AVIA 202 - Air Traffic Control 2
5 credits

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Preferred contact e-mail; then text. Office hours: Tues./Thurs. for 30 minutes after class

Course Description:
Covers ATC procedures in terminal ATC environments for controllers and pilots Emphasizes proper radio communications procedures, terminal ATC radar and non-radar separation and sequencing, correct application of applicable terminal ATC Operational rules and regulations for controllers and correct application of FAR and AIM rules and procedures for pilots.

Course Notes - AVIA 202:
- Provides an overview of US ATC Terminal Operations with emphasis on air safety philosophy, planning and implementation, with special emphasis on Radar Operations and ATC clearances
- Develops fundamental skills for Controllers and Pilots:
  - Data handling including Terminal Strip Marking and Data Coordination procedures
  - Purpose and uses of clearances, issuing clearances, understanding clearances
  - Terminal ATC Radio and Radar procedures with emphasis on correct phraseology
  - Tracking, monitoring and control coordination procedures for Air Traffic
    - ATC rules and procedures for IFR and VFR air traffic control
    - ATC Separation and Sequencing rules and methods
    - Application of ATC Clearances
    - Aircraft Recognition
    - ATC Emergency Services
    - Roles and responsibilities of controllers handling aircraft in distress

Materials for the Course:
Texts and Manuals for Instruction
- FAA Order 7110.65 (specific portions) and other selected FAAOs
- FAR/AIM (Current Year) and other Flight Information Publications (FLIPs)

Suggested Text
- Basic Aviation FUN-damentals – Scott and Comollo, 1st edition

Handouts
- Handouts for memorization, study and scenario practice

Websites
- www.instruction.greenriver.edu/aviation
- www.aviationweather.gov
- www.faa.gov/atpubs/
- www.faa.gov/library/manuals/aircraft/
- www.liveatc.net

Other
- USB Memory Device (thumb drive, flash drive) at least 256k capacity

Learning Objectives:
ATC 202 students should gain sufficient knowledge to:
- Understand Terminal ATC Processes and Operations including purposes and application of ATC Clearances
• Understand FAA separation standards, techniques and equipment Controllers and Pilots use to maintain traffic separation and sequencing in a Terminal ATC environment with emphasis on Terminal Radar Operations
• Be able to describe, explain and be able perform very basic ATC control functions for Terminal Operations such as target recognition, data interpretation, basic sequencing, conflict recognition, conflict resolution methods
• Manage a Terminal ATC environment with up to four Instrument (IFR) aircraft in a non-complex environment (i.e. non-mountainous terrain, good radio and radar coverage, no hazardous weather conditions).
• Understand the purpose of aircraft equipment and ground based (radio, radar, satellite, computer link) needed to conduct normal ATC operations.

Grading and Evaluation
Graded Student Learning
Class Grades for AVIA 202 derive from
(1) Quizzes on Strip Marking, Phraseology, Head Math, Airspace and other ATC topics
(2) Take Home and Closed Book Tests on FAAO 7110.65, FAR/AIM and selected FLIPs
(3) Memory tests on any of following specific topics at the instructors discretion:
   a. Keyboard Data Entry (Controller and Ghost Pilot keystrokes)
   b. Area Knowledge (Jackson Approach Control Terminal airspace)
   c. ATC Flight Clearances, Flight Strip Marking and ATC data handling
   d. Aircraft Performance and Aircraft Recognition
   e. Controller-Pilot Phraseology

Student Learning Evaluated But Not Graded
For AT-CTI students, the evaluation of non-graded items will be part of the overall faculty recommendation I must make to the FAA on your fitness to proceed into the FAA ATC work force. I will discuss the recommendation process with each student. The criteria I use to make a recommendation are: (this list is not all-inclusive, but rather is representative)
• Ability to accurately hear, understand, repeat and record ATC information and instructions, using keyboard entry, manual entry on a Flight Strip, or note taking
• Ability to perceive potential ATC conflicts and take appropriate action in a timely manner
• Awareness of when to coordinate with other Air Traffic Controllers, the pilot, and with Air Traffic and other Aviation entities
• Comprehensive knowledge of ATC procedures and ability to apply rules appropriately
• Ability to work efficiently, effectively, thoughtfully, and cordially with others in a team environment
• Ability to attend classes on time, to complete work on time, to be ready for instruction with all necessary materials on time, and be a ready and able learner

Quizzes, Tests, Test Make-up, Retakes & Grading
Students may earn up to 100% for early or on time tests. All re-takes or late testing will earn a maximum of 85%. Students must arrange for Make-ups and Retakes or early tests with the instructor. Most quizzes will include an opportunity for extra credit. Grade score for tests, make-ups, retakes and late assignments are as follows:

1. No re-takes of any test will be allowed more than 10 class days after the initial test date.
2. Only 1 re-take of any given test will be allowed.
3. No re-takes will be permitted after the official “study day” listed in the college calendar for the quarter (normally the week before finals).

Instructor discretion is allowed for outstanding circumstances in these policies.

What Did I Learn (WDIL) papers for extra credit
Students can earn up to 200 extra credit points by attending aviation events or doing extra work to learn about aviation beyond school work, and then writing a short paper (one or two pages), using Active Voice sentence structure, not using vague words and providing a complete and accurate source reference listing for each paper.

**Grade Components**
Tests and Quizzes of all types (Knowledge, Memory, etc) approximately 90 to 95%
Extra Credit opportunities approximately 10 to 5%

**Grade percent to GRCC Scale Conversion (GRCC decimal grading system)**

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**Academic Honesty:** Cheating in any form will result in zero score, no chance to retake the test, and can eliminate the student from getting a YES recommendation for FAA hiring. * See last page of Syllabus

**Instructional methods:** (All of these methods may be used to teach this class)
- Lectures with and without Powerpoints
- Study Guides and Reviews of assigned Homework
- Pre- and Post Test review and analysis
- Lectures with Seminar discussions
- Tests and Quizzes including pop quizzes
- ATC Computer Lab scenario demonstrations and practices
- Homework assignments of short and long duration
- Tours of ATC facilities

**Campus-wide Outcomes:**
Green River Community College (GRCC) has identified specific fundamental knowledge, skills, behaviors, attitudes, and values that GRCC students must possess to be successful after leaving the Green River Community College environment:
- A sense of the individual's responsibility to the community
- Quantitative and symbolic reasoning
- Critical thinking and rational decision-making
- Written & Oral Communications skills suitable for the modern business environment

**A. Responsibility:**
1. Student must demonstrate knowledge of and a willingness to accept stated and agreed expectations, policies, behavior, and procedures.
2. Student must demonstrate accountability (punctual and ready to learn), integrity (does own work and pulls own weight in collaborative tasks), initiative (seeks help when needed), and tolerance (develops awareness of own biases).
3. Student actively and appropriately interacts with others and is able to respect everyone's opinion.

**Student demonstrates these attributes by preparing for lectures and discussions, submitting assignments on time, and being accountable to other students in classes and in work groups in which the student participates**

3
B. Quantitative/Symbolic Reasoning:
1. Student evaluates and interprets information / data accurately and usefully.
2. Student recognizes which processes or methods are appropriate for solving a given problem, and correctly implements those processes.
3. Student demonstrates the ability to estimate a solution to a presented problem.
4. Student translates data into various formats such as graphs, tables, formulas, and sentences.
   **Student demonstrates these attributes through class work, homework, project work and tests.**

C. Critical Thinking:
1. Student provides reasons for the conclusions the student reaches and assesses the relevance and adequacy of each reason.
2. Student connects past learning with current topics.
   **Student demonstrates these attributes through class work, homework, project work and tests.**

D. Written & Oral Communications:
1. Student demonstrates involvement with the material by expressing a clear awareness of purpose, unity, and focus in his or her writing or speaking.
2. Student demonstrates clear organization of his or her thoughts in written and oral communications.
3. Student demonstrates well-organized and logical writing while using correct grammar and spelling.
   **Student demonstrates these attributes through class work, homework, project work and tests.**

Special Needs:
If you, due to a disability of any kind, need course adaptations or special accommodations because of the disability, have special emergency medical information the instructor should know, or need special accommodations in the event of an emergency building evacuation, please contact the Instructor and make sure the instructor fully understands your special need. At GRCC, students with special needs may use alternate modes to communicate Special Needs information (email, phone). In any case, and using any format, students should inform the Instructor as soon as possible after the start of school about needs the student has. Students should also contact Disability Support Services (DSS) in LSC 277 – Phone DSS at: 253-833-9111, ext. 2631 or TDD at 253-288-3359.

**AVIA 202 Instruction Flow Plan – general topics in the general order of presentation**

**NOTE – this instructional flow plan may change depending on many factors- this plan is just a plan**
- Orientation to Terminal ATC course (ATC 2) with emphasis on learning FAAO7110.65
- Head Math (continuously throughout the term)
  - Understanding numbers
  - Understanding rounding and rapid estimations
- Terminal Strip marking and data handling (continuously throughout the term)
  - Arrival, Departure and Overflight Strip data organization
  - Correct Strip Marking Symbols and Placements
- Communications procedures for Terminal ATC (continuously throughout the term)
  - Correct Phraseology uses
  - Understanding Phraseology implications
- Aircraft Recognition and Performance (continuously throughout the term)
  - Basic recognition features
  - Performance as an ATC consideration
- Radar Operations in a Terminal Environment
  - Target recognition
  - Data tag interpretation
Applying Radar Separation Standards
- Automatic Handoff Coordination
- Manual Handoff Coordination
- Communications Transfers
- Vectoring and Sequencing

- **ATC Clearances**
  - In depth work regarding ATC Clearances of all types
  - Hands-on Practice Creating and Issuing Clearances
- **Non-Radar Operations in a Terminal Environment**
  - Planning non-radar operations
  - Understanding separation of Non-Radar Traffic
  - Applying Separation Standards in Non-Radar traffic situations
  - Manual Handoff Coordination
  - Communications Transfers
- **Integration of Radar and Non-Radar ATC Operations**
  - Applying integrated Radar and Non-Radar Operational Separation Standards
- If time permits, Tower Simulations

**Topical material covered in AVIA 202 students should master**

- FAA Documents for Terminal ATC operations
  - Flight Publications (FLIPS) & Notices to Airmen (NOTAMS)
    - IFR and VFR FLIPS and Charts for Terminal ATC Operations
- Roles and Responsibilities of Terminal Air Traffic Controllers
  - TRACON and Tower Controller responsibilities for Terminal ATC Operations
  - ATC Duty priorities, operational Priorities and procedural implications
- ATC Flight Data processing and information handling
  - ATC Clearances and Terminal ATC Flight Strip information handling
    - Flight Strip/computer data entry, accuracy, timeliness and interpretation
    - Issuing Clearances and ensuring accuracy of clearance information
    - Electronic (keyboard) and hand written flight strip data support

- **ATC Radio and Landline communications**
  - Proper use of ATC communications
  - Exactness of phraseology and essential need for clear communications
    - Importance of correct phraseology for radio communications
    - Importance of effective listening and speaking skills

- **Terminal ATC Radar Operations**
  - Terminal Radar separation standards, procedures and methodology and procedures for supporting IFR and VFR flight operations in a terminal area

- **Terminal Non-Radar ATC operations**
  - Non-Radar separation standards,
  - Procedures and methodology for handling approaches and departures

- **Weather Information pertaining to ATC**
  - Weather impacts on Terminal ATC Operations
    - Impacts of marginal weather on traffic flows
    - Safety considerations during bad weather

- **ATC Normal and Routine Services**
  - Departure Operations
  - Overflight Operations
  - Arrival/Approach Operations
Aircraft Performance considerations
- Understanding and applying knowledge of Aircraft Class, Weight, Type, Category, Climb Rates, Speeds, and Wake Turbulence criteria during Terminal ATC operations

*AT-CTI FAA HIRING RECOMMENDATION CRITERIA:

Each GRCC AT-CTI student must receive a positive recommendation from the GRCC ATC Faculty as part of the FAA ATC Candidate Selection process.

Completing GRCC FAA AT-CTI degree program and receiving a positive recommendation from GRCC is not a guarantee of employment with the FAA.

With due regard for all factors associated with FAA needs for Air Traffic Control Candidates, and to ensure that GRCC ATC Students will have a reasonable chance of success throughout each FAA ATC Candidate’s selection, hiring, training and job qualification process, GRCC has established the following standards for a Positive Recommendation to the FAA from the GRCC ATC Faculty:

**Academic Performance**
Students must successfully complete
1. **All non aviation** courses with at least a grade of 75% (GRCC grade 2.0) or higher.
2. **All aviation** courses (except ATC courses) with at least a grade of 80% (GRCC grade 2.5) or higher.
3. **All Air Traffic Control** (ATC) courses (except AVIA 203 capstone course) with at least a grade of 85% (GRCC grade 3.0) or higher
4. **AVIA 203 Capstone ATC course** with at least 87% (GRCC grade 3.2) or higher and Complete the following AVIA 203 tests
   A. AVIA 203 Area Knowledge Test with a grade of at least 90%
   B. AVIA 203 Phraseology Tests series with grades at or above 80%,
   C. AVIA 203 Strip-Marking Tests, with grades at or above 80%,
   D. AVIA 203 Final-Four AT-Basics Final Tests, with an average score for all four tests of 90% and at least 80% or higher on each individual test
   **NOTE:** Each student has two opportunities to take each of the AVIA 203 Capstone course tests that require minimum scores to earn a positive recommendation
5. Complete the Air Traffic degree program with at least a minimum GPA of 85% (GRCC 3.0).

**Conduct and Demeanor**
Excellent judgment is an essential aspect of being an Air Traffic Controller. Team work is also vital to success in the Air Traffic Control profession. For those reasons, students in the GRCC ATC program must demonstrate excellent judgment and superior cooperative and respectful behavior at all times and in all situations or circumstances. Any inappropriate factual situation or circumstance involving a student that shows the student lacks good judgment or that shows a student’s inability to work effectively in a team environment will affect the recommendation GRCC makes to the FAA about that student.