



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: Basic Electricity

COMMON COURSE NUMBER: AMT 1001

CREDIT HOURS: 2

CONTACT HOUR BREAKDOWN

(per 16 week term)

CLOCK HOURS: 94.5

(Voc. Course ONLY)

Lecture: **45.5**

Lab: **49**

Clinic:

Other:

PREREQUISITE(S): None

COREQUISITE(S): None

PRE/COREQUISITE(S): None

COURSE DESCRIPTION *(750 characters, maximum)*: The course provides the information and skills necessary to proceed into the electrical problems and procedures that will arise when dealing with the electrical systems and components of the aircraft and its powerplant. 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. Capacitance and Inductance
2. Electrical Power
3. Voltage, Current, Resistance, Continuity, and Leakage
4. Relationship of Voltage, Current, and Resistance in Electrical Circuits
5. Electrical Circuit Diagrams
6. Batteries

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 proceed into the electrical problems and procedures that will arise when dealing with the electrical systems and components of the aircraft and its powerplant.



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UNITS

Unit 1 Capacitance and Inductance

General Outcome:

- 1.0 The student shall:** The students should be able to measure capacitance and inductance.

Specific Measurable Learning Outcomes:

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

- 1.1 Explain the effect of inductive reactance in an electrical circuit.
- 1.2 Explain the interrelationship of capacitive and inductive reactance.
- 1.3 Discuss the term that describes the combined resistive forces in an a.c. electrical circuit.
- 1.4 Discuss the unit of measurement for capacitance and inductance.



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Unit 2 Electrical Power

General Outcome:

- 2.0 **The student shall:** The students should be able to calculate and measure electrical power.

Specific Measurable Learning Outcomes:

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

- 2.1 Determine the power furnished by a generator to an electrical system consisting of various electrical units having specific load ratings.
- 2.2 Determine the power required by an electric motor that is operating at a specified efficiency and load



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Unit 3 Voltage, Current, Resistance, Continuity, and Leakage

General Outcome:

- 3.0 The student shall:** The students should be able to measure voltage, current, resistance, continuity and leakage.

Specific Measurable Learning Outcomes:

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

- 3.1 Use an ohmmeter to check for open or short circuits.
- 3.2 Discuss the test instruments used to check continuity.
- 3.3 Explain the basic operating principle of d.c. electrical instruments.
- 3.4 Discuss the basic operating principles of a galvanometer.
- 3.5 Connect voltmeters and ammeters into an electrical circuit.
- 3.6 Explain the purpose of a shunt resistor when used with an ammeter.
- 3.7 Define the meaning of prefixes such as micro, mega, kilo and milli as used in expressing electrical quantities.



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**Unit 4 Relationship of Voltage, Current and Resistance in
Electrical Circuits**

General Outcome:

- 4.0 The student shall:** The students should be able to determine the relationship of voltage, current and resistance in electrical circuits.

Specific Measurable Learning Outcomes:

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

- 4.1 Determine the current flow in an electrical circuit using variable resistance and voltage values.
- 4.2 Determine the power requirements of an electrical circuit when the voltage and resistance values are specified.
- 4.3 Discuss the current relationship in a parallel electrical circuit.
- 4.4 Define the unit of measure used to express electrical power.
- 4.5 Explain the principles of electromagnetic induction.
- 4.6 Discuss the characteristics of magnets and magnetic lines of force.
- 4.7 Explain the factors that affect the voltage drop in an electrical conductor.
- 4.8 Determine the resistance of an electrical device from the wattage and voltage values specified.
- 4.9 Calculate the voltage drop across a resistor.



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Unit 5 Electrical Circuit Diagrams

General Outcome:

5.0 The student shall: The students should be able to read and interpret electrical circuit diagrams.

Specific Measurable Learning Outcomes:

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

- 5.1** Trace electrical circuits using aircraft wiring diagrams.
- 5.2** Identify electrical system malfunctions by reference to circuit diagrams.
- 5.3** Identify the commonly used aircraft electrical symbols.



Common Course Number: AMT 1001

Unit 6 Batteries

General Outcome:

- 6.0 The student shall:** The students should be able to inspect and service batteries.

Specific Measurable Learning Outcomes:

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

- 6.1 Remove spilled electrolyte and treat all adjacent surfaces.
- 6.2 Remove and install a battery in an aircraft with a single-wire electrical system.
- 6.3 Connect batteries to a constant-current battery charger.
- 6.4 Determine the specific gravity of the battery electrolyte.
- 6.5 Perform a high-rate-discharge condition test of batteries.
- 6.6 Explain the design factors that affect battery voltage and capacity.
- 6.7 Describe the factors that determine battery charging rate on a constant voltage source.
- 6.8 Describe the indications of a shorted battery cell.
- 6.9 Explain the significance of battery capacity ratings.
- 6.10 Describe the effects of increased internal resistance on battery operation.
- 6.11 Explain the effects of connecting battery cells in series or parallel.
- 6.12 Discuss the relative advantages of lead-lead-acid and nickel-cadmium batteries for use in aircraft.
- 6.13 Explain the principles of battery construction.
- 6.14 Check battery electrolyte levels.



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- 6.15 Describe the relationship between battery state of charge and the temperature at which the electrolyte will freeze.
- 6.16 Explain the purpose of and requirements for ventilating batteries and battery compartments in civil aircraft.
- 6.17 Discuss the effect of excessive charging rates on batteries.