



BROWARD COMMUNITY COLLEGE COURSE OUTLINE

LAST REVIEW: 2008-2009

. 2007-20008

NEXT REVIEW: 2013-2014

STATUS: A

A

COURSE TITLE: Introduction to Air Traffic Control

COMMON COURSE NUMBER: ATT 2820

CREDIT HOURS: 3

CONTACT HOUR BREAKDOWN

CLOCK HOURS:

Lecture: **48**

Lab:

Clinic:

Other:

PREREQUISITE(S):

COREQUISITE(S): ATT1810, ATT1100 & ASC1100

PRE/COREQUISITE(S):

COURSE DESCRIPTION :

This course covers fundamental topics such as history and an explanation of past decisions affecting current air traffic control systems, navigation, procedures and phraseology; separation of aircraft in the ATC system, an in-depth look at the future of air traffic control, and employment opportunities for air traffic controllers.

UNIT TITLES

- 1. History of Air Traffic Control**
- 2. Navigation Systems**
- 3. Air Traffic Control System Structure**
- 4. Air Traffic Control Communications**
- 5. ATC Procedures and Organization**
- 6. Control Tower Procedures**
- 7. Nonradar Enroute and Terminal Separation**
- 8. Theory and Fundamentals of Radar Operation**
- 9. Radar Separation**
- 10. Operation in the National Airspace System**
- 11. Oceanic and International Air Traffic Control**
- 12. The Future of the National Airspace System**
- 13. The Federal Aviation Administration**



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EVALUATION:

Student will be assessed regarding course outcomes through a series of oral and/or written quizzes and exams to include demonstrated capability on the associated ATC simulators.



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UNITS

Unit 1: History of Air Traffic Control

General Outcome:

- 1.0 The student shall have a good understanding of the history and development of Air Traffic Control.

Specific Measurable Learning Outcomes:

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

- 1.1 Discuss the significance of the Airmail Act of 1925
- 1.2 Describe how the federal government became involved in air traffic control
- 1.3 Discuss the history of the various federal agencies involved in air traffic control
- 1.4 Discuss the formation of organized labor unions as they pertain to air traffic control
- 1.5 Identify the organizations currently involved in the air traffic control system
- 1.6 Identify the various organizations that have represented air traffic controllers
- 1.7 Identify some of the methods air traffic controllers used in the past to separate aircraft



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Unit 2: Navigation Systems

General Outcome:

- 2.0 The student shall understand various aspects of navigation as it relates to air traffic control.**

Specific Measurable Learning Outcomes:

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

- 2.1 Identify the en route navigation aids in use today**
- 2.2 Identify the approach navigation aids in use today**
- 2.3 Explain the operating principles behind each of these navigation aids**
- 2.4 Successfully interpret an instrument approach procedures chart**
- 2.5 Successfully interpret an instrument en route navigation chart**
- 2.6 Successfully interpret a VFR sectional chart**
- 2.7 Determine whether an instrument approach procedure is a precision or nonprecision procedure**



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Unit 3: Air Traffic Control System Structure

General Outcome: In accordance with the Aeronautical Information Manual (AIM),

- 3.0 The student shall be able to understand the purpose and functioning of ATC in relation to aircraft, airspace and services as outlined in FAA standards.**

Specific Measurable Learning Outcomes:

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

- 3.1 Define the primary purpose of air traffic control**
- 3.2 Identify which aircraft are separated by the ATC system**
- 3.3 State the differences between classes of airspace**
- 3.4 Describe the purpose of a standard instrument departure (SID)**
- 3.5 Describe the functions of the various airspace areas**
- 3.6 State the differences between radar services and terminal radar services**
- 3.7 Describe the services offered to pilots in various types of airport areas**
- 3.8 Describe operations under special VFR**
- 3.9 Describe the functions of an airport traffic area and an airport advisory area**



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Unit 4: Airport Air Traffic Control Communications: Procedures and Phraseology

General Outcome: Students will be able to understand and work with typical airport air traffic control procedures and phraseology using accepted communication terminology.

4.0 The student shall identify the concept of Holding Aircraft.

Specific Measurable Learning Outcomes:

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

- 4.1** State the required components of a clearance
- 4.2** Describe what “cleared as filed” means
- 4.3** State which frequency bands are used for aviation communications
- 4.4** State the purpose of coordinated universal time and how it is measured
- 4.5** Describe how parallel runways are numbered
- 4.6** Describe the standard measurement for speed in aviation
- 4.7** Identify the function of a pilot’s discretion clearance
- 4.8** Describe a holding pattern and identify how it is utilized
- 4.9** Be able to distinguish between proper and improper uses of phraseology



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Unit 5: Air Traffic Control Procedures and Organization

General Outcome:

- 5.0 Student shall be able to understand responsibilities of various control center, tower and terminal radar facilities as it relates to each facility, agreements and directives.

Specific Measurable Learning Outcomes:

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

- 5.1 State the general responsibilities of an air route traffic control center, an air traffic control tower, and a terminal radar approach control facility
- 5.2 Describe the function of a letter of agreement
- 5.3 Describe the function of a facility directive
- 5.4 Explain what is meant by “transfer communication”
- 5.5 Explain what is meant by “transfer of control”
- 5.6 Explain a handoff
- 5.7 Identify the responsibilities of a controller in an ARTCC
- 5.8 Identify the responsibilities of a controller in a control tower



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Unit 6: Control Tower Procedures

General Outcome:

- 6.0 The student shall understand controller position duties and responsibilities through utilization of available information and procedures to keep aircraft safe.

Specific Measurable Learning Outcomes:

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

- 6.1 Explain how a controller obtains and amends information from the FDP system
- 6.2 Explain the purpose and operation of the automatic terminal information service (ATIS)
- 6.3 State the duties of a controller in a control tower
- 6.4 Define runway incursions and explain why they should be prevented
- 6.5 Explain how the local controller separates aircraft in the traffic pattern
- 6.6 State the runway separation minima for landing and departing aircraft
- 6.7 Explain wake turbulence and the rules concerning its avoidance



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Unit 7: Nonradar En Route and Terminal Separation

General Outcome:

- 7.0 The student shall be able to understand the design of separation procedures as it relates to airspace both laterally and longitudinally.

Specific Measurable Learning Outcomes:

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

- 7.1 State the four methods of nonradar separation
- 7.2 Define the dimensions of the area generally assigned to each aircraft
- 7.3 Generally state how nonradar separation is applied to aircraft
- 7.4 Be familiar with the methods of marking an aircraft's reported position on a flight progress strip
- 7.5 Determine the appropriate holding pattern to be used in any given situation



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Unit 8: Theory and Fundamentals of Radar Operation

General Outcome:

- 8.0 The student shall understand the development and use of radar and the equipment utilized in air traffic control facilities.

Specific Measurable Learning Outcomes:

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

- 8.1 Describe the operation of a radar system
- 8.2 Explain the need for and the operation of moving target indicator equipment
- 8.3 Describe the advantages of a PRF stagger
- 8.4 Explain the need for and the operation of circular polarization equipment
- 8.5 Describe the differences between primary and secondary radar
- 8.6 Describe the major components and the operation of the Air Traffic Control Radar Beacon System
- 8.7 Identify and distinguish between the different modes used by the ATCRBS system
- 8.8 Explain the differences between TPX-42, ARTS II, ARTS III, NAS-A, DARC, and EARTS



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Unit 9: Radar Separation

General Outcome:

- 9.0 The student shall understand aircraft identification through radar to ensure safe separation, radar assisted navigation and wake turbulence avoidance.

Specific Measurable Learning Outcomes:

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

- 9.1 Identify the methods of primary radar identification
- 9.2 Identify the methods of secondary radar identification
- 9.3 Explain the differences between and the uses for handoffs and point outs
- 9.4 Explain the difference between transfer of control and transfer of communications
- 9.5 Explain the three methods of separating aircraft using radar
- 9.6 Understand the use of radar for instrument approaches
- 9.7 Explain the significance and the purpose of the approach gate



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Unit 10: Operation in the National Airspace System

General Outcome:

- 10.0** The student shall understand all aspects of flight plans as they relate to air traffic control positions and facilities.

Specific Measurable Learning Outcomes:

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

- 10.1** Describe the flow of flight plan information through the air traffic control system
- 10.2** Describe the operation of the flight data processing system
- 10.3** Describe the function of the central flow control facility and traffic management units
- 10.4** Explain the sectorization procedures used at a typical medium- and high- activity radar facility
- 10.5** Understand the procedure used to assist lost or overdue aircraft
- 10.6** Explain the uses of en route flight advisory service



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Unit 11: Oceanic and International Air Traffic Control

General Outcome:

- 11.0 Student shall be able to understand international aspects of air traffic control operations**

Specific Measurable Learning Outcomes:

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

- 11.1 Describe the function of ICAO in international air traffic control**
- 11.2 Describe Canadian airspace definitions**
- 11.3 Explain oceanic air traffic control minima**
- 11.4 Describe operating procedures and separation minima within minimum navigation performance specification airspace**



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Unit 12: The future of the National Airspace System

General Outcome:

- 12.0 The student shall understand the development of new technologies, improvements, projects and advancements in the area of air traffic control.

Specific Measurable Learning Outcomes:

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

- 12.1 Describe the changes planned for the National Airspace System
- 12.2 Identify the advantages of the AERA system
- 12.3 Describe the functional abilities of the AERA system
- 12.4 Identify the advantages of the Advanced Automation System
- 12.5 Explain the concept and the need for Area Control Facilities
- 12.6 Describe the future operation and the components of the Traffic Management System
- 12.7 Describe the improvements planned for the flight service station system
- 12.8 Describe the advantages of mode S transponder systems
- 12.9 Describe the FAA's improvement plan for surveillance radar and radar processing systems



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Unit 13: The Federal Aviation Administration

General Outcome:

The student shall understand how the FAA works in conjunction with other federal agencies as it relates to air traffic control and the scope of career opportunities available.

Specific Measurable Learning Outcomes:

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

- Identify the relationship of the FAA to other federal agencies
- Describe the general structure of the FAA and where air traffic control fits into that structure
- Describe the regional structure of the FAA
- Describe the process of becoming a controller for the FAA
- Identify the various screening programs applied to prospective air traffic controllers
- Describe the FAA controller training process