North Star

AVIATION

Commercial Pilot Certification Course

Airplane Multiengine Land

Training Course Outline (TCO)

Revision 8G

North Star Aviation Inc.
3030 Airport Road North
Mankato, MN 56001

FAA APPROVED
MSP FSDO, GL15
DANIEL LEO SINDT
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RECORD OF REVISIONS

Number	Date	Summary of Changes	Affected Pages
Original	June 05, 2011	Original certification of entire TCO	1–85
Revision 1	Oct. 01, 2011	Corrections and updates	1,2,7,9,11,14,16, 70,84,85
Revision 2	Feb. 15, 2012	Entire manual revision	1–111
Revision 3	Oct. 15, 2012	Merged ground and flight TCO's 1-131	
Revision 4	April 30, 2013		1-8,10,12,14,15,16,24, 44,45,46,49,50,52,53, 55-133
Revision 5	Dec. 01, 2013	Added flight lesson completion record Pg. 114, and some typo corrections	1-3,6–8,10–16,19,20, 25-45,48,63,68,76,85, 89,90,92,96,107,108, 111,112,114–129
Revision 6	Nov. 17, 2014	Chief flight instructor change	1,2,3,8,19
Revision 7	Dec. 21, 2015	Rewrite of flight TCO	1–12,15-21,24,44–133
Revision 8	Jun 1, 2017	Entire manual revision	1–141
Rev. 8b	Aug 31, 2017	Updated to reflect the addition of Piper Archers for ASEL training	1,2,7,16
Rev 8C	July 8, 2019	Revision to grading and lesson progression sections. Addition of the OPTIONAL designation to holding and approach completion topics on solo lessons in stage one. Removed safety pilot statement on solos.	1,2,3,4,7,12,13,66, 67, 68,71,73,75,76,77,120
Rev. 8D	Oct. 27, 2023	Clarified Objectives, Completion Standards, and Graduation Requirements. Some minor line item verbiage updates to be more consistent with current FAA publications. Update of Airport Terminal Floor Plan. Updated company logo on each page.	Entire Manual
Rev. 8E	March 1, 2024	Added ability to use Precision Flight Controls Simulators. Added verbiage to clarify precision approach req's on stage checks.	1,2,4,6,7,12,13,16,17 139-145

RECORD OF REVISIONS cont'd

Number	Date	Summary of Changes	Affected Pages
Rev. 8F	May 31, 2024	Updated TCO to make correct reference to recently updated ACS documents.	Entire Manual
Rev. 8G	December 20, 2024	Minor updates including Training Course Revision Control, Disenrollment, facilities, and slight page re-numbering.	1, 2, 4, 6, 8, 11-13, 16, 17, 136-144

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SECTION ONE

Course Description

Commercial Pilot Certification Course
Airplane Multiengine Land

North Star Aviation, Inc.
3030 Airport Road North
Mankato, MN 56001

Welcome to Commercial Pilot flight training. Minnesota State University, Mankato (MNSU) and North Star Aviation, Inc. (NSA) are committed to providing you with high quality ground and flight instruction designed to transform you into an FAA-certificated Commercial Pilot; a professional. We will do everything possible to help you succeed; however, the ultimate path to becoming a professional pilot requires significant effort on your part. You must come to each lesson fully prepared and ready to learn. Use this Training Course Outline (TCO) as your guide. Look ahead before each lesson so you'll know what to expect and how to prepare. For example, all ground lessons, and most flight lessons, include a section titled "REQUIRED READING/STUDY." Review the material listed there so that you can better retain the information when it's covered by your instructor. As another example, most flight lessons include a review of previously learned maneuvers, procedures, ground topics, etc. Study the lesson and go over those maneuvers/procedures ahead of time by mentally visualizing the flight (i.e. "chair flying.") This is an affordable way to practice, and it will help you progress through your training without repeating lessons. Your instructor will notice the effort, and you will benefit by making steady progress towards your Commercial Pilot certificate.

Introduction
This Training Course Outline (TCO) uses the building block approach to maximize learning—each lesson follows the previous in a logical sequence from start to finish. It is divided into two courses, ground school (36 hours) and flight training (120 hours), and each course is further divided into stages. The ground school and flight training both consist of three stages. A student may attend ground school and flight training concurrently, or he/she may complete ground training first and then begin flight training. When a student successfully passes the final stage check of the flight training course he/she will graduate from this TCO.

[Note: Unless self-examining approval is granted by the FAA, the student must also pass a written and/or practical flight test given by an FAA representative before earning a Commercial Pilot certificate, Airplane Multiengine Land.]

Students who progress normally through the TCO may complete all the requirements in the allotted time. Those who progress quicker may complete the training in less than the allotted time, and by accomplishing less than the identified requirements, provided they meet the minimum requirements specified in 14 CFR 141 Appendix D.

Training Course Revision Control
Revision's to this TCO will be prepared by the NSA Chief Flight Instructor(s), and a record of revisions will be maintained beginning on page 6. Major revisions to this TCO requiring an update to NSA's Electronic lesson grading software will be designated numerically (ex. 1, 2, 3, etc.). Minor revisions to this TCO that do not significantly affect the grading of lessons in NSA's Electronic record keeping system will be designated alphanumerically (ex. 1A, 2C, 3B, etc.).

Course Objective
The student will obtain the knowledge, skill, and aeronautical experience necessary to meet the requirements for a Commercial Pilot certificate, Airplane Multiengine Land.

Completion Standard
This course is complete when the student has satisfied each lesson including the EOC check and FAA written exam, and when they have attained the experience required by 14 CFR Part 141 Appendix D to obtain a Commercial Pilot Airplane Multi Engine Land Certificate.

Enrollment
Students will be enrolled in the ground and flight training courses separately. They must meet specific prerequisites for each course:

> Ground School Prerequisites: Prior to beginning ground school a student must possess a valid Private Pilot certificate with an Instrument Rating, or he/she must have taken the Private Pilot ground school and be enrolled in, or have taken, Instrument ground school, or he/she must have passed the Private Pilot and Instrument written exams with scores of 70% or better within the preceding 24 calendar months.
>
> Flight Training Prerequisites: Prior to beginning the flight training syllabus a student must be enrolled in, or have completed, Commercial Pilot ground school, and he/she must possess a valid and current FAA medical (first, second, or third class), and a Private Pilot, Airplane Single Engine Land certificate with an Instrument Rating, Airplane.

Student enrollment is documented by a paper and/or electronic enrollment certificate signed by the Chief or Assistant Chief Instructor. In addition to the enrollment certificate, students will receive a copy of this TCO and a Safety Procedures and Practices manual (a.k.a. Flight Operations Manual.)

[Note: As required in 14 CFR 141.93(a) a "copy" will be defined as a written copy, emailed copy, an electronic copy in a PDF format that may be distributed to the student through a central download site or delivered through an electronic means.]

Disenrollment

The Chief Instructor will terminate a student from this training course for any of the following reasons:

- Inability to complete any stage of this TCO within 8 months (244 days) of conducting the first lesson of the stage
    - Students who began a stage before this TCO revision date will be given 8 months from the date of revision to complete that stage
    - Students who experience medical and/or family difficulties during this course of training will be able to extend this deadline if approved by the Chief Flight Instructor. Any extensions granted will be documented in the students training record, and they will be considered binding.
- Inactivity; poor attendance of the scheduled flight labs
    - Students will refer to NSA's Flight Operations Manual (FOM) for flight lab attendance and no-show/cancellation policies
- Academic failure or withdrawal of the ground school
    - Students Training account may be placed on hold while a student re-enrolls in the Ground school course; however, the 8 month time frame will still apply for stage completion.
- Any other reason the Chief Instructor determines valid

Lesson Progression

This TCO uses the building block approach to maximize learning – each lesson follows the previous in a logical sequence from start to finish. Lessons will be conducted in order unless there is a logical reason (weather, resource availability, schedule conflicts, etc) to skip a lesson. It is permissible to perform lessons in an individual stage out of order; however, the instructor will ensure that the lesson being skipped does not introduce topics that are reviewed on the lesson to be performed. Topics are commonly introduced on ground lessons, so extra care will be taken to ensure nothing is introduced prior to skipping a ground lesson.

Instructors will consult with their supervising Assistant Chief Flight Instructor before skipping to look at ways to complete the lessons in order. Approval to skip will be documented in the students Talon file.

To complete a flight lesson all required maneuvers must receive a passing grade in an airplane; however, additional flight training may be performed in the Precision Flight Controls DCX Max Advanced Aviation Training Device (AATD). Simulator lessons may be completed in an airplane provided the lesson topics are able to be performed in the airplane (e.g. spins and other emergency procedures that would fall outside of NSA's FOM would not be able to be completed in the airplane.).

Ground School Testing

Commercial Pilot Ground School exams are instructor-created and employ testing methods similar to the FAA's knowledge exam. However, to ensure student comprehension ground instructors are encouraged to employ additional testing methods such as fill-in-the-blank, short essay, oral quizzing, etc. Ground school stage exams are designed to cover the material introduced in the stage. The final stage exam (Stage Three Exam) will cover all course material, and it will provide a good measurement of student ability to pass the FAA knowledge exam.

A student who fails to receive a passing grade on any stage exam may continue with the next stage of training. For part 141 purposes a failing grade will be considered a grade less than 70%. The first score will reflect on the student's academic grade; however, any failed exams will be retaken until a grade of 70% or higher is achieved prior to TCO Graduation.

Flight Training Testing

The Commercial End of Course ground check is an oral examination like the oral portion of FAA practical test. It will be conducted with a plan of action that covers the required elements of the lesson and the required elements of the applicable FAA Test Standards.

The Commercial End of Course flight check is a flight examination like the flight version of FAA practical test. It will be conducted with a plan of action that covers the required elements of the lesson and the required elements of the applicable FAA Test Standards. Both the ground stage checks, and flight stage checks work together to meet all FAA requirements. Because of this relationship, check pilots may use discretion to continue assessing ground items on the flight portion if the evaluator determines knowledge would be better demonstrated in the flight environment.

Incomplete or unsatisfactory results of an End of Course check will need to be completed and satisfied within 60 days of the original date of the start of the check. When more than 60 days has elapsed since the start of the End of Course check, the examiner must test the student on all areas of operation required for that certificate. Receiving an unsatisfactory grade three times on any combination of the ground and flight portions of an End of Course check will result in repeating the entire ground and flight check series.

Flight Training Lesson Grading
Lesson items or maneuvers are graded on a letter scale of “S”, “U”, “I”, and “N/A” based on the following table and procedures:

Grade	Description	Result	Application
S	Satisfactory	PASS	The lesson completion standards have been met
U	Unsatisfactory	FAIL	Performance did not meet completion standards
I	Incomplete	N/A	Required item/maneuver was not performed
N/A	Optional	N/A	Task is not a TCO requirement

- For a lesson to be completed all required items/maneuvers must receive a passing grade of “S”.
- Where there are optional items/maneuvers on a lesson that were not performed, the instructor will use an “N/A” indicating the item was not required to complete the lesson. Otherwise, the appropriate grade of “S” “U” or “I” is required.
- When an individual item/maneuver is graded “U” it will require further training on the same or subsequent training sessions until a grade of “S” is earned to complete the lesson.
- If an item is graded “U” with a previous attempt resulting in a “S” the student must repeat the item until the final attempt of that item results in a “S”.
- In the case where required items/maneuvers were not trained or performed during a lesson a grade of “I” will be applied. That will leave the item open on the electronic system showing it incomplete.
- Any lesson that needs to be repeated more than two times will be brought to the attention of the supervising instructor (Senior CFI, Asst. Chief, Chief).
- Stage checks requiring a “Precision Approach”, are preferred to use the ILS; however, any approach meeting the requirements of the Precision approach task found in the Instrument ACS may satisfy these line items.

Simulator Lesson Conduct
Part 141 Appendix D section 4(c)(1) requires that training in an AATD be conducted in a device that is representative of the aircraft for which the course is approved; therefore, simulator lessons will be conducted in a simulator configured for the aircraft applicable to the stage of training that lesson is found in.

Documentation
Students will document all flight and simulator training time used to earn the Commercial Pilot Certificate in their logbooks per 14 CFR 61.51. Additionally, the training provider will maintain paper and/or electronic training records for each student for a period of not less than one year per 14 CFR 141.101. All lessons in the record system will reflect the TCO presented here as accurately as possible, and all flights will be tracked to the corresponding lesson flown.

Graduation
To graduate from this Commercial Pilot Course, a student must have satisfied the Course Completion Standard. The student’s training records will be audited per NSA’s Student Training Record Certification process to ensure the above requirements are met, and a graduation certificate, signed by the Chief or Assistant Chief Instructor will be issued.

SECTION TWO

Personnel

Chief Instructor
The Chief Instructor must meet the minimum qualification requirements per 14 CFR 141.35 for a Commercial Pilot, Airplane Multiengine Land training course. Specifically, he/she must hold a commercial or airline transport pilot certificate, along with a current flight instructor certificate appropriate to the category, classes, and rating taught in this TCO (i.e. CFI airplane single and multiengine land; instrument airplane.) He/she must also have logged at least 2,000 hours as pilot in command and have accumulated a total of 3 years and 1000 hours, or 1,500 hours, of primary flight training experience.

The Chief Instructor has overall responsibility for the flight school training program. He/she will conduct initial and annual qualification checks of flight instructors, unless delegated to the Assistant Chief Instructor or an approved stage check pilot. Other duties, as outlined in 14 CFR 141.85, include certification of student training records, graduation certificates, stage and final test reports, and stage and final test recommendations. These duties are encompassed in NSA's Student Training Record Certification process and may be delegated to the Assistant Chief Instructor.

When training is taking place the Chief and/or Assistant Chief Instructor will be available for consultation in person or by phone, email, or text.

Assistant Chief Instructor
The Assistant Chief Instructor must meet the minimum qualification requirements per 14 CFR 141.36 for a Commercial Pilot, Airplane Multiengine Land training course. Specifically, he/she must hold a commercial or airline transport pilot certificate, along with a current flight instructor certificate appropriate to the category, classes, and rating taught in this TCO (i.e. CFI airplane single and multiengine land; instrument airplane.) He/she must also have logged at least 1000 hours as pilot in command and have accumulated a total of 1.5 years and 500 hours, or 750 hours, of primary flight training experience.

The Assistant Chief Instructor will perform duties as delegated by the Chief Instructor and outlined above. When training is taking place the Chief and/or Assistant Chief Instructor will be available for consultation in person or by phone, email, or text.

Check Instructors
Check Instructors must meet the minimum qualification requirements per 14 CFR 141.37 for a Commercial Pilot, Airplane Multiengine Land training course. Specifically, they must hold a commercial or airline transport pilot certificate, along with a current flight instructor certificate appropriate to the category, classes, and rating taught in this TCO (i.e. CFI airplane single and multiengine land; instrument airplane.) There is no minimum flight time requirement; however, check instructors must pass a test, given by the chief instructor, on teaching methods, applicable provisions of the Aeronautical Information Manual, applicable provisions of 14 CFR 61, 91, and 141, and the objectives and course completion standards of this TCO. Check Instructors will be designated in writing by the Chief Instructor and approved by the FAA.

Check Instructors will perform stage checks appropriate to their FAA approval letter, and they will assist in student record certification, as defined in NSA's Student Training Record Certification process. Additionally, Check Instructors will perform duties as delegated by the Chief Instructor. A Check Instructor may serve as the primary instructor for a student provided he/she does not conduct a stage check for that student.

Flight Instructors
Flight Instructors must hold at least a commercial pilot certificate for an airplane, single and multiengine land, and a current flight instructor certificate appropriate to the category, classes, and rating taught in this TCO (i.e. CFI airplane single and multiengine land; instrument airplane.) Flight Instructors will train students per this course outline, will document all training in the students' records, and will ensure the records for their assigned students are kept in good order and in accordance with North Star Aviation's record-keeping plan.

Chief Ground Instructor (if applicable)
To be eligible for designation as chief instructor for a ground school course, a person must have 1 year of experience as a ground school instructor at a certificated pilot school.

Ground Instructors
Ground instructors must hold a flight or ground instructor certificate with the appropriate rating for this course. If a person does not meet these requirements he/she may still be assigned ground training duties provided the chief instructor finds the person qualified, and the training is given while under the supervision of the chief instructor or the assistant chief instructor.

Ground Instructors are responsible for keeping attendance and will provide North Star Aviation with an attendance record following each class period. If a student misses a class, he/she must make it up with the Ground Instructor or with a North Star Aviation Flight Instructor. At the end of the course Ground Instructors will certify student completion in a manner acceptable to the Chief Instructor, who will then ensure the students' training records are updated.

Dispatcher
Dispatchers are responsible for releasing flights during normal training hours. North Star Aviation will train dispatchers on how to enter aircraft and student information, how to review student flight logs and documents for appropriate endorsements and currency, how to print dispatch releases, and how to understand aircraft maintenance due dates, among other duties.

SECTION THREE

Resources

Ground Instruction Facilities
Ground instruction is conducted in facilities occupied by North Star Aviation, Inc. at Mankato Regional Airport, and in rooms available to the Department of Aviation on campus at Armstrong Hall, Minnesota State University, Mankato. Details of ground instruction facilities, including room square footage, seating capacity, tools and resources, heating and ventilation, etc. are listed in Appendix A.

Airports
Training flights originate from Mankato Regional Airport (KMKT). Other airports in the vicinity, such as Waseca (KACQ) and New Ulm (KULM) are also available for pattern and instrument approach training. As the base of origination, KMKT meets all requirements per 14 CFR 141.38.

Airport Facilities
The Mankato Regional Airport is equipped with two flight briefing areas located in the terminal. Both briefing areas provide communication access to Flight Service and/or the internet. A 1,670 sq. ft. training room (Flight Office 139) consists of instructor cubicles (18), tables, dry erase boards, aeronautical charts, and current publications such as the FAR/AIM. This training room can support up to 38 students at a time. There are three offices used for the Chief and Assistant Chief Flight Instructors (144, 145, and 146), and each can hold 2-3 students. These three offices are equipped with tables, whiteboards, and monitors capable of being hooked up to with laptop computers. Two 86 sq. ft. rooms (135A and B) are designated for stage checks/checkrides, but they could also support instruction of up to two students at a time. These rooms are equipped with tables and monitors capable of being plugged into by laptop computers. There is also a large conference room (Conference 105, 454 sq. ft) and three smaller conference rooms (106A (145 sq. ft.), 106B (190 sq. ft.), and 111 (160sq. ft.)) available for classroom training, meetings, or private one-on-one training. Each room is furnished with tables, and wall mounted TV's capable of being plugged into with laptop computers. Room 105 can hold 35 people and the three smaller rooms can hold 6 people each. Students also have access to a Student Study Lounge capable of holding 64 people, and it is furnished with tables, chairs, and vending machines. Behind the front office (FBO Staff) there is a testing center appropriately equipped to provide space for FAA written exams. The dispatch center includes a dispatch counter with room for up to three dispatchers, and informational resources on the walls such as chart of the practice areas, three TV's displaying varying information, and an AWOS monitor. See Appendix C for a floor plan of the entire facility.

NSA has also constructed office space around it's corporate hangar. The ground floor of this addition has room for four simulator bays, four table top simulators/briefing areas, and twelve cubicles for flight instructor use. This training room is 3,300 sq. ft. and up to 45 people could conduct training activities at a time. The second floor contains administrative offices, and two are set aside for Chief/Assistant Chief Flight Instructor offices, each capable of holding 4 people. This space is constructed to current local building codes and it is furnished with similar training resources as the main training area in the Airport Terminal Building.

Aircraft

North Star Aviation uses the Piper Warrior/Archer (PA-28) and Piper Seminole (PA-44) for Commercial Pilot training. The PA-28 is a fixed-gear, non-complex four-place aircraft with dual flight controls that meets the requirements of 14 CFR 141.39. The Seminole is a twin-engine, complex four-place airplane with dual flight controls that also meets the requirements of 14 CFR 141.39. While avionics equipment may vary among each airplane, they are all equipped for day/night VFR/IFR flight in the National Airspace System (NAS), including all airspace requiring a Mode-C transponder.

Flight Simulators

North Star Aviation primarily utilizes three aircraft specific Precision Flight Controls DCX Max AATDs. The DCX max's feature motion platforms, fully enclosed cockpits, wrap around exterior visuals with a complete terrain and airport database. These simulators are dedicated to the aircraft they represent featuring actual airplane or replica components. The DCX Max simulators are capable of utilizing Pilot Edge software allowing a student and instructor to connect with actual Air Traffic Controllers to enhance training. For a copy of the FAA letter of authorization (LOA), see Appendix C.

Reference Books and Materials

All students will equip themselves with the PA-28-161/181 POH/IM as applicable, the PA-44 POH/IM, current FAR/AIM, current charts, a view limiting device, a fuel tester, and other resources applicable to complete this training course. Each lesson will contain a "Required Reading/Study" section listing applicable study materials to use during this course of training. Additionally, Appendix D contains an expanded list of supplemental references.

SECTION FOUR

Ground School

COMMERCIAL PILOT GROUND SCHOOL LESSON LAYOUT

STAGE ONE (10.8 HOURS)

LESSON	DISCUSSION TOPIC	REQUIRED READING/STUDY	HOURS
1	Federal Aviation Regulations that apply to Commercial Pilot privileges, limitations, Accident reporting requirements of NTSB	Jeppesen Instrument/Commercial 1-A	1.2
2	Principles and Functions of Advanced Aircraft Systems	Jeppesen Instrument/Commercial 11-A	1.2
3	Oxygen Systems, Pressurization Systems, Ice Control Systems	Jeppesen Instrument/Commercial 11-B	1.2
4	Principles and Functions of Advanced Aircraft Systems - Retractable Landing Gear Systems	Jeppesen Instrument/Commercial 11-C	1.2
5	Principles and Functions of Advanced Aircraft Systems - Electrical Systems	Jeppesen Instrument/Commercial 11-A	1.2
6	Principles and Functions of Advanced Aircraft Systems - Propeller Systems	Jeppesen Instrument/Commercial 11-A	1.2
7	Primary Flight Instruments	Jeppesen Instrument/Commercial 2-A	1.2
8	Airplane Flight Instruments and Basic Attitude Instrument Flight	Jeppesen Instrument/Commercial 2-B	1.2
9	STAGE ONE EXAM	Lesson 1 - 8 Referenced Pages	1.2
	TOTAL		**10.8**
	CUMULATIVE TOTAL		**10.8**

STAGE TWO (13.2 HOURS)

LESSON	DISCUSSION TOPIC	REQUIRED READING/STUDY	HOURS
10	Use of Air Navigation Facilities & Instrument Navigation Systems	Jeppesen Instrument/Commercial 2-C	1.2
11	Review Air Navigation Facilities & Instrument Navigation Systems	Jeppesen Instrument/Commercial 2-C	1.2
12	Airports, Airspace and Flight Info, Airspace, ATC	Jeppesen Instrument/Commercial 3-A, B & C	1.2
13	VFR Enroute Charts, magnetic Compass for Pilotage and Dead Reckoning, Low & High Altitude Enroute Charts	Jeppesen Instrument/Commercial 5	1.2
14	Navigation Charts and Procedures, Departure Procedures & STAR'S	Jeppesen Instrument/Commercial 4 & 6	1.2
15	Approach Charts & Approach Procedures, Visual, IFR	Jeppesen Instrument/Commercial 7 & 8	1.2
16	Basic & Advanced Aerodynamics, Principles of Flight	Jeppesen Instrument/Commercial 12 -A	1.2
17	Performance & Pilot Operating Handbook	Jeppesen Instrument/Commercial 12 -B	1.2
18	Weight and Balance Computations, and Weight Shift Computations	Jeppesen Instrument/Commercial 12-C	1.2
19	Airports, Airspace and Flight Info, Airspace, ATC, Precision and Non-precision Approaches	Jeppesen Instrument/Commercial 3-A, B & C	1.2
20	STAGE TWO EXAM	Lesson 10 - 19 Referenced Pages	1.2
	TOTAL		**13.2**
	CUMULATIVE TOTAL		**24**

STAGE THREE (12 HOURS)

LESSON	DISCUSSION TOPIC	REQUIRED READING/STUDY	HOURS
21	Meteorology, Aviation Weather Fundamentals	Jeppesen Instrument/Commercial 9 A & B	1.2
22	Meteorology - Recognition of Critical Weather Situations, Turbulence and Wind shear	Jeppesen Instrument/Commercial 9 A & B	1.2
23	Meteorology - Use of Aeronautical Weather Reports & Forecasts	Jeppesen Instrument/Commercial 9-C, D & E	1.2
24	Meteorology - Use of Aeronautical Weather Reports & Forecasts	Jeppesen Instrument/Commercial 9-C, D & E	1.2
25	Aviation Physiology, Night and High Altitude Operations	Jeppesen Instrument/Commercial 1-B	1.2
26	Aeronautical Decision making and judgment, Maneuvers, Procedures, and Emergency Operations Appropriate to Aircraft	Jeppesen Instrument/Commercial 1-B, 10-B, 13- A & B	1.2
27	Maximum Performance Takeoff and Landings	Jeppesen Instrument/Commercial 14-A	1.2
28	Commercial Flight Maneuvers	Jeppesen Instrument/Commercial 14-A, B, C, & D	1.2
29	Federal Aviation Regulations for Commercial Pilot Privileges, Limitations, and Flight Operations, Safe & Efficient Operation of Aircraft	FAR's	1.2
30	STAGE THREE EXAM (Final Exam)	Lesson 1 - 29 Referenced Pages	1.2
	TOTAL		**12**
	CUMULATIVE TOTAL		**36**

GROUND LESSON TEMPLATE

GROUND LESSON
X.X HOURS [Approximate hours required to complete the lesson]

LESSON OBJECTIVE
Summarizes the subjects all students are expected to learn from this lesson.

ACADEMIC CONTENT

- ☐ A bulleted list of the lesson's primary subjects
    - Sub-bullets, if required
    - Sub-bullets, if required

COMPLETION STANDARDS
Summarizes how the instructor will assess student learning (e.g. oral or written quiz.) Complete comprehension results from individual study and/or practice before and after the lecture.

REQUIRED READING/STUDY

- A bulleted list of the reference materials for this lesson
- Students are expected to come prepared to each lecture…
- By studying the material from this list beforehand

COMMERCIAL PILOT GROUND SCHOOL

STAGE ONE (10.8 HOURS)

Lessons 1 - 9

STAGE ONE OBJECTIVES: The student will be instructed in commercial flight operations, federal aviation regulations that apply to the commercial pilot privileges, limitations, and flight operations, principals and functions of advanced aircraft systems – (oxygen systems, pressurization systems, ice control systems, retractable landing gear systems, advanced aircraft electrical systems, advanced propeller systems), primary flight instruments, airplane flight instruments and basic attitude instrument flight.

STAGE ONE COMPLETION STANDARDS: The stage will be completed when the student satisfactorily passes the Stage One Exam with a score of 70% or better.

GROUND LESSON 1
1.2 HOURS

LESSON OBJECTIVE
Introduce commercial flight operations, commercial pilot privileges, limitations and flight operations and accident reporting requirements of the national transportation safety board.

ACADEMIC CONTENT
- ☐ FAR's that apply to privileges & limitations of the Commercial Pilot Certificate.
- ☐ Review responsibilities and authority of the pilot-in-command, other required crew, owner-operator, certificate holder and other responsible parties of commercial operations.
- ☐ Accident reporting requirements of NTSB 830
- ☐ Introduction to commercial flight operations.

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 1-A

GROUND LESSON 2
1.2 HOURS

LESSON OBJECTIVE
Gain an understanding of principles and functions of advanced aircraft systems, including being able to describe the operation of high performance engines and constant speed propellers.

ACADEMIC CONTENT
- ☐ Review reciprocating engine cycles
- ☐ Fuel Systems
- ☐ Cause, effect and recognition of detonation and pre-ignition.
- ☐ Engine cooling and lubrication
- ☐ Extreme weather operations

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 11-A

GROUND LESSON 3
1.2 HOURS

LESSON OBJECTIVE
Become familiar with principles and functions of advanced aircraft environmental and ice control systems.

ACADEMIC CONTENT
- ☐ Oxygen systems
- ☐ Pressurization systems
- ☐ Ice control systems

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 11-B

GROUND LESSON 4
1.2 HOURS

LESSON OBJECTIVE
Become familiar with principles and functions of aircraft common retractable landing gear systems.

ACADEMIC CONTENT
- ☐ Electrical gear systems
- ☐ Hydraulic gear systems
- ☐ Gear position indicators and warning systems
- ☐ Emergency operations appropriate to the aircraft

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 11-C

GROUND LESSON 5
1.2 HOURS

LESSON OBJECTIVE
Become familiar with advanced aircraft electrical systems.

ACADEMIC CONTENT
- ☐ Electrical systems
  - Definition of terms
  - Schematics
- ☐ Circuit protections
  - Fuses and circuit breakers
  - Voltage regulators
- ☐ Redundancies
- ☐ Electrical emergencies

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 11-A

GROUND LESSON 6
1.2 HOURS

LESSON OBJECTIVE

Become familiar with advanced aircraft propeller systems.

ACADEMIC CONTENT

- ☐ Propeller systems
  - Definition of terms
- ☐ Typical fixed pitch
- ☐ Typical single engine constant speed
- ☐ Typical multiengine constant speed
- ☐ Typical turbo propeller system

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 11-A

GROUND LESSON 7
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of primary flight instruments.

ACADEMIC CONTENT
- ☐ Pitot static instruments
- ☐ Gyroscopic instruments

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 2-A

GROUND LESSON 8
1.2 HOURS

LESSON OBJECTIVE
Review and ensure an understanding of other airplane flight instruments and their use in basic attitude instrument flight.

ACADEMIC CONTENT
- ☐ Magnetic compass
- ☐ Other instrumentation
  - Engine monitoring
  - Navigation
  - Advanced cockpits (glass)
- ☐ Basic attitude instrument flight

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 2-B

GROUND LESSON 9
1.2 HOURS

LESSON OBJECTIVE
The student will complete a comprehensive written exam covering material in lesson 1 through 9

ACADEMIC CONTENT
Stage One Exam

COMPLETION STANDARDS
This lesson is complete when the student passes the Stage One Exam with a minimum score of 70%.

REQUIRED READING/STUDY
- Lessons 1-8

COMMERCIAL PILOT GROUND SCHOOL

STAGE TWO (13.2 HOURS)

Lessons 10 - 20

STAGE ONE OBJECTIVES: The student will be instructed in use of air navigation facilities and instrument navigation systems, airports, airspace and flight info, airspace, ATC, VFR enroute charts, magnetic compass for pilotage, dead reckoning, IFR low and high altitude enroute navigation charts & procedures, IFR approach charts & approach procedures, visual, IFR, basic and advanced aerodynamics, principals of flight, performance & pilot operating handbook, weight and balance and weight shift computations, airports, Airspace and precision and non-precision approaches.

STAGE ONE COMPLETION STANDARDS: The stage will be completed when the student satisfactorily passes the Stage Two Exam with a score of 70% or better.

GROUND LESSON 10

1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of instrument navigation systems.

ACADEMIC CONTENT

- ☐ VOR
- ☐ DME
- ☐ NDB
- ☐ HSI and RMI

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 2-C

GROUND LESSON 11
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of instrument navigation systems.

ACADEMIC CONTENT
- ☐ ILS, RNAV, GPS, INS, RNP
- ☐ Integrated displays, PFD, MFD

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 2-C

GROUND LESSON 12
1.2 HOURS

LESSON OBJECTIVE

Review and insure an understanding of the National Airspace System, airport markings, lighting systems and other flight information. Review and insure understanding and be able to use appropriate sources of flight information. Review and insure an understanding of the air traffic control system and ATC clearances.

ACADEMIC CONTENT

- ☐ Airports, airspace and flight information
  - Runway and taxiway markings
  - Airport signs and additional markings
  - Airport lighting systems
- ☐ National Airspace System
  - Airspace classifications and requirements
  - Special use and other airspace
- ☐ Flight information
  - AFD, AIM, NOTAMs and Other Sources
- ☐ Air Traffic Control
- ☐ ATC clearances

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 3-A, B, C

GROUND LESSON 13
1.2 HOURS

LESSON OBJECTIVE

Review and insure an understanding of VFR enroute charts, IFR high and low altitude enroute charts and procedures, magnetic compass for pilotage and dead reckoning.

ACADEMIC CONTENT

- ☐ VFR enroute charts
- ☐ Magnetic compass for pilotage and dead reckoning
- ☐ Low and high altitude enroute IFR charts
- ☐ Enroute procedures
    - Communications (reporting procedures)
    - Direct vs airway
    - Airspeed and altitudes
    - VFR on top / over the top
    - Composite flight plans
- ☐ Holding procedures

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 5

GROUND LESSON 14
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of Navigation Charts and Procedures, SIDs and STARs.

ACADEMIC CONTENT
- ☐ VFR charts
- ☐ Departure and arrival charts and procedures
    - Pilot navigation, vector navigation

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 4 & 6

GROUND LESSON 15
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of approach charts and procedures, visual, IFR precision and non-precision.

ACADEMIC CONTENT
- ☐ Visual vs contact vs VFR approaches
- ☐ Non-precision approach
  - Charts
  - Procedures
  - NAVAID on and off airport
  - VOR, NDB, LOC, LDA, RNAV, GPS
- ☐ Precision approach
  - Charts
  - Procedures
  - ILS, LNP, RNP

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 7&8

GROUND LESSON 16
1.2 HOURS

LESSON OBJECTIVE
Become familiar with basic and advanced principles of aerodynamics including the VG diagram and principles of flight.

ACADEMIC CONTENT
- ☐ Review four forces, forces in a climb, forces in a turn, stability, drag and power curves.
- ☐ VG diagram'
- ☐ Thrust and power curves
- ☐ Effects of weight and load factors
- ☐ Rate & radius of turns
- ☐ Stalls and spins
- ☐ Principles of flight

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 12-A

GROUND LESSON 17
1.2 HOURS

LESSON OBJECTIVE
Further develop the ability to explain and use performance charts, tables, and other data to determine performance, including take off, climb, cruise, endurance, landing distance and adverse effects of exceeding aircraft performance limitations.

ACADEMIC CONTENT
- ☐ Factors affecting performance
  - Density altitude
  - Wind
  - Weight
  - Runway conditions
- ☐ Pilots operating handbook
  - Take off charts & tables
  - Rate of climb
  - Time, fuel, and distance to climb
  - Cruise performance (speed, range, and endurance)
  - Time, fuel, distance to descend
  - Landing distance
  - Use of performance charts takeoff, landing, climb cruise
- ☐ Glide distance
- ☐ Stall speed
- ☐ Significance and effects of exceeding limitations

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 12-B

GROUND LESSON 18
1.2 HOURS

LESSON OBJECTIVE

Review and further develop the understanding of the basic principles of weight and balance. Review and be able to perform weight and balance computations and shifting weight problems.

ACADEMIC CONTENT

- ☐ Weight and balance
- ☐ Weight and balance limitations
- ☐ Computing weight and balance
  - Computation method
  - Graft method
- ☐ Weight shift computation
  - Moving, adding or subtracting weights

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 12-C

GROUND LESSON 19
1.2 HOURS

LESSON OBJECTIVE

Review and description of and procedures for operating within National Airspace System, airport markings, lighting systems and other flight information. Review and insure understanding and be able to use appropriate sources of flight information. Review and insure an understanding of the air traffic control system and ATC Clearances.

ACADEMIC CONTENT

- ☐ Airports, airspace, and flight information
  - Runway and taxiway markings
  - Airport signs and additional markings
  - Airport lighting systems
- ☐ National airspace system
  - Airspace classifications, requirements, and description to operate within
  - Special use and other airspace
- ☐ Flight information
  - AFD, AIM, NOTAMs and other sources
- ☐ Air traffic control
- ☐ ATC clearances

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 3-A, B, C

GROUND LESSON 20
1.2 HOURS

LESSON OBJECTIVE
The student will complete a written examination covering all material from lesson 10 through lesson 19.

ACADEMIC CONTENT
Stage Two Exam

COMPLETION STANDARDS
This lesson is complete when the student passes the Stage Two Exam with a minimum score of 70%

REQUIRED READING/STUDY
- Lessons 10-19

COMMERCIAL PILOT GROUND SCHOOL

STAGE THREE (12 HOURS)

Lessons 21 - 30

STAGE THREE OBJECTIVES: The student will be instructed in aviation weather fundamentals, recognition of critical weather situations, turbulence and wind shear recognition an avoidance, meteorology, use of aviation weather services reports and forecasts, night and high altitude operations, aeronautical decision making and judgment, maneuvers, procedures, and emergency operations appropriate to the aircraft, aviation physiology, advanced human factors, maximum performance takeoff and landings, commercial flight maneuvers and review of federal aviation regulations commercial pilot privileges, limitations and flight operations, and review NTSB accident and incident reporting requirements.

STAGE THREE COMPLETION STANDARDS: This stage will be completed when the student satisfactorily passes the Stage Three Exam (Final Exam) with a score of 70% or better.

GROUND LESSON 21

1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of aviation weather fundamentals.

ACADEMIC CONTENT
- ☐ Causes of weather
- ☐ High/low pressure areas
- ☐ Jet stream
- ☐ Temperature
- ☐ Clouds
- ☐ Fog

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 9 A&B

GROUND LESSON 22
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of aviation weather fundamentals (meteorology).

ACADEMIC CONTENT
- ☐ Recognition of critical weather situations
    - Stability
    - Thunderstorms
    - Icing
    - Turbulence and windshear recognition and avoidance

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 9 A&B

GROUND LESSON 23
1.2 HOURS

LESSON OBJECTIVE

Review and insure an understanding of aviation weather services (meteorology). Use of aeronautical weather reports and forecasts.

ACADEMIC CONTENT

- ☐ Sources of weather information
- ☐ Aviation routine weather report (METAR)
- ☐ Terminal Aerodrome Forecast (TAF)

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 9 C, D, & E

GROUND LESSON 24
1.2 HOURS

LESSON OBJECTIVE

Review and insure an understanding of aviation weather services continued (meteorology). Use of aeronautical weather reports and forecasts.

ACADEMIC CONTENT

- ☐ Radar report (SD)
- ☐ Surface analysis chart
- ☐ Constant pressure chart
- ☐ Aviation area forecast (FA)
- ☐ In-flight weather advisories
- ☐ Low-level and high-level prognostic charts
    - Other charts and forecast

COMPLETION STANDARDS

This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 9 C, D, & E

GROUND LESSON 25
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of aviation physiology, night, and high altitude operations.

ACADEMIC CONTENT
- ☐ Spatial disorientation
- ☐ Vestibular disorientation
- ☐ Motion sickness
- ☐ Hypoxia
- ☐ Use of supplemental oxygen
- ☐ Hyperventilation
- ☐ Stress
- ☐ Dehydration
- ☐ Fatigue
- ☐ Alcohol and drugs
- ☐ Fitness for flight
- ☐ I'M SAFE checklist
- ☐ Night and high altitude operations

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 1-B

GROUND LESSON 26
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of advanced human factors concepts and aeronautical decision making and judgment.

ACADEMIC CONTENT
- ☐ Aeronautical decision making and judgment
- ☐ Crew resource management
- ☐ The decision-making process
  - DECIDE model
- ☐ Pilot-in-command responsibility
- ☐ Hazardous attitudes
- ☐ Workload management
- ☐ Situational awareness
- ☐ Emergencies VFR and IFR
  - Minimum fuel
  - Partial panel
  - Communication failure
  - No-gyro approach
  - Malfunction reports
- ☐ Maneuvers, procedures, and emergency operations appropriate to the aircraft

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 1-B, 10-B, 13-A&B

GROUND LESSON 27
1.2 HOURS

LESSON OBJECTIVE
Review and insure an understanding of maximum performance takeoffs and landings.

ACADEMIC CONTENT
- ☐ Soft field operations
- ☐ Short field operations

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- Jeppesen Instrument/Commercial Pilot 14-A

GROUND LESSON 28
1.2 HOURS

LESSON OBJECTIVE
Introduce and develop an understanding of the elements involved with maximum performance commercial flight maneuvers, steep turns, chandelles, lazy-eights, steep spirals, and eights-on-pylons

ACADEMIC CONTENT

- Commercial pilot maneuvers
    - Steep turns
    - Chandelles
    - Lazy-eights
    - Steep spirals
    - Eights-on-pylons

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY

- Jeppesen Instrument/Commercial Pilot 14-A, B, C, D

GROUND LESSON 29
1.2 HOURS

LESSON OBJECTIVE
Review and ensure an understanding of Federal Aviation Regulations with respect to commercial pilot privileges, limitations, and flight operations. Safe operation of aircraft.

ACADEMIC CONTENT
- ☐ FAR part 1 definitions
- ☐ FAR 23 aircraft categories
- ☐ FAR 61 applicable to the commercial pilot certificate, airplane
- ☐ FAR 91 applicable to the commercial flight operations
- ☐ FAR 119 applicability to commercial pilot operations
- ☐ NTSB accident and incident reporting requirements
- ☐ Safe and efficient operation of aircraft

COMPLETION STANDARDS
This lesson will be complete when the student demonstrates through oral questions that they have met the objective above.

REQUIRED READING/STUDY
- FAR's

GROUND LESSON 30
1.2 HOURS

LESSON OBJECTIVE
The student will complete a comprehensive written exam covering material in lesson 1 through lesson 29.

ACADEMIC CONTENT
Stage Three Exam (Final Exam)

COMPLETION STANDARDS
This lesson is complete when the student passes the Stage Three Exam (Final Exam) with a minimum score of 70% or better.

REQUIRED READING/STUDY

- Lessons 1-29

SECTION FIVE

Flight Training

COMMERCIAL PILOT FLIGHT TRAINING LESSON LAYOUT

STAGE ONE (54.2 HOURS)

LESSON	TOTAL	ME Complex	ASEL	DUAL	SOLO	DUAL X/C	SOLO X/C	NIGHT	INST	SIM	PRE/POST
1											3.0
2	4.0		4.0	4.0		4.0		2.0			0.5
3	1.6			1.6					1.6	1.6	0.2
4											2.0
5	3.0		3.0	3.0		3.0			2.5		0.5
6	3.0		3.0		3.0		3.0	2.0			0.3
7	3.0		3.0		3.0		3.0				0.3
8	3.0		3.0		3.0		3.0				0.3
9	4.0		4.0	4.0		4.0			3.3		0.5
10	1.6			1.6					1.6	1.6	0.2
11	3.0		3.0		3.0		3.0				0.3
12	3.0		3.0	3.0		3.0			2.0		0.5
13	3.0		3.0		3.0		3.0				0.3
14	4.0		4.0	4.0		4.0			3.0		0.5
15	3.0		3.0		3.0		3.0				0.3
16	3.0		3.0		3.0		3.0				0.3
17	4.0		4.0		4.0		4.0				0.3
18	2.0		2.0		2.0		2.0				0.3
19	3.0		3.0	3.0		3.0					0.5
20											1.0
21	3.0		3.0	3.0					1.5		1.0
Stage 1 Totals	**54.2**		**51.0**	**27.2**	**27.0**	**21.0**	**27.0**	**4.0**	**15.5**	**3.2**	**13.1**

Note: Lesson hours (dual, pre/post, etc.) are approximations. Instructors will attempt to meet these times for each lesson to maximize efficiency and student learning.

STAGE TWO (18.5 HOURS)

LESSON	TOTAL	ME Complex	ASEL	DUAL	SOLO	DUAL X/C	SOLO X/C	NIGHT	INST	SIM	PRE/POST
22											1.0
23	1.5		1.5	1.5							0.5
24	1.5		1.5	1.5							0.5
25											1.0
26	1.5		1.5	1.5							0.5
27	1.5		1.5		1.5						
28	1.5		1.5	1.5							0.5
29	1.5		1.5	1.5							0.5
30	1.5		1.5		1.5						
31	1.5		1.5	1.5							0.5
32	1.5		1.5		1.5						
33	1.5		1.5	1.5							0.5
34	1.5		1.5	1.5							0.5
35											2.0
36	2.0		2.0	2.0							1.0
Stage 2 Totals	**18.5**		**18.5**	**14.0**	**4.5**						**9.0**

Note: Lesson hours (dual, pre/post, etc.) are approximations. Instructors will attempt to meet these times for each lesson to maximize efficiency and student learning.

STAGE THREE (47.3 HOURS)

LESSON	TOTAL	ME Complex	ASEL	DUAL	SOLO*	DUAL X/C	SOLO X/C*	NIGHT	INST	SIM	PRE/POST
37											2.0
38	1.5			1.5					1.5	1.5	0.5
39											2.0
40	1.5	1.5		1.5							0.5
41	1.5	1.5		1.5							0.5
42											2.0
43	1.5			1.5						1.5	0.2
44	1.8	1.8		1.8							0.2
45											2.0
46	2.0	2.0		2.0		2.0					0.5
47	2.0	2.0		2.0		2.0		2.0			0.5
48	1.5			1.5					1.5	1.5	0.5
49											2.0
50	1.5	1.5		1.5					1.3		0.5
51	1.5			1.5					1.5	1.5	0.5
52	1.5			1.5					1.5	1.5	0.5
53	4.0	4.0		4.0		4.0			2.0		0.5
54	4.0	4.0		4.0		4.0			2.0		0.5
55	5.0	5.0			5.0		5.0				0.5
56	2.5	2.5			2.5		2.5	2.5			0.5
57	2.5	2.5			2.5		2.5	2.5			0.5
58											2.0
59	1.5	1.5		1.5							0.5
60	1.5	1.5		1.5							0.5
61	1.5			1.5					1.5	1.5	0.5
62	1.5	1.5		1.5					1.3		0.5
63	1.5	1.5		1.5					0.2		0.5
64	2.0	2.0		2.0					0.3		0.5
65											3.0
66	2.0	2.0		2.0					0.3		2.5
Stage 3 Totals	**47.3**	**38.3**		**37.3**	**10**	**12**	**10**	**7.0**	**14.9**	**9.0**	**27.9**
Totals	**120**	**38.3**	**69.5**	**78.5**	**41.5**	**33**	**37**	**11**	**30.4**	**12.2**	**50**

Note: Lesson hours (dual, pre/post, etc.) are approximations. Instructors will attempt to meet these times for each lesson to maximize efficiency and student learning.

Note: A student may complete the training in less than the allotted time, and by accomplishing less than the identified requirements, provided he/she meets the minimum requirements specified in 14 CFR 141 Appendix D (maximum simulator credit = 20%, or 24 hours: see the Precision Flight Controls LOA, Appendix C.)

**Note: Student performing duties of PIC under supervision of an authorized instructor*

FLIGHT LESSON TEMPLATE

LESSON #: [Flight, Simulator, or Pre/Post Ground]
X.X HOURS DUAL/SOLO [Approximate flight hours required]
X.X HOURS INSTRUMENT [Simulated or actual]
X.X HOURS Pre/Post [Approximate Pre/Post briefing time required]

LESSON OBJECTIVE
[Summarizes the ground and flight training the student is expected to receive and/or accomplish during this lesson. Lesson requirements will be listed here to clarify expectations.]

GROUND TRAINING: Review [Identifies elements introduced on a previous lesson]

Topic in Bold [The primary topic to reviewed]
- ☐ Square bullets represent graded items
  - Not graded; extra information
  - Not graded; extra information
- ☐ OPTIONAL [Not required]

GROUND TRAINING [Identifies topics to be introduced on this lesson]

Topic in Bold [The primary topic to introduced]
- ☐ Square bullets represent graded items
  - Not graded; extra information
  - Not graded; extra information
- ☐ OPTIONAL [Not required]

FLIGHT TRAINING: Review [Identifies maneuvers/skills to be reviewed on this lesson.]

Maneuver/Skill in Bold: [The primary maneuver/skill to be reviewed]
- ☐ Square bullets represent graded maneuvers/skills
  - Not graded; extra information
  - Not graded; extra information
- ☐ OPTIONAL [Not required]

FLIGHT TRAINING [Identifies maneuvers/skills to be introduced on this lesson]

Maneuver/Skill in Bold: [The primary maneuver/skill to be introduced]
- ☐ Square bullets represent graded maneuvers/skills
  - Not graded; extra information
  - Not graded; extra information
- ☐ OPTIONAL [Not required]

COMPLETION STANDARDS
[Summarizes the level of student performance required to complete the lesson.]

REQUIRED READING/STUDY
- A bulleted list of the reference materials for this lesson
- Students are expected to come prepared to each lesson…
- by studying the material from this list beforehand

COMMERCIAL PILOT FLIGHT TRAINING

STAGE ONE (54.2 HOURS)

Lessons 1 - 21

STAGE ONE OBJECTIVES: Stage One of the syllabus is designed to provide the student with a strong foundation in the single engine airplane to prepare him/her for commercial pilot certification. The student will increase proficiency in cross country operations with a focus on IFR and VFR navigation in day and night operations.

STAGE ONE COMPLETION STANDARDS: At the completion of this stage the student will perform all the maneuvers and procedures for IFR and VFR cross country flight. The student will perform IFR and VFR cross country navigation at a proficiency level that meets the criteria set forth in the current FAA Private Pilot and Instrument Pilot Airmen Certification Standards.

LESSON 1: PRE/POST GROUND 3.0 HOURS

LESSON OBJECTIVE
This lesson reviews VFR operations to assist in developing an application level of knowledge through scenario-based training.

GROUND TRAINING

Enrollment – ensure the student:

- ☐ Is taking, or has taken, Commercial Pilot Ground School
- ☐ Has a valid medical
- ☐ Has Private Pilot Cert. with an Instrument Rating on file
- ☐ Has TSA approval (if applicable)
- ☐ Has read and signed the flight lab Terms of Agreement (if applicable)
- ☐ Is furnished with…
  - a signed enrollment certificate
  - a copy of this TCO
  - a copy of the FOM
- ☐ Review of North Star Aviation FOM
  - Professionalism on cross countries (dress code)
  - Problems occurring on cross countries (popped tire, etc.)

Aeromedical Factors

- ☐ Hypoxia
- ☐ Supplemental oxygen
- ☐ Hyperventilation
- ☐ Middle ear/ sinus problems
- ☐ Spatial disorientation
- ☐ Motion sickness
- ☐ Carbon monoxide poisoning
- ☐ Stress/fatigue
- ☐ Dehydration
- ☐ Causes, effects, and corrective actions for all the above factors.

National Airspace

- ☐ Class A,B,C,D,E, and G
  - VFR weather minimums
  - Pilot certification
  - Aircraft equipment requirements
- ☐ Special use airspace

Emergency Equipment & Survival Gear

- ☐ Winter operations
- ☐ Emergency equipment on each of our aircraft

Night Operations

- ☐ Night vision: rods and cones
- ☐ Night illusions
- ☐ FAAST program: “Operation Lights On”

Navigation

- ☐ Pilotage and dead reckoning
- ☐ Diversion
- ☐ Lost procedures
- ☐ Navigation systems
- ☐ Radar services

Airport Operations

- ☐ Radio communications
  - Professional, standard communications
  - Proper phraseology

Preflight Preparation

- ☐ Certificates and documents
  - What to look for in the Aircraft
- ☐ Passenger and taxi briefings
- ☐ Airworthiness requirements
- ☐ PIC Responsibilities
- ☐ Cockpit management
- ☐ Required logging of time

Preflight Briefing Information*

- ☐ Weather reports
  - METAR, AWOS, ATIS
  - TAF, FA, Prog Charts, etc.
  - AIRMETs, SIGMETs
- ☐ NOTAMs

**Note: Each Task in this section can be satisfied using 1800WXBRIEF or a similar source prior to the first cross country.*

COMPLETION STANDARDS
This lesson is complete when all material is covered and the student can demonstrate, through oral questioning, that an application level of VFR operations knowledge is attained.

REQUIRED READING/STUDY

- Pilot’s Handbook of Aeronautical Knowledge (PHAK) Chapter 17 “Aeromedical Factors”

LESSON 2: FLIGHT
4.0 HOURS DUAL X/C
2.0 HOURS NIGHT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. This lesson will review VFR cross country procedures from the Private Pilot Course.

Lesson Requirements:

- 3 night landings

GROUND TRAINING

Cross Country Preparation

- ☐ Preflight orientation and preparation
- ☐ Explain the VFR cross country flight plan
- ☐ External power start procedures
- ☐ Procedures for self-service fueling

Preflight Weather Information

- ☐ Electronic briefing and filing of flight
  - Present to the instructor a weather briefing from 1800WXBrief or a similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING

Preflight Procedures

- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger and taxi briefings
- ☐ Review hot spots & runway incursions avoidance
- ☐ Positive change of controls
- ☐ Run up procedures

Airport Operations

- ☐ Radio communications
- ☐ Traffic pattern

Takeoffs, Landings, and Go-Arounds

- ☐ Normal/crosswind takeoff and climb
- ☐ Normal/crosswind approach and landing

Aircraft Performance

- ☐ Leaning procedures
- ☐ Endurance calculations
- ☐ Ground speed verification against planning
- ☐ Use of electronic flight log vs paper

Night Operations

- ☐ Night illusions

Navigation

- ☐ Pilotage and dead reckoning
- ☐ Use of navigation systems and radar services
- ☐ Diversion
- ☐ Lost procedures
- ☐ Radio-communications
- ☐ OPTIONAL: Taxi to FBO at control tower
- ☐ OPTIONAL: Marshalled
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM

Emergency Operations

- ☐ Loss of engine enroute
- ☐ OPTIONAL: ATC light signals
- ☐ Systems and equipment malfunctions
- ☐ Emergency approach and landing procedures
- ☐ Emergency equipment and survival gear

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under VFR with CFI guidance and the student is prepared to solo at night on lesson 6.

REQUIRED READING/STUDY

- Airplane Flying Handbook (AFH) Chapter 18 “Emergency Procedures”
- FAA Commercial Pilot Airplane Category Airmen Certification Standards (COMM ACS) Area of Operation (AOO) VI. Task A-D. “Navigation”

LESSON 3: SIMULATOR
1.6 HOURS DUAL
1.6 HOURS INSTRUMENT
0.2 HOURS PRE/POST

LESSON OBJECTIVE
The student will continue to develop his/her instrument skills by being introduced to advanced instrument departure and arrival procedures in busy airspace and/or mountainous airports.

Lesson Requirements:
- 3 approaches

Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.

Note: No landings are logged in the simulator lessons.

SIMULATOR TRAINING

Taxi Procedures
- ☐ Low visibility taxi at a complex airport
  - *Suggested: KMSP, KORD, KMIC, etc.*

Departure Procedures
- ☐ Clearance copying and readback
- ☐ Low visibility take off
- ☐ Climb gradient
  - Calculate the aircrafts ability to meet any required gradient
- ☐ Instructors choice of DP to be flown
  - *Suggested: BLUE MESA THREE out of KMTJ*
  - *Suggested: PIKES NINE or PLANES EIGHT out of KAPA*

Enroute Procedures
- ☐ Victor airway navigation involving a MCA/MRA
  - *Suggested: Starting at CRETO Fly East to West over KRAP on the V26, and be able to identify RULER at 17 DME using the cross radial. Take note of the MCA and MRA along the route.*

Emergency Operations
- ☐ Vacuum or PFD failure
- ☐ Pitot tube blocked
- ☐ Lost communications procedures

Instrument Approach Procedures
- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Additional precision or non-precision
- ☐ Holding procedures

Approach Completion
- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight into land

Arrival Procedures
- ☐ Instructors choice of arrival to be flown
  - *Suggested: ENDEE FOUR via ENDEE into KMDW*

COMPLETION STANDARDS
This lesson is complete when instrument departure and arrival procedures in busy airspace or mountainous airports are flown in the simulator.

REQUIRED READING/STUDY
- Instrument Flying Handbook (IFH) Chapter 10 "IFR Flight"

LESSON 4: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE
This lesson will continue to develop and enhance the student's ability to make good aeronautical decisions through scenarios created by the instructor in each of the topics outlined in this lesson. This lesson can be used to plan the cross country that will be flown in lesson 5.

GROUND TRAINING: Review
Preflight Procedures and Preparation
- ☐ Certificates and documents
  - Pilot and aircraft
- ☐ Required logging of time
- ☐ Airworthiness requirements
- ☐ Cockpit management

Preflight Information Brief
- ☐ Risk management
- ☐ 1800WXBRIEF or similar tool
  - Filing of a Flight Plan
  - METAR, AWOS, ATIS
  - TAF, FA, Prog Charts, etc.
  - AIRMETs, SIGMETs
  - NOTAMS

GROUND TRAINING
Navigation
- ☐ VFR into IFR operations
- ☐ Composite flight plan
- ☐ Special VFR
- ☐ Pop up clearance
- ☐ Non- Radar environment procedures
  - Compulsory reporting points
  - Radio calls
- ☐ Visual approach
  - Descent planning
  - NAVAID backup
  - Clearance scenarios

Airport Operations
- ☐ Radio communication: Class B, C, D & non-towered airports
- ☐ Professional, abbreviated, standard communications

Night Operations
- ☐ Remaining on an IFR flight plan until on the ground at non-towered airports
- ☐ Use of a VDP
- ☐ FAAST Program: "Operation Lights On"

COMPLETION STANDARDS
This lesson is complete when the student can make safe aeronautical decisions through scenarios created by the instructor.

REQUIRED READING/STUDY
- PHAK Ch 15 "Airspace"
- COMM ACS Area of Operation I. Task A, B, C, D and E. "Preflight Preparation"

LESSON 5: FLIGHT
3.0 HOURS DUAL X/C
2.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 approaches
- 2 landings

Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Alternate airports
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

Preflight Procedures

- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger briefing
- ☐ Taxi briefing
- ☐ Review hot spots & runway incursions avoidance.
- ☐ Positive change of controls
- ☐ Run up procedures.

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Visual approach
- ☐ Holding procedures

Approach Completion

- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight into land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR with CFI guidance. Visual approach procedures with descent planning will be introduced.

REQUIRED READING/STUDY

- COMM ACS Area of Operation I. Task D. "Cross-Country Flight Planning"
- Instrument Procedures Handbook (IPH) Ch. 4 "Types of Approaches"
- Jeppesen Instrument Commercial (JIC) 7-61 "Approach Clearance", 7-84 "Visual and Contact Approaches"

LESSON 6: FLIGHT
3.0 HOURS SOLO X/C
2.0 HOURS NIGHT
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 landings total with one night landing

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the student/instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*

- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion

- ☐ OPTIONAL: Missed approach procedure
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when Flight is conducted under IFR to practice IFR cross country.

REQUIRED READING/STUDY

- JIC Ch. 1 Section D "SRM Concepts".

LESSON 7: FLIGHT
3.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the student/instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*

- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion

- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY

- Instrument ACS Appendix: 2 "Aeronautical Decision Making, Risk Management, CRM and SRM"

LESSON 8: FLIGHT
3.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE
The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:
- 2 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the student/instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing
- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds
- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures
- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*
- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion
- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

Post Flight Procedures
- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS
This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY
- PHAK Chapter 2 "Aeronautical Decision Making"

LESSON 9: FLIGHT
4.0 HOURS DUAL X/C
3.3 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of several control-towered airports in a Class C or D environment is recommended to improve ATC communications. Alternatively, a flight to an airport with an ASR approach will give the student more exposure to other IFR operations. This lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 3 approaches
- 2 landings

Suggested: Fly the city loop – KMKT KFCM KMIC KANE KRST(ASR) KMKT

Suggested: KMKT KFSD(ASR) KSTC KMKT

Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Alternate airports
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

Preflight Procedures

- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger briefing
- ☐ Taxi briefing
- ☐ Review hot spots & runway incursions avoidance
- ☐ Positive change of controls
- ☐ Run up procedures

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ Optional: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ OPTIONAL: ASR approach
- ☐ OPTIONAL: Visual descent/approach
- ☐ Additional Approach
- ☐ Holding procedures

Approach Completion

- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight into land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR with CFI guidance to practice IFR cross country procedures.

REQUIRED READING/STUDY

- COMM ACS Area of Operation I. Task F. "Performance and Limitations"

LESSON 10: SIMULATOR
1.6 HOURS DUAL
1.6 HOURS INSTRUMENT
0.2 HOURS PRE/POST

LESSON OBJECTIVE
This lesson will be a review of instrument procedures, and it will introduce an engine failure in IMC.

Lesson Requirements:
- 3 approaches

Note: Frequent repositioning of the flight simulator may be required to accomplish the desired training.

Note: No landings are logged in simulator lessons.

SIMULATOR TRAINING: Review

Taxi Procedures
- ☐ Low visibility taxi at a complex airport
  - *Suggested: KMSP, KORD, KMIC, etc.*

Takeoffs, Landings, and Go-Arounds
- ☐ Crosswind takeoff and climb
- ☐ Crosswind approach and landing

Departure Procedures
- ☐ Clearance copying and readback
- ☐ Low visibility take off
- ☐ Climb gradient
  - Calculate the aircraft's ability to meet any required gradient
- ☐ Published departure procedure
  - *Suggested: KPHF HENRY THREE*
  - *Suggested: KBUF BUFFALO FIVE*

Enroute Procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM

Emergency Operations
- ☐ Vacuum or PFD failure
- ☐ Pitot static system failure
- ☐ Lost communications procedures

Arrival Procedures
- ☐ Published arrival procedure
  - *Suggested: ENCEE ONE arrival into KFCM or KANE*

Instrument Approach Procedures
- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Additional approach
- ☐ Holding procedures

Approach Completion
- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight into land

SIMULATOR TRAINING

Emergency Operations
- ☐ Engine failure in IMC

COMPLETION STANDARDS
This lesson is complete when the student is introduced to an engine failure in IMC and can perform instrument procedures within the Instrument ACS.

REQUIRED READING/STUDY
- COMM ACS Area of Operation II. Task D, Operation IV. Task B

LESSON 11: FLIGHT
3.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*

- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion

- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight in to land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY

- COMM ACS Area of Operation II. Tasks A, B, C, D, and F.

LESSON 12: FLIGHT
3.0 HOURS DUAL X/C
2.0 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario with one leg at least 100NM and two other legs at least 50NM each that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- One leg at least 100NM and two other legs at least 50NM
- 2.0 hours Instrument time
- 2 landings
- 3 approaches

Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Alternate airports
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

Preflight Procedures

- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger briefing
- ☐ Taxi briefing
- ☐ Review hot spots and runway incursions avoidance
- ☐ Positive change of controls
- ☐ Run up procedures

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ OPTIONAL: Visual descent/approach
- ☐ OPTIONAL: ASR approach
- ☐ Additional approach
- ☐ Holding procedures

Approach Completion

- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight in to land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR with CFI guidance to practice IFR cross country procedures.

REQUIRED READING/STUDY

- COMM ACS Area of Operation III. "Airport and Seaplane Base Operations"

LESSON 13: FLIGHT
3.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*

- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion

- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight in to land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY

- PHAK Chapter 16 "Navigation"

LESSON 14: FLIGHT
4.0 HOURS DUAL X/C
3.0 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of several control-towered airports in a Class C or D environment is recommended to improve ATC communications. Alternatively, a flight to an airport with an ASR approach will give the student more exposure to other IFR operations. This lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 3.0 hours instrument time
- 2 landings
- 3 approaches

Suggested: Fly the city loop – KMKT KFCM KMIC KANE KSTP KLVN KMKT

Suggested: KRST(ASR) or KFSD(ASR)

Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Alternate airports
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

Preflight Procedures

- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger briefing
- ☐ Taxi briefing
- ☐ Review hot spots and runway incursions avoidance
- ☐ Positive change of controls
- ☐ Run up procedures

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ OPTIONAL: ASR approach
- ☐ OPTIONAL: Visual approach
- ☐ Additional approach
- ☐ Holding procedures

Approach Completion

- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight in to land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR with no CFI guidance.

REQUIRED READING/STUDY

- PHAK Chapter 14 "Airport Operations"

LESSON 15: FLIGHT
3.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*

- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion

- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY

- PHAK Chapter 13 "Aviation Weather Services"

LESSON 16: FLIGHT
3.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:

- 2 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*

- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion

- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight in to land

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY

- PHAK Chapter 12 "Weather Theory"

LESSON 17: FLIGHT
4.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE
The instructor will develop a cross country flight scenario with one leg at least 250NM and at least 3 points of landing that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. Use of a control-towered airport is recommended. Additionally, this lesson will be conducted under IFR to practice IFR cross country procedures learned in the Instrument course.

Lesson Requirements:
- One leg at least 250NM and at least 3 points of landing
- 3 landings

**Note: Instrument approaches are encouraged to be flown during Solo lessons; however, they can only be logged in actual conditions.*

**Note: If instrument procedures are flown without actual time, the line item may be satisfied but not logged for currency.*

**Note: In addition to the student's logbook, the instructor will include the approaches flown in the remarks section of the grade sheet.*

GROUND TRAINING: Review

Preflight Information Briefing
- ☐ IFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds
- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Instrument Procedures
- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances

Instrument Approach Procedures*
- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach to DA
- ☐ OPTIONAL: Additional approach
- ☐ OPTIONAL: Holding procedures

Approach Completion
- ☐ OPTIONAL: Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight in to land

Post Flight Procedures
- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS
This lesson is complete when the flight is conducted under IFR to practice IFR cross country procedures.

REQUIRED READING/STUDY
- JIC Chapter 9 "Meteorology"

LESSON 18: FLIGHT
2.0 HOURS SOLO X/C
0.3 HOURS PRE/POST

LESSON OBJECTIVE

The instructor will develop a cross country flight scenario that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. This lesson will review VFR cross country procedures from the Private Pilot course. The student will employ all available navigation resources, to include VFR flight following; however, for training he/she will concentrate on pilotage and dead reckoning navigation.

Lesson Requirements:

- 2 landings

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ VFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Preflight Procedures

- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger and taxi briefings
- ☐ Review hot spots and runway incursions avoidance
- ☐ Run up procedures

Airport Operations

- ☐ Radio communications
- ☐ Traffic pattern

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Navigation

- ☐ Pilotage and dead reckoning
- ☐ Ground speed verification against planning
- ☐ Use of navigation systems and radar services
- ☐ Radio-communications
- ☐ OPTIONAL: Taxi to FBO at control tower
- ☐ OPTIONAL: Marshaled to parking
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM

Post Flight Procedures

- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS

This lesson is complete when a VFR cross country is conducted to practice pilotage and dead reckoning navigation.

REQUIRED READING/STUDY

- JIC Chapter 10 “IFR Flight Considerations”

LESSON 19: FLIGHT
3.0 HOURS DUAL X/C
0.5 HOURS PRE/POST

LESSON OBJECTIVE
The instructor will develop a VFR cross country flight scenario with one leg at least 100NM and at least 3 points of landing that will allow the student to further his/her ADM skills by handling situations as they would occur on a normal flight. This lesson will review VFR cross country procedures from the Private Pilot course. The student will employ all available navigation resources, to include VFR flight following; however, for training he/she will concentrate on pilotage and dead reckoning navigation.

Lesson Requirements:
- One leg at least 100NM and at least 3 points of landing
- 3 landings

GROUND TRAINING: Review

Preflight Information Briefing
- ☐ VFR cross country planning
- ☐ Briefing and filing of flight plan
- ☐ Weather briefing given to CFI
  - 1800WXBRIEF or similar source
- ☐ Relate to risk management for the flight

FLIGHT TRAINING: Review

Preflight Procedures
- ☐ Use of checklist
- ☐ Preflight inspection
- ☐ Cockpit organization
- ☐ Passenger and taxi briefings
- ☐ Review hot spots and runway incursions avoidance
- ☐ Run up procedures

Airport Operations
- ☐ Radio communications
- ☐ Traffic pattern

Takeoffs, Landings, and Go-Arounds
- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-around

Navigation
- ☐ Pilotage and dead reckoning
- ☐ Ground speed verification against planning
- ☐ Use of navigation systems and radar services
- ☐ Radio-communications
- ☐ OPTIONAL: Taxi to FBO at control tower
- ☐ OPTIONAL: Marshalled
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM

Post Flight Procedures
- ☐ Parking and securing
- ☐ Post flight inspections

COMPLETION STANDARDS
This lesson is complete when the student performs all the tasks in this lesson to Private test standards.

REQUIRED READING/STUDY
- JIC Chapter 13 “Commercial Flight Consideration”.

LESSON 20: PRE/POST GROUND 1.0 HOURS

LESSON OBJECTIVE
This lesson is used to prepare the student for the Stage One check, and to ensure the student's training records are in order.

GROUND TRAINING: Review
Preflight Preparation
- ☐ Pilot certificates and documents
- ☐ Currency
  - Passenger, IFR, flight review
- ☐ I'M SAFE
  - Use this checklist for passengers also
- ☐ Aeromedical factors

Aircraft Airworthiness
- ☐ Certificates and documents
- ☐ Required maintenance inspections
- ☐ Required equipment (91.205, KOE)
- ☐ 91.213
- ☐ Review of aircraft maintenance logs

Preflight Planning
- ☐ Risk management
- ☐ Flight log
- ☐ Low enroute symbols
- ☐ National airspace system
- ☐ Fuel planning
- ☐ Weight and balance calculations
- ☐ Weather brief
  - 1800WXBRIEF or a similar source will cover all necessary weather reports.

GROUND TRAINING
Records Audit (Student must be present)
- ☐ Complete the *Commercial Pilot Stage One Auditing Checklist* and correct all errors.
- ☐ Certify completion with a remark on this lesson's grade sheet (example below):

  "*I have audited all lessons for TCO compliance using North Star Aviation's Commercial Pilot Stage One auditing checklist.*"

COMPLETION STANDARDS
The student will demonstrate an application level of knowledge on IFR and VFR flight planning procedures in preparation for the Stage One check. Additionally, this lesson is not complete until the record audit is accomplished and all errors are corrected.

REQUIRED READING/STUDY
- Review of all previous ground lessons

LESSON 21: STAGE ONE CHECK
3.0 HOURS DUAL
1.5 INSTRUMENT
1.0 HOURS PRE/POST

LESSON OBJECTIVE

The Chief/Assistant Chief Instructor or an approved Stage Check Pilot will evaluate the student's knowledge and proficiency in the items listed below to determine if he/she is able to operate the aircraft safely in an IFR/VFR cross country environment, and to determine if he/she is ready to begin Stage Two. The check pilot will create a plan of action that includes a diversion scenario. At least one leg of the flight will be IFR and another VFR.

Lesson Requirements:

- 1 landing
- 1 approach

GROUND TRAINING: Review

Preflight Preparation

- ☐ Pilot certificates and documents
- ☐ Currency
  - Passenger, IFR, flight review
- ☐ I'M SAFE
  - Use this checklist for passengers also
- ☐ Aeromedical factors

Aircraft Airworthiness

- ☐ Certificates and documents
- ☐ Required maintenance inspections
- ☐ Required equipment (91.205, KOE)
- ☐ 91.213
- ☐ Review of aircraft maintenance logs

Preflight Planning

- ☐ Risk management
- ☐ Flight log
- ☐ Low enroute symbols
- ☐ National airspace system
- ☐ Fuel planning
- ☐ Weight and balance calculations
- ☐ Weather brief
  - 1800WXBRIEF or a similar source will cover all necessary weather reports.

FLIGHT TRAINING: Review

Preflight Preparation

- ☐ Aircraft preflight
- ☐ Cockpit organization
- ☐ Checklist usage
- ☐ Passenger and taxi brief
- ☐ Positive exchange of flight controls
- ☐ Runway incursion avoidance
- ☐ Run up procedures

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing

Cross Country Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Departure procedures
- ☐ Use of radar
- ☐ Voice communications
- ☐ Enroute procedures and clearances
- ☐ Situational awareness
- ☐ Pilotage and dead reckoning
- ☐ ADM
- ☐ SPRM

Emergency Procedures

- ☐ Emergency Equipment and Survival Gear
- ☐ Partial panel (Vacuum or EFIS failure)
- ☐ Diversion

Holding

- ☐ Holding entry
- ☐ OPTIONAL: ATC assigned
- ☐ OPTIONAL: Published

Instrument Approach Procedures

- ☐ Non-precision or visual approach
- ☐ Precision approach

Approach Completion

- ☐ Missed approach procedure
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

COMPLETION STANDARDS

The student will perform all tasks in this lesson to the Instrument and Private Pilot ACS standards as applicable.

COMMERCIAL PILOT FLIGHT TRAINING

STAGE TWO (18.5 HOURS)

LESSONS 22-36

STAGE TWO OBJECTIVES: In this stage, the student will be introduced to the commercial flight maneuvers in a single-engine airplane.

STAGE TWO COMPLETION STANDARDS: At the completion of this stage, the student will perform the single-engine airplane commercial maneuvers and procedures contained in this stage at a proficiency level that meets or exceeds the criteria set forth in the current FAA Commercial Pilot Airplane Single-Engine Land Test Standards.

LESSON 22: GROUND
1.0 HOURS PRE/POST

LESSON OBJECTIVE

This lesson reviews traffic pattern operations and aircraft limitations. It also introduces the student to single engine commercial maneuvers, including flying techniques and current FAA commercial test standards.

GROUND TRAINING: Review

Airport Operations

- ☐ Traffic pattern entry
- ☐ Judging distance for downwind
- ☐ Judging when to turn base
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance
- ☐ Risk management

Aircraft

- ☐ Operating limitations
- ☐ Normal vs. utility category
- ☐ V-Speeds

GROUND TRAINING

Commercial Maneuvers

- ☐ Slow flight
- ☐ Power on stall
- ☐ Power off stall
- ☐ Accelerated stall
- ☐ Stabilator trim stall
- ☐ Cross control stall
- ☐ Steep turns
- ☐ Spin awareness and recovery
- ☐ Short field takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Power off 180º

COMPLETION STANDARDS

The Student will have a basic understanding of the Commercial Maneuvers on this lesson, they will be able to apply aircraft limitations to the maneuvers being performed.

REQUIRED READING/STUDY

- AFH Chapter 4 “Maintaining Aircraft Control: Upset Prevention and Recovery Training
- AFH Chapter 9 “180° Power-off Approach”
- AFH Chapter 10 “Steep Turns”

LESSON 23: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
The student will focus on practicing maneuvers to current Private Pilot standards. If conditions allow crosswind landings may be practiced. The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 2 landings

GROUND TRAINING: Review

Preflight Preparation

- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Short field takeoff and landing
- ☐ Go-around/rejected landing
    - When to execute
    - Memory items (5 C's)

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall
- ☐ Spin awareness and recovery (do not spin)

Airport Operations

- ☐ Traffic pattern entry
- ☐ Judging distance for downwind
- ☐ Judging when to turn base
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

COMPLETION STANDARDS
This lesson is complete when the student is reintroduced to all landings and maneuvers and can perform maneuvers to Private Pilot Standards.

REQUIRED READING/STUDY

- AFH Chapter 4 "Maintaining Aircraft Control: Upset Prevention and Recovery Training"

LESSON 24: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will introduce the student to the commercial maneuvers discussed in Ground Lesson 22. The instructor may continue to seek opportunities to practice crosswind landings. The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Short field takeoff and landing
- ☐ Forward slip to landing
- ☐ OPTIONAL: Go-around/rejected landing

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall
- ☐ Spin awareness and recovery (do not spin)

Airport Operations

- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

FLIGHT TRAINING

Landings

- ☐ Power off 180° Landing

Stalls

- ☐ Stabilator trim stall
- ☐ Secondary stall
- ☐ Accelerated stall
- ☐ Cross control stall

Performance Maneuver

- ☐ Steep turns (50º Bank)

COMPLETION STANDARDS

This lesson is complete when the student becomes familiar with formally introduced commercial maneuvers and is introduced to new commercial maneuvers.

REQUIRED READING/STUDY

- AFH Chapter 9 "180° Power-off Approach"
- AFH Chapter 10 "Steep Turns"

LESSON 25: PRE/POST GROUND 1.0 HOURS

LESSON OBJECTIVE
This lesson will continue to develop the student's knowledge of the commercial maneuvers learned thus far. The student will also be introduced to the remainder of the commercial maneuvers found in the current FAA test standards.

GROUND TRAINING: Review
Preflight Preparation
- ☐ Required pilot documents
- ☐ Risk management

Aircraft Limitations
- ☐ V-Speeds
- ☐ Section 2 of the POH
- ☐ 91.205
  - Read the regulation
- ☐ Altitude engine

GROUND TRAINING
Commercial Maneuvers
- ☐ Chandelle
- ☐ Steep spiral
- ☐ Lazy 8
- ☐ Eights-on-pylons

COMPLETION STANDARDS
This lesson is complete when the student has achieved an understanding level of knowledge of the maneuvers introduced in this lesson.

REQUIRED READING/STUDY
- AFH Chapter 10 "Performance Maneuvers"
- Piper Archer Information Manual (POH)

LESSON 26: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
The student will be introduced to the maneuvers discussed in lesson 25.-The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Short field takeoff and landing
- ☐ Power off 180° landing
- ☐ OPTIONAL: Forward slip to landing
- ☐ OPTIONAL: Go-around/rejected landing

Stalls

- ☐ Stabilator trim stall
- ☐ Accelerated stall
- ☐ Secondary stall
- ☐ Cross control stall

Airport Operations

- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

Performance Maneuver

- ☐ Steep turn (50º bank)

FLIGHT TRAINING

Performance Maneuvers

- ☐ Chandelle
- ☐ Steep spiral
- ☐ Lazy 8

Ground Reference Maneuver

- ☐ Eights-on-pylons

COMPLETION STANDARDS
This lesson is complete when the student performs take off and landings to private pilot standards and there is an understanding of how to execute and fly the maneuvers.

REQUIRED READING/STUDY

- Review of Ground Lesson 25

LESSON 27: FLIGHT
1.5 HOURS SOLO

LESSON OBJECTIVE
The student will practice the commercial maneuvers previously learned to gain added proficiency.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Safety-related operations and procedures
- ☐ Preflight of the aircraft

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Short field takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Forward slip to landing
- ☐ Power off 180º
- ☐ OPTIONAL: Go-around/rejected landing

Airport Operations

- ☐ Traffic patterns
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall

Performance Maneuvers

- ☐ Steep turn
- ☐ Chandelle
- ☐ Lazy 8

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers.

REQUIRED READING/STUDY

- COMM ACS Area of Operation IV "Takeoffs, Landings, and Go-Arounds"

LESSON 28: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
This lesson introduces emergency procedures and continues to review the commercial maneuvers. Landings will be conducted in crosswinds when conditions allow. The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff (Vx or Vy ±10kts) and landing (1.3 VSO, ±10 knots, aligned with centerline)
- ☐ Short field takeoff (Vx ±10kts) and landing (within 200ft)
- ☐ Power off 180° landing (within 300ft)
- ☐ Forward slip to landing
- ☐ OPTIONAL: Go-around/rejected landing

Airport Operations

- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

Slow Flight and Stalls

- ☐ Maneuvering during slow flight (±100ft, ±20° heading, +10/-0kts)
- ☐ Power-off stall (±20° heading)
- ☐ Power-on stall (±20° heading)

Performance Maneuver

- ☐ Steep turn (±200 feet, airspeed ±20kts, bank ±10°)
- ☐ Chandelle (±20° heading)
- ☐ Lazy 8 (±20° heading, airspeed ±20kts)

FLIGHT TRAINING

Emergency Procedures

- ☐ Engine fire during start
- ☐ Engine fire in flight
- ☐ Emergency descent
- ☐ Low oil pressure
  - Divert to nearest airport
- ☐ Simulated off airport landing
  - Do not go below 500'agl

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers to the standards noted in ( ), when applicable.

REQUIRED READING/STUDY

- COMM ACS Area of Operation V Performance Maneuvers and Ground Reference Maneuvers

LESSON 29: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
The student will review the commercial maneuvers while continuing to develop his/her skill at smoothly handling the aircraft. Landings will be conducted in crosswinds when conditions allow.

Lesson Requirements:
- 3 landings

GROUND TRAINING: Review
Preflight Preparation
- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review
Takeoffs, Landings, and Go-Arounds
- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff (Vx or Vy ±10kts) and landing (1.3 VSO, ±10 knots, aligned with centerline)
- ☐ Short field takeoff (Vx ±10kts) and landing (within 200ft)
- ☐ Power off 180 landing (within 300ft)
- ☐ OPTIONAL: Forward slip to landing
- ☐ OPTIONAL: Go-around/rejected landing

Airport Operations
- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

Slow Flight and Stalls
- ☐ Maneuvering during slow flight (±100ft, ±20° heading, +10/-0kts)
- ☐ Power-off stall with or without bank (±20° heading)
- ☐ Power-on stall with or without bank (±20° heading)
- ☐ Accelerated stall

Performance Maneuvers
- ☐ Steep turn (±200 feet, airspeed ±20kts, bank ±10°)
- ☐ Chandelle (±20° heading)
- ☐ Steep spiral (±20kts, ±20° heading, three 360° turns)
- ☐ Lazy 8 (±20° heading, airspeed ±20kts)

Ground Reference Maneuver
- ☐ Eights-on-pylons

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers to the standards noted in ( ), when applicable.

REQUIRED READING/STUDY
- COMM ACS Area of Operation V Performance Maneuvers and Ground Reference Maneuvers

LESSON 30: FLIGHT
1.5 HOURS SOLO

LESSON OBJECTIVE
The student will practice the commercial maneuvers previously learned to gain added proficiency.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Safety-related operations and procedures
- ☐ Preflight of the aircraft

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Short field takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Forward slip to landing
- ☐ Power off 180º
- ☐ OPTIONAL: Go-around/rejected landing

Airport Operations

- ☐ Traffic patterns
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall

Performance Maneuvers

- ☐ Steep turn (50º bank)
- ☐ Chandelle
- ☐ Steep spiral
- ☐ Lazy 8

Ground Reference Maneuver

- ☐ Eights-on-pylons

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers.

REQUIRED READING/STUDY

- COMM ACS Area of Operation V Performance Maneuvers and Ground Reference Maneuvers

LESSON 31: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This pattern-only lesson will focus on landings. A different airport may be used so the student can practice judging pattern distances to unfamiliar runways. Landings will be conducted in crosswinds when conditions allow.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Safety-related operations and procedures
- ☐ Preflight of the aircraft

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff (Vx or Vy ±10kts) and landing (1.3 VSO, ±10 knots, aligned with centerline)
- ☐ Short field takeoff (Vx ±10kts) and landing (within 200ft)
- ☐ Power off 180 landing (within 300ft)
- ☐ Forward slip to landing
- ☐ Go-around/rejected landing

Airport Operations

- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

COMPLETION STANDARDS

This lesson is complete when the student has performed all required landings and maneuvers to the standards noted in ( ), when applicable.

REQUIRED READING/STUDY

- COMM ACS Area of Operation III. “Airport and Seaplane Base Operations”

LESSON 32: FLIGHT
1.5 HOURS SOLO

LESSON OBJECTIVE
This lesson will focus on commercial level takeoffs and landings. It may be conducted at another airport.

Lesson Requirements:

- 3 landings, incorporating one slip to land

GROUND TRAINING: Review

Preflight Preparation

- ☐ Safety-related operations and procedures
- ☐ Preflight of the aircraft

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Short field takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Forward slip to landing
- ☐ Power off 180º
- ☐ Go-around/rejected landing

Airport Operations

- ☐ Traffic patterns
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers.

REQUIRED READING/STUDY

- COMM ACS Area of Operation XI “Post Flight Procedures”

LESSON 33: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The student will review the commercial maneuvers while continuing to develop his/her skill at smoothly handling the aircraft. Landings will be conducted in crosswinds when conditions allow. The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 3 landings

GROUND TRAINING: Review

Preflight Preparation

- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Short field takeoff and landing
- ☐ Power off 180 landing
- ☐ OPTIONAL: Go-around/rejected landing

Airport Operations

- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall
- ☐ Accelerated stall

Performance Maneuver

- ☐ Steep turn (50º bank)
- ☐ Chandelle
- ☐ Lazy 8
- ☐ Steep spiral

Ground Reference Maneuver

- ☐ Eights on pylons

Emergency Procedures

- ☐ Engine fire during start
- ☐ Engine fire in flight
- ☐ Emergency descent
- ☐ Low oil pressure
  - Divert to nearest airport
- ☐ Simulated off airport landing
  - Do not go below 500'agl

COMPLETION STANDARDS

All maneuvers on this lesson will be performed to current FAA commercial test standards.

REQUIRED READING/STUDY

- COMM ACS Area of Operation VII "Slow Flight and Stalls"

LESSON 34: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The student will review the commercial maneuvers while continuing to develop his/her skill at smoothly handling the aircraft. Landings will be conducted in crosswinds when conditions allow. The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 3 landings

GROUND TRAINING: Review

Preflight Preparation

- ☐ Preflight procedures
- ☐ Safety-related operations and procedures
- ☐ Practice area selection
- ☐ Risk management

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal and/or crosswind takeoff and landing
- ☐ Soft field takeoff and landing
- ☐ Short field takeoff and landing
- ☐ Power off 180 landing
- ☐ OPTIONAL: Go-around/rejected landing

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall
- ☐ Accelerated stall

Airport Operations

- ☐ Traffic pattern
- ☐ Stabilized descent
- ☐ Visual scanning and collision avoidance
- ☐ Radio communications
- ☐ Runway incursion avoidance

Performance Maneuver

- ☐ Steep turn (50º bank)
- ☐ Chandelle
- ☐ Lazy 8
- ☐ Steep spiral

Ground Reference Maneuver

- ☐ Eights on pylons

Emergency Procedures

- ☐ Engine fire during start
- ☐ Engine fire in flight
- ☐ Emergency descent
- ☐ Low oil pressure
  - Divert to nearest airport
- ☐ Simulated off airport landing
  - Do not go below 500'agl

COMPLETION STANDARDS

By the end of this lesson the student will be able to perform all specified maneuvers within current FAA standards for the Commercial Airplane, Single Engine Land practical exam, and he/she will be prepared for the flight portion of the Stage Two check.

REQUIRED READING/STUDY

- COMM ACS Area of Operation IX "Emergency Operations"

LESSON 35: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE
This ground lesson is used to prepare the student for the Stage Two check, and to ensure the student's training records are in order.

GROUND TRAINING: Review

Preflight Preparation

- ☐ Pilot certificate and documents
- ☐ Currency
- ☐ I'M SAFE

Airworthiness Requirements

- ☐ Airworthiness and registration certificates
- ☐ Operating limitations, placards, instrument markings, and POH/AFM
- ☐ Wt.& Balance data and equipment list
- ☐ 91.205: Required equipment
- ☐ 91.213: INOP equipment
- ☐ Requirements and procedures for obtaining a special flight permit
- ☐ Airworthiness directives
- ☐ Maintenance/inspection requirements
  - Review maintenance logs
- ☐ Appropriate record keeping

Operation of Systems

- ☐ Primary flight controls and trim
- ☐ Power plant and propeller
- ☐ Landing gear
- ☐ Fuel, oil, and hydraulic
- ☐ Electrical
- ☐ Avionics
- ☐ Pitot-static, vacuum/pressure, and associated flight instruments

Performance and Limitations

- ☐ Demonstrate ability to calculate aircraft performance in various phases of flight
- ☐ Effects of density altitude on performance
- ☐ V-Speeds
- ☐ Weight and Balance calculation

GROUND TRAINING

Records Audit (Student must be present)

- ☐ Complete the *Commercial Pilot Stage Two Auditing Checklist* and correct all errors.
- ☐ Certify completion with a remark on this lesson's grade sheet (example below):

  "*I have audited all lessons for TCO compliance using North Star Aviation's Commercial Pilot Stage Two auditing checklist.*"

COMPLETION STANDARDS
The student will demonstrate a deeper understanding of all items covered on this lesson concurrent with FAA standards for the Commercial Airplane, Single Engine Land practical exam. This lesson is not complete until the record audit is accomplished and all errors are corrected.

REQUIRED READING/STUDY

- COMM ACS Area of Operation VIII "High Altitude Operations"
- Previous Ground Lessons in this Stage.

LESSON 36: STAGE 2 CHECK
2.0 HOURS DUAL
1.0 HOURS PRE/POST

LESSON OBJECTIVE
The Chief/Assistant Chief Instructor or an approved Stage Check Pilot will evaluate the student's knowledge and proficiency in the procedures and maneuvers listed below.

Lesson Requirements:

- 4 landings

GROUND TRAINING: Review

Preflight Preparation

- ☐ PAVE
- ☐ Pilot certificate and documents
- ☐ Currency
- ☐ I'M SAFE

Airworthiness Requirements

- ☐ Airworthiness and registration certificates
- ☐ Operating limitations, placards, instrument markings, and POH/AFM
- ☐ Wt. & Balance data and equipment list
- ☐ 91.205: Required equipment
- ☐ 91.213: INOP equipment
- ☐ Requirements and procedures for obtaining a special flight permit
- ☐ Airworthiness directives
- ☐ Maintenance/inspection requirements
  - Review maintenance logs
- ☐ Appropriate record keeping

Operation of Systems

- ☐ Primary flight controls and trim
- ☐ Power plant and propeller
- ☐ Landing gear
- ☐ Fuel, oil, and hydraulic
- ☐ Electrical
- ☐ Avionics
- ☐ Pitot-static, vacuum/pressure, and associated flight instruments

Performance and Limitations

- ☐ Demonstrate ability to calculate Aircraft Performance in Various Phases of flight.
- ☐ Effects of density altitude on performance
- ☐ V-Speeds
- ☐ Weight and Balance calculation

FLIGHT TRAINING: Review

Preflight Procedures

- ☐ Preflight inspection
- ☐ Cockpit management
- ☐ Engine starting
- ☐ Taxiing
- ☐ Before takeoff check

Takeoffs, Landings, and Go-Arounds

- ☐ Normal/crosswind takeoff and landing
- ☐ Soft-field takeoff
- ☐ Soft-field approach and landing
- ☐ Short-field takeoff and climb
- ☐ Short-field approach and landing
- ☐ Power-off 180° accuracy approach and landing
- ☐ Go-around/rejected landing

Airport Operations

- ☐ Radio communications and ATC light signals
- ☐ Traffic patterns
- ☐ Runway incursion avoidance

Performance Maneuvers

- ☐ Steep turn
- ☐ Steep spiral
- ☐ Chandelle
- ☐ Lazy 8

Ground Reference Maneuver

- ☐ Eights on pylon

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stall
- ☐ Power-on stall
- ☐ Accelerated stall
- ☐ Spin awareness (do not spin)

Emergency Operations

- ☐ Emergency descent
- ☐ Emergency approach and landing (simulated)
- ☐ Systems and equipment malfunctions
- ☐ Emergency equipment and survival gear

Post Flight Procedures

- ☐ After landing, parking, and securing

COMPLETION STANDARDS
This lesson is complete when the student demonstrates an application and/or correlation level of knowledge to the ground training portion of the check. Additionally, the student will perform all maneuvers within the commercial ACS. Line items that may not be found in the ACS will demonstrate an application level of learning.

COMMERCIAL PILOT FLIGHT TRAINING

STAGE THREE (47.3 HOURS)

LESSONS 37- 66

STAGE THREE OBJECTIVES: In this stage the student will gain the knowledge and skills necessary to operate the multiengine airplane in both VFR and IFR conditions at a level that meets or exceeds the proficiency requirements set forth by the current FAA Commercial Pilot Airplane Multiengine Land test standards.

STAGE THREE COMPLETION STANDARDS: The applicant must successfully complete each of the lessons in Stage III, including the end of course stage check. At the completion of the stage the applicant will be able to demonstrate each of the listed maneuvers and procedures at a proficiency level that meets those criteria outlined in the current FAA Commercial Pilot Airplane Multiengine Land test standards.

LESSON 37: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE

This ground lesson will introduce the student to multiengine airplane systems and limitations. The student will look at performance charts related to a multiengine aircraft, and he/she will be introduced to normal procedures in the Piper Seminole (PA-44).

GROUND TRAINING

Complex Aircraft

- ☐ Normally aspirated vs. turbo or super charger engine
- ☐ Manifold pressure
- ☐ Constant speed propeller
  - Purpose
  - Basic operation
- ☐ Retractable landing gear
  - Purpose
  - Basic operation
  - Precautions

Seminole Systems

- ☐ Primary flight controls and trim
- ☐ G1000/G500 avionics
- ☐ Autopilot/Flight Director
- ☐ Electrical system
- ☐ Engines and propeller system
- ☐ Fuel system
- ☐ Hydraulic system
- ☐ Landing gear system
- ☐ Environmental system
- ☐ Stall warning system

Performance Calculations

- ☐ Takeoff and landing distance charts
- ☐ Accelerate stop distance
- ☐ Accelerate go distance
- ☐ Climb performance with both engines operating (service ceiling)
- ☐ Climb performance with one engine operating (single engine service ceiling)
- ☐ Effects of density altitude on performance.
- ☐ Fuel and power settings table
  - Emphasize the burn rate (gph) needs to be doubled
- ☐ Cruise performance
- ☐ Weight and balance calculations

Seminole Limitations

- ☐ V-Speeds
  - Introduce new list of speeds.
  - Brief V_{mc} (full description on lesson 39)
- ☐ Weights
  - Empty Weight
  - Zero Fuel Weight
  - Maximum Ramp Weight
  - Maximum Takeoff Weight
  - Maximum Landing Weight
- ☐ Useable fuel
- ☐ Load factor limits
- ☐ Chapter 2 of the POH

Airworthiness Requirements

- ☐ Airworthiness and registration certificates
- ☐ Maintenance/inspection requirements.
  - Progressive maintenance
- ☐ Minimum Equipment List (MEL)

PA-44 Preflight

- ☐ Conduct a thorough preflight inspection
  - Use an airplane if available (and if time)
  - Use the preflight Power Point if no airplane/time available
  - Follow along with the checklist

COMPLETION STANDARDS

This lesson is complete when the student is introduced to multiengine airplane systems and limitations.

REQUIRED READING/STUDY

- AFH Chapter 11 “Transition to Complex Airplanes”

LESSON 38: SIMULATOR
1.5 HOURS DUAL
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will give the student an opportunity to perform basic flight maneuvers and general procedures as they relate to multiengine flying while in the simulator. The student will become familiar with all the verbal calls and memory checklists that are associated with complex aircraft.

Lesson Requirements:

- 1 approach

Note: No landings are logged in the simulator lessons.

SIMULATOR TRAINING

Multiengine/Complex Aircraft Operation

- ☐ Ground run (engine run-up; prop checks)
- ☐ Takeoff procedures
- ☐ Climb power settings
  - 25 X 25 (inches and rpm)
  - Move manifold pressure back before the props
- ☐ Climbing turns
- ☐ Climb and note manifold pressure drop
- ☐ Level off from climb, making proper power changes (e.g. 20 inches and 2300-2500 rpm)
- ☐ Straight and level flight
- ☐ Power settings for cruise at altitude
- ☐ Airspeed changes
- ☐ Establishing a climb from cruise
  - 25 X 25 (inches and rpm)
  - Move props before manifold pressure
- ☐ Descents from altitude with proper power and speed adjustments.
- ☐ Descending turns

Checklist Procedures

- ☐ Climb, cruise, in-range, before landing
- ☐ Configuring the aircraft for landing
  - BCCGUMPS
  - Props full forward below 100IAS
  - Flap settings
  - Gear down
- ☐ Landing gear down and locked verification
  - Crew call-outs
  - Multiple gear down checks (e.g. with every flap movement)

Area Maneuvers

- ☐ Power settings and configurations for each maneuver
- ☐ Slow flight
- ☐ Power on/off stalls
- ☐ Accelerated stalls
- ☐ Steep turns

Instrument Approach

- ☐ Precision or non-precision approach
- ☐ Checklist and configuration points along the approach
  - WIRE and In-Range checklists completed before the IAF
  - BCCGUMPS before the IAF and/or FAF
- ☐ Approach airspeeds and configurations
  - Straight-in to land
  - Circle-to-land

COMPLETION STANDARDS

This lesson is complete when the student is introduced to basic flight maneuvers and general procedures in the simulator.

REQUIRED READING/STUDY

- Review of Ground Lesson 37

LESSON 39: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE
This lesson will introduce the student to One Engine Inoperative (OEI) flight. The student will gain a basic understanding of V_{mc} and turning tendencies.

GROUND TRAINING: Review
Seminole Systems
- ☐ G1000/G500 avionics
  - G1000 flight director
  - G1000 autopilot
- ☐ Electrical system
- ☐ Engine and propeller systems

GROUND TRAINING
Multiengine Aerodynamics
- ☐ Centerline thrust
- ☐ Conventional twin
- ☐ Twin with counter rotating propellers
- ☐ Critical engine
- ☐ Sideslip and how to remedy
- ☐ Windmilling propeller
- ☐ Feathered propeller
- ☐ Zero thrust simulation; feathered propeller

Principles of Flight – OEI
- ☐ Meaning of the term Critical Engine
- ☐ V_{mc} Definition/Certification
- ☐ Effects of density altitude on V_{mc}
- ☐ Effects of weight and CG on V_{mc}
- ☐ Effects of bank angle on V_{mc}
- ☐ Relationship of V_{mc} to stall speed
- ☐ Reasons for loss of directional control
- ☐ Importance in maintaining proper pitch, bank, and coordination of controls
- ☐ Recovery procedures for loss of directional control
- ☐ Engine failure during takeoff
  - Planning ahead (i.e. briefing)
  - Decision-making
  - Emphasize controllability first, followed by climb-ability (performance)
- ☐ Performance loss with OEI
- ☐ Factors to consider for single-engine go around

OEI Turning Tendencies (PAST)
- ☐ P-factor
- ☐ Asymmetrical thrust
- ☐ Spiraling slipstream
- ☐ Torque effect

Risk Management
- ☐ 4 Fundamentals of risk (PAVE)
- ☐ Analyzing risk for each flight
- ☐ Changing conditions makes risk a moving target

COMPLETION STANDARDS
This lesson is complete when the student is introduced to One Engine Inoperative (OEI) flight and the factors that influence Vmc. The student will also continue to develop his/her knowledge of integrated avionics.

REQUIRED READING/STUDY
- AFH Chapter 12 “Transition to Multiengine Airplanes”

LESSON 40: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
This lesson will introduce the student to the Piper Seminole. The student will perform an in-depth preflight inspection and basic flight maneuvers in the aircraft.

Lesson Requirements:
- 1 landing

GROUND TRAINING
Pa-44 Preflight Inspection
- ☐ Preflight orientation and preparation
- ☐ Preflight procedures
- ☐ Walk-around and detailed inspection

FLIGHT TRAINING
Preflight Procedures
- ☐ Aircraft servicing
- ☐ Cockpit management
- ☐ Equipment checks
- ☐ Engine starting and warm up
- ☐ Taxiing and taxi procedures
- ☐ Ground run
  - Exercise props
  - Governor check
- ☐ Before takeoff checks
- ☐ Pre-takeoff briefing

Safety Related Operations and Procedures
- ☐ Use of the checklist
- ☐ Crew resource management
- ☐ Positive exchange of the flight controls
- ☐ Wake turbulence avoidance
- ☐ Low level wind shear
- ☐ Visual scanning and collision avoidance
- ☐ Runway incursion avoidance

Takeoffs, Landings, and Go-Arounds
- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ Go-Around/rejected landing

Basic and Performance Maneuvers
- ☐ Straight-and-level flight
- ☐ Turns at different bank angles
- ☐ Climbs and descents
- ☐ Climbing and descending turns
- ☐ Steep turns

Slow Flight and Stalls
- ☐ Maneuvering during slow flight
- ☐ Power-off stall (level and turning)
- ☐ Power-on stall (level and turning)
- ☐ Accelerated stalls
- ☐ Spin awareness (do not spin)

Airport Operations
- ☐ Traffic pattern
- ☐ Pattern entry
- ☐ Determining distance for downwind
- ☐ Execution of memory checklist items (BCCGUMPS)
- ☐ Gear-down checks
  - Crew coordination
  - When to perform (e.g. with every new flap setting)
- ☐ Clearing for traffic
- ☐ Radio communications

Post Flight Procedures
- ☐ After landing
- ☐ Parking and securing the aircraft

COMPLETION STANDARDS
This lesson is complete when the student has performed a flight in the Piper Seminole.

REQUIRED READING/STUDY
- FAA Commercial Pilot for Airplane Category Airmen Certification Standards (Comm ACS) Area of Operation II “Preflight Procedures”

LESSON 41: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
This pattern-only lesson will allow time for the student to practice takeoffs and landings. This lesson may be done at another airport. The number of landings performed is at the CFI's discretion as long as all required tasks are satisfactory.

Lesson Requirements:

- 2 landings

GROUND TRAINING: Review
Pa-44 Preflight Inspection

- ☐ Preflight orientation and preparation
- ☐ Full walk-around and detailed look at the aircraft

GROUND TRAINING
Short Field Takeoff and Landing

- ☐ Short field takeoff and max performance climb
- ☐ Short field approach and landing

FLIGHT TRAINING: Review
Safety Related Operations and Procedures

- ☐ Use of the checklist
- ☐ Safety-related operations and procedures
- ☐ Traffic pattern
- ☐ BCCGUMPS from memory
- ☐ Verbal calls at designated points
- ☐ Stabilized final approach
- ☐ Crew resource management
- ☐ Positive exchange of the flight controls
- ☐ Wake turbulence avoidance
- ☐ Visual scanning and collision avoidance
- ☐ Runway incursion avoidance

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb (Vy ±10kts)
- ☐ Normal approach and landing (within first one-third of available runway)
- ☐ Go-around

Post Flight Procedures

- ☐ After landing
- ☐ Parking and securing the aircraft

FLIGHT TRAINING
Short Field Takeoff and Landing

- ☐ Short field takeoff and max performance climb (Vy ±10kts)
- ☐ Short field approach and landing (within 400ft)

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers to the standards noted in ( ) when applicable.

REQUIRED READING/STUDY

- AFH Chapter 12 "Normal Approach and Landing, Crosswind Approach and Landing, Short-Field Takeoff and Climb, Short-Field Approach and Landing, Go-Around, Rejected Takeoff"

LESSON 42: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE

This lesson will introduce the student to various multiengine emergencies. The student will also be introduced to commercial privileges, and he/she will learn how to apply the privileges to different scenarios.

GROUND TRAINING

Drag Demonstration (V_{yse})

- ☐ Purpose
- ☐ Review the procedure
- ☐ Induced drag effect slower than V_{yse} airspeed
- ☐ Parasitic drag effect faster than V_{yse} airspeed
- ☐ Gear down at V_{yse}
- ☐ Flaps down at V_{yse}
- ☐ Windmilling propeller at V_{yse}
- ☐ Apply observed performance values to real-world scenarios
  - Descent rate with gear down and windmilling prop
  - Attempting to continue takeoff w/ gear down & windmilling prop

Aeronautical Decision Making

- ☐ Both engines operating enroute and landing
- ☐ Single engine operation enroute and landing
- ☐ Engine failure on takeoff roll
- ☐ Engine failure on liftoff with gear down
- ☐ Engine failure on after takeoff with gear up
- ☐ Single-engine go around
- ☐ Takeoff briefing for multiengine aircraft

Risk Management

- ☐ Discuss flight scenarios involving single engine operations
- ☐ Takeoff briefing complacency
  - Repeating the same thing until it becomes a memorized chant
  - Discuss how to do a thoughtful briefing tailored to the situation
  - Practice the OEI memory items while briefing so they are fresh on the pilot's mind

Multiengine Operations (OEI Procedures)

- ☐ Aborted takeoff procedures
  - Engine failure on takeoff roll
  - Memory items
- ☐ Engine failure after takeoff
  - Minimum altitude to simulate
  - Memory items
  - Establishing zero sideslip
- ☐ Maneuvering with OEI
- ☐ Single engine go around
- ☐ Committed to land altitude
- ☐ Engine failure in flight above V_{mc}
- ☐ Procedures to follow in the aircraft for simulated engine shutdown/failure
  - Minimum altitudes (AGL)
  - Minimum temp. per the FOM
  - Establishing zero thrust (simulated feather)
- ☐ Engine fire in flight
  - Memory items
  - Checklist
- ☐ Emergency descent
  - Memory items
  - Landing gear speeds
  - Turning to the nearest airport
- ☐ Engine failure in IMC

Commercial Privileges and Limitations

- ☐ Common carriage
- ☐ Private carriage
- ☐ Holding out
- ☐ Part 119

COMPLETION STANDARDS

This lesson is complete when the student is introduced to various multiengine emergencies, commercial privileges, and learns how to apply the privileges to different scenarios.

REQUIRED READING/STUDY

- Piper Seminole Information Manual: Chair Fly Memory Items

LESSON 43: SIMULATOR
1.5 HOURS DUAL
0.2 HOURS PRE/POST

LESSON OBJECTIVE
This lesson allows the student to practice the emergency procedures learned in lesson 42.

Note: No landings are logged in the simulator lessons.

SIMULATOR TRAINING

Multiengine Operations (OEI Procedures)

- ☐ Engine failure on takeoff roll before V_{mc} (<50% of V_{mc})
- ☐ Engine failure after takeoff (gear down)
- ☐ Engine failure after takeoff (gear up)
- ☐ Maneuvering with OEI
- ☐ Committed to land altitude/configuration (single engine)
- ☐ Single-engine go around
- ☐ V_{mc} demonstration
- ☐ Drag demo
- ☐ Full shutdown, feather, and restart
- ☐ Applying risk management tools to different flight scenarios

Memory Items

- ☐ Engine failure before rotation
- ☐ Engine failure after takeoff (gear down)
- ☐ Engine failure after takeoff (gear up)
- ☐ Single engine go around
- ☐ Engine fire in flight
- ☐ V_{mc} roll and recovery
- ☐ Emergency descent
- ☐ Spin recovery (PARE and POH)

Instrument Procedures

- ☐ Instrument approach
- ☐ OEI flight by reference to instruments
- ☐ OEI instrument approach

COMPLETION STANDARDS
This lesson is complete when the student performs listed emergency procedures with CFI guidance.

REQUIRED READING/STUDY

- JIC Chapter 12 “Advanced Aerodynamics”

LESSON 44: FLIGHT
1.8 HOURS DUAL
0.2 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will review all maneuvers previously learned. This lesson will also introduce the emergency procedures in the aircraft and, time permitting, an instrument approach.

Lesson Requirements:

- 2 landings

GROUND TRAINING: Review

Preflight Procedures

- ☐ Preflight orientation and preparation
- ☐ Full walk around and detailed look at the aircraft

FLIGHT TRAINING: Review

Safety Related Operations and Procedures

- ☐ Use of the checklist
- ☐ Crew resource management
- ☐ Positive exchange of the flight controls
- ☐ Stall/Spin awareness (PARE and POH)
- ☐ Visual scanning and collision avoidance
- ☐ Runway incursion avoidance

Takeoffs, Landings, and Go-Arounds

- ☐ Short field takeoff and maximum performance climb (Vy ±10kts)
- ☐ Short field approach and landing (within 400ft)
- ☐ OPTIONAL: Go-around/rejected landing

Commercial Maneuvers

- ☐ Steep turn (±200 feet, airspeed ±20kts, bank ±10°)
- ☐ Slow flight (±100ft, ±20° heading, +10/-0kts)
- ☐ Power off stall (with or without bank) (±20° heading)
- ☐ Power on stall (with or without bank) (±20° heading)

Post Flight Procedures

- ☐ After landing
- ☐ Parking and securing the aircraft

FLIGHT TRAINING

Multiengine Operations (OEI)

- ☐ Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ Engine failure (simulated) after liftoff and in the traffic pattern (> 500’ AGL)
- ☐ Maneuvering with OEI (simulated)
- ☐ OEI (simulated) pattern and landing
- ☐ Full engine shutdown and air-start
- ☐ V_{mc} demo
- ☐ Drag demo
- ☐ Emergency descent

Instrument Procedures

- ☐ OPTIONAL: Instrument Approach
- ☐ OPTIONAL: Straight in landing/missed
- ☐ OPTIONAL: Circle to land/missed

COMPLETION STANDARDS

This lesson is complete when the student is introduced to emergency procedures and performs all required landings and maneuvers to the standards noted in ( ) when applicable.

REQUIRED READING/STUDY

- JIC Chapter 12 “Predicting Performance”

LESSON 45: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE

This lesson will prepare the student for cross country flights performed at a commercial pilot's level. The instructor will create a scenario to challenge the student's planning and risk management skills (e.g. 3 paying passengers with luggage; long distances requiring fuel stops.)

GROUND TRAINING: Review

Commercial Privileges

- ☐ Common carriage
- ☐ Private carriage
- ☐ Holding out
- ☐ Part 119

Aircraft Performance

- ☐ Aircraft performance data
- ☐ Fuel consumption/fuel burn
- ☐ Power settings
- ☐ Takeoff distance
- ☐ Weight and balance (CG considerations)
- ☐ Density altitude
- ☐ Climb gradient

GROUND TRAINING

Preflight Information Brief

- ☐ 1800WXBRIEF or similar tool
  - Filing a flight plan
  - METAR, AWOS, ATIS
  - TAF, FA, Prog Charts, etc.
  - AIRMETs, SIGMETs
- ☐ NOTAMs/TFRs

Controlled Flight into Terrain (CFIT)

- ☐ VFR night operations
- ☐ VFR low visibility
- ☐ VFR into IMC
- ☐ IFR operations

Aeromedical Factors

- ☐ Hypoxia
- ☐ Hyperventilation
- ☐ Middle ear and sinus problems
- ☐ Spatial disorientation
- ☐ Motion sickness
- ☐ Carbon monoxide poisoning
- ☐ Stress and fatigue
- ☐ Dehydration.

VFR and IFR Cross Country Flight Planning

- ☐ NEXRAD in-cockpit weather/time lags and other risk factors
- ☐ XM/ADS-B (IN) weather
- ☐ Enroute weather updates
- ☐ National Airspace System
- ☐ Use of Electronic Flight Bags
  - Modern flight planning tools
  - Use of electronic charts
  - Back up planning (charts; battery; etc.)
- ☐ Types and sources of briefings available
- ☐ Chart Supplement (a.k.a. A/FD)
- ☐ Diversion ADM
- ☐ Pilotage and dead reckoning for VFR
- ☐ Correcting and recording groundspeed, fuel burn, and heading calculations
- ☐ Types of flight plans
- ☐ IFR to airports without published instrument approaches
- ☐ Alternate airports, VFR and IFR
- ☐ Altitude selection
- ☐ Oxygen requirements
- ☐ Types of O2 masks
  - Continuous flow
  - Diluter demand
  - Pressure
- ☐ Aircraft pressurization

COMPLETION STANDARDS

This lesson is complete when the student develops a flight plan with the instructor to further expand knowledge of the national airspace system, aircraft performance, and risk management, especially as it relates to CFIT and aeromedical factors.

REQUIRED READING/STUDY

- COMM ACS Area of Operation I "Preflight Preparation"

LESSON 46: FLIGHT
2.0 HOURS DUAL X/C DAY
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The student will gain experience operating a complex multiengine aircraft in the National Airspace System by conducting a **DAY** cross country flight. Total flight time ***must*** be at least 2.0 hours, and the furthest point ***must*** be more than 100NM from the original point of departure in order to comply with 14 CFR 141 Appendix D*. Use of a tower controlled airport is recommended.

Lesson Requirements:

- 2.0 hours cross country flight **daytime**
- 100NM from the original point of departure
- 2 landings

**Note: 14 CFR 141 App. D para. 4(b)(2)(iii); "One 2-hour cross country flight in daytime conditions in a multiengine airplane that consists of a total straight-line distance of more than 100NM from the original point of departure."*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross country flight planning
- ☐ Weather/NOTAM/TFR briefing
  - 1800WXBRIEF or similar source
- ☐ Risk management: PAVE

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ Short Field takeoff and maximum performance climb
- ☐ Short Field approach and landing

Airport Operations

- ☐ Traffic pattern entry
- ☐ Traffic patterns
- ☐ Radio communications
- ☐ OPTIONAL: ATC light gun signals
- ☐ Airport signs and markings
- ☐ Runway incursion avoidance

Multiengine Operations - OEI

- ☐ OPTIONAL: Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ OPTIONAL: Engine failure (simulated) after liftoff and in the traffic pattern (> 500' AGL)
- ☐ OPTIONAL: Maneuvering with inoperative engine (simulated)
- ☐ OPTIONAL: Single engine (simulated) landing
- ☐ OPTIONAL: Single engine (simulated) go-around

FLIGHT TRAINING

Navigation in a Multiengine Aircraft

- ☐ Cross-country flight planning
- ☐ **Furthest point >100NM from point of origin***
- ☐ Pilotage
- ☐ Dead reckoning
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Use of navigation systems and radar services
- ☐ Diversion
- ☐ Lost procedures
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM
- ☐ Flight plan log

COMPLETION STANDARDS

This lesson is complete when the student has performed the required cross country and satisfied the requirements of 14 CFR 141 Appendix D, paragraph 4(b)(2)(iii)*.

REQUIRED READING/STUDY

- COMM ACS Area of Operation VI "Navigation"

LESSON 47: FLIGHT
2.0 HOURS DUAL XC
2.0 HOURS NIGHT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The student will gain additional experience operating a complex multiengine aircraft in the National Airspace System by conducting a **NIGHT** cross country flight. Total flight time ***must*** be at least 2.0 hours, and the furthest point ***must*** be more than 100NM from the original point of departure in order to comply with 14 CFR 141 Appendix D*. Use of a tower controlled airport is recommended.

Lesson Requirements:

- 2.0 hours cross country flight **nighttime**
- 100NM from the original point of departure
- 2 landings

**Note: 14 CFR 141 App. D para. 4(b)(2)(iv); "One 2-hour cross country flight in nighttime conditions in a multiengine airplane that consists of a total straight-line distance of more than 100NM from the original point of departure."*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross Country flight planning
- ☐ Weather/NOTAM/TFR briefing
  - 1800WXBRIEF or similar source
- ☐ Risk management: PAVE

GROUND TRAINING

Night Operations

- ☐ Nighttime illusions
- ☐ Eye adaptation
- ☐ Aircraft lighting
- ☐ Airport lighting

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ OPTIONAL: Go-Around

Airport Operations

- ☐ Traffic patterns
- ☐ Radio communications
- ☐ OPTIONAL: ATC light gun signals
- ☐ Airport signs, markings, and lighting
- ☐ Runway Incursions

Multiengine Operations - OEI

- ☐ OPTIONAL: Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ OPTIONAL: Engine failure (simulated) after liftoff and in the traffic pattern (> 500' AGL)
- ☐ OPTIONAL: Maneuvering with OEI (simulated)
- ☐ OPTIONAL: Single engine (simulated) landing

FLIGHT TRAINING

Navigation in a Multiengine Aircraft at Night

- ☐ Cross-country flight planning
- ☐ **Furthest point >100NM from point of origin***
- ☐ Pilotage (nighttime)
- ☐ Dead Reckoning (nighttime)
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Use of navigation systems and radar services
- ☐ Diversion
- ☐ Lost procedures
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM
- ☐ Flight plan log

COMPLETION STANDARDS

This lesson is complete when the student has performed the required cross country and satisfied the requirements of 14 CFR 141 Appendix D, paragraph 4(b)(2)(iv)*.

REQUIRED READING/STUDY

- COMM ACS Area of Operation X "Multi Engine Operations"

LESSON 48: SIMULATOR
1.5 HOURS DUAL
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will allow the student to continue to develop his/her IFR cross country and ADM skills. The instructor will provide a scenario that allows all elements of this lesson to be completed.

Lesson Requirements:

- 3 approaches

Note: No landings are logged in the simulator lessons.

GROUND TRAINING: Review

Preflight Preparation

- ☐ Weather information
- ☐ Cross-country flight planning
- ☐ National Airspace System
- ☐ Performance and limitations
- ☐ Aeromedical factors

SIMULATOR TRAINING: Review

Cross Country Procedures

- ☐ ATC clearances
- ☐ Use of radar
- ☐ Voice communications
- ☐ Airway navigation
- ☐ Direct-to navigation
- ☐ Holding
  - As instructed by ATC
  - Published

Emergency Operations

- ☐ Electrical failure
- ☐ Lost communications/radio failure
- ☐ Other system failure (e.g. low or trapped fuel)
- ☐ Rough engine
- ☐ Engine failure

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Additional approach
- ☐ One of the above OEI Instrument approach

Approach Completion

- ☐ Missed approach procedure
- ☐ Circle to land
- ☐ Straight in to land

SIMULATOR TRAINING

Instrument Departure and Arrival Procedures

- ☐ Clearance copying and readback (CRAFT)
- ☐ Low visibility taxi (1/8-mile visibility)
- ☐ Instrument takeoff (1/8-mile visibility)
- ☐ Climb gradient
  - Published requirements
  - Calculating the aircraft's ability to meet a required gradient
- ☐ Departure clearances
- ☐ Departures Procedure (DP)
- ☐ Standard Terminal Arrival Route (STAR)

COMPLETION STANDARDS

This lesson is complete when the student completes instrument work without a full-scale deflection of the CDI, maintain airspeed ±15 knots, and altitude, if applicable, above MDA, +200/-0 feet.

REQUIRED READING/STUDY

- COMM ACS Area of Operation III "Airport and Seaplane Base Operations"

LESSON 49: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE
This lesson will review the systems on the Piper Seminole and technologically advanced aircraft, with an emphasis on G1000 operations.

GROUND TRAINING: Review

G1000

- ☐ Garmin advanced avionics training course
- ☐ AHRS, ADC, DAU
- ☐ Backup components
- ☐ Backup power sources
- ☐ Troubleshooting errors (use the required G1000 Cockpit Ref. Guide (CRG))
- ☐ Primary Flight Display (PFD)
  - Display options
  - Inlet screens (e.g. map; nearest)
- ☐ Multi-Function Display (MFD)
  - Database currencies
  - Page/sub-page groups (big knob/little knob)
- ☐ Backup/reversionary mode (i.e. the PFD is primary)
- ☐ Comm/nav panel
- ☐ Building a GPS flight plan
  - Direct-to
  - Airway navigation
  - Entering an IAP
- ☐ Jeppesen-View approach plates
- ☐ Obtaining weather data through XM, ADS-B (IN), or another source

Aircraft Systems

- ☐ General information and limitations
- ☐ Primary flight controls and trim
- ☐ Fuel system
- ☐ Environmental system
- ☐ Stall warning system
- ☐ Electrical system
- ☐ Engines
- ☐ Propeller system and feathering accumulator
- ☐ Hydraulic system

Autopilot Operations

- ☐ Programming the autopilot
  - Flight director use
  - Lateral modes
  - Pitch modes
  - Disengagement
- ☐ Autopilot limitations
  - POH supplement
  - Single engine use
- ☐ Coupled approaches
- ☐ Risk management associated with the autopilot and navigation systems
  - Use the autopilot to reduce workload
  - Complacency
  - Garbage in = garbage out
- ☐ Single engine approaches and autopilot use
- ☐ Circling approach and autopilot use

COMPLETION STANDARDS
This lesson is complete when the student has reviewed the systems on the Piper Seminole and technologically advanced aircraft, with an emphasis on G1000 operations.

REQUIRED READING/STUDY

- JIC Chapter 2 “Integrated Displays”
- G1000 Pilot’s Training Guide

LESSON 50: FLIGHT
1.5 HOURS DUAL
1.3 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson focuses on strengthening the student's IFR skills in a complex multiengine aircraft. The instructor will give the student an IFR cross country scenario to plan and then introduce a diversion scenario in flight.

Lesson Requirements:

- 2 approaches

GROUND TRAINING: Review

Preflight Procedures

- ☐ Preflight orientation and preparation
- ☐ Full walk-around/detailed a/c inspection
- ☐ Safety-related operations and procedures

FLIGHT TRAINING: Review

Safety Related Operations and Procedures

- ☐ Use of the checklist
- ☐ CRM/SPRM
- ☐ Positive exchange of flight controls
- ☐ Stall/spin awareness (PARE and POH)
- ☐ Visual scanning and collision avoidance
- ☐ Runway incursion avoidance

Instrument Departure and Arrival Procedures

- ☐ Clearance copying and readback
- ☐ Complying with a departure clearance
- ☐ Approach setup and arrival

Cross Country Procedures

- ☐ Cross country flight plan (grade for accuracy and thoroughness)
- ☐ Program for GPS navigation with VOR/LOC backup
- ☐ Airway navigation
- ☐ Direct-to navigation
- ☐ Radio communications
- ☐ Situational awareness
- ☐ ADM
- ☐ Holding Procedures
  - ATC directed
  - Published

Emergency Operations

- ☐ System failure scenario
- ☐ Diversion scenario
- ☐ Engine failure (simulated)

Instrument Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ OPTIONAL: additional approach
- ☐ One of the above: OEI approach

Approach Completion

- ☐ Missed approach procedure
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

Post Flight

- ☐ Closing of flight plan
- ☐ After landing
- ☐ Parking and securing the aircraft

COMPLETION STANDARDS

This lesson is complete when the student completes instrument work without a full-scale deflection of the CDI, maintain airspeed ±15 knots, and altitude, if applicable, above MDA, +150/-0 feet.

REQUIRED READING/STUDY

- JIC Chapter 7 "Approach Procedures"

LESSON 51: SIMULATOR
1.5 HOURS DUAL
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will allow the student to continue to develop his/her IFR cross country and ADM skills. The instructor will provide a scenario that incorporates flight into severe weather. He/she will sit outside the simulator and act as ATC for this lesson. The number of approaches are at the CFI's discretion; however, at least one single engine approach (precision or non-precision) is required.

Lesson Requirement:

- 1 approach

Note: No landings are logged in the simulator lessons.

GROUND TRAINING: Review

Preflight Preparation

- ☐ Weather information
- ☐ Cross-country flight planning
- ☐ National airspace system
- ☐ Performance and limitations
- ☐ Aeromedical factors

SIMULATOR TRAINING: Review

Instrument Departure and Arrival Procedures

- ☐ Clearance copying and readback (CRAFT)
- ☐ Low visibility taxi (1/8-mile visibility)
- ☐ Instrument takeoff (1/8-mile visibility)
- ☐ Climb gradient
  - Published requirements
  - Calculating the aircraft's ability to meet a required gradient
- ☐ Departure clearances
- ☐ Departures Procedure (DP)
- ☐ Standard Terminal Arrival Route (STAR)

Cross Country Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Use of radar
- ☐ Radio-communications
- ☐ Enroute procedures and clearances
- ☐ Diversion
- ☐ Holding procedures

Hazardous Weather

- ☐ AIRMETS/SIGMETS
- ☐ Apply ADM/SPRM to cope with hazardous weather scenarios
  - Severe icing
  - Turbulence
  - Thunderstorms
- ☐ ATC assistance (e.g. radar vectors around heavy precipitation)

Emergency Operations

- ☐ Electrical failure scenario
- ☐ Other system failure scenario
- ☐ Engine problem scenario (e.g. rough engine; low oil pressure)
- ☐ Engine failure

Instrument Approach Procedures

- ☐ OEI approach
- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach
- ☐ OPTIONAL: Additional approach

Approach Completion

- ☐ OPTIONAL: Missed approach procedure
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight into land

COMPLETION STANDARDS

This lesson is complete when the student has performed items above with CFI guidance to continue to develop IFR cross country and ADM skills.

REQUIRED READING/STUDY

- Federal Aviation Regulations (FAR) Part 119 "Certification: Air Carriers and Commercial Operators"

LESSON 52: SIMULATOR
1.5 HOURS DUAL
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson is similar to the previous lesson, allowing the student to continue developing his/her IFR cross country and ADM skills. The instructor will provide a scenario that forces an emergency diversion. He/she will sit outside the simulator and act as ATC for this lesson. The number of approaches are at the CFI's discretion; however, at least one single engine approach (precision or non-precision) is required.

Lesson Requirement:

- 1 approach

Note: No landings are logged in the simulator lessons.

GROUND TRAINING: Review

Preflight Preparation

- ☐ Weather information
- ☐ Cross-country flight planning
- ☐ National airspace system
- ☐ Performance and limitations
- ☐ Aeromedical factors

SIMULATOR TRAINING: Review

Instrument Departure and Arrival Procedures

- ☐ Clearance copying and readback (CRAFT)
- ☐ Low visibility taxi (1/8-mile visibility)
- ☐ Instrument takeoff (1/8-mile visibility)
- ☐ Climb gradient
  - Published requirements
  - Calculating the aircraft's ability to meet a required gradient
- ☐ Departure clearances
- ☐ Departures Procedure (DP)
- ☐ Standard Terminal Arrival Route (STAR)

Cross Country Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and read back
- ☐ Use of radar
- ☐ Radio-communications
- ☐ Enroute procedures and clearances
- ☐ Diversion
- ☐ Holding procedures

Emergency Operations

- ☐ Electrical failure scenario
- ☐ Other system failure scenario
- ☐ Low fuel/high headwind
- ☐ Icing conditions at night
- ☐ Engine problem scenario (e.g. rough engine; low oil pressure)
- ☐ Engine failure

Instrument Approach Procedures

- ☐ OEI approach
- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach
- ☐ OPTIONAL: Additional approach

Approach Completion

- ☐ OPTIONAL: Missed approach procedure
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight in to land

COMPLETION STANDARDS

This lesson is complete when the student has performed items above with CFI guidance to continue to develop IFR cross country and ADM skills.

REQUIRED READING/STUDY

- Aeronautical Information Manual (AIM) Chapter 5 "Pilot/Controller Roles and Responsibilities"

LESSON 53: FLIGHT
4.0 HOURS DUAL X/C
2.0 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will continue developing the student's risk management and flight planning skills. The instructor will create an IFR cross country scenario that challenges the student to use ATC as much as possible. Each leg may come to a full stop so the student can file the next leg. At least one leg will be 50NM away from the departure airport. This lesson may be combined with lesson 54.

Lesson Requirements:

- 2 landings
- 3 approaches

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross country flight planning
- ☐ Weather/NOTAM/TFR briefing
  - 1800wxbrief or similar source
- ☐ Risk management: PAVE
- ☐ Aircraft performance, limitations, & systems related to IFR cross-country

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb (Vy ±5kts)
- ☐ Normal approach and landing (±400ft)
- ☐ Short field takeoff and climb (Vy ±5kts)
- ☐ Short field approach and landing (within 200ft)
- ☐ Go-around

Cross Country Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and readback
- ☐ Enroute procedures and clearances
- ☐ Calculating ETEs and ETAs
- ☐ Use of navigation systems and radar services
  - Airway navigation
  - Direct-to navigation
- ☐ Autopilot/flight director usage
- ☐ Holding procedures

Airport Operations

- ☐ Radio communications
- ☐ OPTIONAL: ATC light gun signals
- ☐ Airport signs and markings
- ☐ Avoiding runway incursions

Multiengine Operations - OEI

- ☐ OPTIONAL: Engine failure in flight (simulated) by reference to instruments
- ☐ OPTIONAL: Maneuvering with OEI (simulated) by reference to instruments
- ☐ OPTIONAL: Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ OPTIONAL: Engine failure (simulated) after liftoff and in the traffic pattern (>500' AGL)

Other Emergency Operations

- ☐ Loss of communications
- ☐ System malfunctions
- ☐ ADM and SPRM
- ☐ Simulated landing gear emergency

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Additional approach
- ☐ OPTIONAL: One of the above: partial panel approach
- ☐ OPTIONAL: OEI approach by reference to instruments
- ☐ OPTIONAL: DME arc
- ☐ OPTIONAL: Procedure turn
- ☐ OPTIONAL: RNAV Terminal Arrival Area (TAA) NoPT
- ☐ OPTIONAL: Vectors to final
- ☐ OPTIONAL: Visual approach

Approach Completion

- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight into land

COMPLETION STANDARDS

This lesson is complete when the cross country is performed under IFR to continue develop the student's risk management and flight planning skills. Landings and maneuvers will be performed to the standards noted in ( ) when applicable.

REQUIRED READING/STUDY

- AIM Chapter 8 "Medical Facts for Pilots"

LESSON 54: FLIGHT
4.0 HOURS DUAL XC
2.0 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will continue developing the student's risk management and flight planning skills. The instructor will create an IFR cross country scenario that challenges the student to use ATC as much as possible. Each leg may come to a full stop so the student can file the next leg. At least one leg will be 50NM away from the departure airport. This lesson may be combined with lesson 53.

Lesson Requirements:

- 2 landings
- 3 approaches

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross country flight planning
- ☐ Weather/NOTAM/TFR briefing
  - 1800wxbrief or similar source
- ☐ Risk management: PAVE
- ☐ Aircraft performance, limitations, & systems related to IFR cross-country

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb (Vy ±5kts)
- ☐ Normal approach and landing (±400ft)
- ☐ Short field takeoff and climb (Vy ±5kts)
- ☐ Short field approach and landing (within 200ft)
- ☐ Go-around

Cross Country Procedures

- ☐ Air traffic control clearance
- ☐ Clearance copying and readback
- ☐ Enroute procedures and clearances
- ☐ Calculating ETEs and ETAs
- ☐ Use of navigation systems and radar services
  - Airway navigation
  - Direct-to navigation
- ☐ Autopilot/flight director usage
- ☐ Holding procedures

Airport Operations

- ☐ Radio communications
- ☐ OPTIONAL: ATC light gun signals
- ☐ Airport signs and markings
- ☐ Avoiding runway incursions

Multiengine Operations - OEI

- ☐ OPTIONAL: Engine failure in flight (simulated) by reference to instruments
- ☐ OPTIONAL: Maneuvering with OEI (simulated) by reference to instruments
- ☐ OPTIONAL: Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ OPTIONAL: Engine failure (simulated) after liftoff and in the traffic pattern (>500' AGL)

Other Emergency Operations

- ☐ Loss of communications
- ☐ System malfunctions
- ☐ ADM and SPRM
- ☐ Simulated landing gear emergency

Instrument Approach Procedures

- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Additional approach
- ☐ OPTIONAL: One of the above: partial panel approach
- ☐ OPTIONAL: OEI approach by reference to instruments
- ☐ OPTIONAL: DME arc
- ☐ OPTIONAL: Procedure turn
- ☐ OPTIONAL: RNAV Terminal Arrival Area (TAA) NoPT
- ☐ OPTIONAL: Vectors to final
- ☐ OPTIONAL: Visual approach

Approach Completion

- ☐ Missed approach procedures
- ☐ Circle to land
- ☐ Straight in to land

COMPLETION STANDARDS

This lesson is complete when cross country is performed under IFR to continue developing student's risk management and flight planning skills. Landings and maneuvers will be performed to the standards noted in ( ) when applicable.

REQUIRED READING/STUDY

- COMM ACS Area of Operation VIII "High Altitude Operations"

LESSON 55: FLIGHT
5.0 HOURS SOLO X/C
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The next three lessons (55, 56, and 57) are designed to meet 14 CFR 141 Solo requirements*. They may be combined into one or more cross country flight(s) and flown in any order. This lesson includes the requirement to fly cross country with one segment consisting of a straight-line distance of at least 250NM and with landings at three points. The instructor will create a scenario for the student to fly as if Solo. The instructor will accompany the student merely as an observer/safety pilot (i.e. "supervised solo")**.

Requirements by the end of Lesson 57

- 10 hours of Solo (supervised solo)
  - One segment consisting of a straight-line distance of at least 250NM and with landings at three points.
  - 5 hours in night VFR
  - 10 takeoffs and landings – each landing using a traffic pattern with an operating control tower.

**Note: 14 CFR 141 Appendix D paragraph 5 requires 10 hours of Solo ("supervised solo"); one Solo cross country with landings at a minimum of three points and one segment consisting of a straight-line of at least 250NM; 5 hours in night VFR conditions with 10 takeoffs and landings—each landing using a traffic pattern—with an operating control tower.*

***Note: The following statement must be placed in the student's logbook, "Student performing duties of PIC under the supervision of an authorized instructor."*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross country flight planning (***must include one segment at least 250NM, and 3 points of landing.***)
- ☐ Weather/NOTAM/TFR briefing
  - 1800WXBRIEF or similar source
- ☐ Risk management: PAVE

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal/crosswind takeoff and climb
- ☐ Normal/crosswind approach and landing
- ☐ Landings at three different points
- ☐ OPTIONAL: Short field takeoff and climb
- ☐ OPTIONAL: Short field approach and landing

Airport Operations

- ☐ Traffic patterns
- ☐ Radio communications
- ☐ Airport signs and markings
- ☐ Runway incursion avoidance

Navigation in A Multiengine Aircraft

- ☐ Pilotage
- ☐ Dead reckoning
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Use of navigation systems and radar services
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM
- ☐ Autopilot/flight director
- ☐ OPTIONAL: Diversion

COMPLETION STANDARDS

This lesson is complete when the student has met 14 CFR 141 Appendix D paragraph 5(b)(2) requirements* (one segment at least 250NM; landings at three different points.) The flight will be performed with no CFI assistance to at least Private Pilot ACS.

REQUIRED READING/STUDY

- AFH Chapter 17 "Emergency Procedures"

LESSON 56: FLIGHT
2.5 HOURS SOLO X/C
2.5 HOURS NIGHT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

The next two lessons (56 and 57) are designed to meet 14 CFR 141 Solo night requirements*. (Lesson 55 may also be used towards this requirement if nighttime was logged.) Lessons 55-57 may be combined into one or more cross country flight(s) and flown in any order. The instructor will create a VFR scenario to an ***operating*** control tower for the student to fly as if Solo. An instructor pilot will accompany the student merely as an observer/safety pilot (i.e. "supervised solo").**

Requirements by the end of Lesson 57

- 10 hours of Solo (supervised solo)
  - One segment consisting of a straight-line distance of at least 250NM and with landings at three points.
  - 5 hours in night VFR
  - 10 takeoffs and landings – each landing using a traffic pattern with an operating control tower.

Note: 14 CFR 141 Appendix D paragraph 5 requires 10 hours of Solo ("supervised solo"); one Solo cross country with landings at a minimum of three points and one segment consisting of a straight-line of at least 250NM; 5 hours in **night VFR conditions with 10 takeoffs and landings—each landing using a traffic pattern—with an operating control tower.*

***Note: The following statement must be placed in the student's logbook, "Student performing duties of PIC under the supervision of an authorized instructor."*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross country flight planning (***will include an operating control tower.)***
- ☐ Weather/NOTAM/TFR briefing
  - 1800WXBRIEF or similar source
- ☐ Risk management: PAVE

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal/crosswind takeoff and climb
- ☐ Normal/crosswind approach and landing
- ☐ Night patterns and landings at a tower-controlled airport
- ☐ OPTIONAL: Short field takeoff and climb
- ☐ OPTIONAL: Short field approach and landing
- ☐ OPTIONAL: Go around

Airport Operations

- ☐ Traffic patterns
- ☐ Radio communications
- ☐ Airport signs, markings, and lighting
- ☐ Runway incursion avoidance

Night Operation

- ☐ Night preparation and preflight
  - Eye adaptation
  - Aircraft lighting

Navigation in A Multiengine Aircraft

- ☐ Pilotage
- ☐ Dead reckoning
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Use of navigation systems and radar services
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM
- ☐ Autopilot/flight director
- ☐ OPTIONAL: Diversion

COMPLETION STANDARDS

This lesson is complete when the student has conducted the assigned cross country while performing the duties of PIC and working towards meeting the 14 CFR 141 Appendix D paragraph 5(b)(3) requirements*. The flight will be performed with no CFI assistance to at least Private Pilot ACS.

REQUIRED READING/STUDY

- AFH Chapter 10 "Night Operations"

LESSON 57: FLIGHT
2.5 HOURS SOLO X/C
2.5 HOURS NIGHT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This and the previous lesson (56) are designed to meet 14 CFR 141 Solo night requirements*. (Lesson 55 may also be used towards this requirement if nighttime was logged.) Lessons 55-57 may be combined into one or more cross country flight(s) and flown in any order. The instructor will create a VFR scenario to an ***operating*** control tower for the student to fly as if Solo. An instructor pilot will accompany the student merely as an observer/safety pilot (i.e. "supervised solo").**

Requirements by the end of Lesson 57

- 10 hours of Solo (supervised solo)
  - One segment consisting of a straight-line distance of at least 250NM and with landings at three points.
  - 5 hours in night VFR
  - 10 takeoffs and landings – each landing using a traffic pattern with an operating control tower.

Note: 14 CFR 141 Appendix D paragraph 5 requires 10 hours of Solo ("supervised solo"); one Solo cross country with landings at a minimum of three points and one segment consisting of a straight-line of at least 250NM; 5 hours in **night VFR conditions with 10 takeoffs and landings—each landing using a traffic pattern—with an operating control tower.*

***Note: The following statement must be placed in the student's logbook, "Student performing duties of PIC under the supervision of an authorized instructor."*

GROUND TRAINING: Review

Preflight Information Briefing

- ☐ Cross country flight planning (***will include an operating control tower.)***
- ☐ Weather/NOTAM/TFR briefing
  - 1800WXBRIEF or similar source
- ☐ Risk management: PAVE

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal/crosswind takeoff and climb
- ☐ Normal/crosswind approach and landing
- ☐ Night patterns and landings at a tower-controlled airport (***10 required by the end of this lesson.***)
- ☐ OPTIONAL: Short field takeoff and climb
- ☐ OPTIONAL: Short field landing
- ☐ OPTIONAL: Go around

Airport Operations

- ☐ Traffic patterns
- ☐ Radio communications
- ☐ Airport signs, markings, and lighting
- ☐ Runway incursion avoidance

Night Operation

- ☐ Night preparation and preflight
  - Eye adaptation
  - Aircraft lighting

Navigation in A Multiengine Aircraft

- ☐ Pilotage
- ☐ Dead reckoning
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Use of navigation systems and radar services
- ☐ Situational awareness
- ☐ ADM
- ☐ SPRM
- ☐ Autopilot/flight director
- ☐ OPTIONAL: Diversion

COMPLETION STANDARDS

This lesson is complete when the student has met 14 CFR 141 Appendix D paragraph 5(b) requirements* The flight will be performed with no CFI assistance to at least Private Pilot ACS.

REQUIRED READING/STUDY

- Advisory Circular (AC) 00-6B Chapter 19 "Thunderstorms"

LESSON 58: PRE/POST GROUND 2.0 HOURS

LESSON OBJECTIVE

This lesson emphasizes weather theory and all the ground training covered previously in preparation for the student's Multiengine Commercial Checkride.

GROUND TRAINING: Review

Seminole Systems

- ☐ G1000/G500 avionics
- ☐ Electrical system
- ☐ Fuel system
- ☐ Engine(s)
- ☐ Propeller system and feathering accumulator
- ☐ Hydraulic/Landing gear system
- ☐ Environmental system
- ☐ Stall warning system

Multiengine Aerodynamics

- ☐ Centerline thrust
- ☐ Conventional twin
- ☐ Counter rotating propellers
- ☐ Critical engine
- ☐ Sideslip and how to remedy
- ☐ Windmilling propeller
- ☐ Feathering propeller
- ☐ Zero thrust; simulation feathered propeller

Principles of Flight – OEI

- ☐ Meaning of the term Critical Engine
- ☐ Effects of density altitude on V_{mc}
- ☐ Effects of weight and CG on V_{mc}
- ☐ Effects of bank angle on V_{mc}
- ☐ Relationship of V_{mc} to stall speed
- ☐ Reasons for loss of directional control
- ☐ Importance in maintaining proper pitch, bank and coordination of controls
- ☐ Recovery procedures for loss of directional control
- ☐ Performance loss with OEI
- ☐ Factors to consider for OEI go around

OEI Turning Tendencies (PAST)

- ☐ P-Factor
- ☐ Asymmetrical thrust
- ☐ Spiraling slipstream
- ☐ Torque effect

Emergency Immediate Memory Items

- ☐ Engine failure on takeoff roll
- ☐ Engine failure after lift off
- ☐ Engine fire
- ☐ Emergency descent
- ☐ Landing gear emergencies

High Altitude Operations

- ☐ Supplemental oxygen
  - Requirements
  - 3 types of masks
- ☐ Pressurization systems

Preflight

- ☐ 91.205
  - Flight with inoperative equipment
  - Progressive maintenance
  - Maintenance logbook review
- ☐ 91.103 requirements
- ☐ Weather theory
  - High/low pressure
  - Frontal passage weather
  - Effects of temperature on weather
  - Causes/stages of T-storms
  - Where/when to expect ice
  - Where/when to expect fog
- ☐ Reading and interpreting WX reports
  - Prog charts
  - AIRMETS/SIGMETS
  - Area forecasts
  - METAR/TAF
  - Winds aloft

COMPLETION STANDARDS

This lesson is complete when all material is covered above in preparation for the end of course stage check.

REQUIRED READING/STUDY

- Commercial Pilot Closed Book Final Test
- Review of notes from previous ground lessons

LESSON 59: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
This lesson will review commercial flight maneuvers in preparation for the end of course stage check.

Lesson Requirements:
- 2 landings
- 1 approach

GROUND TRAINING: Review

Preflight Procedures
- ☐ Preflight orientation and preparation
- ☐ Full walk-around and detailed look at the aircraft
- ☐ Safety-related operations and procedures

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds
- ☐ Short field takeoff and maximum performance climb (Vx ±5kts)
- ☐ Traffic pattern
- ☐ Short field approach and landing (within 150ft)
- ☐ Go-around/rejected landing
- ☐ OPTIONAL: Normal takeoff and landing

Performance Maneuver
- ☐ Steep turns (±150 feet, airspeed ±15kts, bank ±10°)

Slow Flight and Stalls
- ☐ Maneuvering during slow flight (±100ft, ±10°, +10/-0kts)
- ☐ Power-off stall (level or bank up to 20º) (±10° heading)
- ☐ Power-on stall (level or bank up to 20º) (±10° heading)
- ☐ Accelerated stall
- ☐ Spin awareness (do not spin)

Multiengine Operations - OEI
- ☐ Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ Engine failure (simulated) after liftoff and in the traffic pattern (> 500') (±20° heading, ±10kts)
- ☐ Maneuvering with OEI (simulated) (±200ft, ±20° heading, ±20kts)
- ☐ Single engine (simulated) pattern and landing (Touch down on the first one-third of runway)
- ☐ Full engine shutdown and air start
- ☐ V_{mc} demonstration (±25° heading)
- ☐ OPTIONAL: Drag demonstration

Emergency Operations
- ☐ Engine fire or smoke in the cockpit
- ☐ Emergency descent (level off ±150 feet, +0/-20kts)
- ☐ Other system(s) and equipment malfunction(s)
- ☐ Emergency equipment and survival gear
- ☐ Emergency gear extension

Instrument Approach
- ☐ OEI approach
- ☐ OPTIONAL: DME Arc
- ☐ OPTIONAL: Procedure turn
- ☐ OPTIONAL: RNAV TAA (NoPT)
- ☐ OPTIONAL: Vectors to final

Approach Completion
- ☐ OPTIONAL: Straight in to land
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Missed approach procedure

Post Flight
- ☐ After landing
- ☐ Parking and securing the aircraft

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers to the standards noted in ( ), when applicable.

REQUIRED READING/STUDY
- COMM ACS Area of Operation IV "Takeoffs, Landings, and Go-Arounds"

LESSON 60: FLIGHT
1.5 HOURS DUAL
0.5 HOURS PRE/POST

LESSON OBJECTIVE
This lesson will be planned as a cross country; however, the CFI will create a scenario requiring a diversion. This lesson will allow the student to practice VFR navigation and takeoffs and landings.

Lesson Requirements:
- 3 landings

GROUND TRAINING: Review
Preflight Procedures
- ☐ Cross-country flight planning
- ☐ Preflight orientation and preparation
- ☐ Full walk-around and detailed look at the aircraft
- ☐ Safety-related operations and procedures

FLIGHT TRAINING: Review
Takeoffs, Landings, and Go-Arounds
- ☐ Normal takeoff and climbs (Vx ±5kts)
- ☐ Normal approach and landing (within 200ft)
- ☐ Short field takeoff and maximum performance climb (Vx ±5kts)
- ☐ Short field approach and landing (within 100ft)
- ☐ OPTIONAL: Go-around/rejected landing

Cross Country Navigation
- ☐ Pilotage
- ☐ Dead reckoning
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Use of navigation systems and radar services
- ☐ Autopilot/flight director
- ☐ Diversion
- ☐ Situational awareness
- ☐ Radio-communications
- ☐ ADM
- ☐ SPRM

Multiengine Operations - OEI
- ☐ Engine failure (simulated) during takeoff prior to 50% of V_{mc} (maintain directional control)
- ☐ Engine failure (simulated) after liftoff and in the traffic pattern (> 500') (±15° heading, ±5kts)
- ☐ Maneuvering with OEI (simulated) (±150t, ±15° heading, ±15kts)
- ☐ Single engine (simulated) pattern and landing (+10/-5kts, aligned with centerline)
- ☐ V_{mc} Demonstration (±20° heading)
- ☐ OPTIONAL: Full engine shutdown and air start (±100 feet or a minimum sink rate if applicable, airspeed ±10 knots, and selected headings ±10°)

Post Flight
- ☐ Closing of flight plan
- ☐ After landing
- ☐ Parking and securing the aircraft

COMPLETION STANDARDS
This lesson is complete when the student has performed all required landings and maneuvers to the standards noted in ( ), when applicable. Cross Country Navigation topics will be flown to the Commercial ACS.

REQUIRED READING/STUDY
- COMM ACS Area of Operation XI "Post Flight Procedures"

LESSON 61: SIMULATOR
1.5 HOURS DUAL
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson is designed to challenge the student in a high stress IFR environment, and to elevate his/her confidence. The instructor will create a busy scenario with system malfunctions, requiring the student to use sound ADM and SPRM skills to bring about a safe conclusion. The instructor will sit outside the simulator and act as ATC for this lesson. At least one single engine approach (precision or non-precision) is required.

Lesson Requirement:

- 1 approach

Note: No landings are logged in the simulator lessons.

GROUND TRAINING: Review

Preflight Preparation

- ☐ Weather information
- ☐ Cross-country flight planning
- ☐ National Airspace System
- ☐ Performance and limitations
- ☐ Aeromedical factors

SIMULATOR TRAINING: Review

Instrument Departure and Arrival Procedures

- ☐ Clearance copying and readback (CRAFT)
- ☐ Low visibility taxi (1/8-mile visibility)
- ☐ Instrument takeoff (1/8-mile visibility)
- ☐ Climb gradient
  - Published requirements
  - Calculating the aircraft's ability to meet a required gradient
- ☐ Departure clearances
- ☐ Departures Procedure (DP)
- ☐ Standard Terminal Arrival Route (STAR)

Cross Country Procedures

- ☐ Air traffic control clearance/modified routing
  - Copy and readback
  - Compliance
- ☐ Use of radar
- ☐ Radio communications
- ☐ IFR Navigation
  - RNAV routes (T-routes)
  - Victor airways
  - Direct-to
- ☐ Holding

Emergency Operations

- ☐ Electrical failure
- ☐ Other system failure
- ☐ Low fuel/high headwind
- ☐ Icing conditions at night
- ☐ Engine problem followed by engine failure
- ☐ Diversion

Instrument Approach Procedures

- ☐ OEI approach
- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: Precision approach
- ☐ OPTIONAL: Additional approach

Approach Completion

- ☐ OPTIONAL: Missed approach procedure
- ☐ OPTIONAL: Straight in to land
- ☐ OPTIONAL: Circle to land

COMPLETION STANDARDS

This lesson is complete when the student performs the assigned scenario utilizing single pilot resource management.

REQUIRED READING/STUDY

- JIC Chapter 4 "Departure"
- JIC Chapter 6 "Arrival"

LESSON 62: FLIGHT
1.5 HOURS DUAL
1.3 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE
This lesson will review instrument procedures required to add instrument privileges to the commercial multiengine certificate.

Lesson Requirements:
- 1 landing
- 3 approaches

GROUND TRAINING: Review
Preflight Procedures
- ☐ Preflight orientation and preparation
- ☐ Full walk-around and detailed look at the aircraft
- ☐ Safety-related operations and procedures

FLIGHT TRAINING: Review
Instrument Departure and Arrival Procedures
- ☐ Departure procedures and clearances
- ☐ Clearance copying and readback
- ☐ Holding
  - ATC directed
  - Published

Basic Instrument Maneuvers
- ☐ Straight and level flight
- ☐ Constant airspeed climbs
- ☐ Turns to headings
- ☐ Recovery from unusual attitudes

Emergency Operations
- ☐ Electrical failure
- ☐ Engine failure (simulated) in IMC
- ☐ EFIS or vacuum failure
- ☐ Partial panel aircraft control

Instrument Approach Procedures
- ☐ Non-precision approach
- ☐ Precision approach to DA
- ☐ Additional approach
- ☐ One of the above OEI (simulated) approach
- ☐ One of the above partial panel
- ☐ OPTIONAL: DME arc
- ☐ OPTIONAL: Procedure turn
- ☐ OPTIONAL: RNAV TAA (NoPT)
- ☐ OPTIONAL: Vectors to final

Approach Completion
- ☐ Missed approach procedures
- ☐ OPTIONAL: Circle to land
- ☐ OPTIONAL: Straight in to land

COMPLETION STANDARDS
At the completion of this lesson the student will be able to perform the above tasks within current FAA Instrument and commercial test standards.

REQUIRED READING/STUDY
- COMM ACS Area of Operation IX “Emergency Operations”

LESSON 63: FLIGHT
1.5 HOURS DUAL
0.2 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will provide time for the student to review any items or maneuvers needing additional work. All maneuvers on this lesson are optional. Those performed will be graded.

Lesson requirement:

- 1 landing

GROUND TRAINING: Review

Preflight Procedures

- ☐ Preflight orientation and preparation
- ☐ Full walk-around and detailed look at the aircraft
- ☐ Safety-related operations and procedures

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ OPTIONAL: Normal takeoff and climb
- ☐ OPTIONAL: Normal approach and landing
- ☐ OPTIONAL: Short field takeoff and maximum performance climb
- ☐ OPTIONAL: Short field approach and landing
- ☐ OPTIONAL: Go-around/rejected landing
- ☐ OPTIONAL: Traffic patterns

Performance Maneuver

- ☐ OPTIONAL: Steep turn

Slow Flight and Stalls

- ☐ OPTIONAL: Maneuvering during slow flight
- ☐ OPTIONAL: Power-Off stall (Level or bank up to 20º)
- ☐ OPTIONAL: Power-On stall (Level or bank up to 20º)
- ☐ OPTIONAL: Accelerated stall
- ☐ OPTIONAL: Spin awareness (do not spin)

Emergency Operations

- ☐ OPTIONAL: Systems and equipment malfunctions
- ☐ OPTIONAL: Engine fire or cabin smoke
- ☐ OPTIONAL: Emergency descent
- ☐ OPTIONAL: Emergency equipment and survival gear
- ☐ OPTIONAL: Emergency gear extension

Multiengine Operations - OEI

- ☐ OPTIONAL: Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ OPTIONAL: Engine failure (simulated) after liftoff and in the traffic pattern (> 500')
- ☐ OPTIONAL: Maneuvering with OEI (simulated)
- ☐ OPTIONAL: Single engine (simulated) pattern and landing
- ☐ OPTIONAL: Full engine shutdown and air start
- ☐ OPTIONAL: V_{mc} demonstration

Instrument Approaches

- ☐ OPTIONAL: Precision approach
- ☐ OPTIONAL: Non-precision approach
- ☐ OPTIONAL: OEI approach

Approach Completion

- ☐ OPTIONAL: Missed approach
- ☐ OPTIONAL: Straight in to land
- ☐ OPTIONAL: Circle to land

COMPLETION STANDARDS

The student will be able to perform all tasks on this lesson within current FAA commercial test standards.

REQUIRED READING/STUDY

- COMM ACS Area of Operation VII "Slow Flight and Stalls"
- COMM ACS Area of Operation V Performance Maneuvers and Ground Reference Maneuvers

LESSON 64: FLIGHT
2.0 HOURS DUAL
0.3 HOURS INSTRUMENT
0.5 HOURS PRE/POST

LESSON OBJECTIVE

This lesson will simulate the flight portion of the Stage Three check. It may be completed after lesson 65 (the oral portion of the simulated stage check.) This lesson may be conducted by someone other than the student's primary instructor. The instructor will create a VFR cross country scenario for the student to plan, and then he/she will introduce a diversion scenario to challenge the student's ADM and SPRM skills.

Lesson Requirements:

- 3 landings
- 1 approach

GROUND TRAINING: Review

Preflight Procedures

- ☐ Preflight inspection
- ☐ Cockpit management
- ☐ Engine starting
- ☐ Taxiing
- ☐ Before takeoff check

FLIGHT TRAINING: Review

Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ Short-field takeoff and maximum performance climb
- ☐ Short-field approach and landing
- ☐ Go-around/rejected landing

Airport Operations

- ☐ Radio communications
- ☐ Traffic patterns
- ☐ Airport markings and lighting
- ☐ Runway incursion avoidance

Navigation

- ☐ Pilotage
- ☐ Dead reckoning
- ☐ Correct and record groundspeed, fuel burn, and heading calculations
- ☐ Navigation systems and radar services
- ☐ Autopilot/flight director
- ☐ Lost procedures

Performance Maneuver

- ☐ Steep turns

Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power-off stalls
- ☐ Power-on stalls
- ☐ Accelerated stalls
- ☐ Spin awareness (do not spin)

Emergency Operations

- ☐ Emergency equipment and survival gear
- ☐ Systems and equipment malfunctions
- ☐ Emergency descent
- ☐ Diversion
- ☐ OPTIONAL: Landing gear malfunction

Multiengine Operations - OEI

- ☐ Engine failure (simulated) during takeoff prior to 50% of V_{mc}
- ☐ Engine failure (simulated) after liftoff and in the traffic pattern (> 500')
- ☐ Single engine (simulated) pattern and landing
- ☐ Engine failure or fire (simulated) in flight above V_{mc}
- ☐ Maneuvering with OEI (simulated) by reference to instruments
- ☐ V_{mc} Demonstration
- ☐ Full engine shutdown and air start

Instrument Approach

- ☐ OEI (simulated) approach

Approach Completion (choose one)

- ☐ OPTIONAL: Missed approach
- ☐ OPTIONAL: Straight in to land
- ☐ OPTIONAL: Circle to land

Postflight Procedures

- ☐ After landing, parking, and securing

COMPLETION STANDARDS

Throughout the flight the student will be able to perform all tasks on this lesson within current FAA commercial test standards.

REQUIRED READING/STUDY

- Review all Flight Procedures Previously Learned

LESSON 65: PRE/POST GROUND 3.0 HOURS

LESSON OBJECTIVE

This lesson may immediately precede lesson 64 (complete the audit afterwards.) It prepares the student for the oral portion of his/her Stage Three check and ensures the training records are certifiable for graduation. This lesson may be conducted by someone other than the student's primary instructor. The instructor will create a VFR cross country scenario that will challenge the student's knowledge of all operations.

GROUND TRAINING: Review

Pilot

- ☐ Certificates and documents
- ☐ Aeromedical factors
- ☐ Currency/proficiency
- ☐ Commercial pilot privileges and limitations

Aircraft

- ☐ Certificates and documents
- ☐ Maintenance requirements (review logbooks)
- ☐ 91.205, 91.213, MEL, KOE
- ☐ Seminole systems
  - Propeller system
  - Landing gear system
  - Fuel system
  - Electrical system
- ☐ Supplemental oxygen
  - When required
  - 3 types of masks
- ☐ Pressurization
- ☐ Performance and limitations
- ☐ Principles of Flight – OEI
  - Types of twins
  - Turning tendencies
  - Factors affecting V_{mc}
  - Effect of density altitude on V_{mc}

Environment

- ☐ Cross-country flight planning
- ☐ Risk management
- ☐ National Airspace System
- ☐ Runway incursion avoidance
- ☐ Weather information and theory
- ☐ CFIT

External Pressures

- ☐ Passengers, events, weather, etc.

GROUND TRAINING

Records Audit (Student must be present)

- ☐ Complete the *Commercial Pilot Stage Three Auditing Checklist* and correct all errors.
- ☐ Certify completion with a remark on this lesson's grade sheet (example below):

  - "*I have audited all lessons for TCO compliance using North Star Aviation's Commercial Pilot Stage Three auditing checklist.*"

COMPLETION STANDARDS

The student must be able to demonstrate the knowledge required to pass the multiengine commercial pilot checkride. This lesson is not complete until the record audit is accomplished and all errors are corrected.

REQUIRED READING/STUDY

- Review all Previous Ground Lessons

LESSON 66: STAGE 3 CHECK
2.0 HOURS DUAL
0.3 HOURS INSTRUMENT
2.5 HOURS PRE/POST

LESSON OBJECTIVE

The Chief/Assistant Chief Instructor or an approved Stage Check Pilot will evaluate the student's knowledge and proficiency in all items required for a Commercial Pilot, Multiengine Land certificate. The check pilot should prepare a plan of action that mimics a commercial pilot checkride, emphasizing knowledge areas that were missed on the FAA written test. Refer to the current FAA Commercial Pilot test standards.

Lesson Requirements:

- 3 landings
- 1 approach
- Instrument time

ACADEMIC CONTENT

AOO I Preflight Preparation

- ☐ Pilot Qualifications
- ☐ Airworthiness Requirements
- ☐ Weather Information
- ☐ Cross-Country Flight Planning
- ☐ National Airspace System
- ☐ Performance and Limitations
- ☐ Operation of Systems
- ☐ Human Factors

AOO VIII High Altitude Operations

- ☐ Supplemental Oxygen
- ☐ Pressurization

AOO X Multiengine Operations

- ☐ Maneuvering with One Engine Inoperative
- ☐ V_{MC} Demonstration

FLIGHT CONTENT:

AOO II Preflight Procedures

- ☐ Preflight assessment
- ☐ Flight deck management
- ☐ Engine starting
- ☐ Taxiing
- ☐ Before takeoff check

AOO IV Takeoffs, Landings, and Go-Arounds

- ☐ Normal takeoff and climb
- ☐ Normal approach and landing
- ☐ Short field takeoff/max performance climb
- ☐ Short field approach and landing
- ☐ Go-around/rejected landing

AOO III Airport Operations

- ☐ Communications, light signals, and runway lighting systems
- ☐ Traffic patterns

AOO V Performance maneuvers

- ☐ Steep turn

AOO VI Navigation

- ☐ Pilotage and dead reckoning
- ☐ Navigation systems and radar services
- ☐ Diversion
- ☐ Lost procedures

AOO VII Slow Flight and Stalls

- ☐ Maneuvering during slow flight
- ☐ Power off stalls
- ☐ Power on stalls
- ☐ Accelerated stalls
- ☐ Spin awareness

AOO IX Emergency Operations

- ☐ Emergency equipment and survival gear
- ☐ Systems and equipment malfunctions
- ☐ Emergency descent
- ☐ Engine failure during takeoff prior to 50% of V_{MC} (simulated)
- ☐ Engine Failure After Liftoff (Simulated)
- ☐ Approach and Landing with an Inoperative Engine (Simulated)

AOO X Multiengine Operations

- ☐ V_{MC} Demonstration
- ☐ Maneuvering with One Engine Inoperative
- ☐ One Engine Inoperative (Simulated) (solely by Reference to Instruments) During Straight-and-Level Flight and Turns
- ☐ Instrument Approach and Landing with an Inoperative Engine (Simulated)

AOO XI Post Flight Procedures

- ☐ After landing, parking, and securing

COMPLETION STANDARDS

The student must meet Commercial Pilot Airplane Multi Engine Land ACS in all areas of operation.

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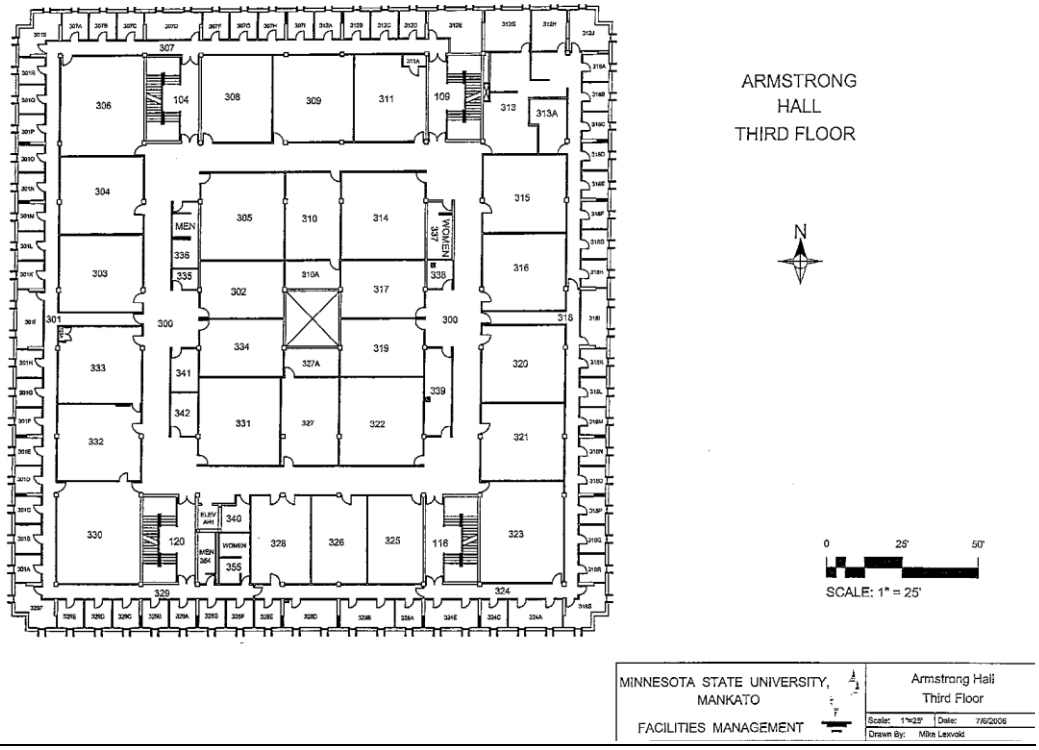
APPENDIX A
Ground Instruction Facilities

The training rooms at MNSU and NSA are well lighted, and the temperature is thermostatically controlled. Each room is ventilated and conforms to the city of Mankato building, sanitation, and health codes. The rooms are designed and located so that students will not be distracted by instruction conducted in the other rooms or by flight and maintenance operations at the airport.

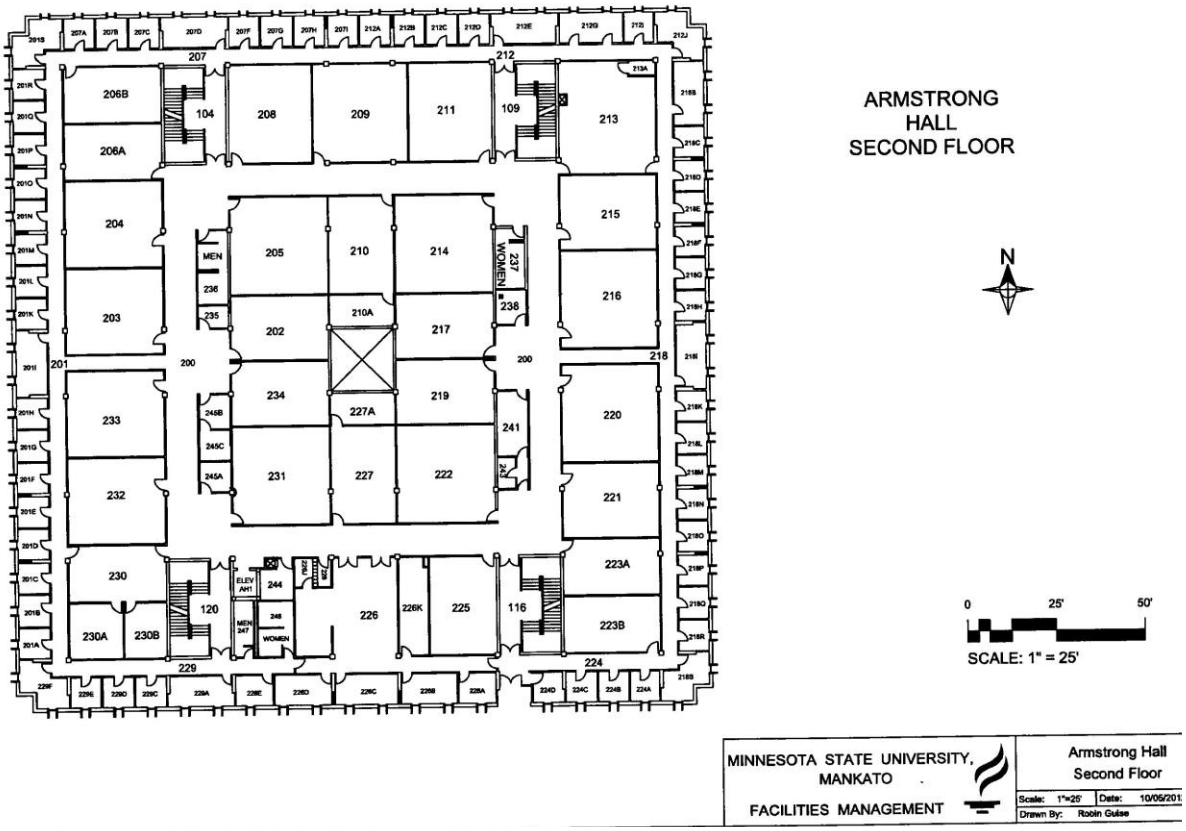
MNSU Armstrong Hall Room Capacity and Square Footage

Room #	Capacity	Sq. Ft.	Room #	Capacity	Sq. Ft.
302	33	503	334	33	501
303	36	669	202	33	504
304	43	674	203	27	665
305	48	762	204	27	670
306	58	881	205	40	761
308	42	644	208	40	650
309	40	733	209	36	741
310	32	501	211	42	650
311	41	653	213	55	882
314	40	764	214	50	761
315	34	671	215	38	581
316	44	664	216	40	763
317	30	501	217	33	503
319	33	500	219	33	505
320	32	665	220	40	761
321	38	671	221	28	581
322	35	765	222	50	770
323	58	881	225	30	522
325	30	502	231	50	762
326	25	502	232	44	668
327	26	528	233	42	668
330	43	882	101	161	1539
331	30	740	102	112	1282
332	10	673	123	42	633
333	30	669			

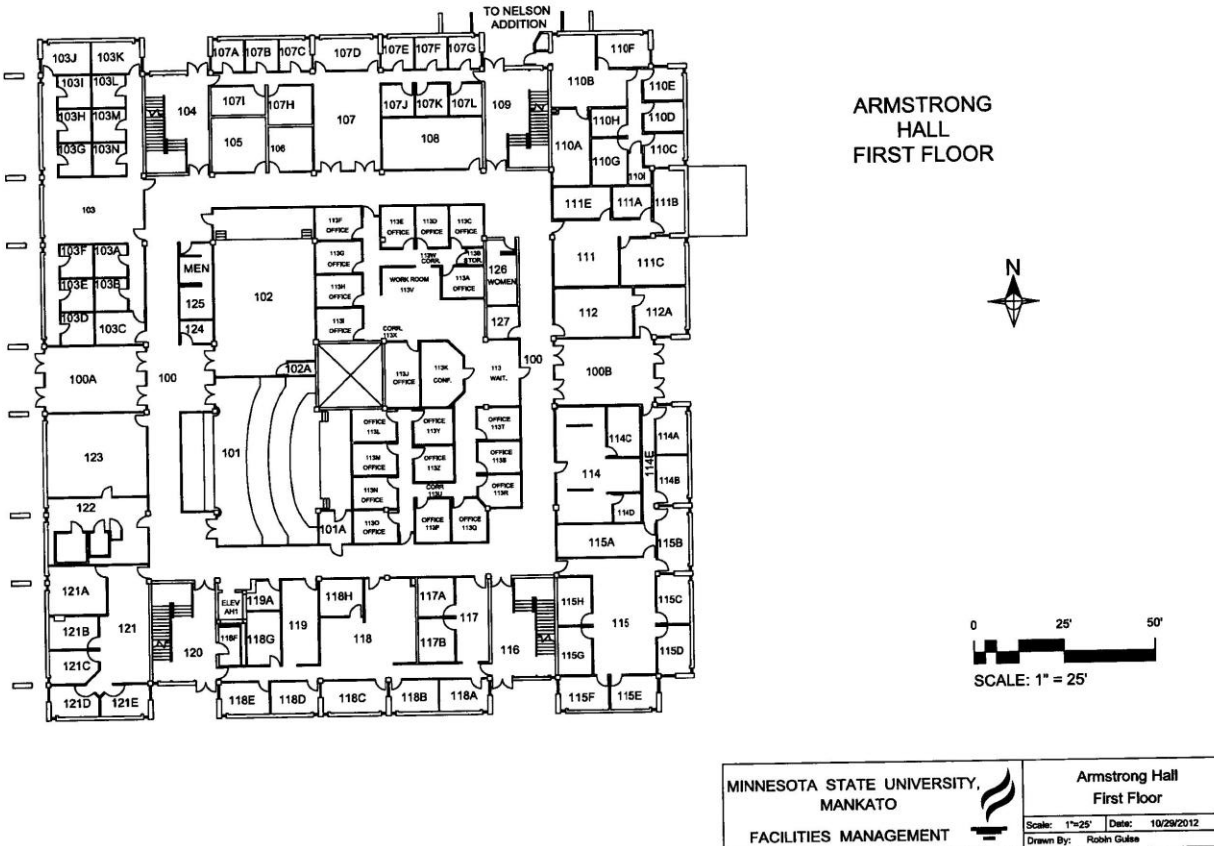
MNSU Armstrong Hall Room Third Floor



MNSU Armstrong Hall Room Second Floor



MNSU Armstrong Hall Room First Floor



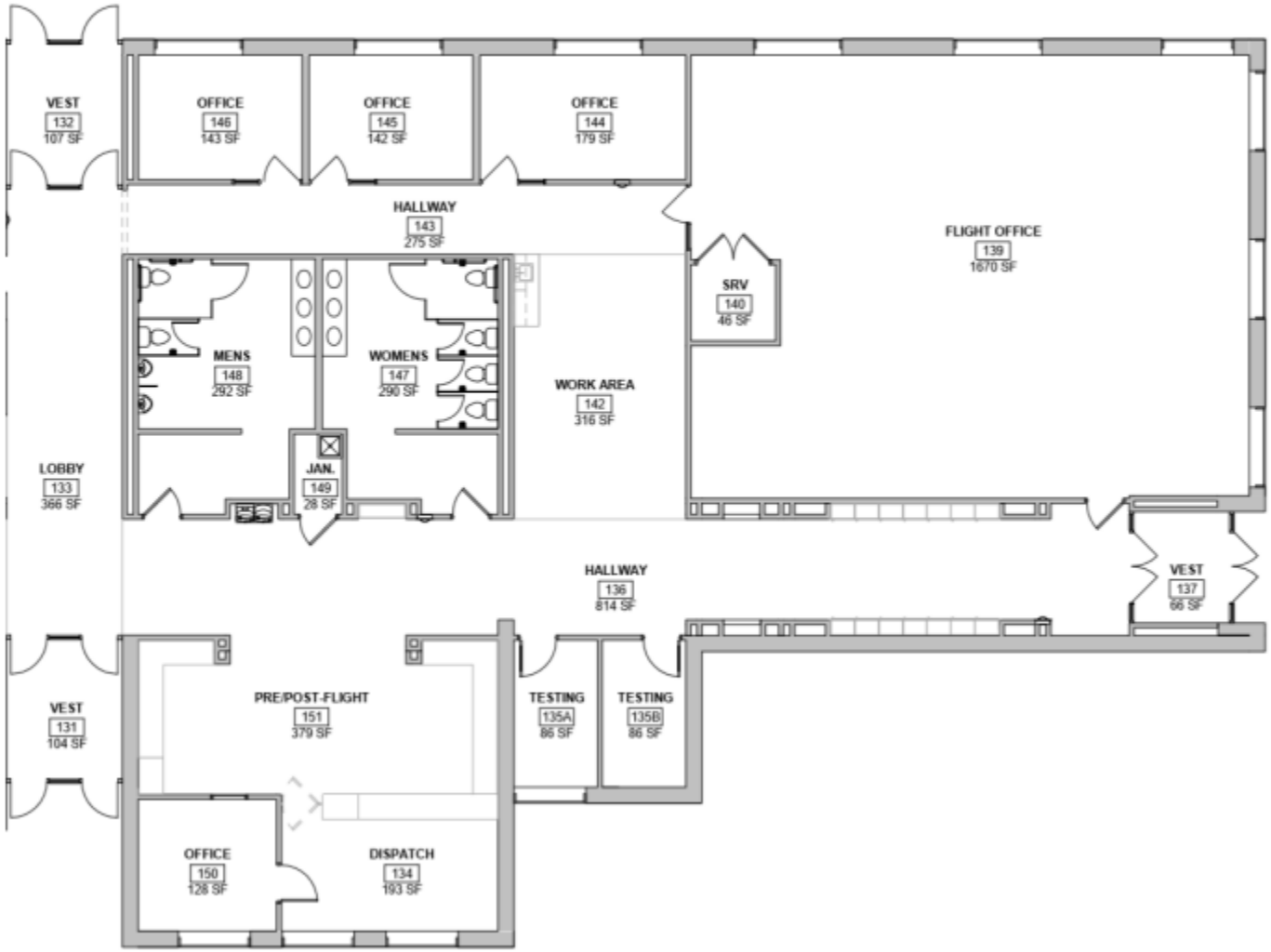
APPENDIX B
Airport Facilities

Airport Terminal (North)

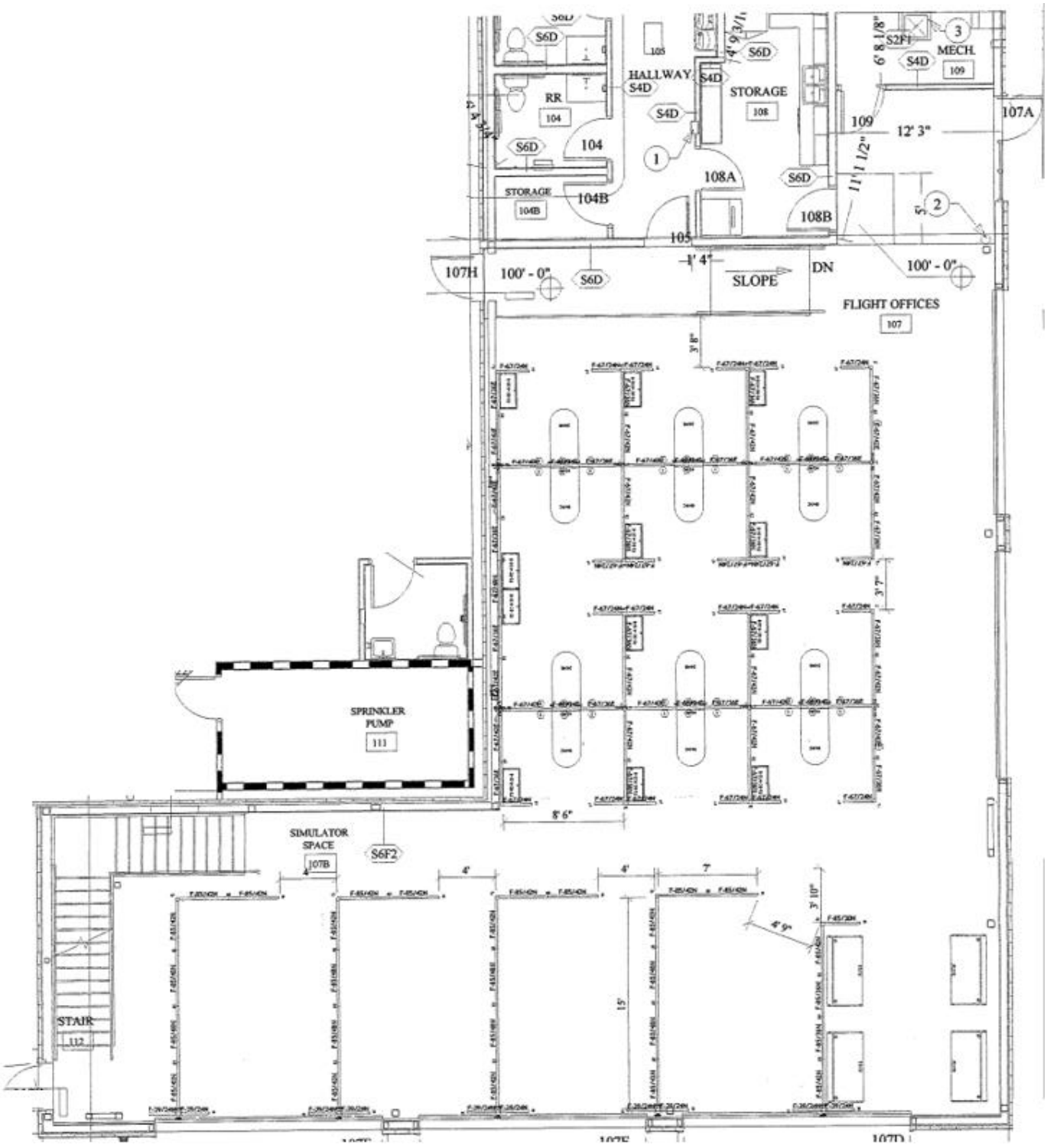
FBO Offices, Conference Rooms, Student Waiting Area

Airport Terminal (South)

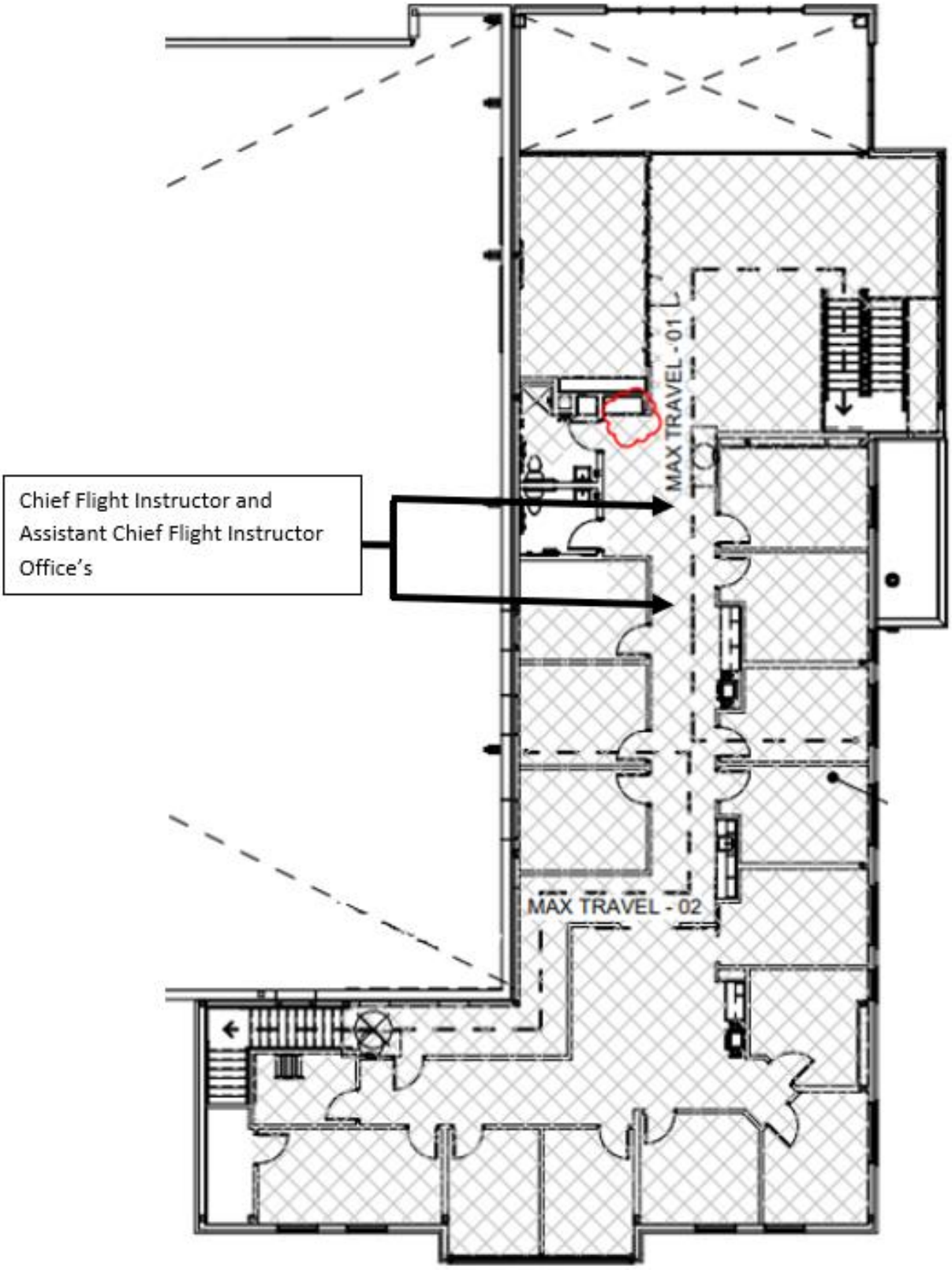
Flight Training Room, Chief/Asst. Chief Offices, Dispatch Area, Preflight Preparation Areas, Checkride Rooms



North Star Aviation Corporate Hangar (Lower Level)
Simulator Bays and Standards Department Cubicles



North Star Aviation Corporate Hangar (Upper Level)
Corporate business offices including Chief/Assistant Chief Office (indicated)



APPENDIX C
Simulator Letters of Authorization (LOA)

Precision Flight Controls:

U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety

800 Independence Ave., SW
Washington DC 20591

February 27, 2024

Mike Altman
CEO, Precision Flight Controls, Inc.
2747 Mercantile Drive, Suite 100
Rancho Cordova, CA 95742

Dear Mr. Altman:

The Federal Aviation Administration (FAA) last qualified and approved your airplane Precision Flight Controls, Inc. model GTX, GTX ProMotion, GTX MAX and GTX MAX ProMotion as an Advanced Aviation Training Device (AATD) on February 25, 2020, in accordance with Title 14 of the Code of Federal Regulations (14 CFR) § 61.4(c).

Review of the revised Qualification and Approval Guide (QAG) revision 1 dated January 11, 2024, validates the current standards and criteria for approval as provided in Advisory Circular (AC) 61-136, *FAA Approval of Aviation Training Devices and Their Use for Training and Experience*. The Precision Flight Controls, Inc. model GTX, GTX ProMotion, GTX MAX and GTX MAX ProMotion airplane AATD is approved for use in satisfying the following sections of parts 61 and 141:

Precision Flight Controls, Inc.
Model GTX, GTX ProMotion, GTX MAX and GTX MAX ProMotion
Airplane Single and Muliengine Land
Advanced Aviation Training Device (AATD)

- § 61.51(b)(3) – Logbook entries;
- § 61.51 (h) – Logging training time;
- § 61.57(c)(2) – Instrument experience;
- § 61.57(d)(1) – Instrument proficiency check, per the Instrument ACS;
- § 61.65(i) – Instrument rating; up to 20 hours;
- § 61.109(k)(1) – Private Pilot Certificate aeronautical experience: up to 2.5 hours;
- § 61.129(i)(1)(i) – Commercial Pilot Certificate: up to 50 hours;
- § 61.159(a)(4)(i) – Airline Transport Pilot Certificate: up to 25 hours; and
- § 141.41(b) – Approved for use under the part 141 appendices as follows:
  - *Appendix B* – Up to 15% toward the total Private Pilot training time requirements;
  - *Appendix C* – Up to 40% toward the total Instrument training time requirements;
  - *Appendix D* – Up to 20% toward the total Commercial Pilot training time requirements;

Expires: 02/28/2029

- *Appendix E* – Up to 25% toward the total Airline Transport Pilot training time requirements;
- *Appendix F* – Up to 5% toward the total Flight Instructor training time requirements;
- *Appendix G* – Up to 5% toward the total Flight Instructor Instrument training time requirements;
- *Appendix I, Private Pilot adding Airplane Category and Single Engine or Multiengine Class Rating Course* – Up to 3 hours toward the total training time requirements;
- *Appendix I, Commercial Pilot adding Airplane Category and Single Engine or Multiengine Class Rating Course* – Up to 11 hours toward the total training time requirements;
- *Appendix I, Airline Transport Pilot adding Airplane Category and Single Engine or Multiengine Class Rating Course* – Up to 6.25 hours toward the total training time requirements; and
- *Appendix M, Combined Private Pilot Airplane Certification and Instrument Rating* – Up to 25% toward the total training time requirements

Note: Minimum training or experience requirements for cross country, night, solo, takeoffs and landings, and the 3 hours of training with an authorized instructor in preparation for the practical test within the preceding 2 calendar months from the month of the test must be accomplished in an aircraft. Private Pilot Airplane applicants must also accomplish the minimum requirement for 3 hours of control and maneuvering of an airplane solely by reference to instruments specified in § 61.109 in an airplane.

No portion of the practical test or type specific training credit can be conducted in an AATD. The flight portion of a flight review specified in § 61.56(a) cannot be accomplished in an AATD. Additionally, an instrument proficiency check (IPC) specified in § 61.57(c) cannot be completed in its entirety in an AATD (see Instrument Rating Airman Certification Standards FAA-S-ACS-8, as amended).

This approval is contingent upon the following conditions and limitations:

1) This AATD must maintain its performance and function without degradation. The minimum instrument requirements specified under § 91.205 for day visual flight rules (VFR) and instrument flight rules (IFR) must be functional during the training session;

2) Only the aircraft make/model and configurations that are in the approved QAG can be utilized. A copy of the FAA approved QAG detailing the approved makes, models, and configurations must be provided to the operator and be readily available when the AATD is in use;

3) A copy of this letter of authorization (LOA) must be readily available in a location near the device when in use. Additionally, a copy must be provided to the person using the above credits for pilot certification or ratings;

4) When used for instructional purposes, only an appropriately qualified FAA-certificated flight instructor may make any subsequent endorsements and/or pilot logbook entries. Pilot time in an ATD may be logged as instruction received, instrument time, or total time only. See FAA airman application 8710-1;

5) Any changes or modifications to this AATD which have not been individually reviewed, evaluated, and approved in writing by the Air Transportation Division will terminate this LOA; and

6) The FAA reserves the right to withdraw this LOA at any time if the Administrator determines that this AATD has been used in a manner contrary to the conditions and limitations described within this LOA, FAA regulation, guidance, or safety.

This approval is valid for sixty (60) calendar months from the date of this letter. Any requests for a new LOA should be made by the aviation training device manufacturer in writing to The Air Transportation Division at least 90 days in advance of expiration. The Air Transportation Division may require a review of the QAG, an on-site functional evaluation, and verification of all the AATD requirements as described in FAA Order 8900.1 Volume 11, Chapter 10, Section 1, *Approval, Oversight, and Authorized Use Under 14 CFR Parts 61 and 141* before a new LOA is issued.

This approval expires on February 28, 2029.

The enclosed signed QAG is approved and a copy of this letter is retained in our files.

Sincerely,

ANDREW SELIGA Digitally signed by ANDREW SELIGA
Date: 2024.02.27 13:52:52 -05'00'

Andrew Seliga
Section Manager, Training and Simulation Group
Air Transportation Division

Enclosure

APPENDIX D
Reference Books and Materials

The following list is not all-inclusive. Instructors may refer to any supplemental source of information (e.g. Advisory Circulars and other FAA publications, NASA training videos, FAA Safety Videos, AOPA Air Safety Foundation web-based safety training, etc.) in order to increase the quality of training. Students will refer to the REQUIRED READING/STUDY section of each lesson for specific study material.

- The Garmin GNS 430: A Pilot Friendly Manual by Jon Dittner
- Pilot Operating Handbooks / Aircraft Flight Manuals (POH/AFM)
- FAA Chart Supplements (a.k.a. Airport Facility Directory)
- Private Pilot Practical Test Oral Study Guide instructor version with answers & explanations by June Bonesteel
- Everything Explained for Professional Pilots by Richie Lengel
- Aircraft Systems for Pilots by Dale De Remer, Phd
- ASA Private Pilot Oral Exam Guide
- Jeppesen Guided Flight Discovery Private Pilot Book
- Jeppesen GFD Private Pilot Video Series on DVD
- Jeppesen Private Pilot CD-ROM (for a power point presentation)
- Gleim Private Pilot Written Test Bank
- FAA Private Pilot Practical Airmen Certification Standards
- North Star Aviation, Inc. Private Pilot ASEL Power Point Standardized Flight Training Presentation – Warrior III PA-28-161
- North Star Aviation, Inc. Standard Operating Procedures - Piper Aircraft Warrior III PA-28-161
- North Star Aviation, Inc. Preflight Power Point Presentation on the Piper Aircraft Warrior III PA-28-161
- North Star Aviation, Inc. Checklist for the Piper Aircraft Warrior III PA-28-161
- VTS, Inc. VTS Training Systems Piper Warrior and Piper Seminole aircraft systems training software
- Garmin’s 400 and 500 Series online flight simulator
- Garmin’s 400W and 500W Series downloadable flight simulator
- Garmin’s 500 Series downloadable flight simulator
- Jeppesen’s Garmin 430 and Garmin 530 Training Software
- Aeronautical Information Manual (AIM)
- Federal Aviation Regulations (FARs)
- Federal Aviation Regulations EXPLAINED by Kent Jackson
- FAA-H-8083-25A: Pilot’s Handbook of Aeronautical Knowledge
- FAA-H-8083-1A: Aircraft Weight and Balance Handbook
- FAA-H-8083-3: Airplane Flying Handbook
- FAA-H 8083-6: Advanced Avionics Handbook
- FAA-H-8083-15: Instrument Flying Handbook
- FAA-H-8083-19: Plane Sense
- AC 00-6: Aviation Weather
- AC 00-45G: Aviation Weather Services
- AC 60-22: Aeronautical Decision Makin

- AC 61-65: Certification - Pilots and Flight Instructors
- AC 61-67: Stall and Spin Awareness Training
- AC 61-84: Role of Preflight
- AC 90-23E: Aircraft Wake Turbulence
- AC 90-48C: Pilot's Role in Collision Avoidance
- AC 90-66A: Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports without Operating Control Towers
- AC 91-33A: Use of Alternate Grades of Aviation Gasoline for Grade 80/87, and use of Automotive Gasoline
- AC 91-51A: Effect of Icing on Aircraft Control and Airplane Deice and Anti-ice Systems
- AC 91-67: Minimum Equipment for General Aviation Operations under FAR Part 91
- AC 120-51: Crew Resource Management Training
- AC 00-54: Pilots Windshear Guide
- AC 00-24B: Thunderstorms
- AC 00-34A: Aircraft Ground Handling and Servicing
- AC 20-43C: Aircraft Fuel Control
- AC 20-73A: Aircraft Ice Protection
- AC 43-9C: Maintenance Records
- AC 43-12A: Preventative Maintenance

APPENDIX E
Acronyms

A/C	Aircraft
AC	Advisory Circular
ACS	Airmen Certification Standards
AD's	Airworthiness Directive's
ADC	Air Data Computer
ADM	Aeronautical Decision Making
AFD	Airport/Facility Directory
AGL	Above Ground Level
AHRS	Attitude Heading Reference System
AIM	Aeronautical Information Manual
AIRMET	Airmen's Meteorological Information
ALS	Approach Lighting System
AME	Airmen Medical Examiner
AMEL	Airplane Multi Engine Land
AOA	Angle Of Attack
APP	Approach
ARR	Arrival
ARTCC	Air Route Traffic Control Center
ASAP	Aviation Safety Action Program
ASEL	Airplane Single Engine Land
ASI	Airspeed Indicator
ASR	Airport Surveillance Radar
ATC	Air Traffic Control
ATIS	Automated Terminal Information Service
AWOS	Automated Weather Observing System
CAP	Civil Air Patrol
CDI	Course Deviation Indicator
CDL	Configuration Deviation List
CFI	Certified Flight Instructor
CFIT	Controlled Flight Into Terrain
CFR	Code of Federal Regulations
CG	Center of Gravity
CRM	Crew Resource Management
DA/H	Decision Altitude/Height
DEP	Departure
DG	Directional Gyro
DME	Distance Measuring Equipment
DP	Departure Procedure
EFB	Electronic Flight Bag
EFC	Expect Further Clearance
EFIS	Electronic instrument flight system
ELT	Emergency Locator Transmitter
ETA	Estimated Time of Arrival
ETE	Estimated Time Enroute
FAA	Federal Aviation Administration
FAASTeam	FAA Safety Team
FAF	Final Approach Fix
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FD	Flight Director
FOM	Flight Operations Manual
FSDO	Flight Standards District Office
FSS	Flight Service Station
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GS	Glide Slope
HAT	High Above Touchdown
HIRL	High Intensity Runway Lights
HSI	Horizontal Situation Indicator
HWAS	Hazardous In-Flight Weather Advisory System
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
IF	Intermediate Fix
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
KCAS	Knots Calibrated Airspeed
KIAS	Knots Indicted Airspeed
LDA	Localizer Directional Aid
LLWAS	Low Level Wind Shear Alert System
LNAV	Lateral Navigation
LOA	Letter Of Authorization
LOC	Localizer
LPV	Localizer Performance w/ Vertical Navigation
MAA	Maximum Authorized Altitude
MAP	Missed Approach Point
MCA	Minimum Crossing Altitude
MDA	Minimum Descent Altitude
MEA	Minimum Enroute Altitude
MEL	Minimum Equipment List

METAR	Meteorological Information
MFD	Multifunction Flight Display
MOA	Military Operations Area
MOCA	Minimum Obstacle Clearance Altitude
MRA	Minimum Reception Altitude
MSA	Minimum Safe Altitude
MSL	Mean Sea Level
MVFR	Marginal Visual Flight Rules
N/A	Not Applicable
NAVAID	Navigation Aid
NDB	Nondirectional Beacon
NEXRAD	Next Generation Weather Radar
NM	Nautical Mile
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
OAT	Outside Air Temperature
OBS	Omni Bearing Selector
ODP	Obstacle Departure Procedure
OEI	One Engine Inoperative
OROCA	Off Route Obstacle Clearance Altitude
OTS	Out of Service
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PED	Personal Electronic Device
PFD	Primary Flight Display
PIC	Pilot In Command
PIREP	Pilot Weather Report
POH	Pilot's Operating Handbook
RCO	Remote Communications Outlet
REIL	Runway End Identifier Lights
RNAV	Area Navigation
RPM	Revolutions Per Minute
RVR	Runway Visual Range
RWY	Runway
SDF	Simplified Directional Facility
SIGMET	Significant Meteorological Information
SM	Statute Mile
SMS	Safety Management System
SOP	Safety Operating Procedure
SPRM	Single Pilot Resource Management
STAR	Standard Terminal Arrival Route
SUA	Special Use Airspace
SVFR	Special Visual Flight Rules
T/O	Take Off
TAC	Terminal Area Chart
TACAN	Tactical Aircraft Control and Navigation
TAF	Terminal Area Forecast
TAS	True Airspeed
TCO	Training Course Outline
TFR	Temporary Flight Restriction
TOGA	Take Off/Go Around
TRACON	Terminal Radar Approach Control
TRSA	Terminal Radar Service Area
TSA	Transportation Security Administration
TXY	Taxiway
UAS	Unmanned Aircraft System
UTC	Coordinated Universal Time (ZULU)
VASI	Visual Approach Slope Indicator
VDP	Visual Descent Point
VFR	Visual Flight Rules
VHF	very high frequency
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation
VOR	VHF Omnidirectional Range
VOR/DME	VOR/Distance Measuring Equipment
VORTAC	VOR with TACAN
VOT	VOR Test Facility
VSI	Vertical Speed Indicator
WAAS	Wide Area Augmentation System
WX	Weather