FAA Air Traffic Control

Behavioral Objectives / Academic Standards

for

FAA Initial Qualification Training Air Traffic Basics

About the Behavioral Objectives and Academic Standards

The following information should be helpful in understanding the behavioral objectives and for developing instructional and evaluation activities to meet the academic standards:

Behavioral Objectives

The academic standards consist of a list of behavioral objectives. To meet the standards, it is expected that each student will achieve each objective. Achievement is assessed through individual testing. Each objective has three parts: 1) conditions, 2) behavior, and 3) performance standard. These are explained in greater detail below.

- **Conditions**, for the most part, define what the student will be given or may use under testing conditions. No conditions are stated explicitly in the objectives, however it is expected that the following conditions will apply to all objectives: 1) students may not use notes, handbooks, handouts, books, orders, etc. in responding to a test item, and 2) students may not work together during tests or collaborate on answers in any way.

- **Behavior** refers to the student behavior that is expected during testing as a result of instruction. Note that the majority of the behaviors in the objectives are "identify," which means that the student must be able to recognize the correct response from other possible responses on a test. This means that for purposes of evaluating whether or not students have mastered an objective, most if not all evaluation items could be constructed in multiple choice format. While this means the correct response would be provided as one of the test items choices, students may be required to perform computations in order to correctly "identify" the correct response.

- The **Performance Standard** provides the source for determining the correct or accurate response for a particular objective. For example, FAA Order 7110.65 is the definitive source for such information as the purpose of a clearance, the types of clearances controllers can issue, and the elements of an air traffic control (ATC) clearance. The number of test items to be given for a particular objective and percent of correct responses required to achieve a passing score on an FAA administered academic test or other related examination (e.g., Control Tower Operator Written Examination) are determined by the FAA. For testing knowledge, such as concepts, facts, etc., ***generally***, the FAA constructs tests that employ multiple choice or matching items and that sample the content areas being taught rather than test all areas and a minimum passing score is 70%.

The list of objectives in this document was originally developed by the FAA Academy in January, 1997 for two purposes: 1) to guide the design of the instruction for the Air Traffic Basics Course (Air Traffic Basics is a course on fundamental ATC knowledge that is common to En Route, Terminal, and Flight Service Specialist options and is taken as part of the FAA Initial Qualifications Training Program for ATCSs at the Academy), and 2) to provide guidance to institutions in the Air Traffic Collegiate Training Initiative (CTI) on FAA expectations for their graduates' level of knowledge. After the objectives were established, individual lessons and their respective content and instructional activities were developed. As a part of this normal course development process, the initial list of objectives was reviewed and refined as each of the lessons were developed. The resulting list of revised objectives are provided below.

FAA Orders, Publications, and Other References

A list of required references is provided at the end of the this document.

Curriculum Development

CTI schools are expected to develop their own curriculum. This provides each school with maximum latitude in developing creative and interesting instructional activities that address the standards. While the behavioral objectives are intended to be knowledge and comprehension levels of learning (e.g., identify the purpose of a clearance), it is highly recommended that the student be provided instructional activities in which they go beyond rote learning and memorization. It is recommended that instructional activities that require application of this knowledge to various example aviation or air traffic situations be included as well.

Lesson/Topic	Objectives
Introduction to the ATC System and National Airspace System	In accordance with Order 7110.65, 7210.3, AC 61-27, and the AIM, the student will identify the following concepts: 1. Elements of the National Airspace System (NAS) 2. Role of the Traffic Management System (TMS) within the NAS. Without references and in accordance with AC 61-27 and Orders 7110.65, Chapter 2; 7110.10, Chapter 1; 3120.4, and the AIM, the student will identify the primary functions and associated team responsibilities (to include interrelationships between positions) of: 1. Air Traffic Control Tower. a. Local b. Ground c. Clearance Delivery/Flight Data 2. Approach Control. a. Arrival b. Departure 3. Air Route Traffic Control Center. a. Radar b. Handoff c. Radar Associate (D side) d. Assistant Controller (A side) 4. Flight Service Station. a. Weather Observer b. Flight Data/Search and Rescue/Notice to Airmen c. Preflight (includes pilot weather briefing) d. Inflight e. Flight Watch f Broadcast g. Coordinator h. Controller-in-Charge In accordance with Order 7110.65, Chapter 2; you will identify duty priority, procedural preference, and operational priorities of the air traffic controller.
Teamwork in the ATC Environment (Note: This topic is not tested.)	The student will discuss the: 1. Characteristics of effective teams. 2. Functions affecting team performance. 3. Stages of group development.
Airports	In accordance with the AIM, you will identify airport: 1. Lighting. 2. Markings.

Lesson/Topic	Objectives
Separation	Without references and in accordance with Order 7110.65, FAA-H-8083-15 Instrument Procedures Handbook, and the AIM, the student will identify the following concepts: 1. Holding aircraft. Without references and in accordance with Order 7110.65, FAA-H-8083-15 Instrument Procedures Handbook, and the AIM, the student will identify the following concepts: 1. Vertical separation. 2. Lateral separation. 3. Longitudinal separation. 4. Radar separation. 5. Runway separation. 6. Visual separation. 7. Airport Advisory Service.
Notices to Airmen (NOTAMs)	In accordance with FAA Order 7110.65, 7930.2 and Title 14, CFR, Parts 139 and 157, you will identify: 1. Methods of disseminating airmen's information. 2. Responsibilities for reporting Notices to Airmen (NOTAMs). 3. Types and uses of NOTAMs.
Fundamentals of Radar	In accordance with FAA Order 7110.65, ETM 12-0-1, and the AIM, you will identify the uses and characteristics of primary and secondary radar.
Introduction to FAA Orders and Manuals	In accordance with FAA Orders 7110.10, 7110.65, 7210.3, 7340.1, 7350.7, and the AIM, you will identify the purpose and organization of each order and manual. In accordance with FAA Order 1320.1 and, you will identify the purpose of: 1. Changes. 2. Notices. 3. Supplements. In accordance with FAA Orders 7110.10, 7110.65, 7210.3, and the AIM, you will identify the following terms as they apply to air traffic control: 1. May. 2. Shall. 3. Should. 4. Will.
Introduction to Letters of Agreement (LOAs) and Standard Operating Procedures (SOPs)	In accordance with FAR, Part 73 and FAA Order 7210.3, you will identify the purpose and content of: 1. Letters of Agreement (LOAs). 2. Standard Operating Procedures (SOPs).

Lesson/Topic	Objectives
Airspace	In accordance with FAR, Parts 71 and 73, ATC Orders 7110.65 and 7400.2, and the AIM, you will identify: 1. Classes of airspace and their use. 2. Special Use Airspace.
Introduction to Federal Aviation Regulations	In accordance with the Federal Aviation Regulations (FARs), Parts 1, 65, 67, and 91 and FAA Orders 7110.65 and 3930.3, you will identify: 1. Terms and definitions. 2. General operating rules. 3. General flight rules. 4. ATC certification. 5. Medical requirements.
FAR, Part 91	In accordance with FAR, Part 91 and the AIM, you will identify selected provisions of VFR and IFR flight rules concerning: 1. Flight plans. 2. Aircraft operations. 3. Pilot's responsibilities. 4. Supplemental oxygen requirements.
Principles of Flight	In accordance with AC 61-23, the Pilot's Handbook; AC 61-13, Basic Helicopter Handbook, FAR, Part 91, and the Airmen's Information Manual (AIM), you will identify: 1. Primary and secondary sources of lift. 2. Relative wind. 3. Types and parts of airfoils. 4. Four forces that affect aircraft in flight, their interrelationships, and the effects on aircraft performance. 5. Effects of altitude, temperature, and pressure on aircraft performance. 6. Functions of primary and secondary flight controls and the movement around the aircraft axes. 7. Helicopter aerodynamics. 8. Helicopter controls. 9. Hazards affecting flight.

Lesson/Topic	Objectives
Wake Turbulence	In accordance with the AIM , FAA Order 7110.65, and AC 61-23C Pilot's Handbook, you will identify the following categories related to wake turbulence: 1. Definition of Wake Turbulence. 2. Factors Affecting Wake Turbulence Intensity. 3. Wingtip Vortices. 4. Induced Roll. 5. Helicopter Downwash. 6. Jet Blast.
Aircraft Characteristics and Recognition	In accordance with FAA Order 7110.65 and the ATG-2, Tri-Option Controller Reference Manual, you will: 1. Identify aircraft: A. Categories. B. Weight Classes. C. Designators. D. Performance Characteristics. E. Identification Features. 2. Recognize selected aircraft.
Special Operations	In accordance with FAA Orders 7110.65 and 7610.4, Special Military Operations, you will identify flights requiring special handling, including terms and definitions associated with these flights.
Basic Navigation	In accordance with the FAA Order 7110.65, *An Invitation to Fly,* AC 61-23, Pilot's Handbook and the AIM, you will identify: 1. Reference lines of the Earth and their purpose. 2. Great circle route, distance, and direction measurement. 3. Methods of time conversion and acronyms used with time. 4. Magnetic variations and headings. 5. Basic methods of navigation. 6. Basic calculations for time, speed, and distance. 7. Effects of wind on flight. 8. Effects of altitude and temperature on speed. In accordance with AC 61-23, the Pilot's Handbook, you will compute aircraft time, speed, and distance.
Radio and Satellite Navigation	In accordance with FAA ORDER 7110.65; FAR, PART 71.75; the AIM, AC 61-23, The Pilot's Handbook, and FAA-H-8083-15 Instrument Procedures Handbook, Instrument Flying Handbook, you will identify the characteristics of: 1. Radio and Satellite Navigation. 2. Federal Airway System.

Lesson/Topic	Objectives
VFR Charts and Publications	Given aeronautical charts and an airport facility directory, and in accordance with the AIM, AC 61-23, FAA Order 7110.65, and chart/directory legends (Dallas-Fort Worth VFR Sectional Aeronautical Chart, a Sample VFR Terminal Area Chart, South Central U.S. Airport/Facility Directory), you will identify the purpose, features, contents, and specific items and information (e.g., NAVAIDS, airport, elevation, etc.) related to: 1. Sectional Aeronautical Charts. 2. VFR Terminal Area Charts. 3. World Aeronautical Charts. 4. Airport/Facility Directory.
En Route IFR Charts	In accordance with FAA Order 7110.65 the AIM, AC 61-23, and as depicted in the chart legends (L-5/L-6 En Route Low Altitude Chart; H-2/H-4 En Route High Altitude Chart; IFR Area Chart), you will identify the purpose, contents, and specific items and information for the following En Route charts: 1. Low Altitude. 2. High Altitude. 3. IFR Area.
SIDs and STARs	In accordance with FAA Order 7110.65, AIM, FAA-H-8083-15 Instrument Procedures Handbook, and the U.S. Terminal Procedures Publication, you will identify the purpose, types, contents, and specific items and information (e.g., altitudes, headings, etc.) of: 1. SIDs. 2. STARs.
Approaches	In accordance with FAA Order 7110.65, the AIM, FAA-H-8083-15 Instrument Procedures Handbook, and the U.S. Terminal Procedures Publication, you will identify types of approaches; and the purpose, contents, and specific items and information (e.g., minimum altitudes, courses, missed approaches, etc.) of an Instrument Approach Procedure (IAP) Chart. Given an IAP Chart, and in accordance with a U.S. Terminal Procedures Chart, you will identify the contents and geographical features.
Pilot's Environment	In accordance with the AIM; AC 61-23, Pilot's Book of Aeronautical Knowledge; AC 61-27, Instrument Flying Handbook; and ATC and TCAS System Overview, you will identify: 1. Characteristics and uses of aircraft instrumentation. 2. Physiological factors affecting flight.

Lesson/Topic	Objectives
Introduction to Emergencies	In accordance with FAA Orders 7110.65 and 7110.10 and the AIM, you will identify: 1. The meaning of distress, urgency, mayday, and pan-pan. 2. Roles and responsibilities of the pilot and controller during an emergency. 3. Information necessary to handle an emergency. 4. Types of emergencies.
Search and Rescue	In accordance with FAA Orders 7110.10 and 7110.65 and the AIM, you will identify the: 1. Purpose of the National Search and Rescue Plan. 2. Roles, responsibilities, and procedures of search and rescue.
Fundamentals of Weather and Aviation Weather Services	In accordance with AC 00-45, Aviation Weather Services, and AC 00-6, Aviation Weather, you will identify: 1. Characteristics of the atmosphere. 2. Principles of atmospheric temperature. 3. Characteristics and modification of air masses. 4. Characteristics of atmospheric pressure. 5. Formation and types of fronts. 6. Characteristics of convection currents. 7. Causes of wind. 8. Formation and types of clouds. 9. Formation and types of precipitation. In accordance with AC 00-45, Aviation Weather Services, and AC 00-6, Aviation Weather, you will identify the duties and responsibilities of the National Weather Service (NWS) and the Center Weather Service Unit (CWSU).
Hazardous Weather	In accordance with Aviation Weather, AC 00-6 and Aviation Weather Services, AC 00-45, and the AIM, you will identify the characteristics of hazardous weather that impact aviation. In accordance with Aviation Weather, AC 00-6 and Aviation Weather Services, AC 00-45, you will identify the effects of hazardous weather on aviation.

Lesson/Topic	Objectives
Current Weather	In accordance with AC 00-45, Aviation Weather Services, and AC 00-6, Aviation Weather, you will identify the contents of METAR, including associated contractions and terms. Given examples of current weather reports, and in accordance with AC 00-45, Aviation Weather Services, and FAA Order 7110.10, you will decode METARs.
Pilot Reports (PIREPs)	In accordance with FAA Orders 7110.10 and 7110.65, and the AIM, you will identify the purpose, uses and contents of Pilot Weather Reports (PIREPs). In accordance with FAA Order 7110.10, you will decode Pilot Weather Reports (PIREPs).
Forecasts and Advisories	In accordance with AC 00-45, Aviation Weather Services, you will identify the contents and purpose of the following weather products: 1. Aviation Terminal Forecast (TAF). 2. Area Forecast (FA). 3. Airman's Meteorological Information (AIRMET). 4. Significant Meteorological Information (SIGMET). 5. Convective SIGMET (WST). 6. Center Weather Advisory (CWA). 7. Meteorological Impact Statement (MIS). 8. Winds Aloft Forecast (FD). In accordance with AC 00-45, Aviation Weather Services, you will decode the following weather products: 1. Aviation Terminal Forecast (TAF). 2. Area Forecast (FA). 3. Airman's Meteorological Information (AIRMET). 4. Significant Meteorological Information (SIGMET). 5. Convective SIGMET (WST). 6. Center Weather Advisory (CWA). 7. Meteorological Impact Statement (MIS). 8. Winds Aloft Forecast (FD).
Basic Communications	In accordance with FAA Orders 7110.65 and 7110.10, you will identify: 1. Radio and interphone communications. 2. ICAO phonetics. 3. Numbers usage. 4. Basic phraseology. 5. Coordination procedures. 6. Purpose and steps of the position relief briefing.

Lesson/Topic	Objectives
Stripmarking	In accordance with FAA Orders 7110.65 and 7110.10, you will identify: 1. Purpose and legal requirements of flight progress strips. 2. Meaning of selected abbreviations and symbols used in Stripmarking. 3. Content requirements of selected blocks in terminal, en route and flight service strips.
ATC Clearances	In accordance with FAA Order 7110.65 and FAR 91.123, you will identify: 1. Purpose of an ATC clearance. 2. Pilot's responsibility for compliance with an ATC clearance. 3. ATC clearance items and their sequence. 4. Clearance prefixes and their use. 5. Types of ATC clearances.

List of Acronyms

AIRMET	Airmen's meteorological information
ALTRV	Altitude reservation
CWA	Center weather advisory
CWSU	Center Weather Service Unit
DME	Distance measuring equipment
DVFR	Defense visual flight rules
ELT	Emergency locator transmitter
FA	Area Forecast
FD	Winds Aloft Forecast
FMS	Flight Management System
FMSP	Flight Management System Procedure
GPS	Global Positioning System
IAP	Instrument Approach Procedure
IFR	Instrument flight rules
ILS	Instrument Landing System
LOA	Letter of Agreement
LORAN-C	Long range air navigation system
METAR	Aviation routine weather report
MIS	Meteorological impact statement
MLS	Microwave Landing System
MTR	Military training route
NAS	National Airspace System
NAVAID	Navigational aid
NDB	Nondirectional radio beacon
NOTAM	Notice to Airmen
NWS	National Weather Service
PIREP	Pilot weather report
RNAV	Area navigation
SID	Standard instrument departure
SIGMET	Significant meteorological information
SOP	Standard Operating Procedure
STAR	Standard terminal arrival
TACAN	Tactical air navigational aid
TAF	Aerodrome forecast
TCAS	Traffic Alert and Collision Avoidance System
TMS	Traffic Management System
VFR	Visual flight rules
VHF	Very high frequency
VOR	Very high frequency omni-directional radio range
VORTAC	VOR and TACAN (collocated)
WST	Convective SIGMET

List of References

Orders

1320.1, FAA Directives System
3120.4, Air Traffic Technical Training
3930.3, ATCS Health Program
7110.10, Flight Services
7110.65, Air Traffic Control
7210.3, Facility Operation and Administration
7340.1, Contractions
7350.7, Location Identifiers
7400.2, Procedures for Handling Airspace Matters
7610.4, Special Military Operations
7900.5, Surface Weather Observing - METAR
7930.2, Notices to Airmen (NOTAMs)

Advisory Circulars

AC 00-6, Aviation Weather
AC 00-45, Aviation Weather Services
AC 61-13, Basic Helicopter Handbook
AC 61-23, Pilot's Handbook of Aeronautical Knowledge
FAA-H-8083-15 Instrument Procedures Handbook

Charts

IFR Area Chart
En Route High Altitude Chart
En Route Low Altitude Chart
Sectional Aeronautical Chart
U.S. Terminal Procedures Publication
Airport/Facility Directory

Manual

AIM, Aeronautical Information Manual
ATG-2, Tri-Option Controller Reference Aircraft Manual
ETM 12-0-1, Fundamentals of Primary and Secondary Surveillance Radar
FTE-2, Aviation Routine Weather Report (METAR)/Aerodrome Forecast (TAF)

Regulations

Federal Aviation Regulations (FARs) 65, 67, 71, 73, 91 (may also be referred to as the Code of Federal Regulations [CFR])

Books

Glaser, Dennis, 1989, An Invitation to Fly, Belmont, CA, Wadsworth Publishing Company
Clausing, Donald J., 1997, Aviator's Guide to Navigation, 3rd ed., New York City, NY, McGraw Hill