FITS Generic
Commercial Pilot Syllabus
Airplane Multi-Engine Land

September 2007

FITS Accepted Commercial Pilot Syllabus - AMEL

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INTRODUCTION

How to use this generic FITS Syllabus

This syllabus is an FAA Industry Training Standards (FITS) accepted training method. This generic syllabus is a guide for you to use in developing your specific FITS curriculum. This FITS Syllabus is intended as a guide for aircraft manufacturers, training providers, and flight schools to use in developing a specific FITS curriculum for their aircraft, geographic region, and customer base. This syllabus is unique in several ways. First, it is a syllabus that uses real-world scenarios as the foundation of the training. Flight maneuvers are still a vital part of flight training and flight maneuvers are a part of this syllabus, but the use of real-world scenarios is used to also enhance the pilot's decision making skills. The syllabus presents situations and circumstances that pilots face everyday as learning experiences and lessons. The primary tenant of FITS training is that you prepare for the real world of flying, by acting as a pilot while in training. Therefore, throughout the syllabus, the pilot in training (PT) will take on different tasks or jobs just as if they were already certificated pilots. The second important unique feature of this syllabus and of FITS training is that it is all competency based. When the pilot in training (PT) masters a particular skill area in the syllabus, he/she moves on regardless of how much time it takes to reach that point of mastery. This means that each lesson does not necessarily equal one flight. It may take several flights before the PT masters the elements of the lesson and is ready to move on to the next lesson. Consequently, the amount of total flight hours a PT has when the syllabus is completed may be more or less than the minimum times under current aviation regulations. Please note that FITS training is conducted under the current CFAR's. Although philosophically, FITS is competency based, many training organizations must still require their students to meet the FAA minimum training hours. Courses under CFAR Part 142 and section 141.55(d) may be approved to train to competency and not require an hours minimum.

Regulations

This generic syllabus is adaptable to 14 CFR Parts 142, 141, or 61. Please refer to the appropriate regulations for your specific curriculum requirements.

FITS Acceptance

FITS acceptance is achieved by developing your specific curriculum and submitting it to your local Flight Standards District Office for operations under CFAR Part 61, 141, and 142. If you are an OEM (Original Equipment Manufacturer, you should submit your curriculum to the FAA FITS Program Manager, AFS-800, Federal Aviation Administration, 800 Independence Ave. SW, Washington, DC 20591. A cover letter explaining exactly for what courses you are requesting FITS acceptance and under what regulations should accompany the curriculum. *Use of the FITS logo*. Once accepted, you are free to use the FITS Logo on all accepted curriculums and in

advertising about this particular curriculum. The FITS logo cannot be used in relationship to non-FITS products.

There are 4 levels of FITS acceptance:

1. Accepted FITS Flight Syllabus: Will contain all the tenets of FITS and will include flight in an aircraft or at least an Advanced Training Device. Examples of this type of syllabus include initial, transition, and recurrent training syllabi.

2. Accepted FITS Syllabus (No flight): It is not intended to teach the pilot in training (PT) psychomotor pilot skills or full cockpit/aircraft integration in a specific aircraft. It's intended to enhance certain skill sets of the PT. Application of this level of acceptance may be to teach the PT how to use a new glass cockpit display or develop better Single Pilot Resource Management (SRM) skills. A FITS Accepted Syllabus will also contain all the tenets of FITS. A live instructor will lead the training.

3. Accepted FITS Self-Learning Program: This acceptance is between the FITS Accepted Syllabus and FITS Supporting Material. It may be either an interactive CD or on-line course on a specific application or subject. The purpose of this training is to learn a specific piece of equipment or enhance a specific higher order thinking skill. Scenario training and/or testing is required. Since a live instructor is not required, Learner Centered Grading may not be applicable.
    a. If the program is for a piece of equipment (i.e. GPS), the equipment should act like the actual piece of equipment during the interaction with the equipment as much as feasible. After basic training on the equipment, scenarios should be used to demonstrate PT proficiency and knowledge.
    b. For non equipment programs (i.e. ADM development) scenarios with multi-string testing should be used.

4. Accepted FITS Supporting Material: These products do not meet the training tenets of FITS (i.e. may not be scenario based), but the subject is integral to FITS. These products could be accepted on their own technical merit, but only as a part of an Accepted FITS Flight Syllabus or FITS Syllabus. For example, a CBI on risk management could be accepted as and used as a module in a FITS accepted transition syllabus. Original equipment manufacturers (Cessna, Cirrus, Eclipse, etc.) or developers of training materials (Sporty's, Jeppesen, King Schools, etc.) normally develop Accepted FITS Supporting Material.

FITS TERMINOLOGY

Automation Bias – The relative willingness of the pilot to trust and utilize automated systems.
Automation Competence – The demonstrated ability to understand and operate the automated systems installed in the aircraft.
Automation Management – The demonstrated ability to control and navigate an aircraft by means of the automated systems installed in the aircraft.
Automated Navigation leg – A flight of 30 minutes or more conducted between two airports in which the aircraft is controlled primarily by the autopilot and the on board navigation systems.
Automation Surprise – Occurs when the automation behaves in a manner that is different from what the operator is expecting.
Candidate Assessment – A system of critical thinking and skill evaluations designed to assess a pilot in training's readiness to begin training at the required level.
Critical Safety Tasks/Events – Those mission related tasks/events that if not accomplished quickly and accurately may result in damage to the aircraft or loss of life.
Data link Situational Awareness Systems – Systems that feed real-time information to the cockpit on weather, traffic, terrain, and flight planning. This information may be displayed on the PFD, MFD, or on other related cockpit displays.
Emergency Escape Maneuver – A maneuver (or series of maneuvers) performed manually or with the aid of the aircraft's automated systems that will allow a pilot to successfully escape from an unanticipated flight into Instrument Meteorological Conditions (IMC) or other life-threatening situations.
IFR Automated Navigation Leg – A leg flown on autopilot beginning from 500 ft AGL on departure (unless the limitations of the autopilot require a higher altitude, then from that altitude) until reaching the decision altitude or missed approach point on the instrument approach (unless the limitations of the autopilot require a higher altitude, then from that altitude). If a missed approach is flown, it will also be flown using the autopilot and on-board navigation systems.
Light Turbine TAA –is a jet or turboprop Technically Advance Aircraft (TAA) certified for single-pilot operations, weighing 12,500 lbs or less, that may be equipped with cabin pressurization, and may be capable of operating in Class A airspace on normal mission profiles.
Mission Related Tasks – Those tasks required for safe and effective operations within the aircraft's certificated performance envelope.
Multi-Function Display MFD – Any display that combines primarily navigation, systems, and situational awareness information onto a single electronic display.
Primary Flight Display (PFD) – Any display that combines the primary six flight instruments, plus other related navigation and situational awareness information into a single electronic display.
Proficiency-Based Qualification – Aviation task qualification based on demonstrated performance rather than other flight time or experience.

Scenario Based Training – A training system that uses a highly structured script of real-world experiences to address flight-training objectives in an operational environment. Such training can include initial training, transition training, upgrade training, recurrent training, and special training. The appropriate term should appear with the term "Scenario Based," e.g., "Scenario Based Transition Training," to reflect the specific application.

Simulation Training Only – Any use of animation and/or actual representations of aircraft systems to simulate the flight environment. Pilot in training interaction with the simulation and task fidelity for the task to be performed are required for effective simulation.

Single Pilot Resource Management (SRM) – The art and science of managing all resources (both on-board the aircraft and from outside sources) available to a single pilot (prior and during flight) to ensure the successful outcome of the flight is never in doubt.

Technically Advanced Aircraft (TAA) – A General Aviation aircraft that contains the following design features: Advanced automated cockpit such as MFD or PFD or other variations of a Glass Cockpit, or a traditional cockpit with GPS navigation capability, moving map display and autopilot. It includes aircraft used in both VFR and IFR operations, with systems certified to either VFR or IFR standards. TAA's may also have automated engine and systems management. **VFR Automated Navigation Leg –** A leg flown on autopilot from 1,000 ft AGL on the departure until entry to the 45-degree leg in the VFR pattern.

TRAINING PHILOSOPHY

FITS Training is a scenario-based approach to training pilots. It emphasizes the development of critical thinking and flight management skills, rather than solely on traditional maneuver-based skills. The goal of this training philosophy is the accelerated acquisition of higher-level decision-making skills. Such skills are necessary to prevent pilot-induced accidents.

FITS Training Goals

- Higher Order Thinking Skills
- Aeronautical Decision Making
- Situational Awareness
- Pattern Recognition (Emergency Procedures) and Judgment Skills
- Automation Competence
- Planning and Execution
- Procedural Knowledge
- Psychomotor (Hand-Eye Coordination) Skills
- Risk Management
- Task Management
- Automation Management
- Controlled Flight Into Terrain (CFIT) Awareness

Previous training philosophies assumed that newly certified pilots generally remain in the local area until their aviation skills are refined. This is no longer true with the advent of Technically Advanced Aircraft (TAA). Offering superior avionics and performance capabilities, these aircraft travel faster and further than their predecessors. As a result, a growing number of entry-level pilots are suddenly capable of long distance/high speed travel—and its inherent challenges. Flights of this nature routinely span diverse weather systems and topography requiring advanced flight planning and operational skills. Advanced cockpits and avionics, while generally considered enhancements, require increased technical knowledge and finely tuned automation competence. Without these skills, the potential for an increased number of pilot-induced accidents is daunting. A different method of training is required to accelerate the acquisition of these skills during the training process.

Research has proven that learning is enhanced when training is realistic. In addition, the underlying skills needed to make good judgments and decisions are teachable. Both the military and commercial airlines have embraced these principles through the integration of Line Oriented Flight Training (LOFT) and Crew Resource Management (CRM) training into their qualification programs. Both LOFT and CRM lessons mimic real-life scenarios as a means to expose pilots to realistic operations and critical decision-making opportunities. The most significant shift in these programs has been the

movement from traditional maneuver-based training to incorporate training that is scenario-based.

Maneuver-based training emphasizes the mastery of individual tasks or elements. Regulations, as well as Practical Test Standards (PTS), drive completion standards. Flight hours and the ability to fly within specified tolerances determine competence. The emphasis is on development of motor skills to satisfactorily accomplish individual maneuvers. Only limited emphasis is placed on decision-making. As a result, when the newly trained pilot flies in the real-world environment, he or she is inadequately prepared to make crucial decisions. Scenario Based Training (SBT) and Single Pilot Resource Management (SRM) are similar to LOFT and CRM training. However, each is tailored to the pilot's training needs. These techniques use the same individual tasks that are found in Maneuver Based Training, but script them into scenarios that mimic real-life cross-country travel. By emphasizing the goal of flying safely, the pilot in training correlates the importance of individual training maneuvers to safe mission accomplishment. In addition, the instructor continuously interjects "What If?" discussions as a means to provide the trainee with increased exposure to proper decision-making. Because the "What If?" discussions are in reference to the scenario, there is a clear connection between decisions made and the final outcome. The "What If?" discussions are designed to accelerate the development of decision-making skills by posing situations for the pilot in training to consider. Once again, research has shown these types of discussions help build judgment and offset low experience.

Questions or situations posed by the instructor must be open-ended (rather than requiring only rote or one-line responses). In addition, the instructor guides the pilot in training through the decision process by: 1) Posing a question or situation that engages the pilot in training in some form of decision-making activity. 2) Examining the decisions made. 3) Exploring other ways to solve the problem. 4) Evaluating which way is best. For example, when the pilot in training is given a simulated engine failure, the instructor might ask questions such as: "What should we do now?" Or, "Why did you pick that place to land?" Or, "Is there a better choice?" Or, "Which place is the safest?" Or, "Why?" These questions force the pilot in training to focus on the decision process. This accelerates the acquisition of improved judgment, which is simply the decision-making process resulting from experience. It is not innate. All of our life experiences mold the judgment tendencies we bring to our flight situations. By introducing decision-making opportunities into routine training lessons, we speed-up acquisition of experience, thus enhancing judgment.

For further information, please reference "Aeronautical Decision Making" in the FAA Aviation Instructor Handbook.

TEACHING METHODS

Scenario Based Training

For Scenario Based Training (SBT) to be effective there must be a purpose for the flight and consequences if it is not completed as planned. It is vital that the pilot in training and the Instructor communicate the following information well in advance of every training flight:

Purpose of flight
Scenario destination(s)
Desired pilot in training learning outcomes
Desired level of pilot in training performance
Desired level of automation assistance
Possible in-flight scenario changes (during later stages of the program)

With the guidance of the Instructor, the pilot in training should make the flight scenario as realistic as possible. This means the pilot in training will know where they are going and what will transpire during the flight. While the actual flight may deviate from the original plan, it allows the pilot in training to be placed in a realistic scenario.

Scenario Planning – Prior to the flight, the Instructor will brief the scenario to be planned. The Instructor will review the plan and offer guidance on how to make the lesson more effective. Discussion, in part, will reflect ways in which the Instructor can most effectively draw out a pilot in training's knowledge and decision processes. This enables the Instructor to analyze and evaluate the pilot in training's level of understanding. After discussion with the Instructor, the pilot in training will plan the flight to include:

Reason to go flying
Route
Destination(s)
Weather
Notams
Desired pilot in training learning outcomes
Possible alternate scenarios and emergency procedures

Example of Scenario Based Training

Consider the following example: During traditional MBT, the Instructor provides a detailed explanation on how to control for wind drift. The explanation includes a thorough coverage of heading, speed, angle of bank, altitude, terrain, and wind direction plus velocity. The explanation is followed by a demonstration and repeated practice of a

specific flight maneuver, such as turns around a point or S turns across the road until the maneuver can be consistently accomplished in a safe and effective manner within a specified limit of heading, altitude, and airspeed***. At the end of this lesson, the pilot in training is only capable of performing the maneuver.***

Now, consider a different example: The pilot in training is asked to plan for the arrival at a specific uncontrolled airport. The planning should take into consideration the possible wind conditions, arrival paths, airport information and communication procedures, available runways, recommended traffic patterns, courses of action, and preparation for unexpected situations. Upon arrival at the airport the pilot in training makes decisions (with guidance and feedback as necessary) to safely enter and fly the traffic pattern using proper wind drift correction techniques. This is followed by a discussion of what was done, why it was done, the consequences, and other possible courses of action and how it applies to other airports. ***At the end of this lesson the pilot in training is capable of explaining the safe arrival at any uncontrolled airport in any wind condition.***

The first example is one of traditional learning, where the focus is on the maneuver. The second is an example of scenario-based training, where the focus is on real world performance. Many course developers in flight training have built on the former option. Traditional training methods in many instances are giving way to more realistic and fluid forms of learning. The aviation industry is moving from traditional knowledge-related learning outcomes to an emphasis on increased internalized learning in which learners are able to assess situations and appropriately react. Knowledge components are becoming an important side effect of a dynamic learning experience.

Reality is the ultimate learning situation and scenario-based training attempts to get as close as possible to this ideal. In simple terms, scenario-based training addresses learning that occurs in a context or situation. It is based on the concept of situated cognition, which is the idea that knowledge cannot be known and fully understood independent of its context. ***In other words, we learn better, the more realistic the situation is and the more we are counted on to perform.***

Michael Hebron, a well-known golf instructor, suggests that there is little the expert can do in the way of teaching the learner particular motions of the golf swing. Instead, learning has to be experiential and feedback based; only a handful of basic principles are involved. The same goes, he says, for any and all kinds of learning. ***"It's about learning, not about golf."***

Scenario-based training (SBT) is similar to the experiential model of learning. The adherents of experiential learning are fairly adamant about how people learn. **They would tell us that learning seldom takes place by rote.** Learning occurs because we immerse ourselves in a situation in which we are forced to perform. We get feedback from our environment and adjust our behavior. We do this automatically and with such frequency in a compressed timeframe that we hardly notice we are going through a learning process. Indeed, we may not even be able to recite particular principles or

describe how and why we engaged in a specific behavior. Yet, we are still able to replicate the behavior with increasing skill as we practice. If we could ask Mark MacGuire to map out the actions that describe how he hits a home run, he would probable look at us dumbfounded and say, “I just do it.” On the other hand, I am sure Mark MacGuire could describe in detail the size and characteristics of every one of the baseball diamonds he was playing in as well as the strengths, weaknesses and common practices of every one of the pitchers he faces.

Developing Scenario-Based Training

Scenario-based training best fits an open philosophy of blended and multiple learning solutions in which change and experience are valued and the lines between training and performance improvement are blurred. For scenario-based training to be effective it must generally follow a performance improvement imperative. The focus is on improved outcomes rather than the acquisition of knowledge and skills. Success requires a blended, performance-based, and reinforced solution.

An athletic exercise such as Basketball might prove to be a very good example. Clearly, the team's objective is to win, which means scoring more points than the other team. That's the performance objective. Each member of the team also has personal performance goals. The coach can stand at a blackboard and explain defensive and offensive diagrams with players, the rules of the game, and so forth. By doing that, he has identified a set of learning subjects (rules and play patterns) that are best delivered in a traditional fashion.

On the other hand, the application of these subjects and the level of proficiency required in their use can only be learned on the court. The scenario in this example is a scrimmage. During a typical scrimmage, experienced players are mixed with non-experienced players and matched against a similarly constituted practice team. The two teams play a game, and the coaches stop the action at appropriate intervals to offer feedback. Learning takes place in a highly iterative fashion often without the player realizing that specific bits of learning are taking place. The scrimmage provides a player with the opportunity to make several decisions, engage in complex and fast-paced behaviors, and immediately see impact. The coach may have some general ideas of basketball in mind and perhaps some specific learning objectives for the day, but in most cases does not know precisely which of them will be addressed during the scrimmage – that depends on the flow of practice.

Similarly, most flight training consists of both kinds of subjects: those amenable to traditional instructional design techniques and those better approached through scenario-based training. Neither is all that useful without the other. Before a learner can engage in a scenario, he or she needs some basic subject knowledge and skill. However, the strongest adherents of the scenario-based approach suggest very little subject knowledge is needed in order to take advantage of SBT. **The main point is that knowledge without application is worth very little.**

The first step in the scenario design process is to engage a number of subject matter experts in a series of discovery sessions and interactive meetings for the purpose of identifying issues and learning objectives including higher-level and performance objectives. With clearly identified learning objectives, appropriate techniques and where to use them can be specified. In the basketball example, players need some rudimentary knowledge of the game and basic skill in order to make the practice session efficient and effective. Consequently, the required knowledge and skill objects need to be integrated into the actual sessions of practice. So, like a train pulling a

number of boxcars, a traditional piece of learning precedes or is integrated into a scenario, with the scenario dictating what information is covered in the traditional piece. If, as described in the scrimmage session above, you don't precisely know what will come up in the practice, you shouldn't waste time in the traditional preparation. It's more efficient to share very basic principles and devote your resources to preparing to teach any situation that may arise. What is important, however, is to establish the boundaries of the scenarios. These are done using performance-based learning objectives (Internalized Responses) as opposed to knowledge-based learning objectives, and are worded as performance objectives rather than skill-based behavior objectives.

For example, in the traditional, more repetitive, intensive flight training sessions, objectives are knowledge-based and tend to be specific and limited. On the other hand, in scenario-based training we are simply trying to determine whether the learner has the minimum necessary knowledge/skill to qualify for the scenario. With scenario-based objectives, we are looking for performance behaviors and indicators of internalized responses, which are usually situational recognition indicators.

We can see this clearly illustrated in an automobile driver-training example (Table 1). The traditional Behavior (skill) objective is knowledge based and the SBT Performance objective is performance-based (responses which are situational recognition indicators).

Table 1: Driving Learning Objectives

Knowledge		**Behavior (Skill)**
Traditional	Know what a STOP sign and a Railroad crossing sign look like and what they mean. Describe the correct parallel parking procedure	Drive an automatic shift car on a county road over a 2-mile route with one RR crossing and 2 full stops. Maneuver the automobile into a normal parallel parking space between 2 other cars.
Internalized Response		**Performance**
Scenario-Based	Appropriately apply the rules of the road for driving in the local area in moderate traffic. Determine the shortest route and apply the appropriate procedures for driving in heavy and complex traffic conditions.	Drive from your garage to the Shopping Center on the same side of town Drive from your garage to a specified address in another town over 50 miles away on the Interstate and an Expressway system.

Scenario design sessions should resemble focus groups in which participants work through a series of issues, from broad scenario outlines to very specific scenario details. Direct participants to address two general areas: content and style.

Sessions to determine content usually ask participants to:

- Share experiences about the subject event
- Describe desirable outcomes
- Share best practices or known instances of consistent achievement of the desired outcomes
- Create indicators of successful outcomes
- Create strategies expected to lead to successful outcomes
- Establish descriptions of successful and unsuccessful performance behaviors related to these strategies (note that outcome measures and performance behaviors will constitute the evaluative criteria for assessing performance in the scenario).

After the content discussion, ask participants to review the look, feel, and flow of the scenario. This is much like the process used for instructional design. Develop a storyboard with a general beginning and end, using the boundaries established earlier. Talk through the scenario in the session and, through iteration, create a flow script from the results.

With these two elements in place, you can begin the actual construction of the scenario. A subcommittee of Flight Instructors and subject matter experts (SMEs) should review and revise the scenario to fit into the whole course of instruction.

Scenarios are meant to be real situations. In an ideal world, an assessment team would evaluate behavior and agree on several critical performance dimensions. The key indicators should come from the initial SMEs, in which they also create strategies expected to lead to successful outcomes and establish descriptions of successful and unsuccessful performance behaviors. Outcome measures and performance behaviors will constitute the evaluative criteria for assessing performance in the scenario.

Examples of indicators of successful outcomes are whether an airplane arrived and was secured at the destination airport and how safe were all aspects of the flight or were there any regulatory violations. Strategies are clusters of internally consistent behaviors directed toward the achievement of a goal. Performance behaviors are the key behaviors in those strategies. Establishing these dimensions should be a group process and is usually completed in the subject matter expert design session.

Review, obtain learner feedback, and revise**.** All learning, even the most traditional, is iterative. The key to creating a useful scenario is to see it as a learning experience for the designers as well as the learners. This means that results and comments about the learning experience are shared with the SMEs and the designer so that they can review and modify the scenarios as necessary. Obtain open –ended qualitative data from the learner and the Flight Instructor about the experience and review the data with the SME's and the designer.

Based on this kind of feedback, scenarios can be revised to better target the learner population. That process mirrors the original design steps. There are some cautions, however, in the revision process. First, there is an old saying: “It doesn’t take a cannon to blow away a tin can.” Basically, revisions should not needlessly complicate the scenario or the technology needed to employ it. It is crucial to weigh the risks of complication against the genuine learning needs. Before any revision, affirm the original purpose statement and the categorization of learning elements.

Also, do not let principles and main points become diluted by revisions. It is tempting to add more items and nuances in a scenario, but doing so further complicates the learning process. Save complexity for a full-scale “capstone” experience. Remember, adding an item in traditional learning complicates the learning process in a linear fashion. In scenarios, complication grows non-linearly with the addition of learning items. So, beware. A rule of thumb is to reduce rather than increase principles and main points in a revision.

Always review success and failure paths for realism. Remember that any change in a scenario item complicates all items on the path following it. Any time a decision node is altered, chances are that the decision nodes and information items following it must change. With every revision, follow and ensure the consistency of associated paths.

Finally, remember that traditional learning elements should service the scenario-based learning elements, which are situated in a real context and based on the idea that knowledge cannot be known and fully understood independent of its context. It is essential to place boundaries around scenarios to make the transitions between scenarios and traditional learning as efficient as possible.

Table 2: The Main Points

- Scenario-based training (SBT) is situated in a real context and is based on the idea that knowledge cannot be known and fully understood independent of its context.
- SBT accords with a performance improvement and behavior change philosophy of the learning function.
- SBT is different from traditional instructional design and one must be aware of the differences to successfully employ SBT.
- All learning solutions should employ both traditional and scenario-based training.
- Traditional learning elements should service the scenario-based training elements.
- It is essential to place boundaries around scenarios to make the transitions between scenarios and traditional learning as efficient as possible.
- Use interactive discovery techniques with subject matter experts (SMEs) and designers to establish the purpose and outcomes of scenarios create the scenarios and appropriate strategies and performance behaviors, and develop learner evaluation criteria.
- SBT occurs by following success and failure paths through a realistic situation. Typically, these paths must be limited to stress the main learning objective. Otherwise the scenario can become too complex and unwieldy.
- Open-ended qualitative learner feedback is key to successful scenario revision, but revisions should not further complicate the scenario unless highly justified.

Kindley, R. (2002). *Scenario-Based E-Learning: A Step Beyond Traditional E-Learning.* Retrieved 02/02/05 from http://www.learningcircuits.org/2002/may2002/kindley.html

Single Pilot Resource Management

Single Pilot Resource Management (SRM) is defined as the art and science of managing all the resources (both on-board the aircraft and from outside sources) available to a single-pilot (prior and during flight) to ensure that the successful outcome of the flight is never in doubt. Most of us remember a favorite Instructor from our past that showed us the best way to solve in-flight problems and unforeseen circumstances. The FITS team has combined much of this collective CFI body of knowledge with some innovative teaching methods to give pilots practical tools to teach aeronautical decision-making and judgment. SRM includes the concepts of Aeronautical Decision Making (ADM), Risk Management (RM), Task Management (TM), Automation Management (AM), Controlled Flight Into Terrain (CFIT) Awareness, and Situational Awareness (SA). SRM training helps the pilot maintain situational awareness by managing the automation and associated aircraft control and navigation tasks. This enables the pilot to accurately assess and manage risk and make accurate and timely decisions. ***This is what SRM is all about, helping pilots learn how to gather information, analyze it, and make decisions.***

Teaching pilots to identify problems, analyze the information, and make informed and timely decisions is one of the most difficult tasks for Instructors. By way of comparison, the training of specific maneuvers is fairly straightforward and reasonably easy to understand. We explain, demonstrate, and practice a maneuver until proficiency is achieved. We are teaching the pilot in training ***"what to think"*** about each maneuver, and sign them off when they demonstrate proficiency. Teaching judgment is harder. Now we are faced with teaching the pilot in training ***"how to think"*** in the endless variety of situations they may encounter while flying out in the "real world." Often, they learn this by watching Instructors. They observe reactions, and more importantly, actions, during flight situations and they often adapt the styles of the Instructor to their own personalities.

Pilots in training may range from 100-hour VFR-only pilots, all the way to multi-thousand hours ATP's. The strength of this format is that the participants learn not only from their Flight Instructor, but from each other as well. The collective knowledge of many pilots, when guided by an experienced CFI, is much greater than the knowledge of each participant, including the Flight Instructor. In these scenarios, there are no right answers, rather each pilot is expected to analyze each situation in light of their experience level, personal minimums, and current physical and mental readiness level, and make their own decision.

The SRM scenarios, developed by the FITS team, incorporate several maneuvers and flight situations into realistic flight scenarios. The scenarios are much like the Line Oriented Flight Training (LOFT) employed by the major corporate and airline training organizations for years. Table 3 gives an example of the performance, standards and conditions using SRM.

Table 3: Single Pilot Resource Management (SRM)

Performance The training task is:	**Standards** The pilot in training will:	**Conditions** The training is conducted during:
1. Task Management (TM)	Prioritize and select the most appropriate tasks (or series of tasks) to ensure successful completion of the training scenario.	Note: All tasks under SRM will be embedded into the curriculum and the training will occur selectively during all phases of training. SRM will be graded as it occurs during the training scenario syllabus.
2. Automation Management (AM)	Program and utilize the most appropriate and useful modes of cockpit automation to ensure successful completion of the training scenario.	Note: All tasks under SRM will be embedded into the curriculum and the training will occur selectively during all phases of training. SRM will be graded as it occurs during the training scenario syllabus.
3. Risk Management (RM) and Aeronautical Decision-Making (ADM)	Consistently make informed decisions in a timely manner based on the task at hand and a thorough knowledge and use of all available resources.	Note: All tasks under SRM will be embedded into the curriculum and the training will occur selectively during all phases of training. SRM will be graded as it occurs during the training scenario syllabus.
4. Situational Awareness (SA)	Be aware of all factors such as traffic, weather, fuel state, aircraft mechanical condition, and pilot fatigue level that may have an impact on the successful completion of the training scenario.	Note: All tasks under SRM will be embedded into the curriculum and the training will occur selectively during all phases of training. SRM will be graded as it occurs during the training scenario syllabus.
5. Controlled Flight Into Terrain (CFIT) Awareness	Understand, describe, and apply techniques to avoid CFIT encounters: a. During inadvertent encounters with IMC during VFR flight. b. During system and navigation failures and physiological incidents during IFR flight.	Note: All tasks under SRM will be embedded into the curriculum and the training will occur selectively during all phases of training. SRM will be graded as it occurs during the training scenario syllabus.

The “5P” Check

SRM sounds good on paper, however, it requires a way for pilots to understand and deploy it in their daily flights. This practical application is called the “Five P’s (5P’s)” The 5P’s consist of “the Plan, the Plane, the Pilot, the Passengers, and the Programming”. Each of these areas consists of a set of challenges and opportunities that face a single pilot. And each can substantially increase or decrease the risk of successfully completing the flight based on the pilot’s ability to make informed and timely decisions. The 5P’s are used to evaluate the pilot’s current situation at key decision points during the flight, or when an emergency arises. These decision points include, pre-flight, pre-takeoff, hourly or at the midpoint of the flight, pre-descent, and just prior to the final approach fix or for VFR operations, just prior to entering the traffic pattern.

The 5P’s are based on the idea that the pilots have essentially five variables that impact his or her environment and that can cause the pilot to make a single critical decision, or several less critical decisions, that when added together can create a critical outcome. These variables are the Plan, the Plane, the Pilot, the Passengers, and the Programming. The authors of the FITS concept felt that current decision-making models tended to be reactionary in nature. A change has to occur and be detected to drive a risk management decision by the pilot. For instance, many pilots ascribe to the use of risk management sheets that are filled out by the pilot prior to takeoff. These catalog risks that may be encountered that day and turn them into numerical values. If the total exceeds a certain level, the flight is altered or cancelled. Informal research shows that while these are useful documents for teaching risk factors, they are almost never used outside of formal training programs. The number of pilots who use them before each and every flight approaches zero. The 5P concept is an attempt to take the information contained in those sheets and in the other available models and operationalize it.

The 5P concept relies on the pilot to adopt a “scheduled” review of the critical variables at points in the flight where decisions are most likely to be effective. For instance, the easiest point to cancel a flight due to bad weather is before the pilot and passengers walk out the door and load the aircraft. So the first decision point is Pre-Flight in the flight planning room, where all the information is readily available to make a sound decision, and where communication and FBO services are readily available to make alternate travel plans.

The second easiest point in the flight to make a critical safety decision is just prior to takeoff. Few pilots have ever had to make an “emergency take-off”. While the point of the 5P check is to help you fly, the correct application of the 5P before takeoff is to assist in making a reasoned go-no-go decision based on all the information available. That decision will usually be to “go”, with certain restrictions and changes, but may also be a “no-go”. The key point is that these two points in the process of flying are critical go-no go points on each and every flight.

The third place to review the 5Ps is at the mid point of the flight. Often, pilots may wait until the ATIS is in range to check weather, yet at this point in the flight many good options have already passed behind the aircraft and pilot. Additionally, fatigue and low altitude hypoxia serve to rob the pilot of much of their energy by the end of a long and tiring flight day. This leads to a transition from a decision-making mode to an acceptance mode on the part of the pilot. If the flight is longer than 2 hours, the 5P check should be conducted hourly.

The last two decision points are just prior to decent into the terminal area and just prior to the final approach fix, or if VFR just prior to entering the traffic pattern, as preparations for landing commence. Most pilots execute approaches with the expectation that they will land out of the approach every time. A healthier approach requires the pilot to assume that changing conditions (the 5Ps again) will cause the pilot to divert or execute the missed approach on every approach. This keeps the pilot alert to all manner of conditions that may increase risk and threaten the safe conduct of the flight. Diverting from cruise altitude saves fuel, allows unhurried use of the autopilot, and is less reactive in nature. Diverting from the final approach fix, while more difficult, still allows the pilot to plan and coordinate better, rather than executing a futile missed approach. Now lets look in detail at each of the “Five P’s”.

The Plan

The “Plan” can also be called the mission or the task. It contains the basic elements of cross country planning, weather, route, fuel, publications currency, etc. Unlike risk management sheets that pilot fill out before a flight, the “Plan” should be reviewed and updated several times during the course of the flight. A delayed takeoff due to maintenance, fast moving weather, and a short notice Temporary Flight Restriction (TFR) may all radically alter the plan. Several excellent flight planning software packages are available that automate this process, allowing the pilot additional time to evaluate and make decisions. Some include real time and graphical TFR depictions. The “plan” is not just about the flight plan, but the entire days events surrounding the flight and allowing the pilot to accomplish the mission. The plan is always being updated and modified and is especially responsive to changes in the other four remaining P’s. If for no other reason, the 5P check reminds the pilot that the day’s flight plan is real life and subject to change at any time.

Obviously the weather is a huge part of any “plan.” The addition of real time data link weather information give the TAA pilot a real advantage in inclement weather, but only if the pilot is trained to retrieve, and evaluate the weather in real time without sacrificing situational awareness. And of course, weather information should drive a decision, even if that decision is to continue on the current “plan.” Pilots of aircraft without datalink weather should get updated weather in-flight through a Flight Service Station and/or Flight Watch.

The Plane

Both the “plan” and the “plane” are fairly familiar to most pilots. The “plane” consists of the usual array of mechanical and cosmetic issues that every aircraft pilot, owner, or operator can identify. For example, Is everything working properly? Is the fuel situation where you expected it to be at that point? Are you using anti-ice equipment? However, with the advent of the Technically Advanced Aircraft (TAA), the “plane” has expanded to include database currency, automation status, and emergency backup systems that were unknown a few years ago. Much has been written about single pilot IFR flight both with, and without, an autopilot. While this is a personal decision, it is just that, a decision. Low IFR in a non-autopilot equipped aircraft may depend on several of the other “P’s” we will discuss. Pilot proficiency, currency, and fatigue are among them. The TAA offers many new capabilities and simplifies the basic flying tasks, but only if the pilot is properly trained and all the equipment is working as advertised.

The Pilot

This is an area all pilots are learning more and more about each day. Flying, especially when used for business transportation, can expose the pilot to high altitude flying, long distance and endurance, and more challenging weather. Technically Advance Aircraft (TAA), simply due to their advanced capabilities can expose a pilot to even more of these stresses. The traditional “IMSAFE” checklist is a good start. However, each of these factors must be taken in consideration of the cumulative effect of all of them together and the insidious effects of low altitude hypoxia. The authors informal survey of TAA pilots show that almost half fly with pulse oxymeters to display the effects of low altitude hypoxia in a graphic manner.

The combination of late night, pilot fatigue, and the effects of sustained flight above 5,000 feet may cause pilots to become less discerning, less critical of information, less decisive and more compliant and accepting. Just as the most critical portion of the flight approaches (for instance a night instrument approach, in the weather, after a four hour flight) the pilot’s guard is down the most. The “5P” process emphasizes that pilot recognize the physiological situation they are placing themselves in at the end of the flight, before they even takeoff, and continue to update their condition as the flight progresses. Once identified, the pilot is in an infinitely better place to make alternate plans that lessen the effect of these factors and provide a safer solution.

The Passengers

One of the key differences between CRM and SRM is the way passengers interact with the pilot. In the airline industry the passengers have entered into a contractual agreement with the pilots company with a clearly defined set of possible outcomes. In corporate aviation, the relationship between crew and passengers is much closer, yet is still governed by a set of operating guidelines and the more formal lines of corporate authority. However, the pilot of a highly capable single engine aircraft has entered into a

very personal relationship with the passengers, in fact, they sit within an arms reach all of the time.

It may be easy, especially in business travel, for the desire of the passengers to make airline connections or important business meetings to enter into the pilot's decision-making loop. If this is done in a healthy and open way, it is a very positive thing. However, this is not always the case. For instance, imagine a flight to Dulles Airport and the passengers, both close friends and business partners, need to get to Washington D.C. for an important meeting. The weather is VFR all the way to southern Virginia then turns to low IFR as the pilot approaches Dulles. A pilot employing the 5P approach might consider reserving a rental car at an airport in northern North Carolina or southern Virginia to coincide with a refueling stop. Thus, the passengers have a way to get to Washington, and the pilot has an out to avoid being pressured into continuing the flight if the conditions do not improve.

Passengers can also be pilots. The old joke says that when four Certified Flight Instructors (CFI) board a light general aviation, a NOTAM should be posted. There is some truth to this. If no one is designated as pilot in command and unplanned circumstances arise, the decision-making styles of four self confident CFI's may come into conflict. Another situation arises when an owner pilot flies with a former CFI in the right seat on a business trip. Unless a clear relationship is defined and briefed prior to the flight, the owner pilot may feel some pressure to perform for the Individual Learning Manager (possibly beyond his or her capability), and the Individual Learning Manager may feel inhibited from intervening in small decisions until it is clearly evident that the pilot is making poor decisions. This is actually a CRM situation and requires clear pre-flight understanding of roles, responsibilities, and communication. Non-Pilots can also cause the pilot to review the SRM process.

Pilots need to understand that non-pilots may not understand the level of risk involved in the flight. There is an element of risk in every flight. That's why SRM calls it risk management not risk elimination. While a pilot may feel comfortable with the risk present in a night IFR flight, the passengers may not and may manifest this during the flight. The human reaction to fear and uncertainty is as varied as the shapes of our ears. Some become quiet, some talk incessantly, and in extreme cases anger and fear are strongly manifested. This may be the last thing the pilot needs to deal with while shooting the ILS to 400 feet and a mile visibility at midnight.

.A pilot employing SRM should ensure that the passengers are involved in the decision-making and given tasks and duties to keep them busy and involved. If, upon a factual description of the risks present, the passengers decide to buy an airline ticket or rent a car, then a good decision has generally been made. This discussion also allows the pilot to move past what he or she "thinks" the passengers want to do and find out what they "actually" want to do. This removes a load of self-induced pressure from the pilot.

The Programming

The TAA adds an entirely new dimension to the way General Aviation aircraft are flown. The Glass Cockpit, GPS, and Autopilot are tremendous boons to reduce pilot workload and increase pilot situational awareness. And frankly, the programming and operation of these devises is fairly simple and straightforward. However, unlike the analog instruments they replace, they tend to capture the pilot's attention and hold it for long periods of time (like a desktop computer). To avoid this phenomenon, the pilot should plan in advance when and where the programming for approaches, route changes, and airport information gathering should be accomplished…as well as times it should not. Pilot familiarity with the equipment, the route, the local air traffic control environment, and their own capabilities vis-à-vis the automation should drive when, where, and how the automation is programmed and used.

The pilot should also consider what his or her capabilities are in response to last minute changes of the approach (and the reprogramming required) and ability to make large-scale changes (a re-route for instance) while hand flying the aircraft. Since formats are not standardized, simply moving from one manufacturer's equipment to another should give the pilot pause and require more conservative planning and decisions.

The SRM Decision Process

The SRM process is simple. At least five times, before and during the flight, the pilot should review and consider the "Plan, the Plane, the Pilot, the Passengers, and the Programming" and make the appropriate decision required by the current situation. It is often said that failure to make a decision is a decision. Under SRM and the 5P's, even the decision to make no changes to the current plan, is made through a careful consideration of all the risk factors present.

Example of Single Pilot Resource Management

The teaching of SRM is best accomplished in a seminar environment. Recently, the authors conducted a set of classroom seminars that presented real time flight scenarios to a room full of qualified pilots of varied experiences. The first scenario presented was a night MVFR/IFR flight from St Augustine Florida to Washington Dulles Airport. The original **"Plan"** called for a non-stop flight with a 45-minute fuel reserve. The **"Plane"** was a well-equipped TAA with a minor navigation light problem that delayed departure by an hour. The **"Passengers"** were one pilot and one non-pilot. The non-pilot seemed nervous about the trip and a little ill. Both passengers needed to get to Washington DC for an important meeting the next day. The **"Pilot"** had spent a full day at a flight refresher clinic, including a two-hour flight and a three-hour class, and felt reasonably refreshed at the 5 PM departure time. And finally, the GPS/MFD, the "**Programming**," combination looked like it would make the flight a snap. However, there were questions about the currency of the database that required the pilot's attention.

The discussion that followed revolved around the reliability of the weather data, the fatigue of the pilot landing at Dulles at 9 PM, alternate ways to get the passengers to their meeting, minimum requirements for aircraft night flight, and a more complete understanding of the benefits and challenges posed by GPS programming and database currency. The 5p's ensured that each pilot looked at the entire picture prior to making the critical decisions that would lay the groundwork for success or failure over four hours later in Washington.

Predictably, the destination weather deteriorated slowly as the flight proceeded northbound. The pilot's fatigue level, low altitude/long duration hypoxia, a succession of minor annoyances caused by the airplane and the passengers, began to become a factor. Again, the pilots applied the 5p's, and many decided to land short of Washington Dulles, check the weather, and secure a rental car as a backup for the Monday morning meeting (in fact many decided this prior to takeoff).

For the purposes of the discussion, this aircraft was equipped with a ballistic parachute system. For those that proceeded to Dulles, the scenario ended with a spatial disorientation incident at 1500 feet, 10 miles short of the airport caused by pilot fatigue, latent hypoxia, and failure to use the autopilot. For many, it was the first time they had considered all the options available, and the criticality of quick and accurate decisions. In the background, another instructor began calling out altitudes and speeds as the aircraft descended to the ground, providing an added dose of realism and pressure. Should the class initiate an unusual attitude recovery, and if it did not work should they attempt another? How much will the passengers help or hinder the pilots thought processes? When, and how, should the ballistic parachute system be deployed, and what are its limitations. This scenario sparked questions about the capabilities and limitations of the autopilot, cockpit automation, and the parachute system. More importantly, it caused the pilots in the room to examine how they should gather critical information, assess the risks inherent in the flight, and take timely action. All agreed that a few accurate decisions before and during the early part of the flight reduced the risk to pilot and passengers.

All these questions were discussed in a lively thirty-minute session following the scenario. In this type of Scenario Based Training, the group discussion is just as important as the actual situation, for it is during the discussion that the pilots are most ready to learn, and begin to develop a mental model of how they might react to situations. Instead of encountering a once in a lifetime, life or death, situation alone on the proverbial dark and stormy night, the participants could examine how the situation had developed, understand the options available to them, and begin to develop a general plan of action well ahead of time.

Learner Centered Grading

The third component of the FITS training method, following each flight scenario, is to use the concept of “learner-centered grading.” Learner centered grading includes two parts: learner self assessment and a detailed debrief by the instructor. The purpose of the self assessment is to stimulate growth in the learner’s thought processes and, in turn, behaviors. The self-assessment is followed by an in-depth discussion between the instructor and the pilot in training which compares the instructor ratings to the pilot in training’s self-assessment.

To improve learning, it is recommended that learners prepare to learn from their experiences both before and after key events. This preparation should increase learning and enhance future performance. Pre-briefs are essential for setting goals. During key events, especially those that require high levels of attention, there may be little time for learning; most individuals allocate the bulk of their cognitive resources to performing the actual task; however, they may also dedicate some cognitive resources to self-monitoring, learning, and correction.

How facilitation and feedback occur is important to the learning process. In order for feedback to be useful for both informational and motivational purposes, it should be designed systematically. For example, the facilitator (Flight Instructor) should avoid lecturing the learner, and should withhold their observations and opinions of the exercise until the learner has given their opinion. The use of closed-ended questions may stymie the usefulness of the feedback process as well, as they encourage one-word/yes/no types of answers that do not elicit opinions of performance or suggestions for improvement. It is more effective to use open-ended questions that probe the learner to assess their own performance. Allotting enough time for the feedback is also important. Debriefs that are rushed often turn into one-way “lectures” due to time constraints.

Referring to prior pre-briefs when conducting subsequent debriefs provides a sense of continuity, reliability, and consistency, all of which are desirable attributes of a feedback source. Reminding learners of goals and lessons learned from prior exercises helps them plan for future events. Learners may also be more receptive to feedback during a debrief if they were appraised of the goal criteria in a pre-brief.

The FITS approach utilizes scenarios to teach Single Pilot Resource Management (SRM) while simultaneously teaching individual tasks such as landings and takeoffs. The authors quickly realized that this required a new approach to the pilot in training's performance measurement. Traditional grading approaches are generally teacher centered and measure performance against an empirical standard. The following example of a traditional flight syllabus demonstrates.

Table 4: A Traditional Grading Scale

Excellent - the pilot in training has performed in an excellent manner Good – the pilot in training has exceeded basic requirements Satisfactory – the pilot in training has met basic standards Marginal – the pilot in training has failed to perform the task standards Unsatisfactory – the pilot in training has demonstrated significant performance difficulties

Lesson Tasks	Lesson Sub Tasks	Lesson Grading
Flight Planning	Flight Planning Weight and Balance and Aircraft Performance Calculations	U, M, S, G, E U, M, S, G, E
Normal Preflight and Cockpit Procedures	Normal Pre-Takeoff Checklist Procedures GPS/Avionics Programming MFD /PFD Setup	U, M, S, G, E U, M, S, G, E U, M, S, G, E

Table 5: A Traditional Lesson

This type of grading scale (See Table 4), or something similar, is in wide use throughout the aviation training industry. While it appears to be based on published standards, in reality it is often used as a tool to determine pilot in training progress and provide motivation. Thus, on the first lesson a pilot in training may receive an “Excellent” grade for attempting to plan the flight and accomplishing the weight and balance with a few minor errors. However, by the third flight, that same performance may only earn a “Satisfactory” grade due to lack of pilot in training progress (***note that while performance remained the same, the grade changed***). Additionally, the Flight Instructor awards the grade based on his or her observation of the pilot in training's performance. This observation, while accurate, may not be based on an understanding of the pilot in training’s level of knowledge and understanding of the task. Lastly, the pilot in training has been conditioned since grade school to look at grades as a reward for performance and may feel that there is a link between grades earned and their self-esteem. In reality, none of this aids pilot in training performance in any meaningful way.

The learner centered grading approach addresses these the above concerns. First, the grade is now a “Desired Scenario Outcome.” These outcomes describe pilot in training-learning behavior in readily identifiable and measurable terms. They reflect the pilot in training’s ability to see, understand, and apply the skills and tasks that are learned to the scenario.

For instance, a pilot in training who can “explain” a successful landing has achieved the basic level of competence to begin the learning process. Once the pilot in training can “explain” the effect of crosswind and speed reduction on rudder effectiveness, they have achieved a level of learning that will allow for meaningful “Practice.” The “Perform” level denotes unsupervised practice and self-correction of errors. These grades are equally applicable to the first scenario to the last since they are not lesson dependent.

The grade of “Manage/ Decide” is used solely for SRM grading and the grade of “Perform” is used solely for task grading. A pilot in training who is becoming proficient at aeronautical decision-making and risk management would be graded first at the “Explain” level, then at the “Practice”, and finally at the “Manage/Decide” level. A Manage/Decide or Perform grade does not describe perfection. Rather, these grades simply show a proficient pilot who corrects their own errors so that the outcome of the flight is never in doubt. Realistically, this is the performance level we desire. All pilots make mistakes, it is in learning to identify and correct mistakes that they become proficient pilots.

Desired Outcomes

The objective of scenario-based training is a change in the thought processes, habits, and behaviors of the pilot in training during the planning and execution of the scenario. Since the training is learner centered, the success of the training is measured in the following desired pilot in training outcomes.

(a) Maneuver Grades (Tasks)

- Describe – at the completion of the scenario, the PT will be able to describe the physical characteristics and cognitive elements of the scenario activities. *Instructor assistance is required to successfully execute the maneuver.*
- Explain –at the completion of the scenario the PT will be able to describe the scenario activity and understand the underlying concepts, principles, and procedures that comprise the activity. *Significant instructor effort will be required to successfully execute the maneuver.*
- Practice – at the completion of the scenario the pilot in training will be able to plan and execute the scenario. *Coaching, instruction, and/or assistance from the CFI will correct deviations and errors identified by the CFI.*
- Perform – at the completion of the scenario, the PT will be able to perform the activity without assistance from the CFI. *Errors and deviations will be identified and corrected by the PT in an expeditious manner.* At no time will the successful completion of the activity be in doubt. ("Perform" will be used to signify that the PT is satisfactorily demonstrating proficiency in traditional piloting and systems operation skills)
- Not Observed – Any event not accomplished or required

(b) Single Pilot Resource Management (SRM) Grades

- Explain – the pilot in training can verbally identify, describe, and understand the risks inherent in the flight scenario. *The pilot in training will need to be prompted to identify risks and make decisions.*
- Practice –the pilot in training is able to identify, understand, and apply SRM principles to the actual flight situation. *Coaching, instruction, and/or assistance from the CFI will quickly correct minor deviations and errors identified by the CFI.* The pilot in training will be an active decision maker.
- Manage/Decide - the pilot in training can correctly gather the most important data available both within and outside the cockpit, identify possible courses of action, evaluate the risk inherent in each course of action, and make the appropriate decision. *Instructor intervention is not required for the safe completion of the flight.*
- Not Observed – Any event not accomplished or required

Grading will be conducted independently by the pilot in training and the instructor, and then compared during the post flight critique.

Learner centered grading (outcomes assessment) is a vital part of the FITS concept. Previous syllabi and curriculum have depended on a grading scale designed to maximize pilot in training management and ease of instructor use. Thus the traditional: "excellent, good, fair, poor" or "exceeds standards, meets standards, needs more training" often meet the instructor's needs but not the needs of the pilot in training. The learner centered grading described above is a way for the instructor and pilot in training to determine the pilot in training's level of knowledge and understanding. "Perform" is used to describe proficiency in a skill item such as an approach or landing. "Manage-Decide" is used to describe proficiency in the SRM area such as ADM. Describe, explain, and practice are used to describe pilot in training learning levels below proficiency in both.

Grading should be progressive. During each flight, the pilot in training should achieve a new level of learning (e.g. flight one, the automation management area, might be a "describe" item by flight three a "practice" item, and by flight five a "manage-decide" item.

An Example of Learner Centered Grading

Immediately after landing, and before beginning the critique, Flight Instructor Linda asks her pilot in training Brian to grade his performance for the day. Being asked to grade himself is a new experience but he goes along with it. The flight scenario had been a two-leg IFR scenario to a busy class B airport about 60 miles to the east. Brian had felt he had done well in keeping up with programming the GPS and the MFD until he reached the approach phase. He had attempted to program the ILS for runway 7L and had actually flown part of the approach until ATC asked him to execute a missed approach.

When he went to place a grade in that block he noticed that the grades were different. Instead of satisfactory or unsatisfactory he found, "Describe, Explain, Practice, and Perform". He decided he was at the Perform level since he had not made any mistakes.

When Linda returned Brian discovered that she had graded his flight as well, with a similar grade sheet. Most of their grades appeared to match until the item labeled "programming the approach". Here, where he had placed a "Perform" Linda had placed a "Explain". This immediately sparked a discussion. As it turned out, Brian had selected the correct approach, but he had not activated it. Before Linda could intervene, traffic dictated a go around. Her explain grade told Brian that he did not really understand how the GPS worked and he agreed. Now, learning could occur.

In Table 6, the desired outcome table denotes a pilot in training near the beginning of training and the grades reflect proficiency of the pilot in training to an expected level of performance in each of these areas. These grades are not self-esteem related since they do not describe a recognized level of prestige (such as A+ or "Outstanding"), rather a level of performance. You can't flunk a lesson. However, you can fail to demonstrate the required flight and SRM skills. By reflecting on the lesson and grading their own performance, the pilot in training becomes actively involved in the critique process. Pilot in training participation in the process also reduces the self-esteem issue. But most importantly, this establishes the habit of healthy reflection and self-criticism that marks most competent pilots.

Table 6: Learner Centered Scenario Grading-Desired Outcome Table

Scenario Activities	Scenario Sub Activities	Desired Scenario Outcome
Flight Planning	1. Scenario Planning 2. Weight and Balance and Aircraft Performance Calculations 3. Preflight SRM Briefing 4. Decision making and risk management	1. Perform 2. Perform 3. Perform 4. Explain/Practice
Normal Preflight and Cockpit procedures	1. Normal Pre-Takeoff Checklist Procedures 2. GPS Programming 3. MFD Setup 4. PFD Setup	1. Perform 2. Explain/Practice 3. Practice 4. Explain/Practice
Engine Start and Taxi Procedures	1. Engine Start 2. Taxi 3. SRM/Situational Awareness	1. Perform 2. Perform 3. Explain/Practice
Before Takeoff Checks	1. Normal and Abnormal Indications 2. Aircraft Automation Management 3. Aeronautical Decision Making and Risk management	1. Perform 2. Explain/Practice 3. Manage/Decide

FITS Commercial Pilot Syllabus Introduction

To the Pilots-in-Training (PT) and Instructor that will use this syllabus.

This Commercial Pilot Syllabus is unique in several ways that you should be familiar with as you use the syllabus to acquire the FAA Commercial Pilot Certificate. First, it is a syllabus that uses real-world scenarios as the foundation of the training. This syllabus is an FAA/Industry Training Standards (FITS) accepted training method. Flight maneuvers are still a vital part of flight training and flight maneuvers are a part of this syllabus, but the use of real-world scenarios is also used to enhance the pilots' decision making skills. The syllabus presents situations and circumstances that Commercial Pilots face everyday as learning experiences and lessons. The primary tenet of FITS training is that you prepare for the real world of Commercial Pilot flying, by acting as a Commercial Pilot while in training. This is called the "Train Like You Fly" approach. The desire is that if you train like you fly, then later you will fly like you have been trained. The airline industry calls this method Line Oriented Flight Training (LOFT). Therefore, throughout the syllabus, the pilot in training (PT) will take on different tasks or jobs just as if they were already Commercial Pilots. The second important unique feature of this syllabus and of FITS training is that it is all competency based. There are no minimum or maximum flight times. When the PT masters a particular skill area in the syllabus, they move on regardless of how much time it takes to reach that point of mastery. This means that each lesson does not necessarily equal one flight. It may take several flights before the PT masters the elements of the lesson and is ready to move on to the next lesson. 14 CFR Part 61 flight schools are still bound by the requirements and minimum flight times of §61.129 (a). Under certain circumstances a Part 141 pilot school may utilize the provisions of §141.55 (d) or (e) to meet requirements without minimum flight times.

The use of Decision Making scenarios in flight training.

For years, good flight instructors have incorporated some form of scenario-based learning into their flight training. Usually during a flight the CFI would tell the PT that something has occurred, such as deteriorating weather, an aircraft malfunction, or air traffic delay. The PT was to assume that the occurrence was actually real and to act accordingly. The PT might decide to divert to a different airport after the CFI tells them that the weather at their destination is poor. The PT then changes from the original plan and flies to a different airport. The difference between that and FITS is that FITS also incorporates the consequences of the failure to arrive at the originally planned airport. If a PT decides to fly to an alternate airport instead of the original destination because the CFI "makes up" a story that the weather is bad, then that outcome does not

consider the consequences of that decision. What if, rather than a training flight, the flight to the original destination was to deliver a human organ for transplant? The decision to divert to an alternate airport could have the consequence of killing the patient that was awaiting the transplant. If the pilot understood that their decision has actual life or death consequences, then the decision to divert would be more difficult. In the real world, these are the type of decisions that are faced by Commercial Pilots everyday – so in this syllabus we attempt to train pilots to be ready to make those decisions. For this reason, most of the lessons in this syllabus are actual "missions" that carry with them an actual purpose for the flight and actual consequences for the decisions the pilot will make. The lessons are not "scripted" to the point that every outcome is known in advance. The PT and flight instructor must be flexible enough to accept this fact. Different PTs will make different decisions, and these different decisions will alter the outcome of each flight. Using real world scenarios as part of flight training does not in any way diminish the need for pilots to also have good "stick and rudder" skills. Pilots will always need the skills, for instance, to land in a crosswind (although enhanced decision skills will prevent them from attempting a dangerous crosswind landing in the first place!). The lessons in this syllabus therefore are all part "mission" training and part "maneuvers" training on a sliding scale. None of the lessons in this syllabus are 100% mission and none are 100% maneuvers. The amount that any lesson is mission-based or maneuver-based is determined by the completion standards of that lesson.

<u>The Pilot-in-Training plays a role in grading the lesson.</u>

Learner Centered Grading means that after each flight, the PT and instructor will have a discussion of the items that were experienced on the flight and each will evaluate the items. The PT will judge her/his own performance. The instructor, likewise, will judge the PT's performance and then the PT and instructor will compare evaluations. There will be items that both the PT and instructor will agree were performed well and other items that both agree could use improvement. Inevitably, the PT and instructors' evaluations will disagree. This will be a great opportunity to discuss alternate methods, solutions, and techniques that could have been used by the student to have produced a more favorable outcome to the lesson. Mission based flight lessons can have multiple outcomes that are "correct." The PT and instructor will discuss if the outcome of the flight was a safe outcome – which is the primary concern of any flight.

Beyond the basic safety of the flight, the PT and instructor will discuss if the outcome of the flight could have been optimized. What would it have taken for the outcome to have been the best? The syllabus calls this the "target" outcome. The instructor will use a "rubric" to grade the lessons based on what is an unacceptable outcome, versus a range of possible acceptable outcomes. Each lesson throughout the syllabus has its own rubric-style grading sheet. A rubric is a form of evaluation often used when there are multiple outcomes to a particular task. Grading of students should not simply be an instructor's individual opinion. The rubric helps the instructor evaluate the PT's performance.

The format of each lesson

Each lesson in this syllabus will have the same format. The student and instructor should read through the format information before the flight and as preparation for the flight. Each lesson will have:

1. Scenario
2. Lesson Objectives
3. Pre-Flight Briefing
4. Completion standards
5. Desired Outcome Grading Sheet using Leaner Centered Grade method
6. Post-Flight Briefing, preview of next lesson and assignments
7. Notes to the FITS Instructor

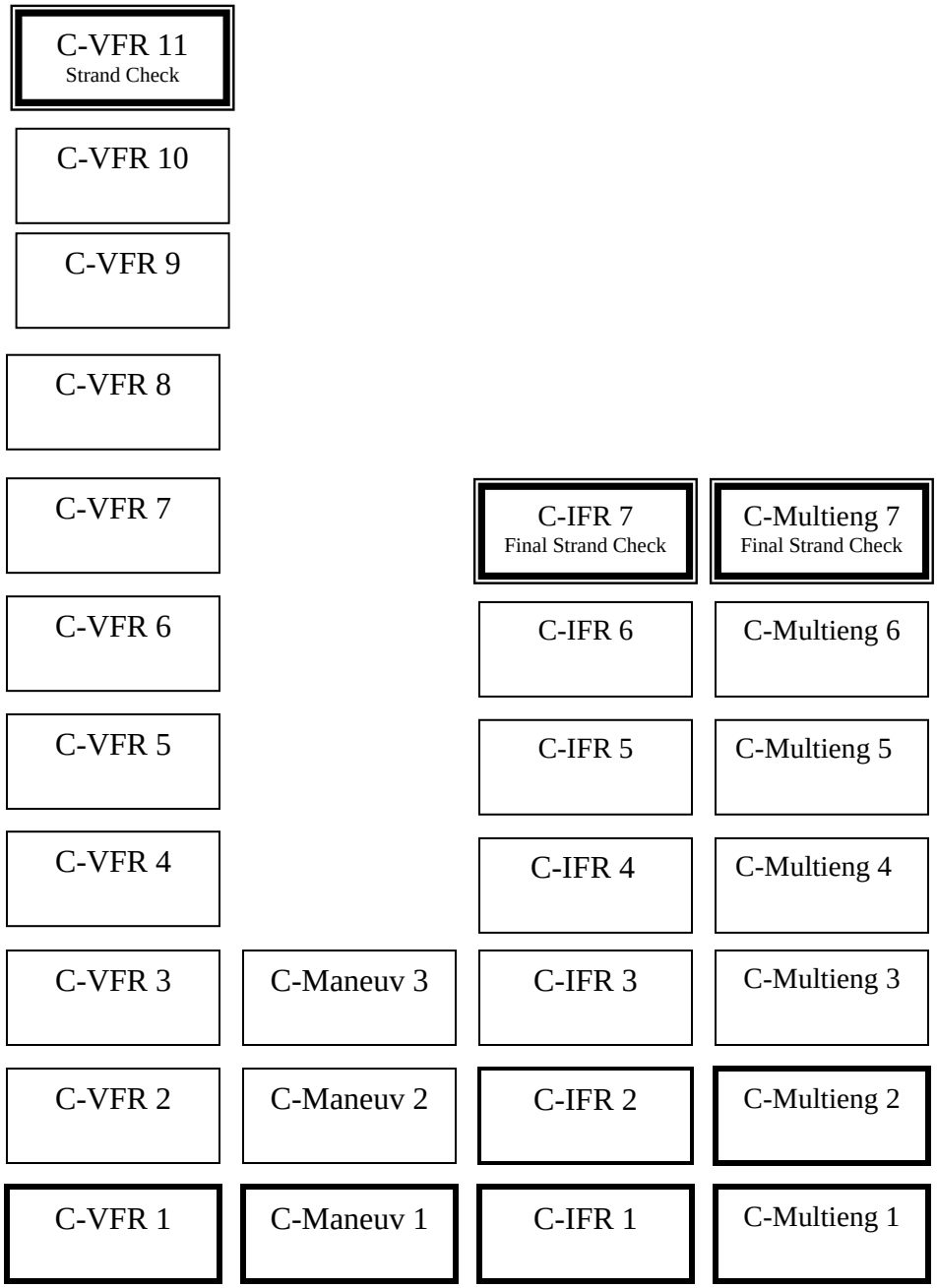
Scenario/Lesson Notes to the Instructor

Flight instructors who use a FITS scenario-based syllabus must be creative, innovative, and have excellent planning. To assist the instructor in delivering the best possible instruction to the student and to get the maximum benefit of the syllabus, a set of Scenario/Lesson Notes to the Instructor is included. These notes are intended for use by the instructor only. Many scenarios require the instructor to withhold certain facts from the PT – allowing the PT to discover critical elements of the scenario on their own. This practice allows the PT to become comfortable making their own decisions over time.

Syllabus Shuffle

This FITS accepted Commercial Pilot Syllabus has one more unique feature. It contains four “learning strands.” The strands are: Commercial VFR operations (C-VFR), Commercial Maneuvers (C-Maneuvers), Commercial IFR operations (C-IFR), and Commercial Multiengine Airplane operations (C-Multiengine). A pilot in training does not have to complete one strand before beginning on another. The syllabus is designed to be “shuffled” and to allow maximum flexibility. There are some prerequisite lessons that must follow in a particular order, but most lessons can come in any order. If an instructor and PT had previously completed C-VFR 1, C-VFR 2, and were scheduled to fly C-VFR 3 today, but the weather at a distant location prevents that lesson, the instructor could switch and conduct lesson C-Maneuvers 1 in the local area instead. The last lesson in the VFR, IFR, and Complex strands are “Strand Checks.” A Strand Check is a flight taken with a Chief Flight Instructor, Assistant Chief Instructor, a Check Instructor, or, in Part 61 applications, a senior instructor, as appropriate to evaluate the PT’s performance in that strand. The Maneuvers strand does not have a separate Strand Check, but the Commercial Maneuvers will be evaluated as part of the Multiengine Airplane’s Strand Check. Although lessons may be shuffled along the way, the final lesson in the syllabus is the End-of-Course Strand Check at the end of the Multiengine strand.

Commercial Pilot Syllabus



Bold Boxes are Skill Acquisition Lessons and must come first
Thin Boxes are Decision Practice Lessons and may be shuffled into any order
Double Boxes are Strand Checks and can come in any order except C-Multieng 4, which is the final lesson in the syllabus.

Commercial – VFR (C-VFR) Single Engine or Multiengine Airplane

C-VFR 1 Aerial Photography Mission
Dual VFR Flight Lesson

C-VFR 2
Sky Diver Mission
Dual VFR Flight Lesson

C-VFR 3
Power Line Patrol Mission
Dual VFR Cross Country Flight Lesson

C-VFR 4
Forest Fire Mission
Dual VFR Cross Country Flight Lesson

C-VFR 5
Airplane Ferry Flight Mission
Dual VFR Cross Country Flight Lesson

C-VFR 6
Candidate for Election Mission
Dual VFR Cross Country Flight Lesson

C-VFR 7
Airplane Ferry Flight Mission
Solo VFR Cross Country Flight Lesson

C-VFR 8
Life Flight Mission
Dual VFR Cross Country Flight Lesson at Night

C-VFR 9
Life Flight Mission
Solo VFR Cross Country Flight Lesson at Night

C-VFR 10
Executive Travel Mission
Solo VFR Long Distance Cross Country Flight Lesson

C-VFR 11
Stage Check on VFR Operations

Commercial Maneuvers Stage (C-Maneuvers) Single or Multiengine Airplane
C-Maneuvers 1
Aircraft Performance Flight
Performance Maneuvers

C-Maneuvers 2
Aircraft Performance Flight
Commercial Maneuvers

C-Maneuvers 3
Aircraft Performance Survey Flight
Commercial Maneuvers

Commercial – IFR (C-IFR) Single or Multiengine Airplane
C-IFR 1
Emergency Mail Delivery Mission
Dual IFR Flight Lesson

C-IFR 2
On-Demand Air Charter Mission
Dual IFR Flight Lesson

C-IFR 3
On-Demand Charter Mission
Dual IFR Flight Lesson

C-IFR 4
On-Demand Charter Mission
Solo IFR Flight Lesson

C-IFR 5
High Density Airport Flight
Dual IFR Flight Lesson

C-IFR 6
On-Demand Life Flight Mission
Solo IFR Flight Lesson

C-IFR 7
IFR Operations Stage Check
Dual IFR Stage Check

Commercial – Multiengine Airplane (C-Multiengine)
C-Multiengine 1
Multiengine/Complex Systems Checkout Flight
Dual Flight Lesson

C-Multiengine 2
Multiengine Airplane Checkout Flight
Dual Flight Lesson

C-Multiengine 3
Multiengine Airplane Performance Flight
Dual Flight Lesson

C-Multiengine 4
On Demand Charter Flight
Dual Flight Lesson

C-Multiengine 5
Multiengine Airplane Performance Flight
Dual Flight Lesson

C-Multiengine 6
Multiengine Airplane Performance Flight
Dual Flight Lesson

C-Multiengine 7
Corporate Pilot Job Interview
Final Course Check Flight

FITS Commercial Pilot Curriculum Outline

I. Prerequisite – Private Pilot Certificate with Instrument Rating

II. Commercial Scenarios VFR Strand (C-VFR)

III. Commercial Maneuvers Strand (C-Maneuvers)

IV. Commercial Scenarios IFR Strand (C-IFR)

V. Multiengine Airplane Strand (C-Multiengine)

Commercial VFR Operations - Lesson 1
(C-VFR 1)
Aerial Photography Mission
Dual Flight Lesson

Scenario: You are a Commercial Pilot. The FBO where you work receives a request from a nearby construction company. The construction company is building at a site near your airport and needs some aerial photos taken of the progress at the construction site. The construction company wants to hire you to fly a photographer over the construction site to take photos.

The owner of your company, who is also your boss, is a good friend of the construction company owner. The construction company needs the photos as soon as possible. Your boss wants to make sure that his friend is satisfied with his aerial photography service. Failure to get this job done safely, quickly and with excellent customer service will reflect badly on your status in the company – in fact, the owner has fired pilots before for not getting these types of jobs done efficiently. The consequence of your decision-making will be your job security.

As a Commercial Pilot, is this Aerial Photography mission legal? Most new Commercial Pilots mistakenly believe that once they pass the Commercial Pilot checkride, they can conduct any Commercial Operation – but nothing is farther from the truth. To haul passengers and cargo, for instance, a Commercial Pilot must also meet the regulations of Part 135 in certain situations. 14 CFR Part 119 is a regulation that outlines the additional requirements that Commercial Pilots must meet in order to conduct certain types of Commercial Operations. Aerial Photography, however, is listed as one of the operations that does not apply to Part 119. That means that no additional requirements, beyond the Commercial Pilot Certificate, are required to conduct an Aerial Photography mission:

14 CFR §119.1(e) "…this part does not apply to—
(4) Aerial work operations, including—
(iii) Aerial photography or survey;"

Read Part §119.1 before this lesson to see what other operations are allowed.

Lesson Objectives

This scenario is planned as a daytime Aerial Photography mission. Federal Aviation Regulation §119.1, Applicability of Air Carriers and Commercial Operators, allows Commercial Pilots to conduct aerial photography and survey missions. The PT will review local area VFR flight operations, including weather analysis and performance calculations. In addition, the PT will gain an understanding of the pressures that can be present on an aerial photography mission: the photographer may ask the pilot to fly too low or to unusually yaw the

airplane for best camera angles. The PT will understand that they are in charge of the flight's ultimate safety despite what requests might come from passengers.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The PT will be advised that often it will take more than one flight to meet the completion standards for one lesson. This should not imply that the student has not performed well – it may simply be that not all the tasks of the lesson could be accomplished in one flight. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion standards

The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Lesson C-VFR 1- Aerial Photography Mission - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Describe								
	Navigation Planning	Describe								
	SRM	Explain								
Preflight Procedures	Aircraft Systems, Instruments, Navigation	Describe								
	Flight deck checks and engine run-ups	Describe								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequencing	Describe								
	Controlled / Uncontrolled airport procedures	Describe								
	SRM	Explain								
Postflight Procedures	Departing the runway safety procedures	Describe								
	Instrument, Equipment checks & Eng Shutdown	Describe								
	SRM	Explain								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Describe								
	Normal and/or Crosswind Takeoff	Describe								
	SRM	Explain								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearance	Describe								
	Departure from the Traffic Pattern/Airport Area	Describe								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Enroute Operations Aerial Photography	Safe aircraft control operation	Describe								
	Safe altitude consideration	Describe								
	SRM	Explain								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD nav to ground landmarks	Describe								
	Flight control with ref to target-wind drift, altitude	Describe								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Describe								
	ATC Clearances and/or Traffic Pattern entry	Describe								
	SRM	Explain								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Approach & Landing Procedures	Transition to Airport environment	Describe								
	Traffic Pattern legs	Describe								
	Collision Avoidance	Describe								
	Normal Landing	Describe								
	Crosswind Landing	Describe								
	SRM	Explain								

Post Flight Briefing, Preview of next lesson and assignments: After the flight has been concluded, properly store/tiedown the airplane, and complete all administrative duties (turn in the aircraft tach and Hobbs times, complete payment invoice, etc). Close the flight plan if one had been opened during the flight. The PT and Instructor should then take separate copies of the lesson's Desired Outcome Grade Sheet to separate and private locations. The PT and Instructor each grade the lesson using the Learner Centered Grading method. After both have completed the grading, the PT and Instructor get back together and compare grade sheets. There will certainly be tasks where the PT and Instructor agree on the grade. There will certainly be tasks where the PT and Instructor disagree on a grade – discussion points some from those areas of disagreement. The PT and Instructor should explain to each other why they indicated the grade that they awarded and from this a greater gain in learning (for both PT and Instructor) will result.

Notes to the Instructor
C-VFR 1
The flight instructor will pose as a building contractor that needs aerial photographs taken at a job site. The instructor will select a landmark beyond 15, but closer than 25 miles from the base airport. This landmark will serve as the job site where photos can be taken for the scenario. The instructor should actually take a camera and become the photographer/customer of this flight. The instructor should test the PTs Aeronautical Decision Making and Risk Management skills by tempting the PT to fly lower for a better photo and yaw the airplane to get better camera angles. At some point the PT should reject the customers request to fly too low and to make dangerous control movements.

Commercial VFR Operations – Lesson 2
(C-VFR 2)
Skydiver Mission
Dual Flight Lesson

Scenario: You are a Commercial Pilot. The FBO where you work has an agreement with a local skydiving club. When the weather permits, the skydiving club contracts with your employer to provide airplane rental and commercial pilot services for the purpose of intentional parachute jumps. Your boss has assigned you to be the pilot for today's jump. You will climb in VFR conditions to an altitude that is at least 6,000 above your airport elevation (if practical), circle a predetermined jump area, and then return to the airport.

Another FBO has been trying to get the Skydiver Club to leave your company and start flying with them. It will be very important that you carry out today's flight with the highest degree of safety and customer service. If the Skydiver Club were to switch to the other company you would lose pay and flight time – doing an excellent job may preserve your income and keep your boss happy.

As a Commercial Pilot, is it legal for you to carry skydivers aloft and allow them to jump out of your airplane? Refer to 14 CFR 119 for the answer. 14 CFR 119 is the section of the Federal Aviation Regulations that governs various pilot operations and dictates what pilot qualifications are required for the various operations. 14 CFR §119.1(e)(6) speaks to intentional parachute jumps:

> 14 CFR §119.1(e) "this part does not apply to—
> (6) Nonstop flights conducted within a 25-statute-mile radius of the airport of takeoff carrying persons or objects for the purpose of conducting intentional parachute operations."

This means that no additional pilot qualifications are required, other than the Commercial Pilot Certificate and valid Second Class Medical or higher to conduct this mission.

The PT should also review the requirements for supplemental oxygen in unpressurized airplanes, and review the air traffic control requirements for parachute jumps.

Lesson Objectives

This scenario is planned as a daytime Skydiver jump mission. Federal Aviation Regulation §119.1, Applicability of Air Carrier and Commercial Operators, allows Commercial Pilots to conduct flights where intentional parachute jumps take place. The PT will review local area VFR operations, including weather analysis. The PT will gain an understanding of airplane performance, specifically best climb performance, best glide performance, lift/drag ratios, high altitude

operations, emergency procedures, engine operation, weight & balance (including weight loss as the jumpers depart the airplane) and safe practices.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The PT will be advised that often it will take more than one flight to meet the completion standards for one lesson. This should not imply that the student has not performed well – it may simply be that not all the tasks of the lesson could be accomplished in one flight. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion Standards

The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Lesson C-VFR 2 – Skydiver Mission - Dual
Desired Outcome Grade Sheet

			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Describe								
	High Altitude Flight Planning	Describe								
	SRM	Explain								
Preflight Procedures	Systems, Instruments, Navigation, Eng Run-ups	Describe								
	Weight and Balance calculation & implications	Describe								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations/taxi clearance	Describe								
	Controlled / Uncontrolled Airport procedures	Describe								
	SRM	Explain								
Postflight Procedures	Departing the runway safety procedures	Describe								
	Instruments & Equipment check & Eng Shutdown	Describe								
	SRM	Explain								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Describe								
	Normal and/or Crosswind Takeoff	Describe								
	SRM	Explain								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Describe								
	Departure from the Traffic Pattern / Airport Area	Describe								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Describe								
	Automation Systems Proficiency	Describe								
	SRM	Explain								
Climb and Parachute Jump Operations	Safe Aircraft Control	Describe								
	Coordination with ATC for jumpers	Describe								
	SRM	Explain								
Enroute Operations Navigation & Automation	Navigation Systems Proficiency	Describe								
	Automation Systems Proficiency	Describe								
	SRM	Explain								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD landmark location	Describe								
	Compensation for wind drift	Describe								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Describe								
	ATC Clearances and/or Traffic Pattern entry	Describe								
	SRM	Explain								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Describe								
	Automation Systems Proficiency	Describe								
	SRM	Explain								
Approach & Landing Procedures	Transition to Airport environment	Explain								
	Traffic Pattern legs	Explain								
	Traffic Pattern spacing and Collision Avoidance	Explain								
	Normal Landing	Practice								
	Crosswind Landing	Practice								
	SRM	Practice								

Post Flight Briefing, Preview of next lesson and assignments: After the flight has been concluded, properly store/tiedown the airplane, and complete all administrative duties (turn in the aircraft tach and Hobbs times, complete payment invoice, etc). Close the flight plan if one had been opened during the flight. The PT and Instructor should then take separate copies of the lesson's Desired Outcome Grade Sheet to separate and private locations. The PT and Instructor each grade the lesson using the Learner Centered Grading method. After both have completed the grading, the PT and Instructor get back together and compare grade sheets. There will certainly be tasks where the PT and Instructor agree on the grade. There will certainly be tasks where the PT and Instructor disagree on a grade – discussion points some from those areas of disagreement. The PT and Instructor should explain to each other why they indicated the grade that they awarded and from this a greater gain in learning (for both PT and Instructor) will result.

Notes to Instructor
C-VFR 2
The flight instructor should select an area near the home airport where a climb to an altitude of 6,000 feet above the home airport elevation can be accomplished safely. Avoid areas of high air traffic congestion. This lesson must be conducted in the daytime with excellent visibility. Discuss with the student the 14 CFR §119.1(e)(6) regulation, and although in most cases this scenario will not take the airplane above 12,500 feet MSL, discuss supplemental oxygen regulations and practice. Discuss 14 CFR Part 105 pertaining to parachute operations. Discuss the unique weight & balance problem whereby jumpers leaving the airplane will abruptly change the airplane's weight and center of gravity. Do a weight & balance problem before and after the jump. Discuss the coordination that must exist between the pilot and air traffic controllers to allow skydivers to jump from the airplane. Discuss the effects of an extended climb on engine cooling, best rates of climb, and traffic avoidance in a climb. Remain at the target altitude long enough to circle the predetermined jump site (which could be the home airport or some other landmark). Discuss hypoxia, its symptoms, and dangers. Perform some level Steep Turn maneuvers over the jump site. In the descent discuss "shock" cooling of the engine and engine protection. Discuss the possibility of carburetor ice when the engine is operated a low power settings, and the prevention of carburetor ice. Demonstrate to the student a Steep Spiral and discuss the circumstances whereby the Steep Spiral maneuver could be used in an engine out emergency to descend from high altitude down to a suitable landing site. After your demonstration, allow the student to practice the maneuver. Discuss the pilots' options should there ever be a fire onboard the airplane in flight. If a fire should ever occur, a time consuming, best glide to the surface would be a luxury that the pilot does not have time for. Demonstrate the Emergency Descent maneuver, but take all safety precautions such as checking for traffic and establishing a "hard deck" altitude to make the recovery.

Commercial VFR Operations – Lesson 3
(C-VFR 3)
Power Line Patrol Mission
Dual Flight Lesson

Scenario: You are a Commercial Pilot and the company that you work for has a contract with an electrical power company to conduct aerial surveillance on their power lines. Powerful thunderstorms came through your area last night damaging power lines and causing wide spread power outages across your region. Your mission is to fly over the power lines in search of problems. Repair crews are standing by for you to direct them to the problem areas. The faster the problems can be identified the faster that power can be restored. A lengthy loss of power will cost millions of dollars in lost revenue, and spoiled food, but the biggest problem is the threat to safety. Traffic signals are not working, hospitals are now on back-up generators, and schools are closed. It is clear that the fastest way to resolve all these problems is to find the downed power lines by air.

Can a Commercial Pilot conduct this type of aerial surveillance work? 14 CFR §119.1(e)(4) lists "Aerial work operations, including—(vi) Power line or pipeline patrol" as one of the operations that can be conducted by a Commercial Pilot without any additional certifications.

Lesson Objectives
When thousands of people are waiting for the power to be restored, time will be critical. The objective of this lesson it to safely conduct aerial surveillance work while under this time pressure. This includes the safe operation of the airplane while looking outside at the power lines. The constant attention outside the airplane could provide a distraction to the safe operation of the airplane. Many accidents have happened in just such a situation. Pilots, while their attention is focused outside, have lost control of airspeed or entered into accelerated stalls while in a turn to observe objects on the ground. Pilots have been lured down to unsafe altitudes to get a better look and then been unable to escape from rising terrain or other obstructions. The primary objective of this lesson is to accomplish the mission (low altitude surveillance of objects on the ground) without compromising safe airplane operations.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The PT will be advised that often it will take more than one flight to meet the completion standards for one lesson. This should not imply that the student has not performed well – it may simply be that not all the tasks of the lesson could be accomplished in one flight. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and

schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion Standards

The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Lesson C-VFR 3 – Powerline Patrol Mission - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & VFR Navigation Plan	Explain								
	Airworthiess Issues – Inop Equip, Inspections	Explain								
	SRM	Explain								
Preflight Procedures	Systems, Instruments, Navigation, Eng Run-ups	Explain								
	Weight and Balance calculation & implications	Explain								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations/taxi clearance	Explain								
	Controlled / Uncontrolled Airport procedures	Explain								
	SRM	Explain								
Postflight Procedures	Departing the runway safety procedures	Explain								
	Instruments & Equipment check & Eng Shutdown	Explain								
	SRM	Explain								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Explain								
	Normal and/or Crosswind Takeoff	Explain								
	SRM	Explain								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Explain								
	Departure from the Traffic Pattern / Airport Area	Explain								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Explain								
	Automation Systems Proficiency	Explain								
	SRM	Explain								
Aerial Patrol Operations	Safe Aircraft Control & Weather Deviations	Explain								
	Coordination with power company officials	Explain								
	SRM	Explain								
Enroute Operations Navigation & Automation	Navigation & Automation Systems Proficiency	Explain								
	Partial loss of navigational capability	Explain								
	SRM	Explain								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD landmark location	Explain								
	Calculation of wind drift	Explain								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Explain								
	ATC Clearances and/or Traffic Pattern entry	Explain								
	SRM	Explain								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Explain								
	Automation Systems Proficiency	Explain								
	SRM	Explain								
Approach & Landing Procedures	Transition to Airport environment	Explain								
	Traffic Pattern legs	Explain								
	Traffic Pattern spacing and Collision Avoidance	Explain								
	Normal Landing	Practice								
	Crosswind Landing	Practice								
	SRM	Practice								

Post Flight Briefing, Preview of next lesson and assignments: After the flight has been concluded, properly store/tiedown the airplane, and complete all administrative duties (turn in the aircraft tach and Hobbs times, complete payment invoice, etc). Close the flight plan if one had been opened during the flight. The PT and Instructor should then take separate copies of the lesson's Desired Outcome Grade Sheet to separate and private locations. The PT and Instructor each grade the lesson using the Learner Centered Grading method. After both have completed the grading, the PT and Instructor get back together and compare grade sheets. There will certainly be tasks where the PT and Instructor agree on the grade. There will certainly be tasks where the PT and Instructor disagree on a grade – discussion points some from those areas of disagreement. The PT and Instructor should explain to each other why they indicated the grade that they awarded and from this a greater gain in learning (for both PT and Instructor) will result.

Note to Instructor
C-VFR 3
The flight instructor should select the aerial surveillance object. The scenario describes a power line mission and therefore it would be best to use an actual power line – but a pipeline, or even a highway or railroad could be used. The object should actually be long so that following the object will require approximately 20 to 25 miles of surveillance. The airplane should not violate the safe altitude and distance from obstructions regulations at any time during the lesson, but along the way the instructor should tempt the PT to go to low or to make “double back” turns that are too steep. The instructor might say: “wait I think I see something – quick, turn around!” One of the completion standards of the lesson will be to see if the PT over-rules unsafe operations, even when the instructor seems to be calling for it. After following the power line for approximately 25 miles, the instructor should simulate a stop for fuel. The PT would then navigate to a near-by airport. The instructor then will select a second power line (or other object that runs along the surface) that brings the flight back toward the home airport.

Use the “shuffle” feature of this syllabus to best advantage here. It may be that you and the PT had planned to conduct this C-VFR lesson, but IFR conditions are present on the day of the proposed lesson. Rather than canceling all flight training, if the weather permits, you could cancel the C-VFR lesson and instead conduct a C-IFR lesson.

Commercial VFR Operations – Lesson 4
(C-VFR 4)
Forest Fire Mission
Dual Flight Lesson

Scenario: You are a Commercial Pilot working independently with your state's Forestry Service to verify the location of a forest fire that is burning near your airport. You have been given a set of coordinates and landmarks that mark the boundaries of the fire, but the wind is blowing and the fire may be moving. Your mission is to navigate to the location of each of the coordinates and/or landmarks and in doing so, fly around the perimeter of the fire. You will take a passenger with you who will communicate with fire crews on the ground. If the fire is moving it will be essential that the speed and direction of the fire can be communicated to the ground so that people can be evacuated in the fire's path and so that fire crews are not cut off by the fire. The safety of many people and the protection of property will rely on your ability to find the coordinates and landmarks so that correct information can be relayed to the fire fighters.

Can a Commercial Pilot, who is not otherwise employed by an air charter company conduct fire spotting missions? Federal Aviation regulation §119.1(e)(4)(iv) allows Commercial Pilots to conduct aerial work to fight fires using an airplane as long as the airplane has 20 seats or less and weighs less than 6,000 pounds.

Lesson Objectives
The objective of this lesson is to effectively display how the airplane can be used to save lives and property - but it is also important to protect the lives of the pilot and passenger as well while on the mission. To successfully meet the objectives of this mission the PT must fly the airplane safely at all times and be able to accurately navigate using a combination of known coordinates and landmarks. The PT must map out the coordinates and landmarks on a chart to determine the perimeter of the fire. Then the PT must decide on a flight path that will connect the landmarks and execute that flight path around the fire. This all must be done quickly. The actual perimeter of the fire may be changing as the fire moves, so speed and accuracy will be both important factors. The PT will only have 30 minutes from the time the instructor assigns the navigation points until time to depart and a total of 45 minutes to be ready for takeoff. The mission will be complete and the lesson objectives met when the PT flies over all the coordinates and/or landmarks, alters the plan based on the changing situation, and operates the airplane safely while conducting the mission.

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Standard Post-Flight Procedures

Lesson C-VFR 4 - Forest Fire Mission - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & VFR Navigation Plan	Practice								
	Airworthiness Issues – Inop Equip, Inspections	Practice								
	SRM	Practice								
Preflight Procedures	Systems, Instruments, Navigation, Eng Run-ups	Explain								
	Weight and Balance calculation & implications	Explain								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations/taxi clearance	Explain								
	Controlled / Uncontrolled Airport procedures	Explain								
	SRM	Explain								
Postflight Procedures	Departing the runway safety procedures	Explain								
	Instruments & Equipment check & Eng Shutdown	Explain								
	SRM	Explain								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Explain								
	Normal and/or Crosswind Takeoff	Explain								
	SRM	Explain								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Explain								
	Departure from the Traffic Pattern / Airport Area	Explain								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Explain								
	Automation Systems Proficiency	Explain								
	SRM	Explain								
Fire Patrol Operations	Safe Aircraft Control	Explain								
	Coordination with ATC & Fire Fighters on ground	Explain								
	SRM	Explain								
Enroute Operations Navigation & Automation	Navigation & Automation Systems Proficiency	Explain								
	Partial loss of navigational capability	Explain								
	SRM	Explain								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD landmark location	Explain								
	Calculation of wind drift	Explain								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Explain								
	ATC Clearances and/or Traffic Pattern entry	Explain								
	SRM	Explain								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Explain								
	Automation Systems Proficiency	Explain								
	SRM	Explain								
Approach & Landing Procedures	Transition to Airport environment	Explain								
	Traffic Pattern legs	Explain								
	Traffic Pattern spacing and Collision Avoidance	Explain								
	Normal Landing	Practice								
	Crosswind Landing	Practice								
	SRM	Practice								

Notes to Instructor
C-VFR 4

The instructor should select between four and six points that will make up the perimeter of the fire. These points should be both latitude and longitude positions and landmarks. The PT will have to use a combination of navigation techniques to find the points that make up the perimeter. Some points should only be lat/long that will require the PT to find that location on the chart – have a landmark already selected at that location so it can be found from the air. Other points may be landmarks that appear on a chart. Other points must be found using radio navigation aids such as two crossing VOR radials or a GPS waypoint. Give the points to the students in a random order and allow the PT to determine the course to be flown. If four points are used, and the home airport is the start and finish point, the flight path would have five legs. The total distance of the perimeter should be approximately 50 miles. The instructor should review with the PT the “missing wind problem” and ways to calculate actual wind while in flight. On this lesson the instructor poses as a forestry service employee who will communicate with ground crews. In that role, the instructor should not help the PT locate the points, but act as an observer only. At the mid-point of the flight around the fire, determine the direction of the wind that is actually present on the day of this flight. With this information, have the PT make an estimate of the direction and speed that the fire would be traveling. In your role as a forestry service employee, ask the PT for this information. The PT will have to estimate the wind using wind drift in turns and during straight and level, and/or complete a calculation of the “missing wind.” Of course, time is critical on this mission. The fire is burning and may be moving. The PT must plan the flight with 30 minutes of receiving the navigation points and must be in the airplane with engine running within 45 minutes.

Commercial VFR Operations – Lesson 5
(C-VFR 5)
Airplane Ferry Flight
Dual Flight Lesson

Scenario: You are a Commercial Pilot and you work for an airplane sales and refurbishing company. The company has just completed the installation and upholstery of new seats in an airplane that is owned by a customer. Your job today is to deliver the airplane back to the customer. You will fly, in VFR daytime conditions, from your home airport to the customer's home airport to make the delivery. Also at the customer's home airport is another airplane that has had avionics work completed. You will pick up that airplane and fly it home.

Can a Commercial Pilot conduct this type of ferry flight? Federal Aviation regulation §119.1 (e)(3) allows Commercial Pilots who do not have any additional qualifications (such as required for air taxi or scheduled air carrier) to conduct these type of delivery or ferry flights. The airplane ferried must be less than 6,000 pounds and have 20 or less seats beyond the flight crew seats.

Lesson Objectives
The objective of this lesson is to deliver the customer's airplane to his home airport and to bring home a second airplane from the avionics shop. The PT must display good judgment and decision making to complete these flights in VFR daytime conditions. It is important to the owners of both airplanes that they be repositioned as soon as the weather will allow, so when a VFR day is selected to conduct the ferry flights, they must be delivered on time and on schedule. The PT must also insure that the airplane is legal to fly and has been properly returned to service after the work has been completed. The PT will determine if the airplane's logbooks have been properly prepared considering: upholstery sign-off, avionics sign-off, pitot-static check, ELT check and VOR check. The PT must safely navigate between the two airport and adhere to all airspace rules that are applicable to the airports involved. This mission will be complete and the objectives of this lesson met when both airplanes have been safely repositioned.

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Standard Post-Flight Briefing Procedures

Lesson C-VFR 5 – Airplane Ferry Flight - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Perform								
	VFR Cross Country Flight Planning	Perform								
	SRM	Practice								
Preflight Procedures	Systems, Instruments, Navigation, Eng Run-ups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations/taxi clearance	Practice								
	Controlled / Uncontrolled Airport procedures	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instruments & Equipment check & Eng Shutdown	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Practice								
	Departure from the Traffic Pattern / Airport Area	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Ferry Flight Operations	Safe Aircraft Control	Practice								
	VFR Navigation – Pilotage, Dead Rec, Radio Nav	Practice								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD landmark location	Practice								
	Calculation of wind drift, fuel consumption in flight	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Practice								
	ATC Clearances and/or Traffic Pattern entry	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Transition to Airport environment	Practice								
	Traffic Pattern legs	Practice								
	Traffic Pattern spacing and Collision Avoidance	Practice								
	Normal Landing	Practice								
	Crosswind Landing	Practice								
	SRM	Practice								

Notes to Instructor
C-VFR 5
The instructor should select an airport that is between 75 and 100 nautical miles from the departure airport. The airport can be within Class G, E, or D airspace. Have the PT complete all pre-flight preparations and file a VFR flight plan. Allow the PT to conduct the flight in all respects: use automation, navigate, communicate, aviate and manage the VFR flight plan and safely arrive at the destination. Even though the scenario calls for dropping off one airplane and picking up another – this can be role-played and the same airplane used for both legs. (Note: At some flight schools it might be possible to coordinate with another instructor who has a student on this lesson at the same time. In that case it might be possible to actually switch airplanes with the other instructor and student at the destination airport to increase the realism of the scenario). Before leaving in the airplane – check all airplane logbook endorsements to insure the airplane has been properly returned to service after the work that has been done. Verify that the upholstery and avionics has been signed-off, pitot-static check, ELT check and VOR check are all in order. On the return leg of the ferry flight, file a second VFR flight plan. While on the return leg introduce the problem of a thunderstorm that has developed on the flight path. Determine, based on the actual wind, which way the thunderstorm would be moving and plan a diversion course around the storm. The diversion would delay your time of arrival to the home airport. Discuss with the student and demonstrate the need communicate with FSS and/or flight watch while enroute to predict the storm's movement and to extend the VFR flight plan's time of arrival. The instructor should have the PT actually contact the nearest FSS and/or flight watch and extend the flight plan to allow for the diversion.

Commercial VFR Operations – Lesson 6
(C-VFR 6)
Candidate for Election Mission
Dual Flight Lesson

Scenario: You are a Commercial Pilot but you not employed at this time by any FBO. Your sister is running for the State Legislature. She asks you to fly her to another city to make a campaign speech. The flight will be flown in VFR daytime conditions, but you must get her (the candidate) to the speech location on time, otherwise she and her campaign manager will not be pleased. She must return immediately after the speech to the home airport.

Can a Commercial Pilot conduct this flight? The Federal Aviation regulation §119.1(e) says the further pilot qualifications do not apply to operations that are conducted under the provisions of 91.321. So what exactly are the provisions of 91.321? Refer to the actual regulation to answer this question:

91.321 Carriage of candidates in elections.

(a) As an aircraft operator, you may receive payment for carrying a candidate, agent of a candidate, or person traveling on behalf of a candidate, running for Federal, State, or local election, without having to comply with the rules in parts 121, 125 or 135 of this chapter, under the following conditions:
    (1) Your primary business is not as an air carrier or commercial operator;
    (2) You carry the candidate, agent, or person traveling on behalf of a candidate, under the rules of part 91; and
    (3) By Federal, state or local law, you are required to receive payment for carrying the candidate, agent, or person traveling on behalf of a candidate. For federal elections, the payment may not exceed the amount required by the Federal Election Commission. For a state or local election, the payment may not exceed the amount required under the applicable state or local law.

(b) For the purposes of this section, for Federal elections, the terms *candidate* and *election* have the same meaning as set forth in the regulations of the Federal Election Commission. For State or local elections, the terms *candidate* and *election* have the same meaning as provided by the applicable State or local law and those terms relate to candidates for election to public office in State and local government elections

Assuming that your sister meets all the requirements to be considered a candidate under this law and the rules of the Federal Election Commission, then it would be legal for you to conduct this flight.

Lesson Objectives

The primary objective of this flight is to provide safe and on time air transportation to a candidate in a state election campaign. You must be aware that the schedule is of vital importance – if you cannot get the candidate to the site of the speech at the proper time, then there will be no reason to conduct the flight in the first place. This mission will be accomplished and the objectives of this lesson met when the candidate is delivered safely

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Standard Post-Flight Briefing Procedures

Lesson C-VFR 6 – Candidate for Election - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & VFR Navigation Plan	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Systems, Instruments, Navigation, Eng Runups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations/taxi clearance	Practice								
	Controlled / Uncontrolled Airport procedures	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instruments & Equip check & Eng Shutdown	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Practice								
	Departure from the Traffic Pattern / Airport Area	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Cross Country Flight Operations	Safe Aircraft Control & Weather Deviations	Practice								
	VFR Navigation–Pilotage,Dead Rec, Radio Nav	Practice								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation & Automation Systems Proficiency	Practice								
	Abnormal situations-loss of full nav capability	Practice								
	SRM	Practice								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD landmark location	Practice								
	Calculation of wind drift, fuel consump in flight	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Practice								
	ATC Clearances and/or Traffic Pattern entry	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Transition to Airport environment	Practice								
	Traffic Pattern legs	Practice								
	Traffic Pattern spacing and Collision Avoidance	Practice								
	Normal Landing	Practice								
	Crosswind Landing	Practice								
	SRM	Practice								

Notes to Instructor
C-VFR 6

The instructor should select a Class D or Class C airport that is 75 to 100 nautical miles away to use as the destination airport. Have the PT conduct all the pre-flight planning for this VFR daytime flight, but do so on a tight time schedule – Allow only 30 minutes for the preflight planning. Set a departure time and stick with it. Be prepared to cancel this lesson if the PT cannot complete the pre-flight planning, file a VFR flight plan, dispatch the airplane, inspect the airplane and be in the air by the set departure time (a total of 45 minutes). During the flight observe the PT's use of automation as applicable, and all navigation aids. Have the PT activate the VFR flight plan and handle all ATC communications enroute and at the destination. Make a full stop landing at the destination and discuss any problem areas and discuss departure procedures. File a second VFR flight plan for the return leg. The outbound leg has significant time pressure as the candidate has to be there by a certain time, but the return leg will have less time pressure. On the return leg, introduce to the PT a bad weather scenario. Plan ahead so that the PT can either 1) divert around weather; 2) make an intermediate landing at an airport along the route to allow bad weather to pass, or 3) make a diversion and land at an airport that is not along the route.

Commercial VFR Operations – Lesson 7
(C-VFR 7)
Airplane Ferry Flight
Solo Flight Lesson

Scenario: You are a Commercial Pilot and you work for an airplane sales and refurbishing company. The company has just completed the sale of an airplane. Your job today is to deliver the airplane to the new owner. You will fly, in VFR daytime conditions, from your home airport to the new owner's home airport to make the delivery. Your company is also buying another airplane. That airplane will be waiting at the airport where you drop of the new owner's airplane. You will pick up that airplane and fly it home.

Can a Commercial Pilot conduct this type of ferry flight? Federal Aviation regulation §119.1 (e)(3) allows Commercial Pilots who do not have any additional qualifications (such as required for air taxi or scheduled air carrier) to conduct these type of delivery or ferry flights. The airplane ferried must be less than 6,000 pounds and have 20 or less seats beyond the flight crew seats.

Lesson Objectives
The objective of this lesson is to deliver the new owner's airplane to his home airport and to bring home a second airplane back. The PT must display good judgment and decision making to complete these flights in VFR daytime conditions. The new owner wants his airplane as soon as possible and your boss wants his newly purchased airplane back as soon as possible. As soon as the weather will allow, these airplanes must be delivered on time and on schedule. The PT must safely navigate between the two airports and adhere to all airspace rules that are applicable to the airports involved. This mission will be complete and the objectives of this lesson met when both airplane have be safely repositioned.

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Standard Post-Flight Briefing Procedures

Lesson C-VFR 7 – Airplane Ferry Flight - Solo **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Perform								
	VFR Cross Country Flight Planning	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Systems, Instruments, Navigation, Eng Runups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations/taxi clearance	Practice								
	Controlled / Uncontrolled Airport procedures	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instruments & Equip check & Eng Shutdown	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Practice								
	Departure from the Traffic Pattern / Airport Area	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
VFR Cross Country Flight Operations	Safe Aircraft Control	Practice								
	VFR Navigation–Pilotage, Dead Rec, Radio Nav	Practice								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Enroute Operations Flight by reference to the ground	Aeronautical Chart/MFD landmark location	Practice								
	Calculation of wind drift, fuel consump in flight	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Practice								
	ATC Clearances and/or Traffic Pattern entry	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Transition to Airport environment	Practice								
	Traffic Pattern legs	Practice								
	Traffic Pattern spacing and Collision Avoidance	Practice								
	Normal Landing	Practice								
	Crosswind Landing	Practice								
	SRM	Practice								

Notes to Instructor
C-VFR 7
The instructor should select an airport that is between 75 and 100 nautical miles from the departure airport. The airport could be within Class C or D airspace but cannot be the same airport used in previous lessons. The PT completes all pre-flight preparations and files a VFR flight plan for both the outbound and inbound legs of the flight. The PT executes the entire ferry flight scenario flying as the sole occupant of the airplane. The PT must accomplish all navigation and communication requirements of the mission and activate and manager a VFR flight plan on both legs. Even though the scenario calls for dropping off one airplane and picking up another – this can be role-played and the same airplane used for both legs. (Note: Since this is a solo flight, do not attempt to make an actual airplane switch during this lesson).

(C-VFR 8)
Life Flight Mission
Dual Flight Lesson at Night

Scenario: You are a Commercial Pilot, but in addition to your Commercial Pilot Certificate, you have acquired additional training and experience to qualify to fly under Federal Aviation regulations part 135 as a VFR air taxi pilot. Your company dispatcher has just called you in to work a night flight. The flight is a Life Flight Mission to carry a Red Cross donation of a rare blood type to another city for immediate transfusion. You must conduct this flight under time pressure. The patient who needs the transfusion will not recover from an accident without this blood donation.

Is this flight legal under all applicable regulations? This type of "on-demand" flight does require additional experience, and training beyond that of the Commercial Pilot Certificate alone. Federal Aviation regulations part 135.1 defines who is subject to these additional requirements: "135.1 Applicability. (a) This part prescribes rules governing—(1) The commuter or on-demand operations of each person who holds or is required to hold an Air Carrier Certificate or Operating Certificate under part 119 of this chapter.

(2) Each person employed or used by a certificate holder conducting operations under this part including the maintenance, preventative maintenance and alteration of an aircraft."

14 CFR §135.1 tells us that there are additional pilot requirements to conduct on-demand or charter-type flights, so what exactly are these additional requirements? 14 CFR §135.243 tells us what additional qualifications are required to be the pilot in command in this situation. "(b)…no certificate holder may use a person, nor may any person serve, as pilot in command of an aircraft under VFR unless that person—

(1) Holds at least a commercial pilot certificate with appropriate category and class ratings and, if required, an appropriate type rating for that aircraft; and

(2) Has had at least 500 hours time as a pilot, including at least 100 hours of cross-country flight time, at least 25 hours of which were at night; and

(3) For an airplane, holds an instrument rating or an airline transport pilot certificate with an airplane category rating; or

For the purpose of this scenario, the PIC meets the requirement of 500 total time (of which 100 is cross country and 25 is at night) for this VFR night on-demand charter flight.

Lesson Objectives
The primary objective of this lesson is to deliver the Red Cross blood donation to the destination airport in VFR conditions at night. There will be a significant time pressure associated with this flight. It should be assumed that the recipient of this blood donation has been in a serious accident and their condition will be grave without this immediate transfusion. The PT must conduct the flight from start to finish safely, but expeditiously. The flight must be in the air with 45 minutes of the pilot's arrival for the mission. This mission will be accomplished and the objectives of this lesson met when the blood transfusion is safely delivered within the prescribed time limit set by the instructor.

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken

Standard Post-Flight Briefing Procedures

Lesson C-VFR 8 – Life Flight Mission – Dual/Night **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information & VFR Navigation Plan	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Systems, Instruments, Navigation, Eng Runups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations at night / taxi	Perform								
	Controlled / Uncontrolled Airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instruments & Equip check & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Perform								
	Night Takeoff	Perform								
	SRM	Practice								
Takeoff & Departure Flight by reference to the ground	Climb out procedures at night and Clearances	Practice								
	Departure from the Traffic Pattern / Airport Area	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
VFR Cross Country Flight Operations	Safe Aircraft Control	Perform								
	VFR Night Nav–Pilotage, Dead Rec, Radio Nav	Perform								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation & Automation Systems Proficiency	Perform								
	Abnormal and Emergency situations	Perform								
	SRM	Manage/Decide								
Enroute Operations Flight by reference to the ground	Chart/MFD landmark location at Night	Practice								
	Calculation of wind drift, fuel consump in flight	Perform								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Practice								
	ATC Clearances and/or Traffic Pattern entry	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Traffic Pattern legs	Perform								
	Traffic Pattern spacing and Collision Avoidance	Perform								
	Normal Landing at Night	Practice								
	Landing at Night without Landing Lights	Practice								
	SRM	Practice								

Notes to Instructor
C-VFR 8

This flight is conducted in VFR conditions at night. The instructor will select an airport that has an operating control tower (either Class D or Class C) at the time of the flight and is located between 75 and 100 nautical miles away from the departure airport. The PT will conduct all the pre-flight planning, including the filing of a VFR flight plan, but must be given a time limit for completion. The flight must be in the air within 45 minutes after the PT's arrival for the lesson. The instructor should be prepared to cancel the flight if the PT cannot prepare the plan and the airplane for takeoff within the reasonable time limit set by the instructor. If the PT cannot complete the preparations in time, they will be told that another pilot, who was ready quicker will take the blood transfusion. (NOTE: Two instructors with student simultaneously on this lesson could complete for the use of one airplane. The first PT ready with an accurate flight plan gets the airplane) It should be emphasized that speed cannot substitute for accuracy in pre-flight planning. To accomplish this mission and meet this lesson's objectives, the PT must be both fast and accurate – as if a life depended on it. There will be considerable time pressure on the out bound leg to get the blood donation there in time, but less pressure on the return leg. To begin the return leg, remain at the tower controlled airport and complete several night landings. Have the student make full stop landings to comply with night recent experience requirements. Then, in addition to the landings required for night currency, conduct several more landings with and without the landing light; and with and without interior lights (simulating light bulb and electrical failures). File and activate the VFR flight plans for both legs of the flight.

Commercial VFR Operations – Lesson 9
(C-VFR 9)
Life Flight Mission
Solo Flight Lesson at Night

Scenario: You are a Commercial Pilot, but in addition to your Commercial Pilot Certificate, you have acquired additional training and experience to qualify to fly under Federal Aviation regulations part 135 as a VFR air taxi pilot. Your company dispatcher has just called you in to work a night flight. The flight is a Life Flight Mission to carry a human transplant donation to another city. You must conduct this flight under time pressure. The patient who needs the transplant will not recover without this donation.

Review from Lesson 8 the regulations that allow this type of flight to be conducted.

Lesson Objectives
The primary objective of this lesson is to deliver the transplant donation to the destination airport in VFR conditions at night. There will be a significant time pressure associated with this flight. The PT must be in the air within 45 minutes of the pre-set time of arrival for the mission. It should be assumed that the recipient of this transplant is in serious condition and will not survive without your delivery. The PT must conduct the flight from start to finish safely, but expeditiously, and do this as the sole occupant of the airplane. This mission will be accomplished and the objectives of this lesson met when the transplant is safely delivered within the prescribed time limit set by the instructor.

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Standard Post-Flight Briefing Procedures

Lesson C-VFR 9 – Life Flight Mission – Solo/Night
Desired Outcome Grade Sheet

Scenario Activities	Task	Desired Performance	Task Grades: Not Observed	Describe	Explain	Practice	Perform	SRM Grades: Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Perform								
	VFR Cross Country Flight Planning	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Systems, Instruments, Navigation, Eng Runups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations at night / taxi	Perform								
	Controlled / Uncontrolled Airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instruments & Equip check & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Perform								
	Night Takeoff	Perform								
	SRM	Practice								
Takeoff & Departure Flight by reference to the ground	Climb out procedures at night and Clearances	Practice								
	Departure from the Traffic Pattern / Airport Area	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Practice								
	Automation Systems Proficiency	Practice								
	SRM	Practice								
VFR Cross Country Flight Operations	Safe Aircraft Control	Perform								
	VFR Night Nav–Pilotage, Dead Rec, Radio Nav	Perform								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
Enroute Operations Flight by reference to the ground	Chart/MFD landmark location at Night	Practice								
	Calculation of wind drift, fuel consump in flight	Perform								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Practice								
	ATC Clearances and/or Traffic Pattern entry	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Traffic Pattern legs	Perform								
	Traffic Pattern spacing and Collision Avoidance	Perform								
	Normal Landing at Night	Practice								
	Landing Illusions at Night	Explain								
	SRM	Practice								

Notes to Instructor
C-VFR 9
This flight will be conducted in VFR conditions at night. The instructor will select an airport that has an operating control tower (either Class D or Class C) at the time of the flight and is located between 75 and 100 nautical miles away from the departure airport. The PT cannot have been to this same airport on any pervious lesson. The PT will be the sole occupant of the airplane. The PT will conduct all the pre-flight planning, including the filing of a VFR flight plan, but must be given a time limit for completion. The PT should be in the air within 45 minutes of the pre-set arrival time for the lesson. The instructor should be prepared to cancel the flight if the PT cannot prepare the plan and the airplane for takeoff within the time limit. If the PT cannot complete the preparations in time, they will be told that another pilot, who was ready quicker, will take the transplant. (NOTE: Two instructors who coincidently both have PTs on this lesson could compete for one available airplane. The PT that presents an accurate flight plan first, gets the airplane) It should be emphasized that speed cannot substitute for accuracy in pre-flight planning. To accomplish this mission and meet this lesson's objectives, the PT must be both fast and accurate – as if a life depended on it. The PT must file and activate VFR flight plans for both legs of the flight. The PT must make a full stop landing at the destination airport. Since this is a night flight, the PT must contact the instructor when the PT arrives at the destination airport and do so by a pre-set time.

Commercial VFR Operations – Lesson 10
(C-VFR 10)
Executive Travel Mission
Solo Flight Lesson

Scenario: You are a Commercial Pilot who also meets the requirements to fly on-demand charter flights in VFR conditions. You are employed by a Part 135 Air Agency Certificate holder and your boss has assigned you to the following mission: You must fly a three-leg trip. The first leg will transport one passenger from your home airport to the first destination airport. At the first destination airport you will pick up a second passenger. The second passenger is the CEO of a corporation in your state. The first passenger works for the CEO and will conduct a business meeting with the CEO while you fly from the first to the second destination airport. At the second destination you will drop off the CEO and return to your home airport with the first passenger. (Note: the CEO's time must be very valuable to warrant having his employee spend the day flying around with you just so that can meet together for the time it takes to fly the middle leg of this trip!). Obviously, the consequences for your failure to complete this mission safely and timely will be your job security with your employer.

Review in Lesson 8 the regulations that apply for such an on-demand charter flight in VFR conditions.

Every leg of this trip must be a distance greater than 50 nautical miles. One leg of this trip must have a straight line distance of greater than 250 nautical miles. The total mileage for all three legs must be greater than 500 nautical miles.

The PT will also have to cope with inoperative equipment and must determine if the airplane still maintains its "legal airworthiness" by consulting 14 CFR §91.213.

Lesson Objectives
This mission will be accomplished and this lesson's objectives met when the three leg trip has been completed within the allotted time. Every portion of the flight is conducted in the daytime – so a timely departure and staying on schedule is essential. The PT must manage all aspects of this flight including pre-flight planning, changing weather, flight plans, navigation, and communications requirements.

Standard Pre-Flight Briefing Procedures

Completion Standards
The PT will have successfully completed this lesson after demonstrating the desired performance for each task listed and exhibiting the required level of SRM to safely and efficiently complete the training scenario. Additionally, the PT should be able to identify any errors or unsafe practices made during the flight, including SRM considerations, and understanding why those actions were not optimal and what corrective action should have been taken.

Standard Post-Flight Briefing Procedures

Lesson C-VFR 10 – Executive Travel Mission- Solo **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & VFR Navigation Plan	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Systems, Instruments, Navigation, Eng Runups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations / taxi	Perform								
	Controlled / Uncontrolled Airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instruments & Equip check & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Perform								
	Night Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Perform								
	Departure from the Traffic Pattern / Airport Area	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
VFR Cross Country Flight Operations	Safe Aircraft Control	Perform								
	VFR Nav–Pilotage,Dead Rec, Radio Nav	Perform								
	SRM	Manage/Decide								
Enroute Operations Navigation & Automation	Navigation & Automation Systems Proficiency	Perform								
	Abnormal situations	Perform								
	SRM	Manage/Decide								
Enroute Operations Flight by reference to the ground	Chart/MFD landmark location	Perform								
	Calculation of wind drift, fuel consump in flight	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Perform								
	ATC Clearances and/or Traffic Pattern entry	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Traffic Pattern legs	Perform								
	Traffic Pattern spacing and Collision Avoidance	Perform								
	Normal Landing	Perform								
	Crosswind Landing	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-VFR 10

The instructor will select two airports that meet the following requirements: Every leg of this trip must be a distance greater than 50 nautical miles. One leg of this trip must have a straight line distance of greater than 250 nautical miles. The total mileage for all three legs must be greater than 500 nautical miles. The student should execute two legs into the wind. In some cases this will be outbound and in others it will be inbound to the home airport. The student should execute the longest, 250 nm, leg with a tailwind. In some cases this will be the outbound leg in others this will be the return leg. This scenario calls for a pilot who qualifies for Part 135 VFR only and is to be flown exclusively during the daytime. Since this flight (at least 500 nm total) with two stops will take most of a day, the instructor must set a “not to exceed” departure time. Be prepared to cancel this lesson if the student cannot be off the ground early enough to allow this entire flight to take place in the day-light. Have the student call you at each stop to insure that they are on schedule and to incorporate another form of time pressure. The completion of this lesson requires sustained and widespread VFR conditions. Because the weather must be so good for so long, there will probably be some cancellations of this flight on days when the weather is not good enough. The instructor should use those cancellations as opportunities to check the PT’s judgment in accessing the situation. Hopefully the student will not experience delays along the way – but this is a real world scenario and it is quite possible that the PT will experience delays that would prevent them from completing the lesson. The PT needs to be prepared for a ‘worse case’ scenario where they actually get stranded and cannot return to the home airport on the day of the original flight. Pay close attention to the ability of the PT to pay for fuel along the way and that airports you select for this flight have fuel available.

Commercial VFR Operations – Lesson 11
(C-VFR 11)
VFR Operations Stage Check
Dual Flight Check

Scenario: You are a Commercial Pilot. You have been hired to fly for a Part 135 Operator, but just recently met the minimums for flight time to qualify as Pilot in Command for VFR operations. Your continued employment is contingent on your ability to start flying Part 135 VFR on your own as PIC. Another pilot recently left the company so now the company needs another VFR Pilot in Command, but for you to fill the position you must pass a check ride given by the company check airman. Today you will fly with the check airman to see if you can keep your job.

Lesson Objectives
The objective of this lesson is to perform all VFR flight operations at the Commercial Pilot skill level while displaying excellent judgment and decision making abilities. The PT will be evaluated by either 1) a senior flight instructor, or 2) the chief flight instructor (if applicable), or 3) an assistant chief instructor (if applicable), or 4) a designated check instructor (if applicable). The instructor who administers this flight check will utilize a scenario that incorporates the elements contained in the Commercial VFR Operations lessons 1 through 10. The lesson will be successful and the objectives of the lesson accomplished when all VFR operations are completed at the Commercial Pilot skills level.

Standard Pre-Flight Briefing Procedure

Completion Standards
All VFR operations evaluated on this lesson must meet the minimum criteria for that operation as described in the most current edition of the Commercial Pilot Practical Test guide.

Standard Post-Flight Briefing Procedure, followed by a recommendation from the Instructor: Completion of this Strand or return to the Strand for further improvement.

Lesson C-VFR 11- VFR Operations Check - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & VFR Navigation Plan	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Systems, Instruments, Navigation, Eng Runups	Perform								
	Weight and Balance calculation & implications	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations / taxi	Perform								
	Controlled / Uncontrolled Airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instruments & Equip check & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry and Clearances	Perform								
	Night Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Flight by reference to the ground	Climb out procedures and Clearances	Perform								
	Departure from the Traffic Pattern / Airport Area	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
VFR Cross Country Flight Operations	Safe Aircraft Control	Perform								
	VFR Nav–Pilotage, Dead Rec, Radio Nav	Perform								
	SRM	Manage/Decide								
Enroute Operations Navigation & Automation	Navigation & Automation Systems Proficiency	Perform								
	Abnormal and Emergency situations	Perform								
	SRM	Manage/Decide								
Enroute Operations Flight by reference to the ground	Chart/MFD landmark location	Perform								
	Calculation of wind drift, fuel consump in flight	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Perform								
	ATC Clearances and/or Traffic Pattern entry	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation Systems Proficiency	Perform								
	Automation Systems Proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Traffic Pattern legs	Perform								
	Traffic Pattern spacing and Collision Avoidance	Perform								
	Normal Landing	Perform								
	Crosswind Landing	Perform								
	SRM	Manage/Decide								

Notes to Check Instructor
C-VFR 11
This lesson is the final lesson in the Commercial VFR sequence. To aid in the evaluation process, the lesson must be conducted by an instructor that does not ordinarily fly with this particular PT. The instructor must be either 1) a senior flight instructor, or 2) the chief flight instructor (if applicable), or 3) an assistant chief instructor (if applicable), or 4) a designated check instructor (if applicable). The scenario calls for the flight to be a test of a person already employed by a Part 135 company, but passing the test is required if the person is allowed to advance in the company or even remain employed with the company. A test which is more than just pass/fail but instead threatens the person's job security will provide additional pressure. The instructor conducting this lesson may incorporate another scenario as a subset of the overall check airman scenario. In other words, the instructor can pose a scenario within the test similar to those in lessons 1 through 10 to help evaluate judgment and decision making.

Commercial Maneuvers – Lesson 1
(C-Maneuvers 1)
Aircraft Performance Flight
Dual Flight Lesson

Scenario: You have a friend who is also a pilot. He is considering the purchase of an airplane. The friend has less flight experience than you, so he asks you to conduct an airplane performance flight and give him a recommendation. In order to help your friend make the best decision, you will really have to put the airplane through its paces – exploring some specific areas of flight performance in particular. The areas you have special interest in are: slow flight characteristics, takeoff and landing performance, and emergency procedures. You get started when the current owner of the airplane allows you to take the airplane for a "test drive."

Lesson Objectives
The objective of this lesson is to become familiar with the performance characteristics of the airplane. The PT should be able to plan and safely execute slow flight and stalls, safely conduct normal and high performance takeoffs and landings, and perform emergency procedures to maintain the safety of flight. The PT will understand the circumstances where all these procedures would become necessary in actual flight operations.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The PT will be advised that often it will take more than one flight to meet the completion standards for one lesson. This should not imply that the student has not performed well – it may simply be that not all the tasks of the lesson could be accomplished in one flight. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion Standards
The objectives of this lesson will be complete when the pilot can perform slow flight and stalls, high performance takeoff and landings, and emergency procedures to at least the Commercial Pilot standard as indicated in the current Commercial Pilot Practical Test guide.

Post Flight Briefing, Preview of next lesson and assignments: After the flight has been concluded, properly store/tiedown the airplane, and complete all administrative duties (turn in the aircraft tach and Hobbs times, complete payment invoice, etc). Close the flight plan if one had been opened during the

flight. The PT and Instructor should then take separate copies of the lesson's Desired Outcome Grade Sheet to separate and private locations. The PT and Instructor each grade the lesson using the Learner Centered Grading method. After both have completed the grading, the PT and Instructor get back together and compare grade sheets. There will certainly be tasks where the PT and Instructor agree on the grade. There will certainly be tasks where the PT and Instructor disagree on a grade – discussion points some from those areas of disagreement. The PT and Instructor should explain to each other why they indicated the grade that they awarded and from this a greater gain in learning (for both PT and Instructor) will result.

Lesson C-Maneuvers 1-Aircraft Performance Flt-Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Explain								
	Navigation Planning	Explain								
	SRM	Explain								
Preflight Procedures	Aircraft Systems, Instruments, Navigation	Describe								
	Flight deck checks and engine run-ups	Describe								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequencing	Describe								
	Controlled / Uncontrolled airport procedures	Describe								
	SRM	Explain								
Postflight Procedures	Departing the runway safety procedures	Describe								
	Instrument, Equipment checks & Eng Shutdown	Describe								
	SRM	Explain								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Describe								
	Normal and/or Crosswind Takeoff	Describe								
	SRM	Explain								
Takeoff & Departure Flight by reference to the ground	Short Field Takeoff and Climb	Describe								
	Soft Field Takeoff and Climb	Describe								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Performance Maneuvers	Safe aircraft control operation	Practice								
	Safe altitude consideration	Practice								
	Flight at Critically Slow Airspeed	Practice								
	Full Stalls – Power On	Practice								
	Full Stalls – Power Off	Practice								
	Accelerated Stalls	Practice								
	Cross Control & Trim Tab Stall Demonstrations	Practice								
	Secondary Stall Demonstrations	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Describe								
	ATC Clearances and/or Traffic Pattern entry	Describe								
	SRM	Explain								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Approach & Landing Procedures	Transition to Airport environment	Describe								
	Normal and/or Crosswind Landing	Describe								
	Short Field Approach and Landing	Describe								
	Soft Field Approach and Landing	Describe								
	Slip to Land	Describe								
	SRM	Explain								

Notes to Instructor
C-Maneuvers 1
This lesson contains maneuvers, but should not be presented as simply a traditional maneuvers only lesson. The scenario calls for the checkout of the airplane, but the instructor's role is to teach and checkout the pilot. This lesson may require more than one flight to accomplish, so advise the student of that fact. The specific performance and emergency maneuvers that should be contained in this lesson are: short, soft, and crosswind takeoffs; maneuvering during slow flight; power on and power off stalls; cross control stalls; elevator trim tab stalls; secondary stalls; steep power turns; emergency descent; simulated engine out and glide to off-airport landing; short, soft and crosswind landings.

Commercial Maneuvers – Lesson 2
(C-Maneuvers 2)
Aircraft Performance Flight
Dual Flight Lesson

Scenario: The flight school where the PT is training has just purchased and placed on the flight line a new airplane. The students of the flight school must now become completely familiar with this new airplane's characteristics. The best way to discover the performance limitations of an airplane is to fly it through a series of maneuvers that are designed to test the airplane and pilot's maximum performance. Your mission is to put the airplane through these maneuvers to learn its limitations. The maneuvers are sometimes called the "Commercial Maneuvers" and are: The Chandelle; The Lazy Eight; The Pylon Eight; and The Steep Spiral. These maneuvers were selected because if they are done correctly the performance of the airplane and the proficiency of the pilot will be showcased – but on the other hand if these maneuvers are not flown correctly they will expose weaknesses of both the airplane and the pilot.

Lesson Objectives
The objective of this lesson is to allow the PT to observe, learn, and practice, the Commercial Maneuvers. The PT should understand that each of these maneuvers is designed to help the PT obtain complete mastery of the airplane.

Standard Pre-Flight Briefing Procedure

Completion Standards: This lesson will be complete when the PT has had a demonstration of all the Commercial Maneuvers and had the opportunity to practice each maneuver.

Standard Post-Flight Briefing Procedure

Lesson C-Maneuvers 2-Aircraft Performance Flt-Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Practice								
	Navigation Planning	Practice								
	SRM	Practice								
Preflight Procedures	Aircraft Systems, Instruments, Navigation	Practice								
	Flight deck checks and engine run-ups	Practice								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequencing	Practice								
	Controlled / Uncontrolled airport procedures	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instrument, Equipment checks & Eng Shutdown	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure Flight by reference to the ground	Short Field Takeoff and Climb	Practice								
	Soft Field Takeoff and Climb	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Commercial Maneuvers	Safe aircraft control operation	Practice								
	Safe altitude consideration	Practice								
	Chandelle	Practice								
	Lazy Eight	Practice								
	Pylon Eight	Practice								
	Steep Turn	Practice								
	Steep Spiral	Practice								
	“Dutch” Rolls	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Practice								
	ATC Clearances and/or Traffic Pattern entry	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Transition to Airport environment	Practice								
	Normal and/or Crosswind Landing	Practice								
	Short Field Approach and Landing	Practice								
	Soft Field Approach and Landing	Practice								
	Slip to Land	Practice								
	SRM	Practice								

Notes to Instructor
C-Maneuvers 2
Scenario/Lesson Notes to Instructor

The Commercial Maneuvers have been the subject of great debate. They mostly do not have any practical application, but they nevertheless are great tools to determine the control smoothness, maneuvering timing, and the ability of the pilot to predict airplane performance. It does take very good “stick and rudder” skills to fly these maneuvers correctly. For that reason this lesson, although presented within the scenario of an airplane checkout flight, will nonetheless be more a maneuvers-based lesson than most others in this syllabus. The instructor can point out that the origin of these maneuvers do have a practical application: Chandelles were used to get out of a box canyon; Lazy Eights were used by fighters in WWII to remain with the slower bombers; Pylon Eights are used in air racing to make sharp corners without cutting the course and getting disqualified from the race; the Steep Spiral is an emergency maneuver to lose altitude over a suitable landing site. But instructors should also make clear than these maneuvers probably will not be used in the PT’s professional flying career – but excellent pilot skill will be. The Commercial Maneuvers are excellent when it comes to highlighting a pilot’s skill or exposing a lack of skill. This lesson may take more than one flight to accomplish, so advise the PT of that fact. One of the traditional drawbacks of teaching Commercial Maneuvers to the PT is that it can quickly turn into multiple hours of “drill-and-practice” only. When this happens the training objectives can be lost on the PT and the Commercial Maneuvers become counter productive. Use the “shuffle” feature of this syllabus and mix in other lessons from other sections of the syllabus (such as a C-VFR lesson) so that the student does not become disinterested by the repetition of the Commercial Maneuvers.

Lesson C-Maneuvers 3
Aircraft Performance Survey Flight
Dual Flight Lesson

Scenario: An aircraft manufacturer is conducting a nationwide survey of pilots to discover pilot preferences with their product. The manufacturer has asked you to participate in the survey by flying their airplane and providing feedback. The manufacturer is specifically interested in what pilots think about their airplane during maximum performance maneuvers. As part of the survey the manufacturer has provided a set of maneuvers that they would like each of the survey pilots to try out. These maneuvers have been selected because they put both airplane and pilot to the test of performance and proficiency. The maneuvers are the “Commercial Maneuvers” and are: The Chandelle; The Lazy Eight; The Pylon Eight; and The Steep Spiral. These maneuvers were selected for use in the survey because if they are done correctly the performance of the airplane and the proficiency of the pilot will be showcased – but on the other hand if these maneuvers are not flown correctly they will expose weaknesses of both the airplane and the pilot. The manufacturer is conducting the survey to see just how well their airplane and the pilots who fly them stack up.

Lesson Objectives
The objective of this lesson is to display the PT’s stick-and-rudder skills to the Commercial Pilot level. In addition the PT will understand that although the Commercial Maneuvers may not have any real world applications, they nevertheless are used to measure a pilot’s skills. These same skills will be translated to real world applications throughout their professional piloting career.

Standard Pre-Flight Briefing Procedures

Completion Standards
This lesson will be complete when the PT can perform all the Commercial Maneuvers to the standard indicated in the current Commercial Pilot Practical Test Standard.

Standard Post-Flight Briefing Procedures

Lesson C-Maneuvers 3-Aircraft Performance Survey Flt-Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Perform								
	Navigation Planning	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Aircraft Systems, Instruments, Navigation	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground ops, signs, taxi, sequencing	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equip checks & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Flight by reference to the ground	Short Field Takeoff and Climb	Perform								
	Soft Field Takeoff and Climb	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Commercial Maneuvers	Safe aircraft control operation	Perform								
	Safe altitude consideration	Perform								
	Chandelle	Perform								
	Lazy Eight	Perform								
	Pylon Eight	Perform								
	Steep Turn	Perform								
	Steep Spiral	Perform								
	“Dutch” Rolls	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Perform								
	ATC Clearances and/or Traffic Pattern entry	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Normal and/or Crosswind Landing	Perform								
	Short Field Approach and Landing	Perform								
	Soft Field Approach and Landing	Perform								
	Slip to Land	Perform								
	SRM	Manage/Decide								

C-Maneuvers 3
Scenario/Lesson Notes to Instructor
The Commercial Maneuvers were demonstrated and the PT was allowed to practice the maneuvers during lesson C-Maneuvers 2. In this lesson the skill level of the maneuvers must be raised to the Commercial Pilot skill level. The PT will also perform the Commercial Maneuvers to the Commercial Pilot skill level in a complex airplane during the C-Complex stage of this syllabus. The completion of this lesson may require more than one flight, so inform the PT of this fact.

Commercial IFR Operations – Lesson 1
(C-IFR 1)
Emergency Mail Delivery Mission
Dual Flight Lesson

Scenario: A hurricane has struck a costal region causing widespread damage and destruction. Normal ground transportation of goods and services has been interrupted because most roads are impassable. You are a Commercial Pilot and work for a fixed based operator (FBO) that has received an emergency contract from the United States Postal Service to provide supplemental air mail service. Your mission will be to fly mail to an airport within the affected area.

Is a Commercial Pilot working for an FBO allowed to carry mail in such circumstances? Federal Aviation regulation 119.1(e) says that Commercial Pilots, even those who do not qualify for air charter operation can fly for hire in these circumstances: FAR 119.1(e)(9) allows, "Emergency mail service conducted under 49 U.S.C. 41906." So what exactly Is 49 USC 41906 and what are the rules that are relevant to the situation?

Sec. 41906. Emergency mail transportation

(a) Contract Authority. - In an emergency caused by a flood, fire, or other disaster, the United States Postal Service may make a contract without advertising to transport mail by aircraft to or from a locality affected by the emergency when the available facilities of persons authorized to transport mail to or from the locality are inadequate to meet the requirements of the Postal Service during the emergency. The contract may be only for periods necessary to maintain mail service because of the inadequacy of the facilities. Payment for transportation provided under the contract shall be made at prices provided in the contract.

FAR 119 allows the use of US Postal Code Section 41906, so under these unique circumstances, a Commercial Pilot, operating under contract authority, can carry the mail.

The PT will also have to cope with inoperative equipment and must determine if the airplane still maintains its "legal airworthiness" by consulting FAR 91.213.

Lesson Objectives
The objective of this lesson is to make a mail delivery to another airport and return to the home airport. The PT will file an IFR flight plan for both legs of this flight. The PT will receive an IFR clearance for both the outbound and inbound legs of this mission and work with ATC throughout the mission. The PT will define their own "personal" weather minimums" and take those minimums into consideration when making the go/no-go decision. The mission will be complete when the mail has been safely delivered.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The PT will be advised that often it will take more than one flight to meet the completion standards for one lesson. This should not imply that the student has not performed well – it may simply be that not all the tasks of the lesson could be accomplished in one flight. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion Standards
This mission will be complete and this lesson's objectives met when the PT has successfully used the IFR system to safely deliver the mail to and from the destination airport.

Post Flight Briefing, Preview of next lesson and assignments: After the flight has been concluded, properly store/tiedown the airplane, and complete all administrative duties (turn in the aircraft tach and Hobbs times, complete payment invoice, etc). Close the flight plan if one had been opened during the flight. The PT and Instructor should then take separate copies of the lesson's Desired Outcome Grade Sheet to separate and private locations. The PT and Instructor each grade the lesson using the Learner Centered Grading method. After both have completed the grading, the PT and Instructor get back together and compare grade sheets. There will certainly be tasks where the PT and Instructor agree on the grade. There will certainly be tasks where the PT and Instructor disagree on a grade – discussion points some from those areas of disagreement. The PT and Instructor should explain to each other why they indicated the grade that they awarded and from this a greater gain in learning (for both PT and Instructor) will result.

Lesson C-IFR 1- Emergency Mail Delivery - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Describe								
	IFR Navigation Planning	Describe								
	SRM	Explain								
Preflight Procedures	IFR Systems, Instruments, Navigation	Describe								
	Flight deck checks and engine run-ups	Describe								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Describe								
	Controlled / Uncontrolled airport procedures	Describe								
	SRM	Explain								
Postflight Procedures	Departing the runway safety procedures	Describe								
	Instrument, Equipment checks & Eng Shutdown	Describe								
	SRM	Explain								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Describe								
	Normal and/or Crosswind Takeoff	Describe								
	SRM	Explain								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Describe								
	Published Departure Procedures	Describe								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Describe								
	ATC Communications	Describe								
	Navigation on Airways and Direct Routes	Describe								
	Weather Deviations	Describe								
	Hold Pattern Entry and Holds	Describe								
	SRM	Explain								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Describe								
	Radar Vectors or Pilot Nav to Initial App Fix	Describe								
	SRM	Explain								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Describe								
	Automation systems proficiency	Describe								
	SRM	Explain								
Approach & Landing Procedures	Visual Approach	Describe								
	Non-Precision App without view limiting	Describe								
	Non-Precision App with view limiting (hood, IMC)	Describe								
	Circle to Lan	Describe								
	Landing Straight In	Describe								
	SRM	Explain								

Notes to Instructor
C-IFR 1

This scenario calls for the delivery of mail, so be as realistic as possible and take along something in the airplane that will be considered the mail delivery container. One of the unique features of this syllabus is that IFR work is incorporated into Commercial Pilot training. This lesson duplicates for the PT a real world situation that they could be faced with while on the job as a Commercial Pilot. This lesson calls for you and the PT to file IFR and accept an IFR clearance. This could take place in VMC or in IMC as the weather on the day you conduct this lesson will dictate. Use the “shuffle” feature of this syllabus to best advantage here. It may have been that you and the PT had planned to conduct one of the C-VFR lessons, but IFR conditions are present on the day of the proposed lesson. Rather than canceling all flight training, if the weather permits, you could cancel the C-VFR lesson and instead conduct this C-IFR lesson. Of course, there will be days when all flight lessons must be cancelled due to weather, but use the concept of “personal weather minimums” here. This lesson is a dual flight, so it may be that the instructor’s personal minimums, being lower that those of the PT, will allow this flight to proceed with weather that would have stopped the PT had this been the PT flying alone. Discuss personal minimums and help the PT define what this means for them at their current stage of experience.

For this lesson the instructor should select an airport that is 75 to 100 nautical miles away. The destination airport should have a non-precision approach or approaches to be used as part of the lesson. When arriving at the destination, plan to fly the approach procedure even if a visual approach is possible. If flying this lesson in VFR conditions, simulate IMC at the PT’s personal minimums using a view limiting device. Make a full stop landing to simulate the drop off and pick up of the mail delivery and to practice the terminal procedures of the airport. Features of managing the IFR clearance should be emphasized. Demonstrate how two IFR flight plans can be filed at once. Depending on the services available at the airports involved and the weather present at the time of the flight demonstrate: 1) accepting the IFR clearance via ATC on the ground; 2) accepting the IFR clearance via ATC after takeoff; or 3) procedures of accepting a void time clearance. Depending on the services available at the airports involved, demonstrate how to verify that an IFR clearance has been cancelled (operating control tower) or the methods in which the pilot must initiate the cancellation of an IFR clearance.

Note: The PT must be able to demonstrate proficiency in the use of whatever avionics is available in the particular airplane to be flown. This could include GPS, ADF, VOR, RMI, or any other equipment applicable.

Commercial IFR Operations – Lesson 2
(C-IFR 2)
On-Demand Air Charter Mission
Dual Flight Lesson

Scenario: You are a Commercial Pilot working for an FAA Part 135 Air Agency Certificate holder. Your employer has assigned you to deliver a customer to a meeting in another city and return that customer back home after the meeting. The customer has learned of the meeting with very little advance notice. The customer tells the PT that this trip has just come up and that the customer is leaving the office and is on the way to the airport right now. The instructor will pose as the customer in this lesson. The instructor/customer will advise the PT of the flight's destination with only 45 minutes until departure – the time it will take the customer to arrive at the airport. The PT must be able to completely and safely plan the flight within the time constraints – otherwise the customer would miss the meeting and therefore have no reason to take the trip. The instructor should be prepared to cancel the lesson if the PT cannot be ready when the customer arrives.

This scenario is planned as a daytime mission to simulate Part 135 On-Demand Air Charter Operations. The scenario will consist of an out and back cross-country originating from the home base airport. This scenario will be conducted under simulated or actual IFR conditions, or a combination of both. The PT can expect a full range of IFR approaches, ATC situations, and emergency scenarios – just as would normally be expected in everyday charter operations. Review IFR cross-country procedures, including IFR flight planning. The lesson will also familiarize the PT with IFR departure, enroute, and arrival procedures. Emphasis will be on preflight planning and IFR cross-country procedures.

The PT should gain increased proficiency in basic instrument maneuvers including GPS, VOR and Radar orientation. The PT will review intercepting and tracking VOR radials. In addition, the PT also will increase proficiency and confidence in partial panel maneuvers and procedures. Included is a review of systems and equipment malfunctions and emergency procedures. Emphasis will be on instrument approaches.

What qualifications must the pilot have in order to conduct a mission as described in this scenario? On-Demand Charter in potential IFR conditions requires additional experience, training and testing of the pilot involved. FAR 135.243 outlines the Pilot in Command qualifications for this flight: "(a) No certificate holder may use a person, nor may any person serve, as pilot in command in passenger-carrying operations—under IFR unless that person—

(1) Holds at least a commercial pilot certificate with appropriate category and class ratings and, if required, an appropriate type rating for that aircraft; and (2) Has had at least 1,200 hours of flight time as a pilot, including 500 hours of cross

country flight time, 100 hours of night flight time, and 75 hours of actual or simulated instrument time at least 50 hours of which were in actual flight; and (3) For an airplane, holds an instrument rating or an airline transport pilot certificate with an airplane category rating."

For the purpose of this flight lesson, it will be assumed that the PT meets all the CFR requirements to conduct this flight.

Lesson Objectives
The mission will be complete and the objective of this lesson will be met when the PT delivers the customer to the meeting and back home using the IFR system to accomplish the mission. The PT must adhere to all IFR flight operations regulations and best practices with the safety of the flight never in doubt.

Standard Pre-Flight Briefing Procedures

Completion Standards
This lesson will be complete when the customer has been delivered to the destination airport and later returned home. The PT will fly the airplane within the standards indicated in the current Instrument Rating – Airplane Practical Test Standard. The PT will be proficient with ATC communications and management of the flight in all respects. The PT must also be aware of the need for good customer service. This includes proper safety information given to the customer, and considerations in flight such as altitude changes to avoid turbulence.

Standard Post-Flight Briefing Procedures

Lesson C-IFR 2- On Demand Air Charter Flight- Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Explain								
	IFR Navigation Planning	Explain								
	SRM	Practice								
Preflight Procedures	IFR Systems, Instruments, Navigation	Explain								
	Flight deck checks and engine run-ups	Explain								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Explain								
	Controlled / Uncontrolled airport procedures	Explain								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Explain								
	Instrument, Equipment checks & Eng Shutdown	Explain								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Explain								
	Normal and/or Crosswind Takeoff	Explain								
	SRM	Practice								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Explain								
	Published Departure Procedures	Explain								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Explain								
	Automation systems proficiency	Explain								
	SRM	Practice								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Explain								
	ATC Communications	Explain								
	Navigation on Airways and Direct Routes	Explain								
	Weather Deviations	Explain								
	Hold Pattern Entry and Holds	Explain								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Explain								
	Automation systems proficiency	Explain								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Explain								
	Radar Vectors or Pilot Nav to Initial App Fix	Explain								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Explain								
	Automation systems proficiency	Explain								
	SRM	Practice								
Approach & Landing Procedures	Visual Approach	Explain								
	Non-Precision App without view limiting	Explain								
	Non-Precision App with view limiting (hood, IMC)	Explain								
	Circle to Land	Explain								
	Landing Straight In	Explain								
	SRM	Practice								

Notes to Instructor
C-IFR 2
Scenario/Lesson Notes to Instructor
The role of the instructor on this lesson has two parts. First the instructor sets up the lesson by selecting an airport that is 75 to 100 nautical miles away from the home airport. The airport should have precision or non-precision approached, or both. The scenario calls for the instructor to reveal to the PT the destination of the flight with only 45 minutes until proposed departure. The PT should then prepare for the flight with little or no coaching or supervision from the instructor. The flight planning would include- selecting the proper charts, getting an extensive weather briefing, planning the route of flight, filing an IFR flight plan, dispatching the airplane, and conducting a thorough preflight inspection of the airplane. Second, the role of the instructor on this lesson is to pose as the customer of this on-demand charter flight. Forty-five minutes after informing the PT of the destination, the instructor should “arrive” for the flight. The PT should be completely ready to board the airplane for departure. Be prepared to cancel this lesson if the PT is not ready to depart on time. The scenario requires an on-time departure so that the customer can arrive in time for the meeting – any delay will cause the customer to miss the meeting and that would cancel the need for the flight in the first place. The full range of IFR approaches and a variety of ATC environments should be experienced. The instructor should plan all emergency scenarios so they allow the PT a realistic time period for resolution and do not detract from the approach activity. Allow the PT to conduct all facets of the flight – IFR clearance management, ATC communications, departure, enroute, and approach procedures. Fly the flight in actual IFR conditions if they are present and within the PT’s personal minimums. If IFR conditions are not present the PT should conduct the flight within the IFR system as if IMC were present. Use a view limiting device for portions of the flight, including approaches, if IMC is not present. Make a full stop landing at the destination airport and then return. The instructor should present realistic partial panel scenarios that are applicable to the specific airplane flown and equipment available.

Note: The PT must be able to demonstrate proficiency in the use of whatever avionics is available in the particular airplane to be flown. This could include GPS, ADF, VOR, RMI, or any other equipment applicable.

Commercial IFR Operations – Lesson 3
(C-IFR 3)
On-Demand Charter Mission
Dual Flight Lesson

Note: This lesson is much like C-IFR 2 but it will involve airports with greater traffic density and will allow the PT to gain additional experience and exposure to real world IFR operations.

Scenario: You are a Commercial Pilot working for an FAA Part 135 Air Agency Certificate holder. Your employer has assigned you to deliver a customer to a meeting in another city and return that customer back home after the meeting. The customer has learned of the meeting with very little advanced notice. The customer tells the PT that this trip has just come up and that the customer is leaving the office on the way to the airport right now. The instructor will pose as the customer in this lesson. The instructor/customer will advise the PT of the flight's destination with only 45 minutes until departure – the time it will take the customer to arrive at the airport. The PT must be able to completely and safely plan the flight within the time constraints – otherwise the customer would miss the meeting and therefore have no reason to take the trip. The instructor should be prepared to cancel the lesson if the PT cannot be ready when the customer arrives.

This scenario is planned as a daytime mission to simulate Part 135 On-Demand Air Charter Operations. The scenario will consist of an out and back cross-country originating from the home base airport. This scenario will be conducted under simulated or actual IFR conditions, or a combination of both. The full range of IFR approaches and a variety of ATC environments should be experienced. Review IFR cross-country procedures, including IFR flight planning. The lesson will also familiarize the PT with IFR departure, enroute, and arrival procedures. Emphasis will be on preflight planning and IFR cross-country procedures.

The PT should gain increased proficiency in basic instrument maneuvers including GPS, VOR and Radar orientation. The PT will review intercepting and tracking VOR radials. In addition, the PT also will increase proficiency and confidence in partial panel maneuvers and procedures. Included is a review of systems, airworthiness items, equipment malfunctions and emergency procedures. Emphasis will be on instrument approaches.

Review from the pervious lesson the FAR 135.243 requirements for a person to act as Pilot in Command on this mission. For the purpose of this flight lesson, it will be assumed that the PT meets all the FAR requirements to conduct this flight.

Lesson Objectives
The mission will be complete and the objective of this lesson will be met when the PT delivers the customer to the meeting and back home using the IFR system to accomplish the mission. The PT must adhere to all IFR flight operations regulations and best practices with the safety of the flight never in doubt. Abnormal and Emergency situations are introduced, including partial loss of flight instruments/panels.

Standard Pre-Flight Briefing Procedures

Completion Standards
This lesson will be complete when the customer has been delivered to the destination airport and later returned home. The PT will fly the airplane within the standards indicated in the current Instrument Rating – Airplane Practical Test Standard. The PT will be proficient with ATC communications and management of the flight in all respects. The PT must also be aware of the need for good customer service. This includes proper safety information given to the customer, and considerations in flight such as altitude changes to avoid turbulence. Lesson C-IFR 4 that follows this lesson calls for the PT to fly solo into the IFR system and into IMC if the weather on the day of that lesson meets the PT's personal minimums. Therefore, one of the completion standards of this lesson is for the PT to display the proficiency necessary to fly IFR solo on the next lesson. Consequently, this lesson may require more than one flight to complete and the PT should be told of this fact.

Standard Pre-Flight Briefing Procedures

Lesson C-IFR 3- On Demand Air Charter Flight- Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information & IFR Navigation Planning	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Practice								
Preflight Procedures	IFR Systems, Instruments, Navigation	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Explain								
	Instrument, Equipment checks & Eng Shutdown	Explain								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Explain								
	Normal and/or Crosswind Takeoff	Explain								
	SRM	Practice								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Explain								
	Published Departure Procedures	Explain								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Explain								
	Automation systems proficiency	Explain								
	SRM	Practice								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Explain								
	ATC Communications	Explain								
	Navigation on Airways and Direct Routes	Explain								
	Partial loss of flight instruments/displays	Explain								
	Hold Pattern Entry and Holds	Explain								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Explain								
	Automation systems proficiency	Explain								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Explain								
	Radar Vectors or Pilot Nav to Initial App Fix	Explain								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Explain								
	Automation systems proficiency	Explain								
	SRM	Practice								
Approach & Landing Procedures	Non-Precision App with view limiting (hood, IMC)	Explain								
	Precision App without view limiting	Explain								
	Precision App with view limiting (hood, IMC)	Explain								
	Circle to Land	Explain								
	Landing Straight In	Explain								
	SRM	Practice								

Notes to Instructor
C-IFR 3
Scenario/Lesson Notes to Instructor
Much the same as the instructor role in C-IFR 2, the instructor should select an airport that is 75 to 100 nautical miles away from the home airport. The airport should have precision approaches to be used on the flight. The airport selected should have the potential for higher density air traffic than was possible for the airports selected in lessons C-IFR1 and C-IFR 2. This could mean Class D, C, or B airspace as applicable. The scenario calls for the instructor to reveal to the PT the destination of the flight with only 45 minutes until proposed departure. The PT should then prepare for the flight with little or no coaching or supervision from the instructor. The flight planning would include- selecting the proper charts, getting an extensive weather briefing, planning the route of flight, filing an IFR flight plan, dispatching the airplane, and conducting a thorough preflight inspection of the airplane. Second, the role of the instructor on this lesson is to pose as the customer of this on-demand charter flight. Forty-five minutes after informing the PT of the destination, the instructor should “arrive” for the flight. The PT should be completely ready to board the airplane for departure. Be prepared to cancel this lesson if the PT is not ready to depart on time. The scenario requires an on-time departure so that the customer can arrive in time for the meeting – any delay will cause the customer to miss the meeting and that would cancel the need for the flight in the first place. Allow the PT to conduct all facets of the flight – IFR clearance management, ATC communications, departure, enroute, and approach procedures. Fly the flight in actual IFR conditions if they are present and within the PT’s personal minimums. If IFR conditions are not present the PT should conduct the flight within the IFR system as if IMC were present. Use a view limiting device for portions of the flight, including approaches, if IMC is not present. Make a full stop landing at the destination airport and then return. If IMC conditions were not experienced by the PT in lessons C-IFR 1 and/or C-IFR 2 then make every effort to include actual IFR conditions on this lesson. The instructor should plan all emergency scenarios so they allow the PT a realistic time period for resolution and do not detract from the approach activity.

Note: The PT must be able to demonstrate proficiency in the use of whatever avionics is available in the particular airplane to be flown. This could include GPS, ADF, VOR, RMI, or any other equipment applicable.

Commercial IFR Operations – Lesson 4 A & B
(C-IFR 4)
On-Demand Charter Mission
Solo Flight Lesson

Note: This scenario is similar to previous lesson scenarios, with the difference being that on this lesson, at the discretion of the Instructor, the PT conducts the mission as the sole occupant of the airplane under Instrument Meteorological Conditions (IMC) or with a view-limiting device and a qualified safety pilot under Visual Meteorological Conditions (VMC). This solo/safety pilot, flight will be considered Lesson 4B. However, at the discretion of the Instructor, the Instructor may elect to conduct this flight as a Dual lesson which would be considered Lesson 4A. The Dual lesson 4A would be followed by the Solo flight (Lesson 4B).

Scenario: You are a Commercial Pilot working for an FAA Part 135 Air Agency Certificate holder. A customer of your company must have a sealed bid for a construction project delivered to another airport and your employer has assigned you to make the delivery. Following the delivery you are to fly back home. The PT must be able to completely and safely plan the flight and make the delivery on time or the bid will not be accepted – potentially costing the customer thousands of dollars. The instructor should be prepared to cancel the lesson if the PT cannot be ready to depart by a pre-set time.
This scenario is planned as a daytime mission to simulate Part 135 On-Demand Air Charter Operations. The scenario will consist of an out and back cross-country originating from the home base airport. This scenario will be conducted under simulated or actual IFR conditions, or a combination of both. The full range of IFR approaches and a variety of ATC environments should be experienced. Review IFR cross-country procedures, including IFR flight planning. The lesson will also familiarize the PT with IFR departure, enroute, and arrival procedures. Emphasis will be on preflight planning and IFR cross-country procedures.
The PT should gain increased proficiency in basic instrument maneuvers including GPS, VOR and Radar orientation. Included is a review systems, airworthiness items and equipment malfunctions. Emphasis will be on instrument approaches.

Review from the pervious lesson the FAR 135.243 requirements for a person to act as Pilot in Command on this mission. For the purpose of this flight lesson, it will be assumed that the PT meets all the FAR requirements to conduct this flight.

Lesson Objectives
The mission will be complete and the objective of this lesson will be met when the PT delivers the bid and returns home using the IFR system to accomplish the mission. The PT must adhere to all IFR flight operations regulations and best practices with the safety of the flight never in doubt.

Standard Pre-Flight Briefing Procedure

Completion Standards
This lesson will be complete when the customer's bid has been delivered to the destination airport and later the PT returns home. The PT will fly the airplane within the standards indicated in the current Instrument Rating – Airplane Practical Test Standard. The PT will be proficient with ATC communications and management of the flight in all respects.

Standard Post-Flight Briefing Procedure

Lesson C-IFR 4 A&B On Demand Air Charter Flight- Dual & Solo **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Practice								
	IFR Navigation Planning	Practice								
	SRM	Practice								
Preflight Procedures	IFR Systems, Instruments, Navigation	Practice								
	Flight deck checks and engine run-ups	Practice								
	SRM	Practice								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Practice								
	Controlled / Uncontrolled airport procedures	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instrument, Equipment checks & Eng Shutdown	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Practice								
	Published Departure Procedures	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Practice								
	ATC Communications	Practice								
	Navigation on Airways and Direct Routes	Practice								
	Weather Deviations	Practice								
	Hold Pattern Entry and Holds	Practice								
	SRM	Practice								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or approach to Airport area	Practice								
	Radar Vectors or Pilot Nav to Initial App Fix	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Visual Approach	Practice								
	Precision and/or Non Precision Approach in VMC	Practice								
	Precision and/or Non Precision Approach in IMC	Practice								
	Circle to Land	Practice								
	Landing Straight In	Practice								
	SRM	Practice								

Notes to Instructor
C-IFR 4
This lesson will either be one Dual Flight (Lesson 4A) followed by a Solo Flight (Lesson 4B). But at the discretion of the Instructor, this lesson can be accomplished with only the Solo Flight (Lesson 4B). The decision to use 4A and 4B versus 4B alone should be based on the Instructor's evaluation of the PT's preparedness to fly in the IFR system alone. If additional confidence and or proficiency is needed, the Instructor can use Lesson 4A one or more times to prepare the PT for a Solo IFR flight. Make sure that the PT is IFR Current before Lesson 4B.

The instructor should select an airport that is 75 to 100 nautical miles away from the home airport. The airport should have non-precision or precision approaches or both to be used on the flight. The airport selected could be an airport that the PT had previously flown to with the instructor. The scenario does not call for the instructor to keep the destination a secret until just prior to takeoff as was the case in previous lessons. It is understood that this is a solo flight where the PT conducts the mission as the sole occupant of the airplane. The flight must take place within the IFR system. The PT will fly the flight in actual IFR conditions if they are present and within the PT's personnel minimums. If IFR conditions are not present the PT should conduct the flight within the IFR system as if IMC were present. No view limiting device would be used however. Allow the PT to plan this flight well in advance, possibly for several days, but on the actual day of the flight, set a departure time that must take place within 30 minutes. Keep in mind that if actual IFR conditions are present on the day of this lesson, it is likely that this will be the PT's first solo IFR experience. Have the PT make a full stop landing at the destination airport, call the instructor when on the ground, and then return.

Commercial IFR Operations – Lesson 5
(C-IFR 5)
High Density Airport Flight
Dual Flight Lesson

Note: This lesson is much like previous On-Demand Charter scenarios, but it will involve airports with greater traffic density, including Class B airspace if practical, and will allow the PT to gain additional experience and exposure to real world IFR operations.

Scenario: You are a Commercial Pilot working for an FAA Part 135 Air Agency Certificate holder. A educator in your area has been asked to deliver a speech at a conference in another city and has employed your company to provide air transportation. Your employer has assigned you to deliver this customer to the conference and return that customer back home afterward.

This scenario is planned as a daytime mission to simulate Part 135 On-Demand Air Charter Operations to a high density airport (Class B if practical). The scenario will consist of an out and back cross-country originating from the home base airport. This scenario will be conducted under simulated or actual IFR conditions, or a combination of both. The full range of IFR approaches and a variety of ATC environments should be experienced. Review IFR cross-country procedures, including IFR flight planning. The lesson will also familiarize the PT with IFR departure, enroute, and arrival procedures. Emphasis will be on preflight planning and IFR cross-country procedures.

The PT should gain increased proficiency in basic instrument maneuvers including GPS, VOR and Radar orientation. The PT will review intercepting and tracking VOR radials. In addition, the PT also will increase proficiency and confidence in partial panel maneuvers and procedures. Included is a review of systems, equipment malfunctions and emergency procedures. Emphasis will be on enroute and instrument approaches.

Review from the pervious lesson the FAR 135.243 requirements for a person to act as Pilot in Command on this mission. For the purpose of this flight lesson, it will be assumed that the PT meets all the FAR requirements to conduct this flight.

Lesson Objectives
The mission will be complete and the objective of this lesson will be met when the PT delivers the customer to the meeting and back home using the IFR system to accomplish the mission. The PT must adhere to all IFR flight operations regulations and best practices with the safety of the flight never in doubt.

Standard Pre-Flight Briefing Procedure

Completion Standards
This lesson will be complete when the customer has been delivered to the destination airport and later returned home. The PT will fly the airplane within the standards indicated in the current Instrument Rating – Airplane Practical Test Standard. The PT will be proficient with ATC communications and management of the flight in all respects. Lesson C-IFR 6 that follows this lesson calls for the PT to fly solo into the IFR system and into IMC if the weather on the day of that lesson meets the PT's personal minimums. Therefore, one of the completion standards of this lesson is for the PT to display the proficiency necessary to fly IFR solo on the next lesson. Consequently, this lesson may require more than one flight to complete and the PT should be told of this fact.

Standard Post-Flight Briefing Procedure

Lesson C-IFR 5 – High Density Airport Flight - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & IFR Navigation Planning	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	IFR Systems, Instruments, Navigation	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equip checks & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Perform								
	Published Departure Procedures	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Perform								
	ATC Communications	Perform								
	Navigation on Airways and Direct Routes	Perform								
	Abnormal and Emergency situations	Perform								
	Hold Pattern Entry and Holds	Perform								
	SRM	Manage/Decide								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Perform								
	Radar Vectors or Pilot Nav to Initial App Fix	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures High Density Airport	Partial loss of flight instruments/displays	Perform								
	Precision and/or Non Precision App in VMC	Perform								
	Precision and/or Non Precision App in IMC	Perform								
	Circle to Land	Perform								
	Landing Straight In	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-IFR 5
Scenario/Lesson Notes to Instructor
The instructor should select an airport that presents the greatest challenge so far in the PT's training. Select a Class B airport, if that is practical. The airport should have precision approaches to be used on the flight. The airport selected should have the potential for higher density air traffic than was possible for the airports previously selected. Allow the PT to plan the flight well in advance. Unlike previous scenarios, the instructor may reveal the destination before the day of the flight, but on the day of the flight there must be a preset departure time. The PT must prepare and depart within 30 minutes of that preset time or the lesson should be cancelled. The PT's flight planning would include: selecting the proper charts, getting an extensive weather briefing, planning the route of flight, filing an IFR flight plan, dispatching the airplane, and conducting a thorough preflight inspection of the airplane. Allow the PT to conduct all facets of the flight – IFR clearance management, ATC communications, departure, enroute, and approach procedures. Fly the flight in actual IFR conditions if they are present and within the PT's personal minimums. If IFR conditions are not present the PT should conduct the flight within the IFR system as if IMC were present. Use a view limiting device for portions of the flight, including approaches, if IMC is not present. Make a full stop landing at the destination airport and then return. If IMC conditions were not experienced by the PT in previous lessons, then make every effort to include actual IFR conditions on this lesson. The instructor should plan all emergency scenarios so they allow the PT a realistic time period for resolution and do not detract from the approach activity

Commercial IFR Operations – Lesson 6
(C-IFR 6)
On-Demand Life Flight Mission
Solo Flight Lesson

Note: This scenario is similar to previous lesson scenarios, with the difference being that on this lesson the PT conducts the mission as the sole occupant of the airplane and into higher density airspace with time constraints.

Scenario: You are a Commercial Pilot working for an FAA Part 135 Air Agency Certificate holder. The company that you work for has a standing contract with an Organ Transplant Procurement agency in your state. The contract requires that airplanes and pilots be standing by in a moments notice to deliver transplant organs to recipients in other cities. Today is one of those days. The hospital has just called your employer and asked that a donated organ be flown to another town for immediate transplant and your boss has assigned to conduct this flight. The transplant organ has just been "harvested" and will be delivered in an ambulance to your airport. There are several potential recipients of this organ. It is the job of the Transplant Procurement agency to decide who will get the transplant. Only when they decide who gets the organ will you know where you are flying. You will only have 45 minutes notice of the destination. Your mission is to completely plan, prepare, and fly this mission alone and deliver the organ for transplant – needless to say you cannot be late. The instructor will cancel this lesson if the PT cannot be ready when the transplant organ arrives (45 minutes after destination notification).

This scenario is planned as a daytime mission to simulate Part 135 On-Demand Air Charter Operations. The scenario will consist of an out and back cross-country originating from the home base airport. This scenario will be conducted under simulated or actual IFR conditions, or a combination of both. The full range of IFR approaches and a variety of ATC environments should be experienced. Review IFR cross-country procedures, including IFR flight planning. The lesson will also familiarize the PT with IFR departure, enroute, and arrival procedures. Emphasis will be on preflight planning and IFR cross-country procedures.

The PT should gain increased proficiency in basic instrument maneuvers including GPS, VOR and Radar orientation. Included is a review systems and airworthiness items. Emphasis will be on enroute and instrument approaches.

Review from the pervious lesson the FAR 135.243 requirements for a person to act as Pilot in Command on this mission. For the purpose of this flight lesson, it will be assumed that the PT meets all the FAR requirements to conduct this flight.

Lesson Objectives
The mission will be complete and the objective of this lesson will be met when the PT delivers the harvested transplant organ to the destination airport and arrives back home using the IFR system to accomplish the mission. The PT must adhere to all IFR flight operations regulations and best practices with the safety of the flight never in doubt.

Standard Pre-Flight Briefing Procedures

Completion Standards
This lesson will be complete when the harvested transplant organ has been delivered to the destination airport and later the PT returns home. The PT will fly the airplane within the standards indicated in the current Instrument Rating – Airplane Practical Test Standard. The PT will be proficient with ATC communications and management of the flight in all respects

Standard Pre-Flight Briefing Procedures

Lesson C-IFR 6 – On Demand Life Flight - Solo **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & IFR Navigation Planning	Perform								
	Airworthiness Issues – Inop Eqip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	IFR Systems, Instruments, Navigation	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equip checks & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Perform								
	Published Departure Procedures	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Perform								
	ATC Communications	Perform								
	Navigation on Airways and Direct Routes	Perform								
	Weather Deviations	Perform								
	Hold Pattern Entry and Holds	Perform								
	SRM	Manage/Decide								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Perform								
	Radar Vectors or Pilot Nav to Initial App Fix	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Visual Approach	Perform								
	Precision and/or Non Precision App in VMC	Perform								
	Precision and/or Non Precision App in IMC	Perform								
	Circle to Land	Perform								
	Landing Straight In	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-IFR 6
Scenario/Lesson Notes to Instructor
The instructor should select an airport that is 75 to 100 nautical miles away from the home airport. This airport should present a significant challenge to the PT with the potential of high density air traffic, multiple arrival procedures, and multiple instrument approaches. The airport selected could be an airport that the PT had previously flown to with the instructor. After the PT arrives at the airport for the lesson inform the PT of the destination. The PT must be able to go from first hearing of the destination to being completely ready to board the airplane for departure within 45 minutes. Cancel this lesson if the PT is not ready to depart on time. It is understood that this is a solo flight where the PT conducts the mission as the sole occupant of the airplane. The flight must take place within the IFR system. The PT will fly the flight in actual IFR conditions if they are present and within the PT's personal minimums. If IFR conditions are not present the PT should conduct the flight within the IFR system as if IMC were present. No view limiting device would be used however. Keep in mind that if actual IFR conditions are present on the day of this lesson, it is possible that this will be the PT's first solo IFR experience. Have the PT make a full stop landing at the destination airport, call the instructor when on the ground, and then return.

Commercial IFR Operations – Lesson 7
(C-IFR 7)
IFR Operations Stage Check
Dual Flight Check

Scenario: You are a Commercial Pilot. You have been hired to fly for a Part 135 Operator, but just recently met the minimums for flight time to qualify as Pilot in Command for IFR operations. Your continued employment is contingent on your ability to start flying Part 135 IFR on your own as PIC. Another pilot recently left the company so now the company needs another IFR Pilot in Command, but for you to fill the position you must pass a check ride given by the company check airman. Today you will fly with the check airman to see if you can keep your job.

Lesson Objectives
The objective of this lesson is to perform all IFR flight operations at the Commercial Pilot / Instrument Rating skill level while displaying excellent judgment and decision making abilities. The PT will be evaluated by either 1) a senior flight instructor, or 2) the chief flight instructor (if applicable), or 3) an assistant chief instructor (if applicable), or 4) a designated check instructor (if applicable). The lesson will be successful and the objectives of the lesson accomplished when all IFR operations are completed at the Commercial Pilot / Instrument Rating skill level.

Standard Pre-Flight Briefing Procedure

Completion Standards
All IFR operations evaluated on this lesson must meet the minimum criteria for that operation as described in the most current edition of the Commercial Pilot Practical Test Standard and the Instrument Rating – Airplane Practical Test Standard.

Standard Pre-Flight Briefing Procedure, followed by a recommendation from the Check Instructor that this Strand has been completed, or that the PT should return to the Strand for improvement.

Lesson C-IFR 7- IFR Operations Check - Dual
Desired Outcome Grade Sheet

Scenario Activities	Task	Desired Performance	Task Grades: Not Observed	Describe	Explain	Practice	Perform	SRM Grades: Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information & IFR Navigation Planning	Perform								
	Airworthiness Issues – Inop Equip, Inspections	Perform								
	SRM	Manage/Decide								
Preflight Procedures	IFR Systems, Instruments, Navigation	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Receiving an IFR Clearance & Read back	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equip checks & Eng Shutdown	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure	IFR Takeoff Minimums & Climb out procedures	Perform								
	Published Departure Procedures	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Enroute IFR Cross Country Operations	Safe attitude instrument flying	Perform								
	ATC Communications	Perform								
	Navigation on Airways and Direct Routes	Perform								
	Abnormal and Emergency situations	Perform								
	Hold Pattern Entry and Holds	Perform								
	SRM	Manage/Decide								
Enroute Operations Navigation & Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or app to Airport area	Perform								
	Radar Vectors or Pilot Nav to Initial App Fix	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures High Density Airport	Partial loss of flight instruments/displays	Perform								
	Precision and/or Non Precision App in VMC	Perform								
	Precision and/or Non Precision App in IMC	Perform								
	Circle to Land	Perform								
	Landing Straight In	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-IFR 7
This lesson is the final lesson in the Commercial IFR sequence. To aid in the evaluation process, the lesson must be conducted by an instructor that does not ordinarily fly with this particular PT. The instructor must be either 1) a senior flight instructor, or 2) the chief flight instructor (if applicable), or 3) an assistant chief instructor (if applicable), or 4) a designated check instructor (if applicable). The scenario calls for the flight to be a test of a person already employed by a Part 135 company, but passing the test is required if the person is allowed to advance in the company or even remain employed with the company. A test which is more than just pass/fail but instead threatens the person's job security will provide additional pressure. The instructor conducting this lesson may incorporate another scenario as a subset of the overall check airman scenario. In other words, the instructor can pose a scenario within the test similar to those in lessons C-IFR 1 through C-IFR 6 to help evaluate judgment and decision making.

Aircraft Systems Checkout Flight
(C-Multiengine 1)
Dual Flight Lesson

Scenario: You are a Commercial Pilot, and have just been hired by a Fixed Base Operator (FBO) to perform various commercial pilot services for the company. As part of the new-hire process you must get checked out in all the airplanes that are owned and operated by the company. This company checkout is necessary to operate the airplanes safely, but also to meet the company's insurance requirements. Today you will check out in a conventional (one engine on each wing) multiengine airplane that also qualifies as a complex airplane. The term "complex" airplane refers to any airplane that has a constant speed propeller, retractable landing gear, and retractable flaps. Because multiengine and complex airplanes has more advanced systems, it requires a more lengthy checkout than for a single engine, non-complex airplane. The insurance company especially is interested in your ability to follow retractable landing gear procedures and deal with issues of multiengine aerodynamics. Multiengine airplanes are obviously more expensive and therefore the cost to insure them is higher. Insurance companies routinely will set minimum experience times for multiengine airplanes before they will offer insurance at any price. The FAA requirements are almost always less than the insurance requirements, consequently pilots who first become multiengine rated are legal to fly a multiengine airplane as far as the FAA is concerned, but at the same time the low-time multiengine pilot is uninsurable. This places a high value on quality multiengine instruction.

Lesson Objectives
The objective of this lesson is to completely familiarize the PT with the multiengine airplane controls, cockpit layout and its complex airplane systems and the proper procedures to safely operate those systems. The PT will demonstrate the safe and efficient operation of the multiengine / complex airplane's systems to the level indicated on the grade sheet to include aircraft systems and airworthiness, safe engine start procedures, taxiing with differential power, pre-takeoff checklists and systems checks, normal takeoff, traffic pattern, slow flight, power off and power on stall demonstrations, demonstration of flight with one engine set for zero thrust, manual landing gear extension, drag demonstration and normal two-engine landing.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The PT will be advised that often it will take more than one flight to meet the completion standards for one lesson. This should not imply that the student has not performed well – it may simply be that not all the tasks of the lesson could be accomplished in one flight. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and

schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion Standards
This lesson is complete when the PT understands the principles of operation of the various multiengine / complex airplane systems and can demonstrate the safe and efficient use of those systems. During takeoff and landing the student will demonstrate good directional control and maintain liftoff, climb, approach and touchdown airspeed within 10 knots of the correct airspeed for the airplane used.

Post Flight Briefing, Preview of next lesson and assignments: After the flight has been concluded, properly store/tiedown the airplane, and complete all administrative duties (turn in the aircraft tach and Hobbs times, complete payment invoice, etc). Close the flight plan if one had been opened during the flight. The PT and Instructor should then take separate copies of the lesson's Desired Outcome Grade Sheet to separate and private locations. The PT and Instructor each grade the lesson using the Learner Centered Grading method. After both have completed the grading, the PT and Instructor get back together and compare grade sheets. There will certainly be tasks where the PT and Instructor agree on the grade. There will certainly be tasks where the PT and Instructor disagree on a grade – discussion points some from those areas of disagreement. The PT and Instructor should explain to each other why they indicated the grade that they awarded and from this a greater gain in learning (for both PT and Instructor) will result.

Lesson C-Multiengine1–Aircraft System Check-Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Practice								
	Airworthiness – Inop Instruments & Equipment	Explain								
	SRM	Practice								
Preflight Procedures	Multiengine / Complex Aircraft Systems – Prop & Landing Gear	Describe								
	Flight deck checks and engine run-ups	Describe								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequencing	Practice								
	Controlled / Uncontrolled airport procedures	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure Complex Airplane	Retractable Landing Gear Operations	Describe								
	Manifold Pressure and Propeller Control	Describe								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Multiengine/Complex Airplane	Safe aircraft control-one engine set at zero thrust	Describe								
	Cruise Manifold Pressure Settings	Describe								
	Cruise RPM Settings & Cowl Flaps	Describe								
	Slow flight (two-engines)	Describe								
	Power on and Power off Stall demonstrations	Describe								
	Steep Turns	Describe								
	Drag demonstration	Describe								
	Landing Gear Emergencies / Manual Gear Ext	Describe								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Practice								
	Retractable Landing Gear Operations & Safety	Explain								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Transition to Airport environment	Practice								
	Traffic Pattern Operations	Practice								
	Normal two-engine Approach and Landing	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instrument, Equipment checks & Eng Shutdown	Practice								
	SRM	Practice								

Notes to Instructor
C-Multiengine 1

This lesson is the first time the PT will fly with two engines and may also be the first time in a complex airplane, so spend plenty of time on cockpit familiarization. Spend more time on the pre-flight briefing on this lesson than on any other in this section. Have the student take home aircraft information manuals prior to this lesson as well. Cover at length the operating principles of the landing gear system, the constant speed/feathering propellers, the manifold pressure gauge, the electrical, hydraulic, and automation systems. The PT can often be overwhelmed by the “fist full of throttles” idea on this lesson. Except for a simulated engine out demonstration during this lesson, you should use both engines through out the lesson and operated the two throttles as one – this will make the PT more comfortable at first. Demonstrate differential power while taxiing and how that can be used to the pilot’s advantage. Also demonstrate how difficult it is to taxi while one engine is at an idle power setting. Within the scenario of an aircraft checkout, put the airplane through its paces: slow flight, power on and power off stall demonstrations, steep turns, prop sync, a simulated loss of power on one engine (at a safe altitude), and a drag demonstration. The drag demonstration should be performed with one engine at “zero thrust” and the other at a setting that will maintain level flight. Lower the landing gear and without adjusting power on either engine note what effect the drag of the landing gear has on the vertical speed indicator. Raise the landing gear and repeat with the flaps at various angles of deflection and note the effect on the VSI. Compare the drag of landing gear versus flaps and relate both to single engine performance charts. You can attempt to maintain level flight by adding power to the operating engine in each case: gear down and flaps down to demonstrate that losing 50% of your power (one engine out) can decrease performance by 80%! Smoothly bring both throttles forward when recovering from the demonstration. Note: The condition known as “zero thrust” is a training maneuver. Often for demonstration purposes instructors will want to simulate one-engine operations without actually shutting down an engine. In an actual engine shut down, the pilot would also feather the proper to reduce drag. An engine at idle, as would be the case with an engine running single-engine demonstration, will produce more drag than a feathered prop. So the instructor can add just enough power to the idle engine to offset this drag and in effect simulate the reduced drag of a feathered prop without actually shutting down the engine and feathering the prop.

Commercial Multiengine – Lesson 2
(C-Multiengine 2)
Aircraft Checkout Flight
Dual Flight Lesson

Scenario: You are a Commercial Pilot but you are away from your home base. While away you want to rent a multiengine/complex airplane from a Fixed Base Operator. The FBO's insurance company requires that before you can be provided with insurance coverage you must receive a thorough checkout in the airplane you intend to rent. Insurance requirements for multiengine airplanes exceed that of single engine airplanes, so verify the minimum requirements of the insurance company before renting any airplane – you never want to rent an airplane without insurance coverage, unless you are prepared to purchase the airplane should anything happen. You set up a time to meet with one of the FBO's instructors to accomplish the checkout. The insurance company specifically requires that in addition to a complete knowledge of the multiengine/complex airplane's systems and their use, the renter also demonstrate proficiency in basic flight skills. Specific areas of interest are: maneuvering the airplane with one engine set at zero thrust, Vmc Demonstrations, two-engine instrument approaches, crosswind and maximum performance takeoff and landings, rejected landing (two engines), and the ability to land the airplane from the traffic pattern with power on only one engine.

Lesson Objectives
The objective of this lesson is to introduce more advanced maneuvers such as crosswind and maximum performance takeoff and landings as well as maneuvers that are unique to the multiengine airplane, such as maneuvering with one engine at idle, Vmc demonstrations, and landing with one engine at idle.

Standard Pre-Flight Briefing Procedure

Completion Standards
The lesson is complete when the PT is at the level indicated for each maneuver on the desire outcome grading sheet.

Standard Post-Flight Briefing Procedure

Lesson C-Multiengine2–Aircraft Check Flight -Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Practice								
	Airworthiness – Inspections / Inop Equipment	Practice								
	SRM	Practice								
Preflight Procedures	Multi-eng Aircraft Systems–Prop & Landing Gear	Explain								
	Flight deck checks and engine run-ups	Explain								
	SRM	Explain								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequencing	Practice								
	Controlled / Uncontrolled airport procedures	Practice								
	SRM	Practice								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Practice								
	Normal and/or Crosswind Takeoff	Practice								
	SRM	Practice								
Takeoff & Departure Multiengine/Complex Airplane	Retractable Landing Gear Operations	Explain								
	Manifold Pressure and Propeller Control	Explain								
	SRM	Explain								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Multiengine Aerodynamics Maneuvers	Safe aircraft control operation	Practice								
	Safe Multiengine maneuvering altitude	Practice								
	Propeller Synchronization	Practice								
	Maneuvering with one engine set at zero thrust	Explain								
	Zero Thrust Demonstration	Explain								
	Flight with zero side slip	Explain								
	Drag Demonstration	Explain								
	Vmc Demonstration	Explain								
	SRM	Explain								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Practice								
	Retractable Landing Gear Operations & Safety	Practice								
	SRM	Practice								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Practice								
	Automation systems proficiency	Practice								
	SRM	Practice								
Approach & Landing Procedures	Transition to Airport / Instrument Approach	Practice								
	Normal and/or Crosswind Landing	Practice								
	Rejected Landing	Practice								
	Short & Soft Field Approach and Landing	Practice								
	Landing with one engine set at zero thrust	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Practice								
	Instrument, Equipment checks & Eng Shutdown	Practice								
	SRM	Practice								

Notes to Instructor
C-Multiengine 2
It may have taken several flights to get the PT to the completion standards of C-Multiengine 1, largely due to the amount of new systems to learn on top of a new airplane that is heavier and with a more complicated cockpit than the PT was previously used to. Lesson C-Multiengine 2 should start to shift the responsibility for the pre-flight inspection and planning to the PT. This lesson is heavy with multiengine aerodynamics topics. You should spend considerable time on the ground discussing how having an engine failure affects the control of the airplane. The use of visual aids and models is highly recommended to illustrate single-engine flight characteristics. In the first lesson you demonstrated the feel of the airplane when one throttle is reduced to idle. In this lesson you actually maneuver the airplane with one engine at idle. Introduce the concept and let the student practice Zero Side Slip while flying straight and level with one engine at idle. One of the most challenging of all flight maneuvers is the Vmc Demonstration. It is highly recommended that this maneuver be conducted without backseat passengers or unnecessary aft weight. Talk with the student on the ground before flight about the factors that effect the minimum control speed: feathered versus windmilling prop, total aircraft weight, center of gravity location, zero side slip versus ball in the center, and the concept of critical engine. Discuss how the Vmc demonstration will be set up in your airplane. Discuss safe altitudes for all multiengine maneuvering. The scenario of this flight is an aircraft insurance checkout flight. The majority of the lesson can be conducted close to the original airport, but you should allow for at least one, two-engine instrument approach. It is very important that the PT has a high level of instrument proficiency when they first begin the Multiengine strand. The two-engine approach, to the IFR proficient pilot, should not be a challenge – using both throttles as one. If you detect that the PT lacks sufficient instrument skills at this point, it may be a good idea to recommend some additional instrument proficiency lessons in a single-engine airplane, before moving on from this point. On this lesson the PT should adapt short and soft field takeoff and landing techniques from previous lessons and pervious airplanes into the multiengine airplane. At the conclusion of the checkout flight, have the PT make an approach and landing from the traffic pattern with one engine set at zero thrust. It is important that the PT realizes that the key to this maneuver is good planning. Planned well the airplane will eventually be on short final approach over the runway when both throttles are reduced to idle and the effects of having power on only one engine will disappear.

Aircraft Performance Flight
(C-Multiengine 3)
Dual Flight Lesson

Scenario: You are a Commercial Pilot working for a Fixed Base Operator (FBO) at your home airport. The owner of the FBO has decided to purchase a multiengine / complex airplane. The current owner of the airplane will allow a test flight to be conducted and your boss has asked you to make that flight. Your boss is specifically interested in the airplane's safety in abnormal situations and single engine performance characteristics. Your mission is to learn how this multiengine / complex airplane performs during engine-out related emergencies and what the pilot must do to maintain safety during those emergencies.

The PT will also have to cope with inoperative equipment and must determine if the airplane still maintains its "legal airworthiness" by consulting 14 CFR 91.213 or Minimum Equipment Lists as appropriate.

Lesson Objectives
This lesson is complete when the PT can demonstrate safe and efficient operation of the multiengine / complex airplane during abnormal situations of engine failure on takeoff roll before Vmc, Engine failure on climbout after Vmc, Identifying a failed engine, engine shut-down enroute, instrument approach with one engine at idle, and rejected landings with two engines operating and with one engine at idle.

Completion Standards
All these maneuvers must be completed to the level indicated on the Desired Outcome Grade sheet for this lesson. More than one flight could be needed to meet the standards of this lesson.

Standard Pre-Flight Briefing Procedure

Standard Post-Flight Briefing Procedure

Lesson C-Multiengine 3–Aircraft Performance Flight -Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Perform								
	Airworthiness – Inspections / Inop Equipment	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Multi-eng Aircraft Sys – Prop & Landing Gear	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground ops, signs, taxi, sequencing	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Multiengine Airplane	Engine failure on takeoff roll prior to Vmc	Practice								
	Engine failure on climbout after Vmc	Practice								
	SRM	Practice								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Loss of One engine Maneuvers and Decision Making	Safe aircraft control operation	Perform								
	Safe altitude for single-engine maneuvering	Perform								
	Identifying an Inoperative Engine	Practice								
	Verifying an Inoperative Engine	Practice								
	Troubleshooting: Fix or Feather?	Practice								
	In-Flight Engine Shutdown procedure	Practice								
	Single Engine Maneuvering	Practice								
	Air Start procedure	Practice								
	SRM	Practice								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Perform								
	Retractable Landing Gear Operations & Safety	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Non-Precision Approach – One Eng at idle	Practice								
	Precision Approach – One Eng at idle	Practice								
	Rejected Landing (Go Around) Two Engines	Practice								
	Rejected Landing - One Eng set at Zero Thrust	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equip checks, Eng shutdown	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-Multiengine 3
The PT has been exposed to single engine operations in previous lessons, but Lesson 3 requires to deal with abnormal situations that take place because of the loss of power to one engine. On the takeoff roll and before Vmc, announce to the PT that there is an abnormality in one engine. Examples: “The left engine has low oil pressure!” or “The right engine has smoke coming out!” The PT should not react to the engine with a problem alone, but should reduce to idle the power on both engines. The natural tendency when you hear of a problem of the left engine is to address only the left engine. Be ready for this – the PT may pull back only the throttle on the engine with the problem – this, of course, will give you a bigger problem. The PT should also understand the relationship between this abnormality and the speed of the aircraft relative to Vmc. The PT should realize that at a speed below Vmc, they cannot safely coax the airplane into the air. Their only safe response is to reduce to idle the power on both engines and then while maintaining directional control on the runway centerline, brake to a stop.

Introduce the loss of power on one engine during the climb out from the runway, but wait until the airplane has reached a safe altitude (at least 500 AGL recommended) before you begin. At this low altitude, simulate the loss of power with the throttle, not with an actual engine shutdown. Resume two engine climb as soon as the PT has identified which engine is out, has controlled the airplane and establishes a climb if a climb is possible. You do not want the PT to actually shutdown the engine and feather the propeller, so establish before the flight how the PT should indicate their decision to verify the dead engine and feather. Many instructors have the PT touch, rather than move, the proper throttle and prop control to indicate that they have properly identified the dead engine.

Climb to a safe altitude for demonstrating actual engine shutdowns. 5,000 feet AGL is recommended plus any additional altitude needed to get back to an airport if you cannot get the engine restarted. Present the loss of power on one engine first by reducing the throttle to idle. The student should start the procedure to identify and then verify the dead engine – but stop short of an actual shutdown and feather. The PT should maintain aircraft control and establish level flight on one engine. With plenty of altitude, the PT should now troubleshoot the problem and ask the question: Can I fix the problem or do I have no choice but to shutdown and feather. The PT should understand that a low-altitude engine failure – like during takeoff and climb out – does not allow time to troubleshoot. An engine failure immediately after takeoff does not allow the luxury of time needed to ask: Can I fix the problem? But in this high altitude situation the PT should attempt to “fix” the problem. It would compound the problem if the PT automatically shutdown and feathered the engine, when all that was really

needed was to turn on a fuel pump, switch fuel tanks, adjust mixture, or isolate a failed magneto. The PT should maintain safe single engine flying speed and divide their attention between safely flying the airplane and troubleshooting the problem. After attempting to identify the cause of the engine failure, you can have the PT reach the conclusion that a “fix” is not possible and the PT is faced with an actual engine shutdown and feather. Use the manufacturer’s recommended procedure to shutdown, feather and secure the failed engine. It always is an eye-opening experience for the PT to see the propeller actually feathered and motionless in flight! Maneuver the airplane for a time with the engine feathered and secured. Have the PT make turns with up to 30 degrees bank in both directions, and make climbs and descents. Do not maneuver for an extended time because of shock cooling problems. The engine that is shut down is no longer producing its own heat and is exposed to cold ram airflow. Use the manufacturer’s recommended procedure for the airstart and allow time after the engine starts for its temperature to rise before going to higher power settings. Always be prepared for the time when the engine will not restart. Plan ahead to have plenty of altitude so that flight back to an airport with one engine is never in doubt.

Allow the student to conduct both non-precision and precision instrument approaches with one engine at idle power.

Conduct safe rejected landings (or missed approach from one of the instrument approaches) with both engines and with one engine at idle. When considering a rejected landing with only one operating engine, discuss with the PT the concept of the “point of no return.” The lower the airplane gets to the surface the less likely a single engine go-around can be performed safely. At some point a single engine go-around is not a safe option and a landing must be made.

Conduct all these maneuvers within the framework of the lesson scenario, which is a Commercial Pilot is evaluating this airplane for possible purchase by the employer. The PT should be asked to make this evaluation throughout the flight. Ask the PT questions like: “How does it feel now that we are flying on one engine in this airplane?” and “What adverse effects are you noticing as we attempt to climb on one engine in this airplane?” and “How is this airplane different when flying an instrument approach on one engine?” These type questions will draw out the PT’s understanding of the various effects, decisions and problems that arise with the loss of one engine. Have the PT make a written evaluation of the airplanes safety and flight characteristics during abnormal situations, just as if they were making a report to the boss. The scenario calls for the boss to make a purchase decision based on the PT’s evaluation.

Commercial Multiengine – Lesson 4
(C-Multiengine 4)
On Demand Charter Flight
Dual Flight Lesson

Scenario: A government agency in your state is selling off some surplus property. People who would like to purchase the property must enter a sealed bid at the location of the government agency. You are a Commercial Pilot working for a Part 135 Air Taxi company and your employer has assigned you to fly to a nearby airport to deliver a set of purchasing bids for a customer. The package with the bids inside must arrive at the airport in time for a courier to drive the package to the bid opening before the deadline. Bids that arrive after the deadline are not opened, so arriving late means that your customer will lose the chance to purchase the property. Your employer assigns you to take a multiengine airplane to deliver the bid package. The customer has hired your company many times but has not always been satisfied. Failing to deliver the bid package this time will result in loosing a customer and having the owner very upset with you.

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Lesson Objectives

The objective of this lesson is to complete the mission and deliver the bid package to its destination. The PT will plan the flight within a limited amount of time in order to arrive on time. The lesson should take place in VFR conditions, but an IFR flight plan should be filed and a IFR clearance received on this flight. The PT should be prepared to make decisions on this flight pertaining to multiengine abnormal situations, ATC procedures and instrument approaches both straight-in and circle to land.

Pre-Flight Briefing: The PT and Instructor will meet to discuss the Scenario and any pertinent factors related to the flight. The completion standards will be discussed. The current weather conditions will be discussed and a decision to dispatch will be made. If the decision is made not to fly, the PT and Instructor should use the time to review ground school material, prepare for knowledge tests, prepare for oral exams, and/or prepare for and schedule the next flight lesson. If the decision is made to fly, then typically the PT will prepare the aircraft for flight, but the Instructor should go with the PT to the airplane for further discussion.

Completion Standards: This lesson is complete when the PT conducts the flight to the level indicated for each item on the Desired Outcomes Grade sheet. In order for the lesson to be complete the bid package must be on the ground at the destination before the pre-set deadline time.

Post Flight Briefing – Standard procedure including Learner Centered Grading

Lesson C-Multiengine 4 – On Demand Charter - Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information & IFR XC planning	Perform								
	Airworthiness – Inop Instruments & Equipment	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Mult-ieng Aircraft Sys.–Prop& Landing Gear	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequence	Perform								
	Controlled / Uncont airport proc & IFR clear	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & IFR Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Complex Airplane	Retractable Landing Gear Operations	Perform								
	Manifold Pressure and Propeller Control	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Multiengine Enroute Procedures	Safe aircraft control – Eng failure enroute	Perform								
	“Fix or Feather” - Engine Shut Down	Perform								
	Engine securing in flight	Perform								
	Engine Temperature Monitoring	Perform								
	Cowl Flaps Operations	Perform								
	Holding pattern – single engine	Perform								
	Maneuvering on one engine	Perform								
	Air Start	Practice								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Perform								
	Retractable Landing Gear Operations & Safety	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Non-Precision instrument approach	Perform								
	Precision instrument approach	Perform								
	Straight-in landing – One engine at zero thrust	Practice								
	Circle to land – One engine at zero thrust	Practice								
	SRM	Practice								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equipment checks & Eng Shutdown	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-Complex 4
Discuss the flight with the PT prior to the day of the flight either in person, on the phone, or by email. Set a timeline for the flight that will allow sufficient time for a professional pilot to prepare for the flight (including weather briefing, IFR flight plan filing and aircraft preflight inspections) and to fly to the destination airport. Set a definite deadline time to be on the ground at the destination airport. The destination airport should be between approximately 40 and 70 miles from the origination airport and have the instrument approached to support the lesson. Take a package with you on the flight to represent the bid package that is to be delivered. There should be a normal (no abnormal situations) takeoff and climb to cruise altitude. Accept an IFR clearance for the flight, but conduct the flight in VFR conditions. Enroute (approximately half way to the destination) present an engine failure scenario. The PT be able to control the airplane during and after the loss power to one engine and troubleshoot the problem. At the discretion of the instructor, allow the student to execute a full engine shutdown, feather and secure the engine. But don't complete the remainder of the flight with a fully shut down engine. In the scenario do not allow the PT to "fix" the problem and assume they flight will have to continue until completion with power on one engine only. Because of cooling considerations and because it would be too hazardous to leave the engine shutdown enroute and all the way to landing, at some point restart the engine, but leave it at zero thrust power setting for the remainder of the flight. You elect to go to zero thrust from the beginning and not execute the actual engine shutdown.

You should file IFR on both the outbound and inbound legs of this flight. Show the PT how to file two IFR flight plans at once before the first leg. Work with ATC to get a holding pattern assigned on one of the two legs. Work with ATC to get a precision approach after one leg and a non-precision approach after the other. Work with ATC and/or local traffic to get one straight-in single-engine approach and one Circle to land single-engine approach (one engine set at zero thrust in each case – not an actual shutdown and feather).

Note: Executing a Circle to Land approach in a multiengine airplane, with one engine failed is one of the most hazardous maneuvers in all of flight training. It requires excellent planning and knowledge of the performance characteristics of single-engine flight. In a scenario where the airplane will have to fly level, just under the clouds, while making a circle to another runway, it is most ;likely that the procedures for the landing gear extension will have to change. Ordinarily the PT would select the gear handle in the down position and lower the landing gear as the descent portion of the instrument approach began. But most light multiengine airplanes cannot maintain level flight on one engine with the landing gear down. So if the PT knows in advance that a Circle to land maneuver will be required at the bottom of the instrument approach, and assuming power on only

one engine, the PT should elect to leave the landing gear up until in a position at then end of the circle to make the final descent to the runway. On the other hand, if the PT anticipates a straight-in landing and places the landing gear down at the normal location, but then determines that a Circle to land will be necessary, the PT may need to raise the landing gear during the circle. All these possibilities should be presented and practiced by the PT under the strict direction of the instructor. Once on the runway, continue the engine out scenario and have the PT attempt to taxi with one engine. Sometimes you have to make a 270 degree taxi turn toward the dead engine to get where you need to be because it may be that the airplane will not turn away from the dead engine.

Aircraft Performance Flight
(C-Multiengine 5)
Dual Flight Lesson

Scenario: You are a Commercial Pilot working for a Fixed Base Operator (FBO) at your home airport. The owner of the FBO has decided to purchase a multiengine/complex airplane. The current owner of airplane will allow a test flight to be conducted and your boss has asked you to make that flight. Your boss is specifically interested in the airplane's maximum performance capabilities and has asked you to put the airplane through the Commercial Maneuvers to see how it performs. Your mission is to apply the techniques of correctly flying the Commercial maneuvers to this specific multiengine/complex airplane.

The PT will also have to cope with inoperative equipment and must determine if the airplane still maintains its "legal airworthiness" by consulting 14 CFR 91.213.

Lesson Objectives
This lesson is complete when the PT can demonstrate safe and efficient operation of the Complex airplane and can perform the "Commercial Maneuvers:" Chandelle, Lazy Eight, Pylon Eight, and Steep Spiral to the standard indicated in the current Commercial Pilot Practical Test Standard.

Standard Pre-Flight Briefing Procedure

Completion Standards
This lesson is complete when the PT can consistently perform the commercial maneuvers listed in this lesson at or above the Commercial Pilot skill level as indicated in the current Commercial Pilot Practical Test Standard.

Standard Post-Flight Briefing Procedure

Lesson C-Multiengine 5 –Aircraft Performance Flight -Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
			Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Scenario Activities	Task	Desired Performance								
Preflight Preparation	Weather Information	Perform								
	Airworthiness – Inspections / Inop Equipment	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Complex Aircraft Sys – Prop & Landing Gear	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground ops, signs, taxi, sequencing	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Multiengine/Complex Airplane	Retractable Landing Gear Operations	Perform								
	Manifold Pressure and Propeller Control	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Commercial and Performance Maneuvers	Safe aircraft control operation	Perform								
	Flight at Critically Slow Airspeed	Perform								
	Power Off Stall Demonstration	Perform								
	Power On Stall Demonstration	Perform								
	Steep Turns and Steep Spiral	Perform								
	Lazy Eight	Perform								
	Chandelles	Perform								
	Pylon Eights	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Perform								
	Retractable Landing Gear Operations & Safety	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach, Landing and Postflight Procedures	Transition to Airport environment	Perform								
	Normal and/or Crosswind Landing	Perform								
	Short Field Approach and Landing	Perform								
	Soft Field Approach and Landing	Perform								
	Landing with one engine set at zero thrust	Perform								
	Departing the runway safety procedures	Perform								
	Instruments, Equipment, and Engine Shutdown	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-Complex 5
Scenario/Lesson Notes to Instructor
The maneuvers required for this lesson may have been presented in previous lessons, but this is most likely the first time the PT has performed the commercial maneuvers in a multiengine/complex airplane. Be prepared to review the maneuvers, but concentrate on applying these maneuvers in the particular multiengine/complex airplane to be used. The completion of this lesson may require more than one flight so make sure the PT is aware of this fact.

Commercial Multiengine – Lesson 6
(C-Multiengine 6)
Aircraft Checkout Flight
Dual Flight Lesson

Scenario: You are a Multiengine rated Commercial Pilot. You have a friend who is an Advanced Placement science teacher at the local high school. She asks you to take her flying in a multiengine airplane and demonstrate for her all the flight maneuvers and characteristics while she video tapes the flight. She wants her students to see on the tape examples of the physics of flight, lever arm, thrust, lift, various maneuvers, stalls, and the force vectors in play during single engine flight.

Lesson Objectives
This lesson is complete when the PT can demonstrate safe and efficient operation of the multiengine/complex airplane and can perform: short, soft and crosswind takeoffs; maneuvers during slow flight, power on and power off stalls, the commercial maneuvers, maneuvering with one engine set at zero thrust, including a Vmc Demonstration, maneuvering with one engine shutdown, feathered, and secured, precision and non-precision approaches with one engine at idle power and short, soft and crosswind landings. All these maneuvers and procedures must meet the standard indicated in the current Commercial Pilot Practical Test Standard.

Standard Pre-Flight Briefing Procedure

Completion Standards
This lesson is complete when the PT can consistently perform the maneuvers listed in this lesson at or above the Commercial Pilot skill level as indicated in the current Commercial Pilot Practical Test Standard.

Standard Post-Flight Briefing Procedure

Lesson C-Multiengine 6–Aircraft Check Flight -Dual
Desired Outcome Grade Sheet

			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Perform								
	Airworthiness – Inspections / Inop Equipment	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Multi-eng Aircraft Systems – Prop & Land Gear	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground operations, signs, taxi, sequence	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Runway entry & Clearances	Perform								
	Normal and/or Crosswind Takeoff	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Complex Airplane	Maximum Perf takeoffs – Short & Soft Field	Perform								
	Retractable Landing Gear Operations	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Commercial, Performance, and Multiengine Maneuvers	Safe aircraft control operation	Perform								
	Flight at Critically Slow Airspeed	Perform								
	Power On and Power Off Stall Demonstrations	Perform								
	Vmc Demonstration	Perform								
	Identifying and Verifying the loss of one engine	Perform								
	Engine shutdown, feather, and secure	Perform								
	Maneuvering with power on one engine	Perform								
	Commercial Maneuvers	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Perform								
	Retractable Landing Gear Operations & Safety	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Transition to Airport environment	Perform								
	Prec and Non-Prec IFR approach-single engine	Perform								
	Short & Soft Field Approach and Landing	Perform								
	Rejected Landing – one and two engines	Perform								
	Landing with one engine set at zero thrust	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equipment checks& Eng Shutdown	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-Multiengine 6
On this lesson the instructor poses as the high school science teacher. You prepare a “script of the video tape” that lists all the maneuvers procedures that will be included on the flight. When you combine maximum performance takeoff and landings, with multiengine maneuvers and commercial maneuvers – this is a very long and challenging lesson – advise the PT that to complete the lesson/video tape it may require more than one flight. This lesson essentially serves as a final proficiency check of a commercial/multiengine/instrument pilot. Everything must be at the Commercial Pilot Standard as described in the Desired Outcome Grade sheet and the current Commercial Pilot Practical Test Standard.

Aircraft Performance Flight
(C-Multiengine 7)
Corporate Pilot Job Interview
(Final Course Check Flight)
Dual Flight Check

Scenario: You are a Commercial Pilot. You are being interviewed by a department store chain to be one of the corporate pilots for the company. Your job description would be to perform Part 91 corporate owned and operated flights with company officials. You would routinely be required to safely fly both VFR and IFR and have excellent interpersonal skills (sometimes referred to as “soft” skills). The interview consists of three parts. The first part is a personnel interview that is conducted by the Humans Resources department of the company. Applicants who are successful in that interview are then scheduled for the second part of the interview process, which is a technical interview on the systems of a multiengine airplane - conducted by the company’s chief pilot. The third part of the interview is a flight test conducted by the company’s chief pilot. Congratulations! You have just received word that the Human Resources department has approved your application and cleared you to the second part of the interview! You must have done well in the HR interview to get this far. Now you must schedule the technical interview and the flight test. The technical interview will be a test over flight rules, flight planning, federal aviation regulations, weather and weather information, air traffic control procedures and airspace, multiengine/complex airplane operations, instrument flying, and commercial pilot knowledge. If you are successful in the technical interview you will move on to the company flight test. The flight test will consist of scenarios, decision making, and all flight skills to the Commercial Pilot level. Good luck – hopefully you will be offered the job!

Lesson Objectives

The objective of this lesson is to perform all flight operations at the Multiengine/ Commercial Pilot / Instrument Rating skill level while displaying excellent judgment and decision making abilities in a multiengine complex airplane. The PT will be evaluated by either 1) a senior flight instructor, or 2) the chief flight instructor (if applicable), or 3) an assistant chief instructor (if applicable), or 4) a designated check instructor (if applicable). The lesson will be successful and the objectives of the lesson accomplished when all ground knowledge and flight operations are completed at the Multiengine / Commercial Pilot / Instrument Rating skill level.

Completion Standards

All flight operations evaluated on this lesson must meet the minimum criteria for that operation as described in the most current edition of the Multiengine / Commercial Pilot Practical Test Standard with the Instrument Rating – Airplane Practical Test Standard. The PT is recommended to take the Multiengine / Commercial Pilot Practical Test following the successful completion of this lesson.

Lesson C-Multiengine 7– Final Check Flight -Dual **Desired Outcome Grade Sheet**			Task Grades					SRM Grades		
Scenario Activities	Task	Desired Performance	Not Observed	Describe	Explain	Practice	Perform	Explain	Practice	Manage/Decide
Preflight Preparation	Weather Information	Perform								
	Airworthiness – Inspections / Inop Equipment	Perform								
	SRM	Manage/Decide								
Preflight Procedures	Multieng Aircraft Sys – Prop & Landing Gear	Perform								
	Flight deck checks and engine run-ups	Perform								
	SRM	Manage/Decide								
Ground - ATC / Airport Clearance and Procedures	Airport ground ops, signs, taxi, sequencing	Perform								
	Controlled / Uncontrolled airport procedures	Perform								
	SRM	Manage/Decide								
Takeoff – ATC/Airport Clearance & Procedures	Normal and/or Crosswind Takeoff	Perform								
	Maximum Performance Takeoffs	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Multiengine Airplane	Engine failure before Vmc and in climbout	Perform								
	Retractable Landing Gear Operations	Perform								
	SRM	Manage/Decide								
Takeoff & Departure Navigation Systems	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Commercial, Performance and Multiengine Maneuvers	Safe aircraft control operation	Perform								
	Flight at Critically Slow Airspeed	Perform								
	Power on & Power off Stall Demonstrations	Perform								
	Single engine Drag Demonstration	Perform								
	Vmc Demonstration	Perform								
	Identifying and Verifying engine power loss	Perform								
	Engine Shutdown, Feathering & Securing	Perform								
	Commercial Maneuvers	Perform								
	SRM	Manage/Decide								
Arrival & Landing ATC/Airport Clearance & Procedures	ATC Clearances and/or Traffic Pattern entry	Perform								
	Retractable Landing Gear Operations & Safety	Perform								
	SRM	Manage/Decide								
Arrival & Landing Navigation and Automation	Navigation systems proficiency	Perform								
	Automation systems proficiency	Perform								
	SRM	Manage/Decide								
Approach & Landing Procedures	Precision and Non-Precision App – Single Eng	Perform								
	Normal, Crosswind, Rejected Landing	Perform								
	Short & Soft Field Approach and Landing	Perform								
	Circle to land with one engine at zero thrust	Perform								
	Landing with one engine set at zero thrust	Perform								
	SRM	Manage/Decide								
Postflight Procedures	Departing the runway safety procedures	Perform								
	Instrument, Equip checks & Eng Shutdown	Perform								
	SRM	Manage/Decide								

Notes to Instructor
C-Complex 7
This lesson is the final lesson in the Multiengine Commercial Pilot syllabus. To aid in the evaluation process, the lesson must be conducted by an instructor that does not ordinarily fly with this particular PT. The instructor must be either 1) a senior flight instructor, or 2) the chief flight instructor (if applicable), or 3) an assistant chief instructor (if applicable), or 4) a designated check instructor (if applicable). The scenario calls for the ground and flight to be an interview of a person applying to become a corporate pilot. A test which is more than just pass/fail but, instead determines the person's career path, will provide additional pressure. The instructor conducting this lesson may incorporate another scenario as a subset of the overall check airman scenario. In other words, the instructor can pose a scenario within the test similar to those in pervious lessons throughout the syllabus to help evaluate judgment and decision making. This ground and flight test serves as the Multiengine Commercial Pilot Practical Test recommendation flight. After successful completion of this lesson the PT should be scheduled to take the Multiengine Commercial Pilot Practical Test.