# COURSE OUTLINE

<table>
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<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>AVI 132</td>
<td>Commercial Pilot II</td>
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**Hours:** 3  
**Lecture/Lab/Other:**  
**Pre-requisite:** AVI 131  
**Co-requisite:** AVI 113 or AVI 114  
**Implementation:** Fall 2012

**Catalog description (2011-2013 Catalog):**  
Basic knowledge to pass the Federal Aviation Administration commercial pilot knowledge test. Includes Advanced multi-engine performance control, advanced meteorology, advanced multi-engine airplane Systems, advanced radio navigation, commercial pilot FARs, physiology of flight, environmental systems, flight planning and commercial maneuvers.

**Is course New, Revised, or Modified?** Revised

**Required texts/other materials:**
- Private Pilot Manual – will be utilized in some of the subject review areas and class lectures
- Commercial Pilot FAA Knowledge Examination by Irvin N. Gleim – Latest Edition

**Revision date:** February 2014  
**Course coordinator:** Joan Jones  
[Email: jonesj@mccc.edu]  
[Phone: 609-570-3436]

**Information resources:**

**Text Books:**
- Pilot’s Handbook of Aeronautical Knowledge by US Department of Transportation, FAA
- Airplane Flying Handbook by US Department of Transportation, FAA
- The Advance Pilot’s Flight Manual by William K. Kershner

**Other learning resources:**
- College Learning and Tutoring Center  
- Flight student mentoring group  
- Aviation Digital Data Service Intellicast ([www.adds.org](http://www.adds.org))  
- Gleim Software ([www.gleim.com](http://www.gleim.com))  
- AOPA ([www.aopa.org](http://www.aopa.org))  
- FAA ([www.faa.gov](http://www.faa.gov))
Course Competencies/Goals:

The Course Goals are outlined in the requirements for the issuance of commercial pilot certificates CFR 141 Appendix D Section 3 b(1)-(15):

1. Applicable Federal Aviation Regulations that relate to commercial pilot privileges, limitations and flight operations.
2. Accident reporting requirements of the National Transportation Safety Board.
3. Basic aerodynamics and the principles of flight.
4. Meteorology to include recognition of critical weather situations, wind shear recognition and avoidance and the use of aeronautical weather reports and forecasts.
5. Safe and efficient operation of aircraft.
6. Weight and balance computations.
7. Use of performance charts.
8. Significance and effects of exceeding performance limitations.
9. Use of Aeronautical charts and magnetic compass for pilotage and dead reckoning.
10. Use of navigational facilities.
11. Aeronautical decision making and judgment.
12. Principles and functions of aircraft systems.
13. Maneuvers, procedures and emergency operations appropriate to the aircraft.
14. Night and high altitude operations.
15. Procedures for operating within the National Airspace System.
### MCCC General Education Core Competencies

**A Written and Oral Communication in English:** Students will communicate effectively in speech and writing, and demonstrate proficiency in reading. (See General Education Goal 1.)

- **B1** Students will distinguish among opinions, facts, and inferences.
- **B2** Students will identify and critique underlying or implicit assumptions.
- **B3** Students will thoughtfully evaluate diverse perspectives and alternative points of view.
- **B4** Students will ask informed questions and make informed judgments.
- **B5** Students will solve problems by applying discipline-appropriate methods and standards.

**B Critical Thinking and Problem-Solving:** Students will use critical thinking and problem solving skills in analyzing information.

- **B1** Students will distinguish among opinions, facts, and inferences.
- **B2** Students will identify and critique underlying or implicit assumptions.
- **B3** Students will thoughtfully evaluate diverse perspectives and alternative points of view.
- **B4** Students will ask informed questions and make informed judgments.
- **B5** Students will solve problems by applying discipline-appropriate methods and standards.

**C Ethical Decision-Making:** Students will recognize, analyze and assess ethical issues and situations.

- **C1** Students will identify ethical implications of an issue or a situation.
- **C2** Students will analyze and evaluate the strengths and weaknesses of different perspectives on an ethical issue or a situation.
- **C3** Students will integrate their knowledge, take a position on an ethical issue or a situation, and defend it with logical arguments.

**D Information Literacy:** Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

- **D1** Students will recognize the value of using information to strengthen arguments and articulate a research question.
- **D2** Students will identify resources needed and develop and modify appropriate search strategies to obtain the information required to answer a research question.
- **D3** Students will recognize the factors that affect the quality of information and extract the pertinent information needed for the specific research question.
- **D4** Students will integrate the information located in a cohesive manner that addresses the research question and communicate the information to the appropriate audience.
- **D5** Students will respect the privacy, security, and ownership of the information they locate and use. Students will identify the ethical considerations relevant to the use of information, with a particular focus preventing plagiarism.

- **E Computer Literacy:** Students will use computers to access, analyze or present
### Goal 1  Written and Oral Communication in English:

Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.

- **1.1** Students will read, write, and listen actively, critically, and reflectively.
- **1.2** Students will logically, informatively, persuasively, and creatively respond orally and/or in writing to what they read, hear, and see.
- **1.3** Students will evaluate and revise their written and/or oral communication.
- **1.4** Students will write and speak clearly and effectively in formal American English.
- **1.5** Students will understand, analyze, and assess nonverbal, cultural, and gender communication in both small group and public communication settings.

**Activities, projects, assignments, and exams that evaluate student learning of the course’s General Education goals and objectives**

There will be 13-15 in-class quizzes and 10-11 unit tests in which the students will demonstrate their proficiency in reading, writing and oral communications.

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<th><strong>E</strong></th>
<th><strong>Written and Oral Communication in English</strong></th>
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<td><strong>E1</strong> Students will demonstrate proficiency in using major categories of computer software such as word processing, spreadsheet and presentation software.</td>
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<td><strong>E2</strong> Students will be proficient in using an interface and managing files.</td>
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<td><strong>E3</strong> Students will use email and communication software effectively and appropriately.</td>
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<td><strong>E4</strong> Students will use a web browser and search engines to seek information and will recognize types of information and sources.</td>
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<td><strong>E5</strong> Students will understand the impact of computers on society.</td>
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**Objective:** Students will demonstrate proficiency in using major categories of computer software such as word processing, spreadsheet and presentation software. The computer is the major means for obtaining information about weather, regulations, advisory circulars, airport diagrams for projects and assignments. Crew Resource Management is a means by which the student’s cooperative and collaborative skills can be demonstrated. Various projects employing cooperative actions for trip planning, weather and decision making will be employed.

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<th><strong>Collaboration and Cooperation:</strong> Students will develop the interpersonal skills required for effective performance in group situations.</th>
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<td><strong>F1</strong> Students will demonstrate communication skills that promote effective function and interpersonal relations within group situations or settings.</td>
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<td><strong>F2</strong> Students will recognize and employ strategies and role-playing which encourage a productive and supportive group climate.</td>
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<td><strong>F3</strong> Students will employ aspects of reflective thinking to solve problems utilizing brainstorming and consensus within collaborative projects.</td>
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<td><strong>F4</strong> Students will identify leadership, task/maintenance and self-serving roles and their effect on group function.</td>
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**Objective:** Students will develop the interpersonal skills required for effective performance in group situations. Collaboration and Cooperation: Students will develop the interpersonal skills required for effective performance in group situations. Crew Resource Management is a means by which the student’s cooperative and collaborative skills can be demonstrated. Various projects employing cooperative actions for trip planning, weather and decision making will be employed.

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<th><strong>G</strong></th>
<th><strong>Intra-Cultural and Inter-Cultural Responsibility:</strong> Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness.</th>
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<td><strong>G1</strong> Students will understand the privileges and responsibilities of being a citizen in a democratic society.</td>
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<td><strong>G2</strong> Students will demonstrate understanding of the behaviors and beliefs of different social groups within a pluralistic society, including groups based on culture, ethnicity, race, religion, creed, disability, marital status, national origin or ancestry, age, gender, economic status, and sexual orientations.</td>
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<td><strong>G3</strong> Students will utilize strategies for effective cross-cultural communication.</td>
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<td><strong>G4</strong> Students will respect and appreciate diverse points of view.</td>
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<td><strong>G5</strong> Students will use inclusive language.</td>
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**Objective:** Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness. Intra-Cultural and Inter-Cultural Responsibility: Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness. Activities, projects, assignments, and exams that evaluate student learning of the course’s General Education goals and objectives

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| **MCCC General Education Goals & Objectives** |
|---|---|
| **Goal 1**  Written and Oral Communication in English: Students will communicate effectively in speech and writing, and demonstrate proficiency in reading. |

**Objective:** There will be 13-15 in-class quizzes and 10-11 unit tests in which the students will demonstrate their proficiency in reading, writing and oral communications.
### Goal 2: Quantitative Understanding:
Students will demonstrate quantitative understanding by appropriately using mathematical and statistical concepts and operations to interpret data accurately and to solve problems.

- **2.1 Students will develop graphical, numeric, analytical and verbal models to describe quantitative relationships that exist in the world and explain the connections between these various models.**

- **2.2 Students will investigate and interpret these models using the mathematical skills, tools and reasoning appropriate to each type of model.**

- **2.3 Students will draw logical conclusions by applying a variety of mathematical problem-solving strategies.**

- **2.4 Students will be able to communicate mathematical concepts effectively.**

- **2.5 Students will demonstrate an appreciation for mathematics, its historical development, its use as a precise language, and its value as a tool for solving complex problems in many disciplines.**

The students will be solving weight and balance problems, time, speed and distance problems in conjunction with class projects and assignments.

Performance tables and graphical data will be utilized to determine takeoff distances.

### Goal 3: Natural Science:
Students will apply the scientific method of inquiry to draw conclusions based on verifiable evidence, use scientific theories and knowledge to understand the natural world, and assess the impact of scientific theories, discoveries and technological changes on society.

- **3.1 Students will identify and analyze scientific information and theories, and, integrating and applying this knowledge, will use the scientific method to solve problems and draw conclusions from data.**

- **3.2 Students will integrate scientific principles and scientific discovery, and will critically investigate the impact of science and scientific discovery on our understanding of the natural universe.**

Dead reckoning and pilotage will be utilized to solve cross-country positioning and timing.

### Goal 4: Technology:
Students will use technology to access, analyze or present information, solve problems, and communicate with others.

- **4.1 Students will demonstrate proficiency with electronic communications as appropriate to their program.**

- **4.2 Students will demonstrate a working knowledge of a major domain of technological application.**

- **4.3 Students will demonstrate the ability to use a particular technology or group of technologies to analyze or solve problems in general and within their academic discipline.**

- **4.4 Students will explain the social and ethical issues that surround a particular technology or group of technologies and articulate their opinions about such issues using written and oral communications tools.**

Computers will be utilized to assess the states of weather patterns, locate advisory circulars, and access federal regulation and aeronautical information.

### Goal 5: Social Science:
Students will critically evaluate behavioral or societal issues using theories and concepts from a social science.

- **5.1 Students will analyze and appreciate how social and political institutions and organizations influence individual development and behavior.**

As a result of the Federal Aviation Regulations, the students will gain a further understanding of the FAA’s impact on flight.

### COMMERCIAL GROUND INSTRUCTION COURSE OBJECTIVES

The purpose of this course is to have the student acquire the knowledge and information to meet the requirements specified in the Code of Federal Regulations Part 141 that pertain to the commercial pilot certificate CFR 61.125 Section (b).
COURSE COMPLETION STANDARDS

The student must demonstrate through written testing and classroom activities that they have gained the knowledge and information necessary to pass the FAA commercial rating airplane knowledge test with a minimum grade of 70%. All quizzes and unit tests, whether oral or written, must be corrected to 100% accuracy upon review by the student.

Unit 1 Advanced Airplane Systems, 250 minutes

Learning Objectives
The objective of this lesson is for the student to gain an understanding of the principals and functions with the various systems found in complex and multi-engine airplanes.

Lesson Content
Propellers, Fuel Injection, Turbo Charging, and Landing Gear

A. Controllable Pitch Propellers
   The student will be able to...
   1. Define Constant Speed Propellers and Contrast with other Propellers
   2. Define Propeller Efficiency
   3. Define RPM Control
   4. State Operation Procedures
   5. Propeller Overspeed Indications and Corrections

B. Fuel Injection and Turbo Charging
   The student will be able to...
   1. Define Fuel Injection Systems and Contrast with Carburetor System
      a) Components
      b) Normal Starting Procedures
      c) Detonation
      d) Pre-ignition
      e) Carburetor Icing
      f) Induction Icing
   2. Define Exhaust Gas Temperature (EGT) Gauge and State its Use
   3. List Mixture Leaning Procedure
   4. Define Alternate Air Source and State How it is Used
   5. Define Turbo Charging and List its Effect on Performance
      a) System Components
      b) Turbo Charging Operations

C. Landing Gear Systems
   The student will be able to...
   1. Define Retractable Landing Gear and Contrast with Fixed Gear
   2. Contrast and State Advantages and Disadvantages of:
      a) Electrical System
      b) Hydraulic System
      c) Electro-Hydraulic System
   3. Landing Gear Components
      a) Micro-Switches
b) Squat-Switches
c) Pressure Switches
d) Warning Horn and Lights
e) Position Indicators
f) Emergency Gear Extension

4. Landing Gear Malfunctions
5. Airspeed Limitation
   a) \( V_{le} \)
   b) \( V_{lo} \)

**Lesson Completion Requirements**
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

**Next Assignment**
Weight & Balance

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**Unit 2**  
**Weight & Balance, 150 minutes**

**Learning Objectives**
The objective of this lesson is to enable the student to review weight and balance theory and computations, and to reinforce his/her understanding of the significance and effects of exceeding aircraft performance limitations.

**Lesson Content**
Weight and Balance Control

*The student will be able to...*

1. Define Ramp Weight, Takeoff Weight, BEW, Payload, Useful Load, Datum, Center of Gravity, Aerodynamic Center
2. State Effects of Overload
3. Describe Importance of the Center of Gravity Envelope
4. List Effects of Load Forward of CG Limit
5. List Effects of AFT Loading
6. Discuss Lemac, Temac, Mac
7. Perform Weight and Balance Computations
   a) Computational Method
   b) Graph Method
   c) Table Method
8. Compute Weight and Balance Problems Involving Adding, Removing and Shifting Weight
9. Standard Weights
   a) Passenger
   b) Gasoline
   c) Jet Fuel
   d) Oil

**Lesson Completion Requirements**
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

**Next Assignment**
Basic Aerodynamics
Unit 3  Basic Aerodynamics, 200 minutes

Learning Objectives
After completing this lesson, the student will understand basic aerodynamics and the principles of flight.

Lesson Content
Basic Airplane Aerodynamics
The student will be able to...

1. Define Lift
   a) Lift Equation
2. List Several High Lift Devices
3. Define Drag
   a) Induced Drag
   b) Parasite drag
   c) Total Drag
4. Define Thrust
5. Define Propeller Efficiency
6. Discuss Flight in the Area of Reverse Command
7. Define Weight
8. Discuss Aircraft Stability
   a) Static
   b) Dynamic
   c) Dutch Roll
   d) Spiral Instability
   e) Longitudinal
   f) Lateral
   g) Directional
9. Define and Contrast Aerodynamics and Flight Performance
   a) Straight and Level Flight
   b) Climbs
   c) Glides
   d) Turns

Lesson Completion Requirements
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

Next Assignment
Advanced Performance Control

Unit 4  Advanced Performance Control, 200 minutes

Learning Objectives
The objective of this lesson is for the student to gain a firm understanding of the use of performance charts, the significance of exceeding aircraft performance limitations, and focus attention on decision-making and judgment.
Lesson Content
Commercial Advanced Airplane Performance Control
The student will be able to...

1. Calculate Aircraft Performance from Information Provided
2. Define and Calculate Density Altitude
3. Define Pressure Altitude and State How to Obtain it
4. List the Effects of Humidity on Performance
5. Use Multi-engine Performance Charts to Extract Performance Data
   a) Takeoff
   b) Accelerate-stop Distance
   c) Single-engine Takeoff
   d) Climb
   e) Multi-engine Climbs
   f) Best Angle of Climb
   g) Best Rate of Climb
   h) Cruise Climb
   i) Cruise Control
   j) Landing
6. Discuss Safe and Efficient Operation Procedures for Multi-engine and Complex Single-engine Aircraft
7. List Airplane Inspection and Certification Documents
8. State Operating Limitations of a Specific Airplane and Where they are Found
9. Define Airplane Performance Speeds and State Where Each is Used
10. Compute Runway Distance and Obstacle Clearance
11. Calculate Crosswind Component and State Effects on Performance
12. VMC
   a) Definitions
   b) Factors Influencing VMC
13. Critical Engine
   a) Forces Associated Single-Engine Operation
14. Trim Tabs Use for Multi-Engine Operations
15. Engine Failure
   a) Takeoff
   b) Climb
   c) Cruise
   d) Descent
   e) Landings

Lesson Completion Requirements
The student must pass the unit test at the College Testing Center with a minimum grade of 84%. In the classroom, the student will demonstrate his/her understanding of this unit by answering questions and satisfactorily completing work problems.

Next Assignment
Aeronautical Information Manual and FAA Advisory Circular System
Unit 5 Aeronautical Information Manual and Advisory Circular System, 50 minutes

Learning Objectives
The objective of this lesson is for the student to be able to effectively use the AERONAUTICAL INFORMATION MANUAL (AIM) and the FAA Advisory Circular System (ACS).
Aeronautical Information Manual and FAA Advisory Circular System

The student will be able to...

1. Locate information in the AERONAUTICAL INFORMATION MANUAL
2. Locate information in the FAA Advisory Circular System Series 00, 20, 60, 70, 90, 150 and 170

Lesson Completion Requirements
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

Next Assignment
Use of Air Navigational Facilities

Unit 6 Use of Air Navigational Facilities, 150 minutes

Learning Objectives
After completing this lesson, the student will be able to use radio facilities for cross-country navigation. He/she will be able to use ground-based radar and a transponder as aids to navigation.

Lesson Content
Radio Navigation Systems

A. VOR Navigation and DME
   The student will be able to...
   1. Define VOR Navigation and State Advantages of VOR
   2. List Classes of VOR Facilities
   3. Apply VOR Orientation and Navigation to Simulated Flights
   4. Define Distance Measuring Equipment and List Characteristics
   5. Describe Horizontal Situation Indicator and Contrast with VOR Indicator and Directional Gyro

B. ADF, Area Navigation, GPS
   The student will be able to...
   A. Explain Automatic Direction Finder
      a) NDB Tracking
      b) NDB Course Interception Procedures
   B. Explain RMI
   C. Relate how to use RMI
   D. State RMI Accuracy Checks
   E. Describe RNAV
   F. Describe Course-Line Computers
   G. Explain GPS Principles and Use
   H. Explain VOR Use
      a) Reception, Identification
      b) Tracking
      c) Interception
      d) Bracketing

C. Radar and Transponders
   The student will be able to...
Lesson Completion Requirements
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

Next Assignment
Federal Aviation Regulations and National Transportation Safety Board

Unit 7 Federal Aviation Regulations and National Transportation Safety Board, 150 minutes

Learning Objectives
The objective of this lesson is for the student to have a thorough understanding of the areas in Parts 61, 91, and 135 of the FAR's which pertain to commercial privileges, limitations and flight operations. The student will also understand the accident reporting procedures of NTSB 830.

Lesson Content
Code of Federal Aviation Regulations and Implications
The student will be able to understand and explain...

A. FAR Part 1
   Part 1 of the FARs alphabetically lists the definitions of terms used in the subsequent regulations. In addition, any abbreviations or symbols used in FARs are defined and explained in Part 1.
   1 Definitions and Abbreviations
   23 Airworthiness Standards: Normal, Utility, and Acrobatic Category Airplanes
   43 Maintenance, Rebuilding, and Alteration

B. FAR Part 61
   61.3 Requirements for Certificates, Ratings, and Authorizations
   61.5 Certificates and Ratings Issued Under this Part
   61.19 Duration of Pilot and Flight Instructor Certificates
   61.23 Duration of Medical Certificates
   61.31 General Limitations
   61.51 Pilot Logbooks
   61.57 Recent Flight Experience: Pilot in Command
   61.60 Change of Address
   61.69 Glider Towing: Experience and Instruction Requirements
   61.129 Airplane Rating: Aeronautical Experience

C. FAR Part 91
   91.103 Pre-flight Action
91.105 Flight Crewmembers at Stations
91.107 Use of Safety Belts
91.307 Parachutes and Parachuting
91.311 Towing: Other than Under 91.17
91.21 Portable Electronic Devices
91.167 Fuel Requirements for Flight in IFR Conditions
91.215 ATC Transponder and Altitude Reporting Equipment and Use
91.171 VOR Equipment Check for IFR Operations
91.211 Supplemental Oxygen
91.205 Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates; Instrument and Equipment Requirements
91.315 Limited Category Civil Aircraft; Operating Limitations
91.207 Emergency Locator Transmitters
91.23 Truth in Leasing Clause Requirements in Leases and Conditional Sales Contracts
91.111 Operating Near Other Aircraft
91.113 Right-of-Way Rules; Except Water Operations
91.117 Aircraft Speed
91.303 Acrobatic Flight
91.209 Aircraft Lights
91.155 Basic VFR Weather Minimums
91.157 Special VFR Weather Minimums
91.159 VFR Cruising Altitudes or Flight Level
91.177 Minimum Altitudes for IFR Operations
91.403 Maintenance, Preventive Maintenance, and Alterations: General
91.405 Maintenance Required
91.407 Operation after Maintenance, Preventive Maintenance, Rebuilding or Alteration
91.409 Inspections
91.413 ATC Transponder Tests and Inspections
91.417 Maintenance Records
91.421 Rebuilt Engine Maintenance
91.213 Inoperative Instruments and Equipment

D. FAR Part 135

135.1 Applicability
135.21 Manual Requirements
135.22 Manual Contents
135.33 Area Limitations on Operations
135.85 Carriage of Persons without Compliance with the Passenger-Carrying Provisions of the Part
135.87 Carriage of Cargo Including Carry-On Baggage
135.89 Pilot Requirements: Use of Oxygen
135.93 Autopilot: Minimum Altitudes for Use
135.105 Exception to Second-in-Command Requirement: Approval for Use of Autopilot System
135.107 Flight Attendant Crewmember Requirement
135.117 Briefing of Passengers before Flight
135.149 Equipment Requirements
135.171 Shoulder Harness Installations at Flight Crewmember Stations
135.183 Performance Requirements: Land Aircraft Operated Over Water
135.203 VFR: Minimum Altitudes
135.205 VFR: Visibility Requirements
135.211 VFR: Over-the-Top Carrying Passenger: Operating Limitations
135.243 Pilot in Command Qualifications

E. NTSB Part 830
   Notifications and Reporting of Aircraft Accidents, Incidents, and Overdue Aircraft, etc.

F. Additional Applicable Regulations
   1. Hazmat Part 175
   2. TSA Part 1500
   3. Part 119 Air Carrier and Commercial Operators
   4. Part 121 Domestic Air Carrier

**Lesson Completion Requirements**
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

**Next Assignment**
Meteorology

**Unit 8**  Meteorology, 225 minutes

**Learning Objectives**
The objective of this lesson is to provide a basic working knowledge of meteorology, recognition of critical weather hazards, wind shear avoidance, and the use of aeronautical weather reports and forecasts.

**Lesson Content**
Weather Factors, Weather Hazards, Printed Reports and Forecasts

A. Weather Factors
   *The student will be able to understand...*
   1. Layers of the Atmosphere
   2. Atmosphere Circulation
   3. Moisture
   4. Atmospheric Stability
   5. Clouds and Cloud Formations, Mountain Wave Turbulence
   6. Air Masses, Fronts and Weather Associated with Each Type

B. Weather Hazards
   *The student will be able to understand...*
   1. Thunderstorms
   2. Thunderstorm Avoidance
   3. Turbulence
   4. Reporting Turbulence
   5. Wake Turbulence
   6. Low Visibility
   7. Restrictions to Visibility
   8. Icing
   9. Estimating Freezing Level
   10. Avoiding Ice
   11. Hydroplaning
12. Cold Weather Operations
13. Mountain Wave Phenomena
14. Clear Air Turbulence

C. Printed Reports and Forecasts
   The student will be able to understand...
   1. Surface Aviation Weather Reports
   2. Radar Weather Report
   3. Terminal Forecasts
   4. Area Forecasts
   5. Winds and Temperatures Aloft
   6. Severe Weather Reports and Forecasts
   7. In-flight Weather Services
   8. Automated Weather Observation System (AWOS)

D. Charts and Graphs and Inform
   1. Pireps
   2. HIWAS
   3. Weather Depiction
   4. Constant Pressure Charts
   5. Freezing Level
   6. Low and High Level Significant Weather Prognostic Charts

Lesson Completion Requirements
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

Next Assignment
Physiology of Flight

Unit 9    Physiology of Flight, 150 minutes

Learning Objectives
The objective of this lesson is for the student to become familiar with certain physiological factors associated with flight and the consequences of the detrimental factors.

Lesson Content
Physiology of Flight

A. Oxygen Requirements
   The student will be able to...
   1. Define Hypoxia and Describe its Effects
   2. Define Hyperventilation and its Effects
   3. Describe effects of Pressure Change
   4. Describe Sinus Cavities and Associated Problems
   5. Describe Decompression and its Effects
   6. Describe Fatigue and its Effects
   7. Describe Circadian Rhythms and its Effects
   8. Describe Sensory Illusions and the Associated Effects
   9. Define Vestibular Sense
   10. Define Kinesthetic Sense
   11. Carbon Monoxide Dangers
   12. Scuba Diving Restrictions
13. Motion Sickness

B. Vertigo and Vision

_The student will be able to..._

1. List Motion Illusions / Spatial Disorientation
2. List Visual Illusions
3. Define Flicker Vertigo
4. List Vertigo Prevention Procedures
5. Define Light Sensitivity
6. Define Dark Adaptation
   a) Function of Rods and Cones
7. Explain Scanning Techniques
   a) Blind Spots
8. Blood Donations and Flight

**Lesson Completion Requirements**

The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

**Next Assignment**

Environmental Systems

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**Unit 10 Environmental Systems, 150 minutes**

**Learning Objectives**

The objective of this lesson is to gain understanding and knowledge of the various oxygen systems used in aviation, cabin pressurizations, and ice control systems.

**Lesson Content**

Oxygen Systems, Cabin Pressurizations, and Structural Ice Control Systems

A. Oxygen Systems

_The student will be able to..._

1. Define and Contrast:
   a) Continuous Flow Oxygen Systems
   b) Diluter-Demand Oxygen Systems
   c) Pressure-Demand Oxygen Systems
2. Calculate Oxygen Supply Duration

B. Cabin Pressurization

_The student will be able to..._

1. Describe Operation
2. List Safety Features
3. List Other Features
4. Itemize Pressurization Instruments and Controls

C. Structural Ice Control Systems

_The student will be able to..._

1. Explain Ice Control Equipment and Systems
2. Describe Electrical Propeller Anti-Ice
3. Describe Fluid Propeller Anti-Ice
4. Describe Wing De-Icing and Anti-Icing Equipment
5. Describe Electrically Heated Windshield
6. Describe Ground Applied Anti-Icing Chemicals
7. Describe Operation of De-Icing Equipment

**Lesson Completion Requirements**
The student must pass the in-class quiz with a minimum grade of 70%.

**Next Assignment**
Flight Computer and Aeronautical Charts

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**Unit 11**  
Flight Computer and Aeronautical Charts, 225 minutes

**Learning Objectives**
The objective of this lesson is for the student to review the functions and uses of the flight computer for problem solving and the use of aeronautical charts and the plotting of magnetic courses for pilotage and dead reckoning.

**Lesson Content**
Flight Computer Problem Resolution; Plotting Courses, Designating Checkpoints, and Calculation of Time Based Upon Winds for Pilotage and Dead Reckoning with Aeronautical Charts

A. Flight Computer
*The student will be able to...*
1. Identify Calculator Side
2. Calculate Density Altitude
3. Calculate TAS
4. Calculate Time-Speed-Distance
5. Calculate Fuel Consumption
6. Identify Wind Side
7. Gather Wind Data
8. Plot the Wind
9. Find Heading with Groundspeed
10. Calculate Unknown Winds
11. Explain Wind Component Chart

B. Aeronautical Charts
*The student will be able to...*
1. Plot Courses
2. Determine True Course
3. Calculate Wind Correction Angle
4. Apply Isogonic Variation for Magnetic Heading
5. Understand Variation for Course Heading
6. Establish Checkpoints
7. Fill out Navigation Log

**Lesson Completion Requirements**
The student must pass the in-class quiz with a minimum grade of 70%.

**Next Assignment**
Operating Procedures and Flight Information
Learning Objectives
The objective of this lesson is for the student to review and understand the procedures of operating within the National Airspace System.

Lesson Content
Operating Procedures and Flight Information for Airspace And Airports
The student will be able to...

1. Explain Collision Avoidance
2. Define Class “A” Airspace
3. Define Class “B” Airspace
4. Define Class “C” Airspace
5. Define Class “D” Airspace
6. Define Class “E” Airspace
7. Define Class “G” Airspace
8. Define Special Use Airspace
   a) Prohibited
   b) Restricted
   c) Warning
   d) Alert
   e) MOA’s
   f) Controlled Firing Area
9. Other Airspace
   a) ADIZ
   b) FRZ
   c) RVSM
10. Define Navigational Aids and Frequencies
11. List Types of Communications Facilities
12. Describe Flight Service Stations
13. Define UNICOM
14. Describe Air Traffic Control Facilities
15. List Airport Markings
16. List Airport Lighting
17. Describe Continental Control Area
18. Describe Visibility Requirements

Lesson Completion Requirements
The student must pass the unit test at the College Testing Center with a minimum grade of 84%.

Next Assignment
Aeronautical Decision Making and Judgment

Unit 13   Aeronautical Decision Making and Judgment, 150 minutes

Learning Objectives
The objective of this lesson is for the student to review the factors associated with the decision making process, which defines the problem, evaluates the circumstances, and resolves the problem.

**Lesson Content**
Pic Responsibility, Communications, Workload Management, Resource Use, Situational Awareness, and Incidents and Incidences

*The student will be able to understand...*

1. Pilot in Command Responsibility  
   a) Factors Influencing Responsibilities  
   b) Hazardous Attitudes  
   c) Interpersonal Relationships
2. Communications  
   a) Effective Listening  
   b) Barriers to Communications  
   c) Verbal and Non-verbal Communications
3. Workload Management  
   a) Planning and Preparation  
   b) Prioritizing  
   c) Work Overload
4. Resource Use  
   a) Resource Recognition  
   b) Internal Resources  
   c) External Resources
5. Situational Awareness  
   a) Operational Conditions  
   b) Environmental Condition  
   c) Obstacles to Maintaining Situational Awareness
6. Accidents and Incidents  
   a) Accident Synopsis  
   b) Human Factor Training in Action  
      i) United Flight 232 7/19/1989  
      ii) US Airways Hudson River

**Lesson Completion Requirements**
The student must pass the in-class quiz with a minimum grade of 70%.
Evaluation of student learning:

Grading Criteria:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Tests</td>
<td>30%</td>
</tr>
<tr>
<td>In-Class Quizzes</td>
<td>30%</td>
</tr>
<tr>
<td>FAA Knowledge Test*</td>
<td>20%</td>
</tr>
<tr>
<td>Class Work**</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

*A score of less than 70 on the FAA Knowledge Test will result in a failure for AVI 132

**Projects, Homework, Participation

Academic Integrity Statement:

MCCC ACADEMIC INTEGRITY POLICY OMB 210

Mercer County Community College is committed to Academic Integrity – the honest, fair and continuing pursuit of knowledge, free from fraud or deception. This implies that students are expected to be responsible for their own work and that faculty and academic support services staff members will take reasonable precautions to prevent the opportunity for academic dishonesty.

The College recognizes the following general categories of violations of Academic Integrity, with representative examples of each. Academic Integrity is violated whenever a student:

A. Uses or obtains unauthorized assistance in any academic work.
   - Copying from another student’s exam
   - Using notes, books, electronic devices or other aids of any kind during an exam when prohibited
   - Stealing an exam or possessing a stolen copy of an exam

B. Gives fraudulent assistance to another student.
   - Completing a graded academic activity or taking an exam for someone else
   - Giving answers to or sharing answers with another student before, during or after an exam or other graded academic activity
   - Sharing answers during an exam by using a system of signals

C. Knowingly represents the work of others as his/her own, or represents previously completed academic work as current.
   - Submitting a paper or other academic work for credit which includes words, ideas, data or creative work of others without acknowledging the source
   - Using another author’s words without enclosing them in quotation marks, without paraphrasing them or without citing the source appropriately
   - Presenting another individual’s work as one’s own
   - Submitting the same paper or academic assignment to another class without the permission of the instructor
     - Falsifying bibliographic entries
     - Submitting any academic assignment which contains falsified or fabricated data or results

D. Inappropriately or unethically uses technological means to gain academic advantage
   - Inappropriately or unethically acquiring material via the Internet or by any other means
   - Using any electronic or hidden devices for communication during an exam

Each instructor and academic support service area is authorized to establish specific guidelines consistent with this policy.
**Consequences for Violations of Academic Integrity**

For a single violation, the faculty member will determine the course of action to be followed. This may include assigning a lower grade on the assignment, assigning a lower final course grade, failing the student in the course, or other penalty appropriate to the violation. In all cases, the instructor shall notify the Chair of the Academic Integrity Committee of the violation and the penalty imposed.

When two (or more) violations of academic integrity are reported on a student, the Academic Integrity Committee (AIC) may impose disciplinary penalties beyond those imposed by the course instructors. The student shall have the right to a hearing before the AIC or a designated AIC subcommittee.

**Appeals**

The student has a right to appeal the decision of the instructor or the Academic Integrity Committee. Judicial procedures governing violations of Academic Integrity are contained in the Student Handbook.

Approved: Board of Trustees  
May 19, 1983

Revised: May 18, 2000  
March 18, 2004

**ATTENDANCE POLICY**

Students are expected and required to attend all classes. If you cannot avoid an absence, contact your instructor for assignments. Prolonged absences due to illness, injury, bereavement for an immediate family member should be reported to the office of the Executive Dean for Student Affairs. If for a valid reason you require an excused absence, you may obtain consent from your instructor, provided you fulfill all course requirements.