

STATUS: A

COMMON COURSE NUMBER: ASC 2110

COURSE TITLE: Navigation Science II

CREDIT HOURS: 3

CONTACT HOURS BREAKDOWN:

Lecture/Discussion 48

Lab

Other

Contact Hours/Week 3

CATALOG COURSE DESCRIPTION:

Prerequisite: ATT1100 and ASC1100

Corequisite: ATT2120 and ASC1210

Methods and procedures for the solution of advanced pilotage, and dead reckoning problems. Functioning, capabilities and limitations of radio navigation systems. Prerequisite: Private pilot's license, or instructor's permission.

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

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

UNIT TITLES:

1. E6B Computations
2. VOR Navigation
3. ADF Navigation

I. Course Overview:

Upon successful completion of this course, the students should be able to meet the written examination requirements in the areas of E6B computation and radio navigation calculations required for a commercial certificate, demonstrate the navigational knowledge necessary to use the E6B radio as a primary means of air navigation which included a variety of calculations involving solutions to VOR and ADF navigation problems, and exhibit a thorough understanding of E6B computations.

II. Units:

Unit 1. E6B Computations

General Outcome:

- 1.0 The students should be able to calculate a variety of problems appropriate for commercial flight using the E6B.

Specific Learning Outcomes:

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

- 1.1 Calculate speed/time/distance, fuel consumption, true air speed, compass heading and group speed problems.
- 1.2 Interpolate winds aloft forecasts for specified altitudes.
- 1.3 Calculate problems involving rate of climb, descent, distance traveled, altitude change, and speed.
- 1.4 Calculate problems involving the determination of wind direction and velocity based on course and actual group speed.
- 1.5 Calculate off course correction problems.
- 1.6 Calculate short time and distance problems using the second's index.

- 1.7 Determination of pressure altitude, density altitude and true altitude.
- 1.8 Solve radius of action problems from a fixed base.
- 1.9 Calculate a variety of conversion methods using the E6B.

Unit 2. VOR Navigation

General Outcome:

2.0 The students should be able to discuss the characteristics of VOR navigation systems and calculate solutions to a variety of navigation problems involving VOR systems.

Specific Learning Outcomes:

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

- 2.1 Discuss the characteristics, frequencies, service range, advantages and disadvantages of the VOR, VORTAC and DME.
- 2.2 Explain the relationship of the instrument indication to the aircraft position.
- 2.3 Graphically display orientation and aircraft location.
- 2.4 Calculate headings used in order to intercept radials under specified conditions.
- 2.5 Determine time and distance to a VOR station by the 90 degree method.
- 2.6 Determine time and distance to a VOR station by the double angle method.

Unit 3. ADF Navigation

General Outcome:

3.0 The students should be able to discuss the characteristics of navigation systems based on non-directional beacons and the solution of navigation problems involving ADF.

Specific Learning Outcomes:

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

3.1 Discuss LF/MF systems, frequencies, stations, and advantages and disadvantages of the system.

3.2 Calculate relative and magnetic bearings to and from the station.

3.3 Calculate MH for interception of bearings to and from the station and calculate relative bearing upon interception.

3.4 Compare/contrast homing, tracking, and intercepting predetermined tracks inbound and outbound.

3.5 Calculate true bearings and discuss the relationship of course, heading, wind correction angle, and relative bearing when tracking inbound or outbound.

3.6 Determination of time and distance to a station using the 90 degree method.

3.7 Determination of time and distance to a station using the double angle method.