



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

LAST REVIEW: 2008-2009

(i.e. 2003-2004)

NEXT REVIEW: 2032-2014

(i.e. 2008-2009)

STATUS: A

(A, I, D)

COURSE TITLE: Lubrication Systems

COMMON COURSE NUMBER: AMT 2435

CREDIT HOURS: 1

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS: 42

(Voc. Course ONLY)

Lecture: **16**

Lab: **26**

Clinic:

Other:

PREREQUISITE(S): None

COREQUISITE(S): None

PRE/COREQUISITE(S): None

COURSE DESCRIPTION *(750 characters, maximum):* Provides a comprehensive knowledge of the purpose, and function of lubricants, and lubrication systems for power plants; Gives experience in identifying and selecting lubricants as well as inspecting, checking, servicing, and troubleshooting repair of the system and components. Student fee charged.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area

General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area

General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

UNIT TITLES

1. Lubricants
2. Lubrication System Components
3. Engine Lubrication Systems

ASSESSMENT:



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Please provide a brief description (250 characters maximum) that details how students will be assessed on the course outcomes.

1. **Quizzes, Test, and/or Final Exam (cumulative/comprehensive);**
2. **Selected faculty may assess homework, projects, class participation/attendance, and/or extra credit projects.**
Upon successful completion of this course, the students should be able to identify and select lubricants and inspect, check, service and troubleshoot repair of the lubrication system and its components.

**** Complete the following only if course is seeking general education status ****

GENERAL EDUCATION Competencies and Skills *:

Please highlight in **green** font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

| | |
|--|--|
| 1. Read with critical comprehension | |
| 2. Speak and listen effectively | |
| 3. Speak and listen effectively | |
| 4. Think creatively, logically, critically, and reflectively (analyze, synthesize, apply, and evaluate) | |
| 5. Demonstrate and apply literacy in its various forms: (highlight in green ALL that apply) (1. technological, 2. informational, 3. mathematical, 4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or 8. environmental) | |
| 6. Apply problem solving techniques to real-world experiences | |
| 7. Apply methods of scientific inquiry | |
| 8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings | |
| 9. Demonstrate an understanding of and appreciation for human diversities and commonalities | |
| 10. Collaborate with others to achieve common goals. | |
| 11. Research, synthesize and produce original work | |
| 12. Practice ethical behavior | |
| 13. Demonstrate self-direction and self motivation | |
| 14. Assume responsibility for and understand the impact of personal behaviors on self and society | |
| 15. Contribute to the welfare of the community | |

** General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*



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Common Course Number: AMT 2435

UNITS

Unit 1 Lubricants

General Outcome:

- 1.0 The student shall:** The students should be able to identify and select lubricants.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Describe the desirable characteristics for aircraft engine lubricating oils.
- 1.2 Explain the meaning and importance of oil viscosity.
- 1.3 Explain the meaning and significance of oil flash point.
- 1.4 Describe the purpose of using synthetic lubricants for turbine engines.
- 1.5 Describe the effect of heat on lubricants.
- 1.6 List the grade designations for aviation oils.
- 1.7 List the designations for synthetic turbine oil.
- 1.8 Describe the results of operating an engine using an incorrect lubricant.
- 1.9 Describe the functions of engine oil in addition to lubricating the engine.



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Unit 2 Lubrication System Components

General Outcome:

2.0 The student shall: The students should be able to repair engine lubrication system components.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1 Clean and repair aluminum alloy external oil lines.
- 2.2 Clean external lubrication system components.
- 2.3 Describe the function and location of an oil temperature regulator.
- 2.4 Discuss the size requirement for the oil inlet line.
- 2.5 Clean and test oil tanks.
- 2.6 Describe the purpose and operation of the oil cooler.
- 2.7 Describe the operating principles of lubrication pumps.



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COURSE OUTLINE

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Unit 3 Engine Lubrication Systems

General Outcome:

The student shall: The students should be able to inspect, check, service, troubleshoot and repair engine lubrication systems.

Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1 Determine source and cause of metallic particles in the lubricating oil.
- 3.2 Describe the purpose and principles of operation of engine oil dilution systems.
- 3.3 Describe the expansion space requirements for engine oil supply tanks.
- 3.4 Describe the purpose for changing engine lubricating oil at specified intervals.
- 3.5 Discuss the type of lubrication system generally used in high-volume reciprocating engines.
- 3.6 List the factors that affect the oil consumption of a reciprocating engine.
- 3.7 Explain the method normally used to prevent excessive oil from accumulating in the cylinders of inverted engines or the lower cylinders of radial engines.
- 3.8 Describe the method of controlling the oil film on cylinder walls.
- 3.9 Describe the method of lubricating the valve-operating mechanism in an overhead-valve engine.
- 3.10 Explain the venting requirements of dry-sump and wet-sump engine lubrication systems.
- 3.11 Describe the effect of broken or leaking lines in various parts of the lubrication system.



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- 3.12 Describe the effect of engine wear on the operation of the lubrication system.
- 3.13 Explain the operating indications of a low engine oil supply.
- 3.14 Describe the method of maintaining a reserve supply of oil in the engine oil supply tank for use in propeller feathering.
- 3.15 List the requirements for marking oil tank fillers.
- 3.16 Describe the purpose and operating principles of the lubrication system pressure-relief valve.
- 3.17 Describe the purpose and operation of the oil cooler bypass valve.
- 3.18 Explain the effect of congealed oil in the heat exchange portion of an oil radiator.
- 3.19 Describe the purpose, location and operation of anti-sludge chambers in the lubrication system of a reciprocating engine.
- 3.20 Describe the purpose and operation of the bypass feature built into most engine oil filtering systems.
- 3.21 Explain the operating principles of the stacked disc, edge filtration type of filter.
- 3.22 List the characteristics and operating principles of dry-sump and wet-sump engine lubricating systems.
- 3.23 Describe the purpose, location and operation of the oil separator.
- 3.24 Adjust engine oil pressure.
- 3.25 Describe the purpose of the restricted orifice in the oil pressure gauge line.
- 3.26 Explain the effect of obstructed rocker box inter-cylinder oil drain lines on engine operation.
- 3.27 Describe the characteristics and principles of operation of a radial engine oil scavenging system.