



# BROWARD COLLEGE COURSE OUTLINE

**LAST REVIEW: 2008-2009**

*(i.e. 2003-2004)*

**NEXT REVIEW: 2013-2014**

*(i.e. 2008-2009)*

**STATUS: A**

*(A, I, D)*

**COURSE TITLE: Human Factors of Flight and Air Traffic Control**

**COMMON COURSE NUMBER: ASC 2470**

**CREDIT HOURS: 3**

**CONTACT HOUR BREAKDOWN**

*(per 16 week term)*

**CLOCK HOURS:**

*(Voc. Course ONLY)*

Lecture: 48 Lab:

Clinic: Other:

**PREREQUISITE(S): ATT1810, ATT2820, ATT1100, ASC1100**

**COREQUISITE(S):**

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION** *(750 characters, maximum):*

**This course discusses the human factor issues involved with flight and those affecting air traffic controllers. Students will learn the significant aero-medical factors common to the aviation environment and the decision making process. Students will apply knowledge gained through examination of NTSB accident reports outlining the causes and describing ways an accident could have been prevented.**

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. Aviation Physiology**
- 2. The Decision Making Process**
- 3. Human Information Processing in Air Traffic Control**
- 4. Situational Awareness in Air Traffic Control**
- 5. Individual Differences in Performance in Air Traffic Control**
- 6. Air Traffic Control Team Coordination**
- 7. Workstation and Software Interface Design in Air Traffic Control**
- 8. Impact of Automation on Air Traffic Controllers**
- 9. Communication Issues in Air Traffic Control**



## BROWARD COLLEGE COURSE OUTLINE

### **EVALUATION:**

Student will be assessed regarding learning objectives / course outcomes through oral and/or written quizzes and exams, class participation and presentation projects.

Common Course Number: ASC 2470

## UNITS

### Unit 1 Aviation Physiology

#### General Outcome:

- 1.0 The student shall have a good understanding of the aero-medical factors associated with flight.

#### Specific Measurable Learning Outcomes:

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

- 1.1 Explain the atmosphere and its impact on the human body
- 1.2 Discuss Boyle's Law, Charles' Law, Graham's Law, Henry's Law and Dalton's Law
- 1.3 Explain respiration and circulation in the human body
- 1.4 Discuss hypoxia, its causes symptoms, prevention and treatment
- 1.5 Describe hyperventilation, its causes, symptoms, prevention and treatment
- 1.6 Explain decompression sickness, its causes, symptoms, prevention and treatment
- 1.7 Identify the problems and benefits associated with cabin pressurization
- 1.8 Give specific examples of vision issues in flight, its limitations and illusions
- 1.9 Explain spatial disorientation and its effects on flight performance
- 1.10 Discuss communication issues and the effect of noise in flight
- 1.11 Give specific examples of the impact of stress, mental ailments and self-imposed stresses such as alcohol, drugs and fatigue on safety and performance
- 1.12 Discuss the importance of maintaining proper physical fitness

**Unit 2 Decision Making Process**

**General Outcome:**

- 2.0 The student shall have an understanding of the aeronautical decision making process and how it relates to safety by minimizing risk factors created by human error**

**Specific Measurable Learning Outcomes:**

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

- 2.1 Discuss Aeronautical Decision Making and the problem solving process**  
**2.2 Give specific examples of the impact of leadership, attitude and motivation on safety**  
**2.3 Explain the incorporation of training and training devices to enhance safety**  
**2.4 Highlight the challenge of addressing human error**  
**2.5 Describe the elements of risk management on aviation operations**  
**2.6 Summarize “Go / No-go” decisions and self assessment as it relates to safety**

**Common Course Number: ASC 2470**

**Unit 3      Human Information Processing in Air Traffic Control**

**General Outcome:**

- 3.0    The student shall have an understanding of how humans process information in Air Traffic Control**

**Specific Measurable Learning Outcomes:**

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

- 3.1    Discuss information processing and the Air Traffic Control Task**
- 3.2    Describe processes and memory**
- 3.3    Explain problem solving and decision making**
- 3.4    Summarize the effects of automation on information processing**
- 3.5    Discuss the future in ATC information processing**

**Common Course Number: ASC 2470**

**Unit 4            Situational Awareness in Air Traffic Control**

**General Outcome:**

- 4.0    The student shall be able to understand and discuss the role of situational awareness and its relationship to Air Traffic Control**

**Specific Measurable Learning Outcomes:**

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

- 4.1    Define situational awareness**
- 4.2    Explain the requirements of situational awareness for Air Traffic Control**
- 4.4    Give specific examples of situational awareness and controller performance and workload**
- 4.5    Discuss situational awareness and ATC automation**
- 4.6    Summarize situational awareness and the operational concept**

**Common Course Number:**

**Unit 5 Individual Differences in Performance in Air Traffic Control**

**General Outcome:**

- 5.0 The student shall understand individual factors affecting performance in air traffic control**

**Specific Measurable Learning Outcomes:**

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

- 5.1 Discuss individual factors affecting performance**
- 5.2 Understand interactions between organizational and individual Factors**
- 5.3 Explain the individual factors affecting the regulation of workload and stress**

**Common Course Number: ASC 2470**

**Unit 6**      **Air Traffic Control Team Coordination**

**General Outcome:**

- 6.0**    The student shall be able to understand the significance of coordination and teamwork in air traffic control

**Specific Measurable Learning Outcomes:**

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

- 6.1**    Describe coordination demands in ATC  
**6.2**    Discuss coordination training and ATC

**Common Course Number: ASC2470**

**Unit 7      Workstation and Software Interface Design in Air Traffic Control**

**General Outcome:**

- 7.0    The student shall have an understanding of the importance of design and software considerations in air traffic control**

**Specific Measurable Learning Outcomes:**

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

- 7.1    Describe physical design considerations**  
**7.2    Discuss workstation design**  
**7.3    Explain functional design considerations**

**Common Course Number:**

**Unit 8      Impact of Automation on Air Traffic Controllers**

**General Outcome:**

- 8.0    The student shall understand and discuss historical and present day automation and its implications to humans**

**Specific Measurable Learning Outcomes:**

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

- 8.1    Describe early forms of automation**
- 8.2    Explain current forms of automation**
- 8.3    Highlight errors and incidents**
- 8.4    Discuss human factor implications of advanced technology**
- 8.5    Define machine-driven and human driven computer assistance**
- 8.6    Discuss the future directions of automation**

**Unit 9      Communication Issues in Air Traffic Control**

**General Outcome:**

- 9.0    The student shall obtain an understanding of the various communication responsibilities in air traffic control**

**Specific Measurable Learning Outcomes:**

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

- 9.1    Levels of Routine ATC Communication**
- 9.2    ATC-Pilot vs. ATC-Facility Communication**
- 9.3    Types of Communication Problems**
- 9.4    Factors Related to Communication Problems**
- 9.5    Improving ATC Communications**
- 9.6    Alternative Communication Media**
- 9.7    Future Communication Directions**