I. INTRODUCTION

A. The purpose of this course is to increase the student’s knowledge of aircraft operations, aircraft systems, meteorology, and the regulatory nature of aviation in the United States.

B. This course is required to meet curriculum requirements for the Central Texas College program(s) associate degree in aviation science.

C. This course is occupationally related and serves as preparation for jobs in aviation.

D. This course, in conjunction with AIRP 2337 and AIRP 1451 meets all the requirements of Appendix D of F.A.R. 141.

E. The prerequisite for this course is successful completion of AIRP 1417 or its equivalent.

II. OVERALL OR GENERAL OBJECTIVES OF THE COURSE

Upon successful completion of this course, Advanced Air Navigation, the successful student will be able to:

A. Demonstrate, through written tests and discussions, an increased knowledge of aircraft operations (C5; F1; F2; F3; F5; F6)

B. Recognize hazardous weather conditions and how to avoid them (F8, F9, F12)

C. Explain factors involved with Pilot Judgment and aeronautical decision-making

D. Demonstrate an increased knowledge of the Federal Aviation Regulations and related aviation publications (F8)

III. INSTRUCTIONAL MATERIALS

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

IV. COURSE REQUIREMENTS

A. To attend class regularly.

B. To be prepared to participate in classroom discussions and to take unannounced quizzes relating to lecture material presented and text assignments.

C. To be present for all examinations.

February 2007
V. EXAMINATIONS

A. There will be a minimum of three major examinations:
   1. Exam 1
   2. Mid-term exam
   3. Final exam

B. A student must be present for all examinations. No make-up examinations will be given. Students who know in advance will be absent from a examination due to valid reasons, must arrange to take an early examination. Unexpected absences due to illness or extenuating circumstances will require the student to see the instructor about individual make-up work in lieu of the missed examination.

C. Students without excused absences will be given a zero for the examination missed.

VI. SEMESTER GRADE COMPUTATIONS

<table>
<thead>
<tr>
<th>Course</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams 1</td>
<td>100</td>
</tr>
<tr>
<td>Mid-Term exam</td>
<td>100</td>
</tr>
<tr>
<td>Final exam</td>
<td>100</td>
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<tr>
<td>Quizzes/instructor</td>
<td>100</td>
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<tr>
<td>evaluation</td>
<td></td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>400</strong></td>
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</tbody>
</table>

A student must take the final examination to receive a grade for the course.

VII. NOTES AND ADDITIONAL INSTRUCTIONS FROM COURSE INSTRUCTOR

A. Withdrawal from course: It is the student’s responsibility to officially drop a class if circumstances prevent attendance. Any student who desires to, or must, officially withdraw from a course after the first scheduled class meeting must file an Application for Withdrawal or an Application for Refund. The withdrawal form must be signed by the students.

Application for Withdrawal will be accepted at any time prior to Friday of the 12th week of classes during the 16 week fall and spring semesters. The deadline for sessions of other lengths is as follows.

- 11 week session       Friday of the 8th week
- 8 week session        Friday of the 6th week
- 5½ week session       Friday of the 4th week

The equivalent date (75% of the semester) will be used for session of other lengths. The specific last day to withdraw is published each semester in the Schedule Bulletin.

Students who officially withdraw will be awarded the grade of “W”, provided the student’s attendance and academic performance are satisfactory at the time of official
withdrawal. Students must file a withdrawal application with the college before they may be considered for withdrawal.

A student may not withdraw from a class for which the instructor has previously issued the student a grade of “F” or “FN” for nonattendance.

B. Administrative withdrawal: An administrative withdrawal may be initiated when the student fails to meet College attendance requirements. The instructor will assign the appropriate grade on the Administrative Withdrawal Form for submission to the registrar.

C. An Incomplete Grade: The College catalog states, “An incomplete grade may be given in those cases where the student has completed the majority of the course work but, because of personal illness, death in the immediate family, or military orders, the student is unable to complete the requirements for a course…” Prior approval from the instructor is required before the grade of “I” is recorded. A student who merely fails to show for the final examination will receive a zero for the final and an “F” for the course.

D. ADA Statement: 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.
APPENDIX I

COMMERCIAL PILOT CERTIFICATION COURSE AIRPLANE
GROUND TRAINING - 40.5 HOURS

STAGE I - REGULATIONS, PUBLICATIONS, AND JUDGEMENT TRAINING

STAGE I - OBJECTIVES: To increase the student’s knowledge of the Federal Aviation Regulations, use of the Aeronautical Information Manual and Airport Facility Directory, and to reinforce the previous judgment training.

STAGE I - COMPLETION STANDARDS: This stage will be successfully completed when the student passes the appropriate test for stage one.

LESSON ONE

A. OBJECTIVES: To familiarize the student with the pertinent parts of FAR as they apply to Commercial Pilots and to reinforce previous knowledge of FARs Parts 1 and 61 as they apply to all pilots.

CONTENT

1. FAR Part 1

2. FAR Part 61 as applies to VFR Pilots
   a. Requirements for certificates and ratings
   b. Medical certificate requirements
   c. Pilot logbooks
   d. Recency of experience requirements
   e. Private and commercial pilot privileges and limitations
   f. Written tests and flight tests

B. COMPLETION STANDARDS: The student will have successfully completed this lesson when, by oral quizzing, a greater understanding of the appropriate Federal Aviation Regulations Parts 1 and 61 is demonstrated.

LESSON TWO

A. OBJECTIVES: This lesson will be used by the instructor to reinforce knowledge of FAR Part 91.

CONTENT

1. FAR Part 91
   a. Subpart A
b. Subpart B

c. Subpart C

2. Emphasis will be placed on areas important to commercial operations

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a greater understanding of FAR Part 91

LESSON THREE

A. OBJECTIVES: This lesson will be used by the instructor to refresh the student’s knowledge of those parts of the Aeronautical Information Manual and Airport Facility Directory that are pertinent to VFR operations.

CONTENT

1. Aeronautical Information Manual
2. Airport Facility Directory

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a greater understanding of the Aeronautical Information Manual and the Airport Facility Directory.

LESSON FOUR

A. OBJECTIVES: This lesson will be used by the instructor to familiarize the student with judgment training concepts, introduce crew coordination concepts, and administer the pilot personality profile test.

CONTENT

1. Judgment training concepts (Five Hazardous Thought Patterns)
2. Crew Coordination concepts
3. Pilot personality profile test

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates thought oral quizzing and understanding of judgment training and crew coordination and has taken the pilot personality profile test.

LESSON FIVE

A. OBJECTIVES: This lesson will be used to administer the STAGE I Test.

B. COMPLETION STANDARDS: This lesson will be completed when the student has taken the Stage I test and passed with a 70%.
STAGE II
AERODYNAMICS AND COMMERCIAL MANEUVERS

STAGE II OBJECTIVES: This stage will be used to familiarize the student with the maneuvers required in the Commercial Pilot Practical Test Standards, and to increase the student’s knowledge of basic aerodynamics.

STAGE II COMPLETION STANDARDS: This stage will be complete when the student demonstrates through oral and/or written exam a greater understanding of basic aerodynamics, and an understanding of advanced training maneuvers.

LESSON ONE

A. OBJECTIVES: This lesson will be used by the instructor to increase the student’s knowledge of basic aerodynamic principles

CONTENT

1. Four forces
   a. Lift
   b. Weight
   c. Thrust
   d. Drag
2. Bernoulli’s principle
3. The three axis of the airplane
4. Principles of airfoils
5. Propeller forces

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a greater understanding of basic aerodynamics, the principles of lift, and the forces acting on the airplane and propeller while in flight.

LESSON TWO

A. OBJECTIVES: To increase the student’s understanding of the stability forces acting on the airplane.

CONTENT

1. Definitions
2. Lateral stability
3. Longitudinal stability

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates
through oral quizzing a higher degree of understanding of stability.

LESSON THREE

A. OBJECTIVES: This lesson will be used to familiarize the students with the commercial maneuvers that are covered in the Commercial Pilot Practical Test Standards.

CONTENT

1. Steep Power Turns
2. Chandelles
3. Lazy 8's
4. Steep Spirals
5. Pylon 8's

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a greater understanding of the commercial maneuvers as outlined in the Commercial Pilot Practical Test Standards.

LESSON FOUR

A. OBJECTIVES: This lesson will be used to increase the student’s knowledge of the techniques involved in operating from short and soft fields.

CONTENT

1. Short Field Take-offs and landings
2. Soft Field Take-offs and landings

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a higher degree of understanding of the principles of operating from short and soft fields.

LESSON FIVE

A. OBJECTIVES: This lesson will be used to administer the Stage II written exam.

B. COMPLETION STANDARDS: This lesson will be complete when the student has taken the Stage II written exam and passed with a minimum of 70%.

STAGE III

AIRCRAFT SYSTEMS AND PERFORMANCE CHARTS
STAGE III OBJECTIVES: To familiarize the student with advanced aircraft systems and performance charts to include fuel systems, hydraulic systems, landing gear systems, propellers, pressurization, and oxygen systems. Performance charts will include take-off and landing charts, cruise charts, climb and descent charts, and weight and balance charts.

STAGE III COMPLETION STANDARDS: This stage will be complete when the student has taken the Stage III written exam.

LESSON ONE

A. OBJECTIVES: To familiarize the student with more advanced aircraft systems to include fuel systems, hydraulic systems, and landing gear systems.

CONTENT

1. Fuel Systems
2. Hydraulic Systems
3. Landing gear systems

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a greater understanding of the advanced aircraft systems.

LESSON TWO

A. OBJECTIVES: This lesson will be used to familiarize the student with more advanced systems on more complex aircraft to include propellers, pressurization, and oxygen systems.

CONTENT

1. Propellers
2. Pressurization
3. Oxygen systems

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a greater understanding of advanced systems.

LESSON THREE

A. OBJECTIVES: This lesson will be used to familiarize the student with performance charts to include takeoff and landing charts, climbs and descents charts, and en route charts.

CONTENT

1. Takeoff charts
2. Landing charts 
3. Climbs and descent charts 
4. En route or cruise charts 
5. Class exercises

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through classroom exercises and oral quizzing a higher degree of understanding of the performance charts used in this lesson.

LESSON FOUR

A. OBJECTIVES: This lesson will be used to familiarize the student with the importance of computing weight and balance and the various methods of doing so.

CONTENT

1. Explanations of terms
   a. Center of Gravity
   b. Arm
   c. Moment
2. Effects of C.G. location on stability
3. Methods of computing weight and balance
   a. Mathematical
   b. Graphs
   c. Tables
   d. Loading templates
4. Class exercises
5. Shift problems

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through class exercises and oral quizzing a higher degree of understanding of weight and balance.

LESSON FIVE

A. OBJECTIVES: This lesson will be used to administer the Stage III written exam.

B. COMPLETION STANDARDS: This lesson will be complete when the student has taken the Stage III Exam and passed with a minimum of 70%.

STAGE IV- NAVIGATION AND METEOROLOGY

STAGE IV OBJECTIVES: This stage is the final stage of the course and will be used to increase the student’s knowledge of navigation procedures, and the basic principles of meteorology.
STAGE IV COMPLETION STANDARDS: This stage will be complete when the student has taken the stage four written exam.

LESSON ONE

A. OBJECTIVES: This lesson will be used to increase the student’s knowledge of VOR and ADF navigation systems and their uses.

CONTENT

1. VOR navigation
   a. Principles of operation
   b. Identification of equipment used for VOR navigation
   c. Orientation
   d. VOR radial interception and tracking
2. ADF navigation
   a. Principles of operation
   b. Identification of equipment used for ADF navigation
   c. Definition of terms
   d. Orientation
   e. ADF bearing interception and tracking

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing and classroom exercises a greater understanding of VOR and ADF navigation systems.

LESSON TWO

A. OBJECTIVES: This lesson will be used to familiarize the student with the principles of RMI, Area Navigation (RNAV), and LORAN systems.

CONTENT

1. Radio Magnetic Indicator (RMI)
2. Area Navigation (RNAV)
3. Long Range Navigation

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a basic understanding of the principles of the navigation systems discussed.

LESSON THREE

A. OBJECTIVES: This lesson will be used to review the use of the E6B flight computer and to increase the student’s expertise in its use.
CONTENT

1. Review basic computer problems
2. Advanced computer problems
   a. Off-course correction
   b. Weight shift
3. Windside problems
4. Review

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through class exercises and oral quizzing a higher degree of understanding of the E6B flight computer.

LESSON FOUR

A. OBJECTIVES: This lesson will be used to increase the student’s knowledge of meteorology including circulation, pressure systems, and stability.

CONTENT

1. Circulation in the atmosphere
2. Pressure systems
3. Stability

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a higher degree of understanding of basic meteorology.

LESSON FIVE

A. OBJECTIVES: This lesson will be used by the instructor to review the different types of weather fronts and their associated weather.

CONTENT

1. Cold fronts
2. Warm fronts
3. Stationary fronts
4. Occluded fronts

B. COMPLETION STANDARDS: This lesson will be complete when the student displays through oral quizzing a higher degree of understanding of weather fronts.

LESSON SIX

A. OBJECTIVES: This lesson will be used to reinforce the student’s knowledge of commonly used weather reports and forecasts.

CONTENT

1. Surface aviation reports (METAR’S)
2. Terminal Aerodrome Forecasts (TAF’s)
3. Area forecasts (FA)
4. Winds aloft forecasts (FD)

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a higher degree of understanding of weather reports and forecasts.

LESSON SEVEN

A. OBJECTIVES: This lesson will used to increase the student’s awareness of hazardous weather and associated weather advisors.

CONTENT

1. Thunderstorms
   a. Types
   b. Associated weather
2. Squall lines
3. Ice
4. Fog
5. Wind shear
6. Weather advisories
   a. AIRMETS
   b. SIGMENTS

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a higher degree of understanding hazardous weather.

LESSON EIGHT

A. OBJECTIVES: This lesson will be used to review the techniques involved in planning a VFR cross-country of at least 300 nautical miles.

CONTENT

1. Weather briefing
   a. Types of reports and forecasts needed by the pilot
   b. Technique of getting a briefing
2. Use of WAC charts
3. Developing a flight log

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing and the development of a navigation log an increased proficiency in planning a long VFR cross country.

LESSON NINE

A. OBJECTIVES: This lesson will be used to review the entire course with emphasis on VFR procedures and techniques.
CONTENT

1. Review of selected areas

B. COMPLETION STANDARDS: This lesson will be complete when the student demonstrates through oral quizzing a higher degree of understanding of the areas covered in the review.

LESSON TEN

A. OBJECTIVES: This lesson will be used to administer the Stage IV written exam.

B. COMPLETION STANDARDS: This lesson will be over when the student has passed the stage exam with a 70%.