:
- a. Explain why there's a need for regulating operating temperature of the cooling system.
  - b. Enumerate the types of engine cooling systems used, and explain their operation.
  - c. Explain the function of cooling system's major components.

Assessment Method: Multiple choice questions

Short answer questions  
Practical exercises/tests

**Learning Outcome 3: Identify major parts of the standard power train systems and explain their operation and function.**

- Assessment Criteria:
- a. Draw out a block diagram of the various power train designs and trace its power flow.
  - b. Enumerate parts and explain function and operation of the drive lines and differentials used in automobiles.

Assessment Method:  
Multiple choice questions  
Short answer questions  
Practical exercises/tests

**Learning Outcome 4: Demonstrate the ability to access and understand instructions from service manuals and publications.**

- Assessment Criteria
- a. Demonstrate the ability to interpret instructions from service manuals.
  - b. Demonstrate the ability to access internet-based vehicle recalls, publications and service informations.

Assessment Method  
Multiple choice questions  
Short answer questions  
Practical exercises/tests

**Learning Outcome 5: Demonstrate basic maintenance of the fuel, engine cooling, and power train systems.**

- Assessment Criteria
- a. Perform basic cooling systems maintenance.
  - b. Perform basic power train systems maintenance.
  - c. Perform basic fuel systems maintenance.

Assessment Method  
Multiple choice questions  
Short answer questions  
Practical exercises/tests

***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.***

**II. COURSE CONTENTS:**

1. Fuel system
  - Design, function, and operation of carburetors.
  - Components related to the fuel system, such as the fuel pump, filters and fuel lines.
  - Basic fuel injection system.
2. Standard power train system
  - Design, function, and operation of various transmissions.
  - Drive lines and differentials used with the automobile.
3. Engine cooling system
  - Need for regulation of operating temperature of cooling systems.
  - Cooling system types
  - Function of various components in the system.
4. Service manuals and publications
  - Manufacturer's (service) manuals
  - Vehicle recalls and publications
5. Basic maintenance
  - Engine cooling system
  - Fuel system
  - Power train system

**III. TEXTBOOK:**

Modern Automotive Technology, Duffy, 2003

**IV. REQUIRED COURSE MATERIALS:****1. Instructor:**

- a. Classroom with whiteboard
- b. Laboratory equipment with tools of the trade
- c. Text, Teacher's Resource Guide, workbook
- d. Computer, Overhead projector, transparencies

**2. Student:**

- a. Text(s), handouts provided when deemed necessary by the Instructor
- b. Ring binder
- c. College ruled note sheet, pencil or pen
- d. Tool Kit

**V. REFERENCE MATERIALS:**

*Modern Automotive Technology, Duffy*  
*How Stuff Works, www.howstuffworks.com*  
*Manufacturer's Service Manuals*  
*NIDA (Introductory Lessons Only)*  
*Selected Films and Charts from Various Sources*

**VI. METHODS OF INSTRUCTION:**

1. Computer Aided Instruction
2. Practical/Experimentation
3. Lecture/Demonstration

**VII. EVALUATION:**

Final Grade for this course will be based on meeting the course requirements at the following percentage rates:

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

**VIII. ATTENDANCE POLICY:**

The COM-FSM attendance policy will apply.

**IX. ACADEMIC HONESTY POLICY:**

The COM-FSM academic honesty policy will apply.