

1/15/2022

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

LIST OF EFFECTIVE PAGES

PAGE #	DATE OF REVISION	# OF REVISION
1	01/15/2022	1
2	01/15/2022	1
3	01/15/2022	1
4	01/15/2022	1
5	01/15/2022	1
6	01/15/2022	1
7	01/15/2022	1
8	01/15/2022	1
9	01/15/2022	1
10	01/15/2022	1
11	01/15/2022	1
12	01/15/2022	1
13	01/15/2022	1
14	01/15/2022	1
15	01/15/2022	1
16	01/15/2022	1
17	01/15/2022	1
18	01/15/2022	1
19	01/15/2022	1
20	01/15/2022	1
21	01/15/2022	1
22	01/15/2022	1
23	01/15/2022	1
24	01/15/2022	1
25	01/15/2022	1
26	01/15/2022	1
27	01/15/2022	1
28	01/15/2022	1
29	01/15/2022	1
30	01/15/2022	1
31	01/15/2022	1
32	01/15/2022	1
33	01/15/2022	1

AFG-WRS-FSDO Digitally Signed by
Approved: Renae M Renae M Almond
Date: Allmond Date:2022.01.06
07:48:03-06' 00

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

THERE ARE NO PREREQUISITES FOR ENROLLMENT IN THE GROUND TRAINING PORTION OF THE INSTRUMENT RATING COURSE

GROUND TRAINING COURSE OBJECTIVES

This ground training syllabus will provide the student the aeronautical knowledge required to be an instrument airplane rated pilot as specified by 14 CFR Section 141, Appendix C, paragraph 3(b).

GROUND TRAINING COMPLETION STANDARDS

The student will demonstrate through discussion, written and oral quizzes, and written examinations that he/she has acquired the knowledge needed to pass the FAA Instrument Rating Airplane knowledge test.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

INSTRUMENT GROUND TRAINING SYLLABUS

STAGE I

Lesson 1 - Chapter 1, Section D	1.3 hrs	
Lesson 2 - Chapter 2, Sections A & B	1.3 hrs	
Lesson 3 - Chapter 3, Section C	2.6 hrs	
Lesson 4 - Chapter 2, Section D	1.3 hrs	
Lesson 5 - 14 CFR Sections 61 and 91	1.3 hrs	
Lesson 6 - Chapter 3, Section B & AIM	1.3 hrs	
Lesson 7 - Chapter 3, Section C & AIM	1.3 hrs	
Lesson 8 - Stage I Exam		1.3 hrs
Lesson 9 - Stage I Exam Review	1.3 hrs	

STAGE II

Lesson 1 - Chapter 4, Sections A & B & AIM	1.3 hrs	
Lesson 2 - Chapter 5, Sections A & B & AIM	1.3 hrs	
Lesson 3 - Chapter 5, Section C & AIM	1.3 hrs	
Lesson 4 - Chapter 6, Sections A & B & AIM	1.3 hrs	
Lesson 5 - Chapter 7, Sections A & B & AIM	2.6 hrs	
Lesson 6 - Chapter 8, Sections A & B & C	2.6 hrs	
Lesson 7 - Stage II Exam		1.3 hrs
Lesson 8 - Stage II Exam Review	1.3 hrs	

STAGE III

Lesson 1 - Chapter 9, Section A	2.6 hrs	
Lesson 2 - Chapter 9, Section B & AIM	2.6 hrs	
Lesson 3 - Chapter 9, Sections C & D & E	2.6 hrs	
Lesson 4 - Chapter 10, Sections A	1.3 hrs	
Lesson 5 - Chapter 10, Section C	1.3 hrs	
Lesson 6 - Stage III Exam		1.3 hrs
Lesson 7 - Stage III Exam Review	1.3 hrs	

TOTALS	35.1 hrs	3.9 hrs
---------------	----------	---------

GRAND TOTAL-39.0 HOURS

Note: The chapters and sections referred to in this syllabus are based on the Instrument Commercial Manual, published by Jeppesen Sanderson, Inc, Englewood, Colorado. Exercises are incorporated into the textbook at the end of each section. The hours designated for each chapter are suggested guidelines only, and may vary at the instructor's discretion. At no time will the hours of instruction be less than the total number of hours defined in this syllabus.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE I

STAGE OBJECTIVE

During this stage, the student will learn the concepts of crew resource management, crew communication and coordination, aeronautical decision making and judgement. The student will also learn the principles of instrument flight, including the operation use, and limitations of flight instruments and instrument navigation using GPS, VOR, and DME. The student will learn the function of the air traffic control as well as the FARs applicable to instrument flight operations.

STAGE COMPLETION STANDARD

This stage is complete when the student has taken the Stage I written exam with a minimum passing score of 70%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to Stage II.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE I GROUND LESSON 1**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 1, Section D, "Crew Resource Management/Single Pilot Resource Management"

LESSON OBJECTIVE:

The student will gain an appreciation for Aeronautical Decision Making and Judgement as well as Crew Resource Management/Single Pilot Management.

CONTENT:

Crew Resource Management (CRM)/Single Pilot Resource Management (SRM)

- Aeronautical Decision Making (ADM) and Judgement Process
 - Recognize a Change
 - Define the Problem
 - Choose a Course of Action (Judgement)
 - Implement Your Decision
 - Evaluate the Outcome
- Risk Management - PAVE and 5Ps Checklists
 - PAVE Checklist
 - 5Ps Checklist
- Task Management
 - Planning and Prioritizing
 - Resource Use
 - Checklists
- Crew Communications and Briefings
- Situational Awareness
 - Obstacles to Situational Awareness
 - Situational Awareness During Ground Operations
 - Controlled Flight Into Terrain Awareness
- Automation Management
 - Managing Workload
 - Mode of Operation
 - Automation Considerations

COMPLETION STANDARDS

Through oral quizzing and/or discussion, the student will demonstrate an understanding of the principles of Crew Resource Management, including ADM, Risk Management, Crew Communication and Briefings, Situational Awareness and Automation Management prior to proceeding to Ground Lesson I-2.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE I GROUND LESSON 2**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 2, Section A, "Analog Flight Instruments"
Chapter 2, Section B, "Electronic Flight Displays"

LESSON OBJECTIVE:

The student will gain a working knowledge of analog flight instrument systems and Integrated Flight Displays.

CONTENT:

Analog Flight Instruments

- Gyroscopic Flight Instruments
 - Directional Gyro
 - Attitude Indicator
 - Turn Coordinator
 - Errors
- Magnetic Compass and Errors
- Pitot-Static Instruments
 - Airspeed Indicator
 - Altimeter
 - Vertical Speed Indicator
 - Errors
- Instrument Checks

Electronic Flight Displays

- Primary Flight Display (PFD)
 - Attitude and Heading reference System (AHRS)
 - Attitude Display
 - Horizontal Situation Indicator Display
 - Airspeed, Altitude, Turn Coordination and Vertical Speed Displays
- Multifunction Display (MFD)
 - Moving Map
 - Aviation Chart & Approach Plate Overlays
 - Aircraft System Status
 - Checklists
- System Checks
- System Failures

COMPLETION STANDARDS:

Through oral quizzing and/or discussion, the student will demonstrate an understanding of analog flight instrument and Integrated Flight Display systems, including System checks and errors/failures before progressing to Ground Lesson I-3.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE I GROUND LESSON 3**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 2, Section C, "Attitude Instrument Flying"

LESSON OBJECTIVE:

The student will learn the fundamentals of attitude instrument flying and how the various flight instruments are used to maintain aircraft control.

CONTENT:

Instrument Cross-Check and Common Cross-Check Errors

Instrument Interpretation and Aircraft Control

Attitude Instrument Flying Methods

- Control and Performance
 - Control Instruments: Attitude Indicator and Tachometer or Manifold Pressure
 - Performance Instruments: Airspeed, Altimeter, Turn Coordinator, VSI
- Primary and Supporting
 - Pitch Instruments: Attitude, Airspeed, Altimeter and VSI
 - Bank Instruments: Attitude, Turn Coordinator, Directional Gyro
 - Power Instruments: Tachometer or Manifold Pressure
- Use of Each Method in Performing Basic Flight Maneuvers
 - Control and Performance Method - Simply an extension of VFR Basic Attitude Flying
 - Control Instruments for VFR and IFR: The Same - just no outside reference
 - Performance Instruments for VFR and IFR: The same - just no outside reference
 - Primary and Supporting Method - For each maneuver there are primary and supporting instruments to establish an attitude and different primary and supporting instruments to maintain that attitude.

Common Errors

- Control Errors
- Altitude Errors
- Heading Errors

Instrument Failures and Partial Panel Flying

- Gyroscopic Instrument Failure
- Pitot-Static Instrument Failure

Unusual Attitude Recovery Procedures

- Nose High Instrument Indications and Recovery
- Nose Low Instrument Indications and Recovery
- Stall Instrument Indications and Recovery

COMPLETION STANDARDS:

Through oral quizzing and/or discussions, the student will demonstrate an understanding of attitude instrument flying methods, common errors, partial panel flying and unusual attitude recovery before progressing on to Ground Lesson I-4.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE I GROUND LESSON 4

TEXT REFERENCE:

Instrument Rating Manual - Chapter 2, Section D, "Instrument Navigation" and Aeronautical Information Manual 1-1 and 1-2

LESSON OBJECTIVE:

The student will learn and understand the function, use, and limitations of VOR, DME, and GPS RNAV navigation systems.

CONTENT:

VOR

- Interpreting VOR Information on Horizontal Situation Indicator (HSI) and VOR Indicator
 - Intercepting and Tracking Courses
 - Determining Your Progress
 - Station Passage
- Operational Considerations
 - Service Volumes
 - VOR Checks

Distance Measuring Equipment (DME)

- Operational Considerations - Slant Range
- Substituting GPS derived distances for DME - No Slant Range
- DME Arcs

Area Navigation

- Required Navigation Performance (RNP)
- Inertial Navigation System
- Satellite Navigation (GPS)
 - Wide Area Augmentation System (WAAS)
 - Ground Based Augmentation System (GBAS)
 - Receiver Autonomous Integrity Monitoring (RAIM) - For receivers without WAAS
 - Navigation Data Base
 - Navigating with GPS
 - CDI Sensitivities - Enroute, Terminal and Approach
 - GPS Flight Planning
 - Manual Course Selection
 - Determining Aircraft Position From a Waypoint
 - Intercepting a Course
 - Tracking a Course
 - Tracking an Arc

COMPLETION STANDARDS:

Through oral quizzes and/or discussion, the student will demonstrate an understanding of VOR, DME and GPS RNAV navigation before progressing to Ground Lesson I-5.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE I GROUND LESSON 5**TEXT REFERENCE:**

14CFR Part 61 and 91.

LESSON OBJECTIVE:

During the study of the Federal Aviation Regulations, the student will learn the regulations that relate specifically to instrument flight. This will enable the student to safely conduct operations in the national airspace system.

CONTENT:

FAR Part 61.57(c) and (d)

- Instrument Experience (Currency) Requirements
- Use of FMS, FTD and/or ATD to maintain currency
- Instrument Proficiency Check

FAR Part 91

- 91.109 Simulated Instrument Flight and Safety Pilot Requirements
- 91.167 Fuel Requirements For Flight in IFR Conditions
- 91.169 IFR Flight Plan Information Required
 - Requirements For Filing an Alternate
 - Standard Weather Requirements for Alternate, Precision/Non-Precision Approaches
- 91.171 VOR Equipment Check for IFR Operations
- 91.173 Requirement to in Controlled Airspace Under IFR
 - Flight Plan Filed
 - ATC Clearance
- 91.175 Takeoff and Landing Under IFR
 - Authorized DA/DH or MDA
 - Operation Below DA/DH or MDA
 - Landing Visibility Requirements
 - Missed Approach Procedures
 - Civil Airport Takeoff Minimums (Part 121 and 135)
- 91.177 Minimum Altitudes for IFR Operations
- 91.179 IFR Cruising Altitude or Flight Level
- 91.181 Course to Be Flown
- 91.183 IFR COMMUNICATION - Events Requiring a Report to ATC
 - Waypoints
 - Unforecast Weather
 - Any Issue Related to Safety of Flight
- 91.185 IFR Operations: Two-Way Radio Communication Failure
 - VFR Conditions
 - IFR Conditions
 - Route
 - Altitude
 - Leave Clearance Limit
- 91-189 Operation Under IFR in Controlled Airspace: Malfunction Reports

COMPLETION STANDARDS:

Through oral quizzes and/or discussion, the student will demonstrate an understanding of the Federal Aviation Regulations applicable to IFR flying before progressing to Ground Lesson I-6.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE I GROUND LESSON 6**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 3, Section B, "Air Traffic Control System" and Aeronautical Information Manual 4-1 and 4-5

LESSON OBJECTIVE:

The student will learn the basic components of the Air Traffic Control System and Surveillance Systems

CONTENT:

Automatic Dependent Surveillance Broadcast (ADS-B)

- ADS-B Services
- ADS-B Data Links

Air Route Traffic Control Center (ARTCC)

- ARTCC Traffic Separation
- Processing the IFR Flight Plan
- Air Route Surveillance Radar (ARSR)
- Maintaining Separation
- Pilot Responsibilities
- Additional ARTCC Services
 - Separation From VFR Traffic
 - Weather Avoidance
 - Safety Alerts
 - Emergency Assistance

Terminal Facilities

- Terminal Radar Approach Control
- Control Tower
 - ATIS
 - Clearance Delivery

Interpreting Traffic Advisories

COMPLETION STANDARDS:

Through oral quizzes and/or discussion, the student will demonstrate an understanding of the air traffic control and surveillance systems before progressing to Ground Lesson I-7.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE I GROUND LESSON 7**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 3, Section C, "ATC Clearances" and Aeronautical Information Manual 4-4

LESSON OBJECTIVE:

The student will become familiar with the various ATC clearances and their use in IFR flight operations. Additionally, the student will learn clearance shorthand symbols.

CONTENT:

Pilot Responsibilities

- See and Avoid
- IFR Climb and Descent Considerations

IFR Flight Plan and ATC Clearance/Elements of an IFR Clearance (CRAFT)

- Clearance Limit
- Route
- Altitude Data
- Frequency
- Transponder Code

Holding Instructions

Abbreviated IFR Departure Clearance

Departure Restriction

- Release Time
- Hold For Release
- Clearance Void Time

Climb to VFR on Top/VFR on Top

Cruise Clearance

Holding Clearance

VFR on Top and Climb to VFR on Top

Approach Clearances

VFR Restrictions to an IFR Clearance

Clearance Readback

Clearance Shorthand

COMPLETION STANDARDS:

Through oral quizzing and/or discussion, the student will demonstrate an understanding of ATC clearances before progressing to Ground Lesson I-8.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE I GROUND LESSON 8

STAGE I - EXAM

LESSON OBJECTIVE:

The student will complete a written test covering the material in the Stage I, Ground Lessons 1-8.

CONTENT:

Stage I Exam

Crew Resource Management and Aeronautical Decision Making
Flight Instrument Systems
Attitude Instrument Flying
Instrument Navigation
FAR's Part 61 and 91 Covering Instrument Regulations
Air Traffic Control System
ATC Clearances

COMPLETION STANDARDS:

The student will demonstrate understanding of the test material by passing the test with a minimum score of 70%.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE I GROUND LESSON 9

TEXT REFERENCE:

Instrument Commercial Manual - Chapters 1, 2 and 3
FAR's 61, 91,
Aeronautical Information Manual

LESSON OBJECTIVE:

Review of questions missed on the written test.

CONTENT:

The instructor will review questions missed on the written test.

COMPLETION STANDARDS:

Through oral quizzing and/or review, the student will demonstrate satisfactory knowledge of the questions missed on the written test.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II

STAGE OBJECTIVE

During this stage, the student will learn the use of instrument flight charts for IFR planning and flight as well as the procedures used to execute the various IFR approaches and the procedures for IFR departure, enroute, and arrival operations.

STAGE COMPLETION STANDARD

This stage is complete when the student has taken the Stage II written exam with a minimum passing score of 70%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to Stage III.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II GROUND LESSON 1**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 4, Section A, "Departure Charts"
And Chapter 4, Section B, "Departure Procedures," and Aeronautical Information Manual
5-2

LESSON OBJECTIVE:

The student will learn the use of SID charts and IFR departure procedures and the operational considerations of the departure.

CONTENT:

Instrument Departure Procedures
- Climb Gradients
- Standard Instrument Departure
- Vector SID Chart Procedures
- Pilot Navigation SID Chart Features
- RNAV SID Chart Features

Departure Procedures
- Takeoff Minimums
- Climb Gradients
 -- Visual Climb Over Airport
 -- Obstacle Clearance
- Departure Options
 -- Briefing the Departure
 -- Performing a SID
 -- Climb Via Clearance
 -- Climb Via Considerations
 -- Obstacle Departure Procedures
 -- Vectors
 -- VFR Departures

COMPLETION STANDARDS:

Through oral quizzes and/or discussion, the student will demonstrate an understanding of departure charts and procedures before proceeding to Ground Lesson II-2.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE II GROUND LESSON 2**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 5, Section A, "Enroute and Area Charts" and Section B, "Enroute Procedures," Aeronautical Information Manual 5-3

LESSON OBJECTIVE:

The student will become familiar with IFR enroute and area charts, including the information contained on the charts and the symbols used to present that information and IFR enroute procedures.

CONTENT:

Enroute and Area Charts

- Enroute Charts
- Front Panel
- Navigation Aids
- Victor airways
- Communication
- Airports
- Airspace
- Area Charts

Enroute Procedures

- Enroute Radar Procedures
- Communication - Radar and Non-Radar Reporting Procedures
- Enroute Navigation Using GPS
 - Random RNAV Routes
 - T-Routes and Q-Routes
 - Enroute RNP
- Special Use Airspace
- IFR Cruising Altitudes
- Reduced Vertical Separation Minimums (RVSM)
- Descending From the Enroute Segment

COMPLETION STANDARDS:

Through oral quizzing and/or discussions, the student will demonstrate an understanding of enroute and area charts and enroute procedures before progressing to Ground Lesson II-3

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II GROUND LESSON 3**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 5, Section C, "Holding Procedures," Aeronautical Information Manual 5-3-8

LESSON OBJECTIVE:

The student will learn the purpose of holds, types of holds, holding fixes, holding entries and timing and wind correction to maintain the hold.

CONTENT:

- Holding Procedure
- Standard and Non-Standard Holding Patterns,
 - Outbound and Inbound Timing
 - Leg Distance (In Lieu of Timing)
 - Crosswind Correction
 - Maximum Holding Speed
 - Holding Pattern Entries
 - Direct
 - Teardrop
 - Parallel
 - Visualizing Entry Procedures
 - ATC Holding Instructions
 - Holding Clearance
 - Expect Further Clearance (EFC) Time

COMPLETION STANDARDS:

Through oral quizzing and/or discussions, the student will demonstrate an understanding of holding procedures before progressing to Ground Lesson II-4.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II GROUND LESSON 4**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 6, Section A, "Arrival Charts" and Section B, "Arrival Procedures," Aeronautical Information Manual 5-4-1

LESSON OBJECTIVE:

The student will learn the use of STAR Charts, IFR arrival procedures and operational considerations of the arrival.

CONTENT:

Arrival Charts

- Standard Terminal Arrival Route
- Interpreting the STAR
- RNAV STAR

Arrival Procedures

- Preparing For the Arrival
- Briefing the STAR Procedure
- Flying the Arrival
 - Airspeed
 - Descend Via Clearance
 - Descend Via Considerations
- Vertical Navigation Planning
 - Calculating Required Rate of Descent
 - Calculating Where to Begin a Descent

COMPLETION STANDARDS:

Through oral quizzes and/or discussion the student will demonstrate an understanding of STAR charts and arrival procedures before progressing to Ground Lesson II-5

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II GROUND LESSON 5**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 7, Section A, "Instrument Approach Charts" and Section B, "Approach Procedures," Aeronautical Information Manual 5-4-5 through 25

LESSON OBJECTIVE:

The student will learn to interpret and use the information published on instrument approach charts and gain an understanding of instrument approach procedures.

CONTENT:

Instrument Approach Charts

- Approach Procedure Types
- Approach Segments
- Transition From Enroute to Approach
- Approach Segments
 - Initial
 - Intermediate
 - Final
 - Missed
 - Runway and Approach Lighting
- Chart Layout
 - Heading Section
 - Pilot Briefing Information
 - Communications Section
 - Minimum Safe Altitude (MSA)
 - Plan View
 - Navaid and Flight Path Depiction
 - Course Reversal Depiction
 - Terrain and Obstacle Depiction
 - Profile View - Flight Path Depiction
 - Missed Approach Instructions
 - Step Down Fixes
 - Visual Descent Point
 - Descent Timing Conversion Table
 - Time and Speed Table and Rate of Climb/Descent Table
 - Landing Minimums Based on Aircraft Approach Categories
 - Visibility Requirements
 - Minimum Descent Requirements
 - Inoperative Components
 - Airport Sketch
 - Heading and Communications
 - Alternate Airports

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II GROUND LESSON 5 (CONTINUED)

Approach Procedures

- Preparing For the Approach
 - Approach Overview
 - Approach Briefing
 - Approach Clearance
- Performing the Approach
- Course Reversals
- Straight-In Landing Versus Circling Approach
- Use of ATC Radar for Approach
- Course Reversals
- Final Approach
 - Operating Below the DA or MDA
 - Descending to the DA or MDA
- Landing - Use of Visual Glideslope Indicators (VASI/PAPI)
- Circling Approaches
- Sidestep Maneuver
- Missed Approach Procedures
- Visual and Contact Approaches

COMPLETION STANDARDS:

Through oral quizzes and/or discussion, the student will demonstrate an understanding of instrument approach charts and approach procedures before progressing on to Ground Lesson II-6.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE II GROUND LESSON 6**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 8, Section A, "VOR Approaches", Section B, "ILS Approaches", Section C, "RNAV Approaches"

LESSON OBJECTIVE:

The student learns the methods and procedures used to perform VOR, ILS, GPS RNAV approaches.

CONTENT:

RNAV (GPS) Approaches

- Approach Design
- GPS Approach Equipment
 - Baro-Nav
 - WAAS Certified GPS
- Landing Minimums
 - LNAV, LNAV+V, LNAV/VNAV, LPV, LP
 - Determining Landing Minimums
- RNP Approach
- RAIM Failure (Non-WAAS Equipped GPS Equipment)
- Preparing For the Approach (Overview, Briefing)
- Performing the Approach (Clearance, Initial, Intermediate, Final and Missed Segments)

ILS, Localizer, LDA/SDF Approaches

- ILS Categories and Minimums
- ILS Components
 - Localizer
 - Glideslope
 - Range Information (RNAV/GPS, DME, VOR Fixes, Radar, Outer Marker)
- Preparing For the Approach (Overview, Briefing)
- Performing the Approach (Clearance, Initial, Intermediate, Final and Missed Segments)
- Simultaneous Approaches to Parallel Runways
- Localizer Approach
- Localizer Back Course Approach
- LDA and SDF Approaches

VOR Approaches

- Preparing For the Approach (Overview, Briefing)
- Performing the Approach (Clearance, Initial, Intermediate, Final and Missed Segments)

COMPLETION STANDARDS:

Through oral quizzing and/or discussion, the student will demonstrate an understanding VOR, ILS, Localizer, LDA, SDF and GPS RNAV approaches before progressing to Ground Lesson II-7.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE II GROUND LESSON 7

STAGE II EXAM

LESSON OBJECTIVE:

The student will complete a written test covering the material in the Stage II, Ground Lessons 1 through 6.

CONTENT:

Stage II Exam

Departure Charts
Departure
Procedures
Enroute and Area
Charts Enroute
Procedures
Holding
Procedures
Arrival Charts
Arrival Procedures
Instrument Approach
Charts
Approach Procedures
VOR Approaches
ILS Approaches
Localizer
Approaches
LDA and SDF
Approaches
RNAV (GPS) Approaches

COMPLETION STANDARDS

The student will demonstrate understanding of the test material by passing the test with a minimum score of 70%.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE II GROUND LESSON 7

STAGE II - REVIEW

TEXT REFERENCE:

Instrument Commercial Manual - Chapters 4, 5, 6, 7 and 8 and Aeronautical Information Manual

LESSON OBJECTIVE:

Review of questions missed on the written test.

CONTENT:

The instructor will review questions missed on the written test.

COMPLETION STANDARDS:

Through oral quizzing and/or review, the student will demonstrate satisfactory knowledge of the questions missed on the written test.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE III

STAGE OBJECTIVE

During this stage, the student will learn to analyze weather information, conditions, and trends while on the ground and in flight. In addition, the student will learn IFR flight planning and emergency procedures.

STAGE COMPLETION STANDARD

This stage is complete when the student has taken the Stage III Examination

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE III GROUND LESSON 1

TEXT REFERENCE:

Instrument Commercial Manual - Chapter 9, Section A, "Weather Factors"

LESSON OBJECTIVE:

The student will learn the major factors that affect weather patterns and cause hazardous weather situations.

CONTENT:

The Atmosphere

Atmospheric Circulation

- Pressure and Wind Patterns
- Local Convective Circulation

Moisture Precipitation and Stability

- Dewpoint
- Precipitation
- Latent Heat of Water
- Stability
- Clouds
 - Low
 - Middle
 - High
 - Vertical Development

AIRMASS

- Airmass Types Based on Temperature and Moisture Content
- Cold Fronts - Fast and Slow Moving
- Warm Fronts
- Stationary Fronts
- Occluded Fronts
- Frontal Cyclone - Structure and Development

COMPLETION STANDARDS:

Through oral quizzes and/or discussions, the student will demonstrate an understanding of weather factors, before progressing to Ground Lesson III-2.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE III GROUND LESSON 2

TEXT REFERENCE:

Instrument Commercial Manual - Chapter 9, Section B, "Weather Hazards"
Aeronautical Information Manual 7-1, 7-2 and 7-3

LESSON OBJECTIVE:

The student will learn weather hazards causes, recognition and avoidance.

CONTENT:

Thunderstorms

- Stages - Cumulus, Mature, Dissipating
- Airmass versus Frontal Thunderstorms
- Embedded Thunderstorms
- Associated Hazards - Lightning, Hail, Turbulence, Microbursts and Icing
- Thunderstorm Avoidance

Turbulence

- Mechanical
- Convective
- Frontal
- Clear Air
- Mountain Wave
- Reporting Turbulence

Wind Shear and Microbursts

- Indications
- Avoidance

Low Visibility/Fog

- Radiation
- Advection
- Upslope
- Precipitation Induced

Volcanic Ash

Icing

- Induction
- Structural
 - Conditions For Formation
 - Types
 - Impact on Performance
- Avoiding Icing Encounters
- Ice Control Systems
 - Airfoil - Boots, Thermal, Fluid
 - Windshield Ice Control - Defrost, Electric Heat, Fluid
 - Propeller Ice Control - Electric Boots, Fluid
 - Other Ice Control Systems
- Use of Autopilot in Icing Conditions

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE III, GROUND LESSON 2 (CONTINUED)

Cold Weather Operations

- Cold Temperature Airports - Procedures For Correcting ALSTG Errors at Low Temperatures

COMPLETION STANDARDS:

Through oral quizzing and/or discussion, the student will demonstrate an understanding of weather hazards before progressing to Ground Lesson III-3.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE III GROUND LESSON 3

TEXT REFERENCE:

Instrument Commercial Manual - Chapter 9, Section C, "Printed Reports and Forecasts", Section D, "Graphic Weather Products" and Section E, "Sources of Weather Information"

LESSON OBJECTIVE:

The student will learn how to interpret printed and graphic weather products and how to obtain weather information on the ground and in the air.

CONTENT:

Aviation Weather Reports and Forecasts

- Observations
 - Aviation Routine Weather Report (METAR)
 - Pilot Weather Reports (PIREPs's)
- Forecasts
 - Terminal Aerodrome Forecasts (TAF's)
 - Winds and Temperatures Aloft Forecast (FB)
 - AIRMENTS
 - SIGMENTS
 - Convective SIGMENTS
 - Severe Weather Reports and Forecasts
 - Hurricane Advisory
 - Convective Outlook
 - Severe Weather Watch Bulletin

Graphic Weather Products

- Observations
 - Radar Observations
 - Satellite Imagery
 - Graphical Depiction of METARS
- Analysis
 - Surface Analysis Chart
 - Ceiling and Visibility Analysis (CVA)
- Forecasts
 - Short-Range Surface Prognostic (PROG) Charts
 - U.S. Low-Level Significant Weather (SIGWX) Chart
 - Mid and High-Level SIGWX Charts
 - Wind and Temperature Aloft Forecast
 - Freezing Level Graphics
 - Icing Products
 - G-AIRMET
 - Convective Weather Outlook Chart
 - GFA Tool

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE III GROUND LESSON 3 (CONTINUED)

Sources of Weather Information

- Preflight Sources of Weather (AFSS, EFB/ForeFlight, WWW)
 - Outlook Briefing
 - Standard Briefing
 - Abbreviated Briefing
- In-Flight Weather Sources
 - Air Traffic Control
 - Ride Reports (PIREPs)
 - Radar depiction and Avoidance Recommendations
 - Center Weather Advisories
 - Automated Flight Service Station
 - Verbal Description of Text and Graphic Weather Products
 - Flight Information Service Broadcast (FIS-B) (ADS-B In)
 - Text and Graphic Products Downloaded
 - Robustness of Display Depends on Device Receiving the Download
 - AWOS/ASOS
 - Airborne Weather Equipment

COMPLETION STANDARDS:

Through oral quizzing and/or discussion, the student will demonstrate an understanding of printed and graphic weather products as well as sources of weather information before progressing to Ground Lesson III-4.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE III GROUND LESSON 4

TEXT REFERENCE

Instrument Commercial Manual - Chapter 10, Section A, "IFR Flight Planning"

LESSON OBJECTIVE:

The student will learn to plan IFR cross-country flights, including the use of flight information publications, obtaining weather briefings, and the preparation of a navigation log.

CONTENT:

Prepare a Flight Overview

Develop the Route

- Preferred Routes
- Enroute Chart Planning
- Approach Transition
- Alternate Airports

Obtain a Weather Briefing

- Outlook the Day Prior
- Standard the Day Of
- Abbreviated Shortly Before Departure

Review of NOTAM's

Altitude Selection

Complete the Nav Log

File ICAO Flight Plan

Perform Pre-Flight Tasks

Closing The IFR Flight Plan

COMPLETION STANDARDS:

Through oral quizzing and/or discussion the student will demonstrate and understanding of IFR Flight Planning before progressing to Ground Lesson III-5.

**UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS**

STAGE III GROUND LESSON 5**TEXT REFERENCE:**

Instrument Commercial Manual - Chapter 10, Section C "IFR Emergencies"

LESSON OBJECTIVE:

The student will learn considerations for dealing with emergencies in IFR flight.

CONTENT:

Declaring an Emergency

Malfunction Reports

Minimum Fuel

Loss of Primary Flight Instrument Indicators

- Gyroscopic Instrument Failure
- Pitot-Static Failures
- TAA Display Failures
 - PFD Failure
 - ADHRS Failures
 - Pitot-Static Failures
 - Use of Backup Analog Instruments
- Surveillance (ASR) No-Gyro Approaches

Loss of Communications

- Alerting ATC - 7600 on Transponder
- Route
 - Assigned
 - Being Vectored
 - Expected Routing
 - Filed Route
- Altitude
 - Assigned in Last ATC Clearance
 - Minimum altitude for IFR Operations
 - Altitude Expected in Further Clearance
- Leaving the Clearance Limit, Including Holding

COMPLETION STANDARDS:

Through oral quizzing and/or discussion, the student will demonstrate an understanding of IFR emergency procedures before progressing to Ground Lesson III-6.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE III GROUND LESSON 6

STAGE III - EXAM

LESSON OBJECTIVE:

The student will complete a written test covering the material in the Stage III, Ground Lessons 1 through 5.

CONTENT:

Stage III Exam

Weather Factors
Weather Hazards
Printed Reports and Forecasts
Graphic Weather Products
Sources of Weather Information
IFR Flight Planning
IFR Emergencies

COMPLETION STANDARDS

The student will demonstrate understanding of the test material by passing the test with a minimum score of 70%.

UNIVERSITY OF OKLAHOMA
INSTRUMENT RATING GROUND TRAINING SYLLABUS

STAGE III GROUND LESSON 7

STAGE III - REVIEW

TEXT REFERENCE:

Instrument Commercial Manual - Chapters 9 and 10 and Aeronautical Information Manual

LESSON OBJECTIVE:

Review of questions missed on the written test.

CONTENT:

The instructor will review questions missed on the written test.

COMPLETION STANDARDS:

Through oral quizzing and/or review, the student will demonstrate satisfactory knowledge of the questions missed on the written test.