

Aviation 201 Air Traffic Control I

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Course Description:

Introduction to radar and non-radar air traffic control, flight data processing, aircraft communications, FAA separation standards, controller techniques, and airspace management, Computer simulation of ATC problems

Course Notes

AVIA 201 is a “foundation course” for all GRCC Aviation students, but most particularly for GRCC FAA AT-CTI* students who need a sound understanding of ATC rules and procedures to prepare for the FAA ATC Academy.

*FAA Air Traffic –Collegiate Training Initiative program

Learning Objectives:

At the completion of AVIA 201 successful students should:

- Understand the FAA philosophy of air safety and the ATC methodologies for conducting safe, orderly, efficient ATC operations
- Know the purpose of equipment Controllers use to provide ATC services (radios, radar and computer equipment)
- Understand fundamental ATC procedures for En Route ATC and be able to explain the rationale for basic ATC functions
- Understand ATC Operational separation standards and gain a limited understanding of ATC control techniques and methodology
- At a fundamental and very limited level, be able to perform basic ATC control functions for safe aircraft sequencing and separation
- Understand fundamental problems of managing air traffic in En Route, Terminal and Airport airspace environments with consideration for weather, hazardous terrain, and traffic volume

Homework: (Your job)

- Read and understand materials and resources (texts, FAAOs, Web sites and FAA publications pertinent to ATC studies)
- Memorize information
- Monitor ATCLive.net, learn and practice specific ATC phraseology
- Record scenario voice communications, listen to yourself, strive to improve your speaking and listening skills
- Treat ATC scenario play like the real thing – what you do in practice you will do for real. Sloppy practice leads to sloppiness on the job.. Attention to detail in practice and doing things right, leads to doing the right thing on the job.

Each CTI Student should have basic knowledge of the **FAAO 7110.65** regarding Air Traffic Controller responsibilities and understand the connection between what Controllers do with what pilots do as described in the **FAR** and the **AIM** regarding ATC procedures, rules, airspace and other knowledge fundamental to safe, orderly efficient ATC Operations. NOTE: these publications are at the www.faa.gov/atpubs website.

Learning Resources for AVIA 201:

Texts

- Fundamentals of Air Traffic Control – Michael S. Nolan, (4th Edition)
- *FAR/AIM (Current Year)
- *FAA Handbook 7110.65 (Instructor will designate specific portions)
- Suggested Text – *Basic Aviation Fundamentals* – Scott, Comollo

Handouts

- Handouts for scenario practice, memorization, and study

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

FAA Publications pertinent to AT-CTI students:

- **FAA Order 7110.65 - Air Traffic Control**
- **AIM – Aeronautical Information Manual (AIM)**
- **CFR Part 14- Federal Aviation Rules (FAR) Parts**
 - **1 - Definitions and Abbreviations**
 - **71 - Designation of A, B, C, D and E Airspace**
 - **73 - Special Use Airspace**
 - **91 - General Operating and Flight Rules**
 - **Portions of CFR pertaining to Controller Medical Requirements**

Other FAA Publications pertaining to the AT-CTI program

- FAA Order 7110.10 - Air Traffic (AT) Flight Services
- FAA Order 7210.3 - AT and ATC Facility Operations and Administration
- FAA Order 7340.1 - Contractions used in Aviation
- FAA Order 7350.7 - Location Identifiers used in Aviation
- FAA Order 7400.2 - Procedures for Handling Airspace Matters
- NOAA Manual AC 00-6 - Aviation Weather
- NOAA Manual AC 00-45 - Aviation Weather Services

ATC Human Resources Manuals AT-CTI students must be aware of

- FAA Manual 3930.3 - ATC Specialist Health Programs
- FAA Air Traffic Controller Work Force Plan (Ten-year Plan)

Class Attendance:

ATC 201 is one of the tougher classes in each Aviation Degree program. Class pace is very rapid, we cover a tremendous amount of material, much of what we do includes rote memorization of a lot of trivial material, and we test constantly. Do everything in your power to attend class. If you can't attend class (illness, unexpected hardship, etc) you're still responsible for keeping up with class activities. Get information from your class mates or contact me so you can learn what's going on. Treat school like work. For AT-CTI students, part of my teaching job here is to prepare you for the FAA ATC Academy. Along those lines, regular class attendance, strong work ethic, and the ability to work well with others in class are important factors that are part of recommendation considerations for your fitness to be in the FAA ATC workforce

For the students going into other Aviation Careers (not into ATC), employers often (very frequently, in fact) ask GRCC aviation faculty members about student progress here at GRCC as part of employer hiring due process. Regular class attendance, dedication to studies and the ability to work well with others are important characteristics for any job setting, are excellent skills to learn, and are part of our reports that we make to a potential employer. Consistent, timely, prepared attendance indicates a lot about your ability to think, to plan ahead and to your ability to adapt to changing situations. Please do your best to be on time and ready to learn, so we can give a future potential employer a good report on you.

Cell phones and other personal communication devices

Please put your cell phones to OFF or VIBRATE during class. Please don't use cell phones or use text messaging in class. Also, please don't play with computers in the ATC Lab. Changing computer settings without specific direction to do so are grounds for being removed from class and getting a course grade of zero.

Grading and Evaluation

Graded Student Learning

Class Grades for AVIA 201 will derive from

- (1) Written tests on specific detailed knowledge from FAAO 7110.65, and the FAR/AIM
 - a. Basic Knowledge
 - b. Radar Procedures Knowledge
 - c. Non-Radar Procedures Knowledge
- (2) Memory tests over any or all of the following specific topics:
 - a. Keyboard Data Entry (Controller and Ghost Pilot keystrokes)
 - b. Area Knowledge (Memphis Center Sector 66 & adjacent area airspace)
 - c. ATC Flight Clearances, Flight Data Information and data entry procedures
 - d. Aircraft Recognition and Aircraft Performance
 - 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 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 actions in a timely manner
- Awareness of when to coordinate with other Air Traffic Controllers, the pilot and other Air Traffic or 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

Testing, Test Make-up, Retakes & Grading

To earn 100%, students must take tests on or before the scheduled day. Class will decide, by vote, when to take tests (majority vote). Instructor can override class vote. Coordinate with the Instructor to make up or retake tests – Normally, students will have two attempts to score a test for grade. Normally, for knowledge tests, 90% is the highest score for a make-up test or a retake of a test. Tests completed 15 days or more after the designated test day will normally be capped at 80% score

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)

%	GRCC	%	GRCC	%	GRCC	%	GRCC
100	4.0	90	3.5	80	2.5	70	1.5
99	4.0	89	3.4	79	2.4	69	1.4
98	3.9	88	3.3	78	2.3	68	1.3
97	3.9	87	3.2	77	2.2	67	1.2
96	3.8	86	3.1	76	2.1	66	1.1
95	3.8	85	3.0	75	2.0	65	1.0
94	3.7	84	2.9	74	1.9	64	0.9
93	3.7	83	2.8	73	1.8	63	0.8
92	3.6	82	2.7	72	1.7	62	0.7
91	3.6	81	2.6	71	1.6		

*NOTE – AVIA 201 students must achieve a grade of GRCC 3.0 (85%) or better, or receive instructor permission to enroll in AVIA 202

Academic Honesty: Cheating in any form is cause to receive zero score and no chance to retake the test.

Instructional methods: I usually use all of these methods to teach this class

- Lectures with Seminar discussions
- Study Guides
- Tests and Quizzes
- ATC Computer Lab scenario demonstrations and practices
- Tours of ATC facilities

GRCC Campus-wide Outcomes:

Green River Community College (GRCC) 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:

1. Student's sense of individual responsibility to the community
 - Demonstrate knowledge of and willingness to accept stated/agreed expectations, policies, behavior, and procedures.
 - Demonstrate accountability (be punctual, prepared, ready to learn), integrity (do your own work, do your share of shared work), initiative (seek help when you need help), and tolerance (be awareness of your own biases). Actively and appropriately interact with others while respecting everyone's opinion.
 - Measured by occurrences of student readiness for class, participation in class, timely assignment submissions, and effective group membership.
2. Quantitative and symbolic reasoning
 - Student can evaluate and interpret information and data, can recognize which processes or methods are appropriate for solving a given problem, can estimate a solution, and correctly implements those processes.
 - Student can translate data into various formats such as graphs, tables, formulas, and sentences.
 - Measured by student work in class, on projects, homework, and tests.
3. Critical Thinking:
 - Student provides reasons for the conclusions he or she reaches and assesses the relevance and adequacy of those reasons.
 - Student connects past learning with current topics.
 - Measured by student work in class, on projects, homework, and tests.
4. Written & Oral Communications skills suitable for the modern business environment
 - Student becomes involved with the material and can express a clear sense of purpose, unity, and focus in his or her writing or speaking.
 - Student can organize of his or her thoughts in written and oral communications clearly and effectively using well-organized, logical writing and using correct grammar and spelling.
 - Measured by student work in projects, test answers, and class and group participation

Special Needs:

If, because of a disability, the student:

- Needs special accommodations (adapt a course activity, have additional assistance, etc.),
- Has emergency medical information the instructor should know about, or
- Has a need for special assistance in the event of a building evacuation,

Please contact the Instructor and be sure the instructor fully understands the special need. Students 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.

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.

Topics covered in AVIA 201 include:

FAA Regulatory Documents

- FAA Orders, Manuals and Regulations
- Letters of Agreement (LOAs)
- Standard Operating Procedures (SOPs)

Basic Roles and Responsibilities of Air Traffic Controllers

- Responsibilities of ARTCC, TRACON and Tower Controllers
- ATC Duty priorities, operational Priorities and procedural implications
Responsibilities

ATC Flight Data processing and information handling

- ATC Clearances and ATC Flight Strip information handling
- Legal implications and operational uses of ATC Data and Clearances
- Flight Strip/computer data entry, accuracy, timeliness and interpretation

ATC Radio and Landline communications

- Proper use of ATC communications
- Importance of correct phraseology and radio communications procedures
- Listening and speaking skills
- Logic of need for exactness of phraseology and clear understanding

Fundamentals of Radar and ATC Radar Control Operations

- Radar separation standards, procedures and methodology
- Radar operations supporting IFR and VFR flight operations

Fundamentals of Non-Radar ATC operations

- Non-Radar separation standards, procedures and methodology
- Flight Strip data entry and traffic flow coordination
 - Issuing Clearances and ensuring accuracy of clearance information
 - Electronic (keyboard) and hand written flight strip data support

National Airspace management and use

- ATC operations in types of controlled airspace
- Airspace management and procedural separation methodology
- Traffic Management versus Traffic Control

Flight Publications (FLIPS) & Notices to Airmen (NOTAMS)

- ATC use of IFR and VFR FLIPs and Charts
- ATC Operations and NOTAMS processing

Weather Information

- ATC Operations with regard to ICAO weather data (METARs, TAFs, PIREPs, AIRMETs and SIGMETs)
- ATC Operations during Hazardous Weather
 - Impacts of marginal weather on traffic flow and safety considerations

ATC Normal and Routine Services

- Departure Terminal to Enroute Operations
- Enroute to Enroute Operations
- Enroute to Arrival Terminal Operations
- Communications and coordination between AT and ATC facilities

Aircraft Recognition, Aircraft Performance

- Size, Type, Category, A/C characteristics (Climb Rates, Speeds)
- Wake Turbulence

Other

- Military Operations and Special Operations
- Cockpit Environment and Crew Resource Management (CRM)

GRCC AT-CTI Program Completion Standards (Approval Criteria) to earn a GRCC FAA AT-CTI Program Positive Recommendation (approval for FAA hiring opportunity)

APPROVAL CRITERIA

ACADEMIC PERFORMANCE

A. Non-Aviation Courses

Successfully complete all non-aviation courses with at least a grade of 75% (GRCC grade 2.0) or higher,

B. Aviation Courses (except ATC Courses)

Successfully complete all aviation courses, except ATC courses, with at least a grade of 80% (GRCC grade 2.5) or higher

C. GRCC ATC Courses (except AVIA 203 Capstone Course)

Successfully complete all ATC courses excluding AVIA 203 ATC Capstone Course with at least a grade of 85% (GRCC grade 3.0) or higher

D. AVIA 203 Capstone Course

Successfully complete AVIA 203 – the GRCC ATC Degree Capstone Course – with at least 87% (GRCC grade 3.2) or higher, AND, complete the following tests in the AVIA 203 Capstone Class with at least a 90% average:

- a. The AVIA 203 Area Knowledge Test, and
- b. All AVIA 203 Phraseology Tests, with no Phraseology Test score below 80%, and
- c. All AVIA 203 Strip-Marking Tests, with no Strip Marking Test score below 80%, and
- d. All AVIA 203 *Final-Four* AT-Basics Final Tests, with no AT- Basics Test score below 80%

NOTE: Each student has two opportunities to take each of the AVIA 203 Capstone tests that require a minimum score of 80% and an overall average of 90%

E. Complete the ATC Degree Program with at least a minimum GPA of 85% (GRCC 3.0)

CONDUCT and DEMEANOR

Because excellent judgment is such a essential and important aspect of being an Air Traffic Controller, and because team work is such a vital and critical component of working in the Air Traffic Control profession, GRCC AT-CTI students must demonstrate excellent judgment and superior cooperative and respectful behavior at all times and in all situations or circumstances. Any factual situation or circumstance a GRCC AT-CTI student is involved in, that reflects on the student's judgment in any situation, or the student's ability to work effectively within groups, and which comes to the attention of the GRCC faculty through any sources or any means, will be part of the evaluation to determine the suitability of the student to be in the Air Traffic Control profession, and will directly affect the FAA AT-CTI GRCC Recommendation for FAA Hiring.