CENTRAL TEXAS COLLEGE
AIR AGENCY No. DU8S099Q
SYLLABUS FOR AIRP 1451
INSTRUMENT GROUND SCHOOL
Semester Hours Credit: 4

Instructor: ______________
Office Hours: ______________

I. INTRODUCTION

A. The training course outline meets part of the curriculum requirements for the Commercial Pilot Certification Course with a Single-engine Land rating contained in Part 141.
B. The training syllabus herein contains a separate ground training course. See Appendix D, Commercial Pilot Certification Course - Airplane Single Engine Land Ground Training. It is to be used in conjunction with AIRP 1341 and AIRP 2337 as part of the total Commercial Pilot Certification.

II. OVERALL OR GENERAL OBJECTIVES OF THE COURSE

This course, in conjunction is designed to provide the student with the necessary aeronautical knowledge and ground instruction to meet the prerequisites specified in FAR Part 61 for the instrument pilot written test.

III. TRAINING COURSE COMPLETION STANDARDS

This course will have been successfully completed when the student has demonstrated, through oral and written tests, the completions standards of each stage contained herein.

IV. INSTRUCTIONAL FACILITIES

This course is conducted at facilities of Central Texas College. See Appendix II for the description of the facilities which will be used.

V. INSTRUCTIONAL MATERIALS

The instructional materials identified for this course are viewable through www.ctcd.edu/books

VI. COURSE REQUIREMENTS

This course, being technical in nature, will require that the student be attentive in class, keep a complete set of notes and complete the study assignments and practical exercises as given. The course is set up in a logical sequence and presented in a manner normally understandable to the aeronautical student.

In addition to the regular daily textbook assignments, practical exercises will be given. These will be completed by the student; handed in and evaluated as part of the course grade.

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In addition to the scheduled exams, the course grade will be determined by class participation, attendance and the completeness and promptness of outside assignments.

The student is required to attend class and absences will be dealt with in accordance with procedures and policies outlined in the college handbook. Any work missed must be made up.

Disability Support Services provide services to students who have appropriate documentation of a disability. Students requiring accommodations for class are responsible for contacting the Office of Disability Support Services (DSS) located on the central campus. This service is available to all students, regardless of location. Explore the website at www.ctcd.edu/disability-support for further information. Reasonable accommodations will be given in accordance with the federal and state laws through the DSS office.

VII. EXAMINATIONS

A. There will be five examinations as follows:
   1. Stage One - FAR governing flight under IFR and Radio Aids to Navigation, Radar and Transponders
   2. Stage Two - Flight instruments and airplane performance
   3. Stage Three - Air traffic control systems and procedures for IFR flight and Instrument publications, including AIM, Low altitude en route charts and Instrument Approach Procedure Charts.
   4. Stage Four - IFR weather and IFR cross-country flight planning, including dead reckoning and radio Navigation
   5. Final Exam - A comprehensive Final Exam covering materials in stages one through four.

B. A student must maintain a 70% average to meet the requirements of the class and the FAR’s

Semester Grade Computation

<table>
<thead>
<tr>
<th>Exam</th>
<th>Points</th>
<th>Points to Grade Ratio</th>
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<tbody>
<tr>
<td>Stage One</td>
<td>200</td>
<td>900 - 1050</td>
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<tr>
<td>Stage Two</td>
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<td>Final Exam</td>
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<td>Incentive Pts.</td>
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<td>Total</td>
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STAGE ONE - FAR GOVERNING FLIGHT UNDER IFR AND RADIO AIDS TO NAVIGATION, RADAR & TRANSPONDERS

STAGE ONE OBJECTIVES: To develop the student’s knowledge of the Federal Aviation Regulations which govern IFR flight operations and the types of operation authorized by an instrument rating, and to develop the student’s knowledge of radar, transponders and radio aids to navigation available to and used by instrument pilots under IFR.

STAGE ONE COMPLETION STANDARDS: This stage will be successfully completed when the student passes the Stage One written exam with a grade of 70%.

LESSON ONE

A. OBJECTIVE: During this lesson, the student will be introduced to this ground training course, the course requirements, and the textual materials. The student will be instructed in the appropriate regulatory requirements of FAR Part 1 and 61 as they apply to flight under IFR and instrument rating requirements.

CONTENT:

2. FAR Part 1, Definitions and Abbreviations
3. FAR Part 61, Certification of Pilots and Flight Instructors

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a basic understanding of the course content and the textual material and a working knowledge of the appropriate portions of FAR Parts 1 and 61.

LESSON TWO

A. OBJECTIVE: During this lesson, the instruction on FAR Part 61 will be completed and the student will be instructed in the pertinent regulatory requirements of FAR Part 71.

CONTENT:

1. FAR Part 61, Certification of Pilots and Flight Instructors
2. FAR Part 71 Designation of Federal Airways, Area Low Routes, Controlled Airspace and reporting points

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates, through oral quizzing, a working knowledge of the regulatory requirements of FAR Parts 61 and 71.
LESSON THREE
A. OBJECTIVE: During this lesson, the student will be instructed in the pertinent regulatory requirements of FAR Part 91 as it applies to IFR operations.

CONTENT

1. FAR Part 91, General Operating and Flight Rules

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates, through oral quizzing, a working knowledge of the appropriate portions of FAR Part 91 governing IFR flight operations.

LESSON FOUR
B. OBJECTIVES: During this lesson, the instruction on the pertinent regulatory requirements of Part 91 governing IFR flight operations.

CONTENT:

1. FAR Part 91, General Operating and Flight Rules

C. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination and demonstration, the student can locate and apply information in the appropriate rule in Part 91 concerning IFR flight operations.

LESSON FIVE
A. OBJECTIVES: During this lesson, the student will be instructed in the requirements of FAR Parts 95, 97 and NTSB Part 830 as they apply to IFR flight operations.

CONTENT:

1. FAR Part 95, IFR altitudes
2. FAR Part 97, Standard Instrument Approach Procedures
3. NTSB Part 830, Rules pertaining to the notification and reporting of aircraft accidents, incidents and overdue aircraft.

B. COMPLETION STANDARDS: The lesson will have been successfully completed when the student, by oral examination, displays a working knowledge of FAR Parts 95, 97 and NTSB Part 830 as they apply to IFR flight operations.

LESSON SIX
A. OBJECTIVES: During this lesson, the student will be instructed in the radio aids to IFR navigation and their operational principles, limitations, and uses. Instruction in the use of dead reckoning appropriate to IFR navigation and the use of radar and transponders in IFR flight operations will be covered during this stage.

CONTENT:

2. Stage one reading assignments: Instrument Flying Handbook. The student is expected to read and study this publication in addition to the specific assignments in the primary textbook.

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination, the student displays a working knowledge of IFR navigation aids and radar and transponder usage in IFR flight operations.

LESSON SEVEN

A. OBJECTIVES: During this lesson, the instruction begun on radio aids to IFR navigation, radar and transponders will be completed. A review of previous lessons in Stage One will be conducted as necessary.

CONTENT:

2. Instrument Flying Handbook

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination, the student displays a working knowledge of navigation aids, radar and transponders as used in IFR navigation and indicates that he is prepared to take the Stage One Written Examination.

STAGE ONE WRITTEN EXAM: Exam will cover FAR’s and NTSB Part 830

STAGE TWO - FLIGHT INSTRUMENTS AND AIRPLANE PERFORMANCE

STAGE TWO OBJECTIVES: To develop knowledge, understanding and interpretation of the flight instruments and radio navigation instruments used in controlling and navigating an airplane in IFR flight operations and to review and further develop the student’s ability to determine and control airplane performance by reference to airplane flight manuals, performance charts, graphs and tables.

STAGE TWO COMPLETION STANDARDS: This stage will be complete when the student passes the stage written exam with a minimum score of 70%.

LESSON ONE

A. OBJECTIVES: During this lesson, the student will be instructed in the concept of attitude instrument flying, instrument cross-check, instrument interpretation and airplane control by reference to flight instruments. The student will also be instructed in the construction, operation and use of the pitot-static system instruments.

CONTENT:

1. Stage Two Reading Assignment: Instrument Flying Handbook

B. COMPLETION STANDARDS: The student will have successfully completed the lesson when, by oral examination, he displays an understanding of the concept of attitude instrument flying and displays a working knowledge of the construction, operation and use
of the pitot-static system instruments.

LESSON TWO

A. OBJECTIVES: During this lesson, the student will be instructed in the construction, operation, interpretation, limitations and use of the gyroscopic flight instruments and the magnetic compass in IFR flight operations.

CONTENT:

1. FAA Instrument Flying Handbook

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination, the student displays a working knowledge of the construction, operation, interpretation, limitations and use of the gyroscopic flight instruments and the magnetic compass in IFR flight operations.

LESSON THREE

A. OBJECTIVES: During this lesson, the student will be instructed in the ground and airborne components, limitations, use and interpretation of the VOR and ILS in IFR navigation.

CONTENT:


B. COMPLETION STANDARDS: The student will have successfully completed the lesson when, by oral examination, he demonstrates a working knowledge of the ground and airborne components, limitations, use and interpretation of the VOR and ILS in IFR navigation.

LESSON FOUR

A. OBJECTIVES: During this lesson, the student will be instructed in the ground and airborne components, limitations, use and interpretation of DME, ADF and RMI in IFR navigation.

CONTENT:


B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination, the student demonstrates a working knowledge of the ground and airborne components, limitations, use and interpretation of DME, ADF, and RMI in IFR navigation.

LESSON FIVE:

A. OBJECTIVES: During this lesson, there will be a review of airplane weight and balance control and takeoff performance, and the student will be instructed in these areas of airplane performance control related to IFR flight operations.

CONTENT:

B. **COMPLETION STANDARDS:** The lesson will have been successfully completed when, by oral examination and demonstration, the student displays a working knowledge of airplane weight and balance control and takeoff performance related to IFR flight operations.

**LESSON SIX**

A. **OBJECTIVES:** During this lesson, there will be a review of airplane landing, climb, cruise and turning performance and density altitude and the student will be instructed in these areas of airplane performance control related to IFR flight operations.

**CONTENT:**


B. **COMPLETION STANDARDS:** The lesson will have been successfully completed when, by oral examination and demonstration, the student displays a working knowledge of airplane landing, climb, cruise and turning performance and density altitude related to IFR flight operations.

**STAGE TWO WRITTEN EXAMINATION:** Exam will cover flight instruments and aircraft performance

**STAGE THREE:  IFR PUBLICATIONS AND AIR TRAFFIC CONTROL**

**STAGE THREE OBJECTIVES:** To develop the knowledge of IFR publications, including the AIM, Low altitude en route charts, Departure Procedures, Standard Terminal Arrival Routes, and Instrument Approach Procedure Charts and to develop the knowledge of the Air Traffic Control system and IFR procedures, including flight plans, clearances, communications, position reports, holding procedures, radar approaches, emergency procedures and flight physiology.

**STAGE THREE COMPLETION STANDARDS:** This stage will have been successfully completed when the student passes the Stage Three Written Examination with a grade of at least 70%.

**LESSON ONE**

A. **OBJECTIVES:** During this lesson, the student will be instructed in the use of the Aeronautical Information Manual, Low Altitude En route Charts in IFR flight planning and flight operations.

**CONTENT:**

1. Aeronautical Information Manual
3. FAA *Instrument Flying Handbook*

B. **COMPLETION STANDARDS:** The student will have successfully completed the lesson when, by oral examination and demonstration, he displays a working knowledge of the use
of the Aeronautical Information Manual and Low Altitude En route Charts in IFR flight planning and flight operations.

LESSON TWO

A. OBJECTIVES: During this lesson, there will be a review of Lesson One and the student will be instructed in the use of Standard Instrument Departures and Standard Terminal Arrival Routes in IFR flight planning and flight operations.

CONTENT:

1. Review of Lesson One

B. COMPLETION STANDARDS: The student will have successfully completed the lesson, when by oral examination, he demonstrates a working knowledge of the use of DP’s, STAR’s in IFR flight planning and flight operations.

LESSON THREE

A. OBJECTIVES: During this lesson the student will be instructed in the interpretation of and use of Instrument Approach Procedure Charts including ADF, VOR, VOR-DME, ILS, Localizer Back Course, LDA, RNAV and radar approaches in IFR flight planning and flight operations.

CONTENT:

2. AC 90-1A, Civil Use of US Government Produced Instrument Approach Charts
3. Various instrument approach procedure charts.

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination and demonstration, the student displays a working knowledge of the interpretation of and use of Instrument Approach Charts in IFR flight planning and flight operations.

LESSON FOUR

A. OBJECTIVES: During this lesson the student will be introduced to IFR clearance shorthand and will be instructed in the Air Traffic Control System, IFR flight plans and IFR clearances.

CONTENT:

2. FAA Instrument Flying Handbook

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination, the student displays a working knowledge of the ATC system, IFR flight plans and IFR clearances.

LESSON FIVE

AIRP 1451
A. OBJECTIVES: During this lesson the student will be instructed in IFR communications and position and other reports in IFR flight operations.

CONTENT:


B. COMPLETION STANDARDS: The student will have successfully completed the lesson when, by oral examination and demonstration, he displays a working knowledge of IFR communication and position reports and other reports is IFR flight operations.

LESSON SIX

A. OBJECTIVES: During this lesson, the student will be instructed in ATC procedures governing IFR holding patterns and entry procedures, radar assistance and radar approaches and missed approach procedures.

CONTENT:


B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination and demonstration, the student displays a working knowledge of ATC procedures governing IFR holding patterns and entry procedures, radar assistance and radar approaches, and missed approach procedures.

LESSON SEVEN

A. OBJECTIVES: During this lesson, the student will be instructed in IFR emergency procedures and various aspects of flight physiology related to flight under IFR and miscellaneous ATC procedures.

CONTENT:


B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination, the student demonstrates a working knowledge of IFR emergency procedures and various aspects of flight physiology related to flight under IFR and miscellaneous ATC procedures.

STAGE THREE WRITTEN EXAMINATION: Exam will cover IFR publications and Air Traffic Control system

STAGE FOUR - IFR WEATHER, FLIGHT PLANNING AND THE SAFE AND EFFICIENT OPERATION OF AIRPLANES UNDER IFR

STAGE FOUR OBJECTIVES: To develop the knowledge of IFR weather and the procurement and use of aviation weather reports and forecasts, IFR flight planning by use of dead reckoning and radio navigation, and the safe and efficient operations of airplanes under instrument weather conditions.
STAGE FOUR COMPLETION STANDARDS: This stage will have been successfully completed when the student passes the stage four written examination with a grade of at least 70%.

LESSON ONE

A. OBJECTIVES: During this lesson there will be a review of the student’s knowledge of aviation weather and the student will be instructed in the atmosphere, moisture content, stability, wind, air masses, fronts, frontal flight procedures, thunderstorms, fog, icing and turbulence, as they affect safe and efficient instrument flight operations.

CONTENT:

2. Aviation Weather

B. COMPLETION STANDARDS: The student will have successfully completed the lesson when, by oral examination, he demonstrates a working knowledge of the atmosphere, moisture content, stability, wind, air masses, fronts, frontal flight procedures, thunderstorms, fog, icing and turbulence, as the affect safe and efficient instrument flight procedures.

LESSON TWO

A. OBJECTIVES: During this lesson there will be a review of the student’s knowledge of aviation weather reports and forecasts and the student will be instructed in surface observations, PIREP’s, in-flight weather advisories, radar reports and summaries, area forecasts, terminal aerodrome forecasts, winds aloft forecasts and sever weather forecasts. Constant pressure charts, winds aloft charts, weather depiction charts, radar summary charts, low level prognostic charts, weather broadcasts and securing a weather briefing, as they affect safe and efficient instrument flight operations, will be covered.

CONTENT:

2. Aviation Weather

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination and demonstration, the student displays a working knowledge of the weather reports, forecasts and charts identified in the ‘objectives’ and is capable of securing weather briefings as they affect safe and efficient instrument flight operations.

LESSON THREE

A. OBJECTIVES: During this lesson the student’s knowledge of dead reckoning navigation will be reviews and the student will be instructed in the use of calculator and wind face sides of the flight computer in planning and conducting an IFR cross country flight.

CONTENT:

1. Review of flight computer functions in IFR flight operations
2. FAA Instrument Flying Handbook
B. COMPLETION STANDARDS: The lesson will have been successfully completed when the student, by oral examination and demonstration, displays a working knowledge of the use of the calculator and wind face sides of the flight computer in planning and conducting an IFR cross country flight.

LESSON FOUR

A. OBJECTIVES: During this lesson, the previous lesson and the student’s knowledge of radio navigation will be reviewed, and the student will be instructed in the use of Low Altitude En route Charts, Area Charts, DP’s, STAR’s, Instrument Approach Procedure Charts, Aeronautical Information Manual, ATC Procedures and radio navigation aids in planning and conducting an IFR cross country flight.

CONTENT:
1. Review of previous lesson
2. FAA Instrument Flying Handbook

B. COMPLETION STANDARDS: The student will have successfully completed the lesson when, by oral examination and demonstration, he displays a working knowledge of the use of Low Altitude En route Charts, Area Charts, DP’s, STAR’s, Instrument Approach Procedure Charts, Aeronautical Information Manual, ATC Procedures, and radio navigation aids in planning and conducting an IFR cross country flight.

LESSON FIVE

A. OBJECTIVES: During this lesson, the student will be instructed in planning and conducting a safe and efficient IFR cross country flight, including FAR, navigation, terminal area operations, airplane performance, use of the AIM weather reports and forecasts, ATC procedures, and the many other elements involved in the safe and efficient operation of the airplane under IFR. Previous lesson will be reviewed as necessary.

CONTENT:
1. Planning a complete IFR cross country flight
2. Review of previous lessons as necessary

B. COMPLETION STANDARDS: The lesson will have been successfully completed when, by oral examination and demonstration, the student displays his ability to plan and conduct a safe and efficient IFR cross country flight, including the many elements involved in the safe and efficient operation of the airplane under IFR.

STAGE FOUR WRITTEN EXAMINATION: The exam will cover IFR weather, flight planning and the operation of the aircraft under IFR.

FINAL WRITTEN EXAMINATION: The exam will be comprehensive.