



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

LAST REVIEW: 2007-2008

(i.e. 2003-2004)

NEXT REVIEW: 2012-2013

(i.e. 2008-2009)

STATUS: A

(A, I, D)

COURSE TITLE: Lubrication Systems

COMMON COURSE NUMBER: AMT 0435

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



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ASSESSMENT:

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 <u>ALL</u> 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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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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Unit 3 Engine Lubrication Systems

General Outcome:

- 3.0 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.