



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: Turbine Engines & Turbine Engine Troubleshooting

COMMON COURSE NUMBER: AMT 2312

CREDIT HOURS: 4

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS: 147

(Voc. Course ONLY)

Lecture: 50

Lab: 97

Clinic:

Other:

PREREQUISITE(S): None

COREQUISITE(S): None

PRE/COREQUISITE(S): None

COURSE DESCRIPTION *(750 characters, maximum):* The students will be able to apply and understand physics laws related to jet power plants. They will be able to identify and understand the operation of jet engines and their components. They will be able to perform inspection, maintenance repair, troubleshooting and adjustments of jet power plants and accessories. They will be able to analyze engine performance and interpret operational charts, graphs and tables. 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. Overhaul
2. Inspections, Service and Repair of Engines and Engine Installations
3. Troubleshooting and Removal

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 inspect, repair, troubleshoot, and adjust jet power plants and accessories.

*** 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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UNITS

Unit 1 Overhaul

General Outcome:

- 1.0 The student shall:** The students should be able to overhaul turbine engines.

Specific Measurable Learning Outcomes:

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

- 1.1 Explain the relationship between rotor speed and total thrust of a turbine engine.
- 1.2 Explain the relationship between turbine inlet temperature and thrust of a turbine engine.
- 1.3 Explain the relationship between operating altitude and thrust of a turbine engine.
- 1.4 Describe the operating characteristics of turbine engines equipped with two-spool or "split" compressors.
- 1.5 Describe the operating characteristics of fan and bypass turbine engines.
- 1.6 Explain the relative gas pressures in various portions of a turbine engine.
- 1.7 Discuss the function of nozzle diaphragm in a turbine engine.
- 1.8 Discuss the function of the exhaust cone in a turbine engine.
- 1.9 Describe the operating characteristics and types of combustion chambers.
- 1.10 Remove and install outer combustion-chamber case and liners.
- 1.11 Describe the methods for disassembling compressor sections.
- 1.12 Describe the function and location of fuel nozzles.

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COURSE OUTLINE

Unit 2 Inspections, Service and Repair of Engines and Engine Installations

General Outcome:

- 2.0 The student shall:** The students should be able to inspect, check, service and repair turbine engines and turbine engine installations.

Specific Measurable Learning Outcomes:

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

- 2.1 Describe the principles of operation of thrust reversing systems used with turbine engines.
- 2.2 Identify the advantages of gas turbine geared to a propeller.
- 2.3 List the types of compressors most commonly used in turbine engines.
- 2.4 Describe the construction and operating characteristics of axial-flow compressors.
- 2.5 Identify the advantages of the axial-flow compressor over the centrifugal compressor.
- 2.6 Discuss the function and location of the diffuser section.
- 2.7 Describe the basic design of turbine blades.
- 2.8 Explain the effect of high ambient temperatures on turbine engine operation.
- 2.9 List the type failures to which turbine components are subject.
- 2.10 Describe the results of excessive operating temperature.



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Unit 3 Troubleshooting and Removal

General Outcome:

3.0 The student shall: The students should be able to install, troubleshoot and remove turbine engines.

Specific Measurable Learning Outcomes:

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

- 3.1 Explain the operating principles of a turbine engine.
- 3.2 Explain the effect of air density on the thrust of a turbine engine.
- 3.3 Describe the effect of exhaust nozzle adjustments on turbine engine operation.
- 3.4 Describe the method of controlling compressor surge.
- 3.5 Discuss the purpose and operation of fuel control devices.
- 3.6 Identify the cause of hot spots on the outer combustion casing.
- 3.7 Describe the method of insuring ignition in combustion chambers not equipped with igniter plugs.
- 3.8 Adjust turbine engine fuel controls.