I.F. Techniques of Flight Instruction

Objectives	The student should develop knowledge of the elements related to the different techniques of flight instruction as described in the CFI PTS.
Elements	✈ Obstacles to learning ✈ Demonstration-performance training delivery method ✈ Positive exchange of flight controls ✈ Sterile cockpit rules ✈ Use of distractions ✈ Integrated flight instruction ✈ Assessment of piloting ability ✈ Aeronautical decision making
Schedule	1. Discuss objectives 2. Review material 3. Development 4. Conclusion
Equipment	✈ White board ✈ Markers ✈ References
Instructor's Actions	1. Discuss lesson objectives 2. Present lecture 3. Questions 4. Homework
Student's Actions	Participate in discussion Take notes
Completion Standards	The student can competently explain and teach the range of topics discussed in this lesson.

References	FAA-H-8083-9, *Aviation Instructor's Handbook* (Chapter 8)

Instructor Notes

Introduction	Overview—review objectives and elements Why—flight instructors must competently pass along standards and practices that encourage safe flying.
Obstacles to learning	May apply directly to student's attitude, and physical and psychological condition.
Unfair treatment	Belief that instruction is inadequate or that efforts are not considered and evaluated, or making unreasonable demands for performance/progress, decrease student motivation, even when the student is willing to learn. Give students goals that are difficult but attainable—provide challenge and promote learning. ✈ Lesson objectives: reasonable goals ✈ Completion standards: desired levels of proficiency
Impatience	Greater deterrent to learning than recognized. ✈ Desire to solo early ✈ Desire to do cross-country flights before learning the basic elements of flight Impatient students do not understand the need for preliminary training—rather seek out the ultimate objective. Instructor can correct impatience—present preliminary training one step at a time, define and state goals clearly at the beginning of each step. Advance student to subsequent step as soon as one goal is attained to avoid disinterest (avoid unnecessary repetition.)
Worry or lack of interest	Worried or emotionally upsets students are not ready to learn. Do not ignore outside issues—use outside interests and enthusiasm, divert attention from worries and troubles to learning at task. Prevent flight training-related worries by ensuring students understand objectives of each training step and their progress/deficiencies at the end of each lesson.
Physical discomfort,	Slow the rate of learning.

illness, fatigue, and dehydration	Resistance to airsickness developed in a relatively short period of time. Keeping students interested and occupied during flight helps. Terminate flight as soon as incipient sickness is experienced.
Fatigue	May not be apparent to pilot until serious errors are made. Acute fatigue: normal occurrence of everyday living, after long periods of physical/mental strain; primary consideration in determining length/frequency of flight instruction periods Characterized by ✈ Inattention ✈ Distractibility ✈ Errors in timing ✈ Neglect of secondary tasks ✈ Loss of accuracy and control ✈ Lack of awareness of error accumulation ✈ Irritability Chronic fatigue: occurs when there is not enough time for a full recovery from repeated episodes of acute fatigue. Not resolved by rest alone—requires prolonged and deliberate solution. Can impair personal performance and adversely affect pilot judgment/decision-making.
Dehydration and heatstroke	Dehydration: critical loss of water from body. Reduces pilot's level of alertness, slows decision-making processes, may make pilot unable to control the aircraft. First noticeable effect is fatigue, followed by dizziness, weakness, nausea, tingling of hands and feet, abdominal cramps, and extreme thirst. Heatstroke: condition caused by inability of body to control its temperature. Onset recognized by dehydration symptoms, sometimes only by collapse. Carry and use water, wear light-colored, porous clothing and a hat, keep the deck well ventilated
Apathy due to inadequate instruction	Provide well-planned, appropriate, and accurate instruction. Poorly organized instruction destroys student's interest. Overly explicit/elementary instruction may fail to hold student interest; general/complicated instruction may fail to evoke interest. Teach for the level of the student.
Anxiety	Limits student's perceptive ability and retards the development of insights

Demonstration-Performance Training Delivery Method	Divided into four phases ✈ Explanation ✈ Demonstration ✈ Student performance with instructor supervision ✈ Evaluation
Explanation phase	Instructor: well prepared and organized Student: intellectually and psychologically ready for activity Achieved prior to the flight lesson—discussion of lesson objectives and completion standards and thorough preflight briefing. Clear explanations, pertinent to objectives, based on student's experience and knowledge. Tell students what they will learn and how they will learn it. Cover appropriate safety procedures. Encourage students to ask questions about any step of the procedure they do not understand.
Demonstration phase	Show students necessary actions to perform sill. Avoid extraneous activity. If demonstration does not closely conform to the explanation—acknowledge and explain deviation immediately
Student Performance and Instructor Supervision phase	Separate actions performed concurrently. Once instructor is satisfied that the student is well prepared and understands the task, student practices to learn skill—allot enough time as soon as possible after demonstration. Student learns to follow procedures and reach established standards. Instructor reviews and determines to what extent the student has met the objectives. Observe, then make appropriate comments.
Evaluation phase	Evaluate student performance, record student performance, and advise student of progress made toward objectives. Pointing out areas that need improvement—offer concrete suggestions that help; avoid ending the evaluation on a negative note. Collaborative assessment (or learner centered grading)—form of authentic assessment currently used with PBL. Used to evaluate whether learning criteria were met during SBT. 1. Learner self-assessment—stimulate growth in learner's thought process and behaviors 2. Flight instructor detailed assessment

Positive exchange of controls	Integral part of flight training—especially critical during demonstration-performance method. Accidents due to misunderstanding/lack of communication regarding who had aircraft control. Include procedures for exchange of flight controls in preflight briefing. Always guard the controls and be prepared to take control. Three-way exchange when giving/taking controls.
Sterile cockpit	Refrain from non-essential activities during critical phases of flight. *[14 CFR 121.542]* ✈ Ground ops/taxi ✈ Takeoff ✈ Landing ✈ All flight ops below 10,000 ft except cruise flight Reduce distractions during those phases, model behavior during instruction.
Use of distractions	Most stall/spin accidents—pilot's attention was diverted from flying. Performing secondary tasks to controlling aircraft increases the risk of entering an inadvertent stall or spin. Purpose of distractions—to determine that applicants possess the skills required to cope with distractions while maintaining the degree of aircraft control required for safe flight. PIC must know when to tell passengers when something is too distracting.
Integrated flight instruction	Students taught to perform flight maneuvers both by outside visual references and reference to flight instruments. Begin use of instrument references the first time each new maneuver is introduced.
Development of habit patterns	Observing and relying on flight instruments from beginning of flight training. Student learns feel of airplane while conducting maneuvers. Continuously monitor pilot's and aircraft's performance. Leads to better landings, instrument cross-check, instrument interpretation, and aircraft control.
Operating efficiency	Use of correct power settings and climb speeds and the accurate control of headings during climbs—measurable increase in climb performance. Holding heading and altitude in cruising flight—increases average cruising performance.

	Integrated flight instruction does not mean student can handle IMC flight
Procedures	Brief the function of the flight controls—expected instrument indications and outside references to be used to control the aircraft's attitude. Introduce each new flight maneuver using both outside and instrument references—flight control manipulation is identical regardless.
See and avoid	Ensure student develops habit of looking for traffic at all times from start of flight training—correct tendencies to enter maneuvers without checking for traffic immediately. Introduce right-of-way rules to students. *[14 CFR 91.113]*
Assessment of piloting ability	Essential component of teaching process. Determines how, what, and how well a student is learning. Provides student with something constructive to work on or build; direction and guidance to raise the level of performance. Students must understand the purpose of the assessment to accept evaluation and improve.
Demonstrated ability	Based upon established standards of performance, suitably modified to apply to student's experience/stage of development as a pilot. Consider student's mastery of elements involved rather than overall performance. Solo flight sign-off: determine that student is qualified and proficient in flight tasks necessary for flight.
Postflight evaluation	Keep student informed of progress—as each procedure or maneuver is completed or summarized during postflight critiques. Use written format—explain errors in performance, point out elements in which deficiencies originated, suggest appropriate corrective measures. Collaborative assessment: self-assessment and instructor assessment.
First solo flight	Instructor present to assist in answering questions/resolving flight issues. Consider time of day when scheduling—traffic congestion, possible winds, sun angles, reflection.

Correction of student errors	Don't immediately take controls away—let students progress part of the way into the mistake and find a way out, allow student to see the effect of control inputs. Require student to vary performance of maneuver slightly, combine it with other operations, or apply same elements to performance of other maneuvers when students don't understand principles/objectives involved.
Pilot supervision	Provide guidance and restraint with respect to solo ops. Require student to demonstrate consistent ability to perform all of fundamental maneuvers before endorsing student for solo flight.
Dealing with normal challenges	Teach students how to solve ordinary problems encountered during flight. Traffic pattern congestion, change in active runway, unexpected crosswinds—master individually before performing collectively.
Visualization	Student visualizes how flight may occur under normal circumstances. Instructor adds unforeseen circumstances, and student visualizes how they will handle the unexpected change. Ask questions to check student's thought processes. Challenge student with realistic flying situations without overburdening them with unrealistic scenarios.
Practice landings	Teach full stop landings—help student develop aircraft control and checklist usage. Aircraft speed and control take precedence. Land in the first third of the runway or go around. Bounce—go around.
Practical test recommendations	Require applicant to demonstrate thoroughly knowledge and skill level required for certificate/rating. FAA Form 8710-1 signature valid for 60 days. Same date as flight proficiency endorsement in logbook. *[AC 61-65]*
Aeronautical decision-making	System safety: ADM, risk management, situational awareness, SRM ADM: systematic approach to mental process used by pilots to consistently determine the best course of action in response to given set of circumstances. Risk management: decision-making process designed to systematically identify hazards, assess the degree of risk, and determine the best course of action associated with each flight.

	Situational awareness: accurate perception and understanding of all factors and conditions within four fundamental risk elements that affect safety before, during, and after the flight. SRM: the art and science of managing all resources available to a single pilot to ensure the successful outcome of the flight. Teaching pilots to make sound decisions—key to preventing accidents.
Decision-making process	Three steps: 1. Defining the problem Recognize that a change has occurred/expected change did not occur. Perceive problem by senses, then through insight and experience. Defining the problem incorrectly can divert pilot's attention from important tasks. 2. Choosing a course of action Evaluate need to react to defined problem and determine actions that may be taken to resolve situation. Consider expected outcome of each possible action and assess risks before deciding on response. 3. Implementing the decision and evaluating the outcome Think ahead and determine how the decision could affect other phases of flight, continue to evaluate outcome of decision to ensure it is producing the desired result.
Factors affecting decision-making	Recognizing hazardous attitudes—instructor must be able to spot hazardous attitudes in students. Attitude: personal motivational predisposition to respond to persons, situations, or events in a given manner. Stress: body's response to demands placed upon it, pleasant or unpleasant. Inevitable and necessary part of life. Certain amount of stress is good, but has to be coped with adequately. Can impair ability to make effective decisions during flight. ✈ Physical stress ✈ Physiological stress ✈ Psychological stress
Use of resources	Internal resources: found in the flight deck during flight. Ingenuity, knowledge, skill. Thorough understanding of equipment/systems (advanced navigation, autopilot systems). Checklists, AFM/POH, passengers. External resources: ATC, AFSS.

	Expose students to ATC as much as possible, encourage them to take advantage of services. Workload management: plan, prioritize, and sequence tasks to avoid work overload. Increase workload gradually while monitoring student's management of tasks.
Conclusion	Review of main points Additional information on recommendations and endorsements can be found in Appendix E of the Aviation Instructor's manual.

CFI PTS

Objective: To determine that the applicant exhibits instructional knowledge of the techniques of flight instruction by describing:

1. Obstacles in learning during flight instruction.
2. Demonstration-performance training delivery.
3. Positive exchange of controls.
4. Sterile cockpit.
5. Use of distractions.
6. Integrated flight instruction.
7. Assessment of piloting ability.
8. Aeronautical decision making.