



Broward Community College

Course Outline

STATUS: A

COMMON COURSE NUMBER: ATT 2120

COURSE TITLE: Instrument Flight Theory

CREDIT HOURS: 3

CONTACT HOURS BREAKDOWN:

Lecture/Discussion	<u> 48 </u>
Lab	<u> </u>
Other	<u> </u>
Contact Hours/Week	<u> 3 </u>

CATALOG COURSE DESCRIPTION:

Prerequisite: ATT1100 and ASC1100

Corequisite: ASC1210 and ASC2110

A study of the functioning of basic flight instruments and their use in controlling aircraft under instrument conditions, electronic aids and their use, communications facilities and equipment, the airways system, air traffic control facilities and procedures as related to instrument flight planning, enroute charts, and approach procedure charts. Successful completion of ATT 2120, ASC 2110 and ASC 1210 will prepare the student for the FAA instrument written examination. Prerequisite: Private pilot's license, or instructor's permission required.

General Education Requirements - Associate of Arts Degree, meets Area(s):
 General Education Requirements - Associate in Science Degree, meets Area(s):

UNIT TITLES:

1. Federal Aviation Regulations
2. Flight Instruments
3. Navaids
4. ATC Procedures/Low Enroute Altitude Chart/Holds
5. Instrument Approach Procedures

I. Course Overview:

Upon successful completion of this course, the students should be able to acquire the instrument knowledge necessary to prepare them for their instrument theory related portions of the Federal Aviation Administration's Instrument Written Exam along with the knowledge of the rules and procedures for IFR operations and the functioning of instruments and navigation aids to permit safe flight under IFR conditions.

II. Units:

Unit 1. Federal Aviation Regulations

General Outcome:

1.0 The students should be able to discuss pertinent regulations from FAR Part 61 and Part 91.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Describe regulations under Part 61 pertinent to instrument flight including but not necessarily limited to pilot in command responsibilities, medical conditions, logging time and recency of experience.
- 1.2 Describe regulations under Part 91 pertinent to instrument flight including but not limited to preflight regulations, instruments and equipment required for IFR flight fuel requirements, VOR accuracy checks, altimeter and static system checks, simulated instrument flight, compliance with ATC clearance, altimeter settings, IFR flight plans, alternate airport requirements and minimums, airspace, radio failure, and all IFR flight rules.
- 1.3 Describe VFR minimums (REVIEW)

Unit 2. Flight Instruments

General Outcome:

2.0 The students should be able to discuss the principles of operation, capabilities, limitations, and the interpretation of instruments used for instrument flight.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Identify the instruments involved in the pilot/static system. Explain alternate static sources and their effect on instrument indications.
- 2.2 Explain the basic operation of the altimeter, types of associated altitude, instrument markings, interpretation, and limitations.
- 2.3 Explain the basic operation of the vertical velocity indicator, and the airspeed indicator. Discuss markings, V speeds, interpretation and limitations.
- 2.4 Identify the gyroscopic instruments and explain their operating characteristics including the various methods of powering the gyroscopic instruments such as engine-driven vacuum pump systems, venturi, and electrical systems.
- 2.5 Explain the basic operation of the turn and slip indicator, heading indicator and attitude indicator, include markings, interpretation, and limitations. In addition, calculate roll out headings using a specified rate.
- 2.6 Explain the construction and operation of the magnetic compass. Include compass errors and necessary corrections for a normally functioning compass.

Unit 3. Nav aids

General Outcome:

- IFR 3.0 The student should be able to discuss the operating characteristics, capabilities and limitations of nav aids.

Specific Learning Outcomes:

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

- 3.1 Explain the operating characteristics, capabilities, and limitations of the VOR/VORTAC/TACAN/DME. Work navigational problems using the VOR.
- 3.2 Explain the operations characteristics, capabilities and limitations of the ADF system. Work navigational problems using the ADF.
- 3.3 Explain the operating characteristics of the Horizontal Situation Indicator (HSI) and calculate navigational problems using the HSI.
- 3.4 Explain the operating characteristics of the Radio Magnetic Indicator (RMI) and calculate navigational problems using the RMI.
- 3.5 Discuss primary and secondary radar procedures, capabilities and limitations. (Include DF procedures)
- 3.6 Discuss principals of transponder operation, purpose, and standard codes.
- 3.7 Discuss runway lighting and markings. Include 2 bar VASI Systems, 3 bar VASI and Tricolor Visual Approach Indicators.

Unit 4. ATC Procedures/Low Enroute Altitude Charts/Holds

General Outcome:

- 19 4.0 The student should be able to explain various ATC procedures, understand holding patterns, the L-charts and emergency procedures.

Specific Learning Outcomes:

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

- 4.1 Discuss the IFR flight plan and be aware of how to file, cancel, make changes, and operate VFR under special conditions on an IFR flight plan.
- 4.2 Discuss the ATC clearance, understanding the order, elements, limits, release times, void times, refusal and acceptance.
- 4.3 Explain communication procedures including pre-taxi clearance, position reports, frequency change procedures, and additional reports.
- 4.4 Discuss holding including types of patterns, when holding is required, entry into holds, speeds, wind correction, time, instructions, leaving the fix and loss of radio communication.
- 4.5 Identify and define a variety of symbols found on the low enroute altitude charts.
- 4.6 Discuss various types of emergency procedures.

Unit 5. Instrument Approach Procedures

General Outcome:

5.0 The students should be able to read and interpret a variety of instrument approach procedure charts.

Specific Learning Outcome:

Upon successful completion of this unit, the students should be able to:

- 5.1 Define and discuss approach nomenclature. (DH, MDA, HAT, HAA, NOPT, etc.)
- 5.2 Discuss and interpret the precision instrument approach with a thorough understanding of the ILS-Instrument Landing System.
- 5.3 Discuss and interpret a variety of non-precision approaches.
- 5.4 Discuss radar services, and radar monitored approaches. ASR and PAR approaches.
- 5.5 Discuss approach clearances and interpret missed approach instructions.
- 5.6 Discuss SIDS and STARS.
- 5.7 Define approach segments and approach plate sections (profile, plan view, etc.)