Fundamentals of Instruction

Course Development and Lesson Planning

Motivation:

Building upon the learning process to develop effective lesson objectives, lesson plans, and curriculum.

Objective:

Understand appropriate and effective techniques for teaching and planning instructional sessions.

Overview

- Teaching: Process and Essential Skills
- Course of Training
- Planning Instructional Activity
- Preparation of a Lesson
- Organization of Material
- Training Delivery Methods
- Electronic Learning (e-Learning)
- Instructional Aids & Training Technologies
- Integrated Flight Instruction
- Problem-Based Instruction

Teaching: The Process

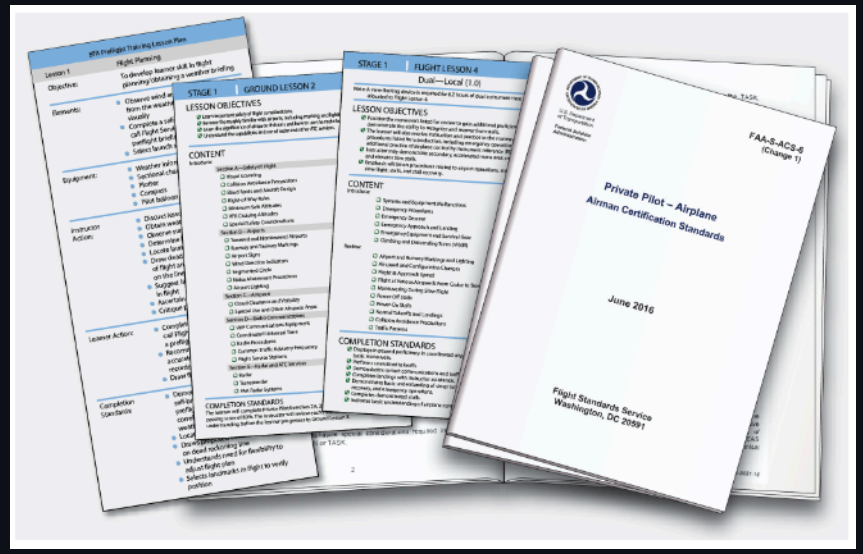
- Teaching = Organizing and presenting material for learner understanding
- Four basic steps:
    i. Preparation
    ii. Presentation
    iii. Application
    iv. Assessment

Teaching: Essential Skills

- **People skills:** Effective communication, listening
- **Subject matter expertise:** Deep knowledge of the subject
- **Management skills:** Planning, leading, organizing, supervising
- **Assessment skills:** Evaluating student progress

Course of Training

- A curriculum or training plan for a specific goal (e.g., rating or certificate)
- Outlines the sequence and scope of instruction
  - Informed by blocks of learning, stages of instruction, overall objectives



Planning Instructional Activity

- Identify **blocks of learning**
  - Skills that are required for the overall course objective
  - Break-down skills into their basic components
  - Blocks should build upon one another
- Develop a **syllabus**
  - Using these blocks of learning, determine lesson objectives
  - Lesson should have specific objectives that contribute to one or more blocks

STAGE 1 | GROUND LESSON 2

LESSON OBJECTIVES

- Learn important safety of flight considerations.
- Become thoroughly familiar with airports, including marking and lighting aids.
- Learn the significance of airspace divisions and how to use the radio for communications.
- Understand the capabilities and use of radar and other ATC services.

CONTENT

Introduce:

Section A—Safety of Flight

- Visual Scanning
- Collision Avoidance Precautions
- Blind Spots and Aircraft Design
- Right-of-Way Rules
- Minimum Safe Altitudes
- VFR Cruising Altitudes
- Special Safety Considerations

Section B—Airports

- Towered and Nontowered Airports
- Runway and Taxiway Markings
- Airport Signs
- Wind Direction Indicators
- Segmented Circle
- Noise Abatement Procedures
- Airport Lighting

Section C—Airspace

- Cloud Clearance and Visibility
- Special Use and Other Airspace Areas

Section D—Radio Communications

- VHF Communications Equipment
- Coordinated Universal Time
- Radio Procedures
- Common Traffic Advisory Frequency
- Flight Service Stations

Section E—Radar and ATC Services

- Radar
- Transponder
- FAA Radar Systems

COMPLETION STANDARDS

The learner will complete Private Pilot Exercises 2A, 2B, 2C, 2D, and 2E with a minimum passing score of 80%. The instructor will review each incorrect response to ensure understanding before the learner progresses to Ground Lesson 3.

Planning Instructional Activity (cont.)

- Develop individual **lesson plans**
  - Detailed information about each lesson
  - Objectives for individual lessons
  - Include timing, materials, instructor actions, student actions

Preparation of a Lesson

- **Training objectives:** Define what the learner should learn, perform, or exhibit
  - Performance objectives: Specific, performance criteria
  - Decision-based objectives: Evaluate decision-making and risk management
- **Completion standards:** Criteria for successful performance

Performance-Based Objectives

Area of Operation VII. Takeoffs, Landings, and Go-Arounds

Note: *The evaluator must select at least two takeoff and two landing Tasks from Area of Operation VII, Takeoffs, Landings, and Go-Arounds.*

Task A. Normal Takeoff and Climb

References: AIM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-9, FAA-H-8083-23, FAA-H-8083-25; POH/AFM

Objective: To determine the applicant understands normal takeoff and climb, can apply that knowledge, manage associated risks, demonstrate appropriate skills, and provide effective instruction.

Note: *If a crosswind condition does not exist, the applicant's knowledge of crosswind elements must be evaluated through oral testing.*

Knowledge:	The applicant demonstrates instructional knowledge by describing and explaining:
AI.VII.A.K1	Procedures for normal and crosswind takeoff.
AI.VII.A.K2	Effects of atmospheric conditions, including wind, on takeoff and climb performance.
AI.VII.A.K3	Best angle of climb speed (V_X) and best rate of climb speed (V_Y).
AI.VII.A.K4	Appropriate airplane configuration.
AI.VII.A.K5	Common errors related to this Task.
Risk Management:	The applicant explains and teaches how to identify and manage risk associated with:
AI.VII.A.R1	Selection of runway based on pilot capability, airplane performance and limitations, available distance, and wind.
AI.VII.A.R2	Effects of:
AI.VII.A.R2a	a. Crosswind
AI.VII.A.R2b	b. Windshear
AI.VII.A.R2c	c. Tailwind
AI.VII.A.R2d	d. Wake turbulence
AI.VII.A.R2e	e. Takeoff surface/condition
AI.VII.A.R3	Abnormal operations, including planning for:
AI.VII.A.R3a	a. Rejected takeoff
AI.VII.A.R3b	b. Potential engine failure in takeoff/climb phase of flight
AI.VII.A.R4	Collision hazards.
AI.VII.A.R5	Low altitude maneuvering, including stall, spin, or controlled flight into terrain (CFIT).
AI.VII.A.R6	Distractions, task prioritization, loss of situational awareness, or disorientation.
AI.VII.A.R7	Runway incursion.

- Reasonable, measurable standards for judging learner progress
- Used to determine readiness to advance
- ACS maneuver tolerances are examples of performance-based objectives

Decision-Based Objectives

- Evaluate judgment and risk management
- Used for complex topics (e.g., cross-country, emergencies, ADM)
- Scenario-based training is well-suited for decision-based objective lessons

Importance of ACS in Aviation Training

- ACS/PTS provides specific skills and objectives for learning
- ACS encourage use of scenario-based and maneuver-based training for ground and flight instruction
- Note ACS/PTS is an evaluation document, not a teaching document

Organization of Material

Lesson plans should consistently and thoughtfully outlines and organized

Introduction:

- Attention: Get the student interested and introduced to the topic
- Motivation: What are we learning this?
- Overview: Roadmap of what is to be covered

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Organization of Material

Development: How should we present the material?

- Different lessons will require different strategies
- Remember our cognitive learning theories:
  - Chronological
  - Simple-to-complex
  - Known-to-unknown
  - Most-to-least used

Conclusion:

- Recap important items
- Leave a good impression

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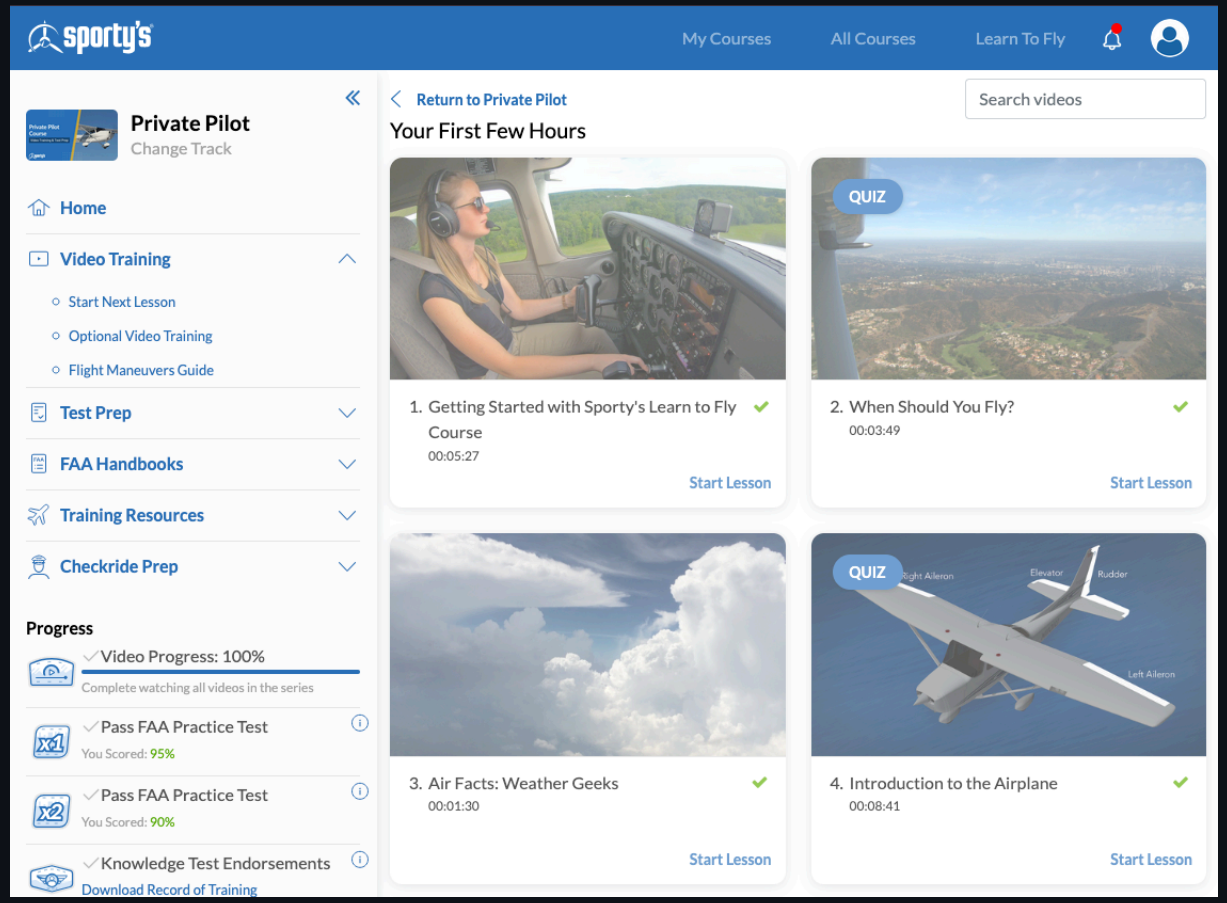
Structure of a Lesson Plan

- Objective
- Motivation
- Timing
- Content / Elements
- Completion Standards
- Risk Management
- Instructor actions
- Student actions

Training Delivery Methods

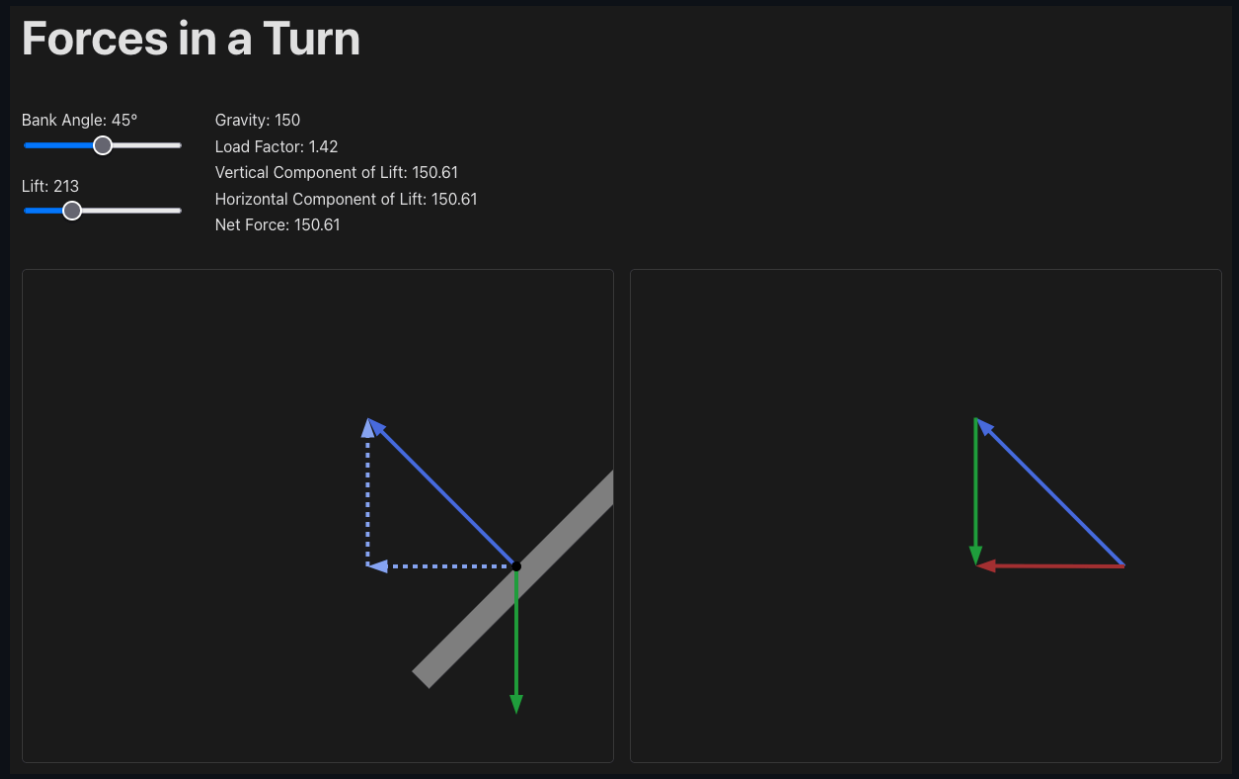
- **Lecture:** Good for background info, large groups; less interactive
- **Discussion:** Engages higher-order thinking, can be instructor- or learner-led
- **Guided Discussion:** Instructor steers with questions
- **Cooperative/Group Learning:** Small groups, active participation
- **Demonstration-Performance:** Instructor demonstrates, learner performs
- **Drill and Practice:** Repeated application for skill mastery

Electronic Learning (e-Learning)



- **Advantages:** Flexible, low cost, updatable, self-paced
- **Disadvantages:** Less peer interaction, less personalized feedback

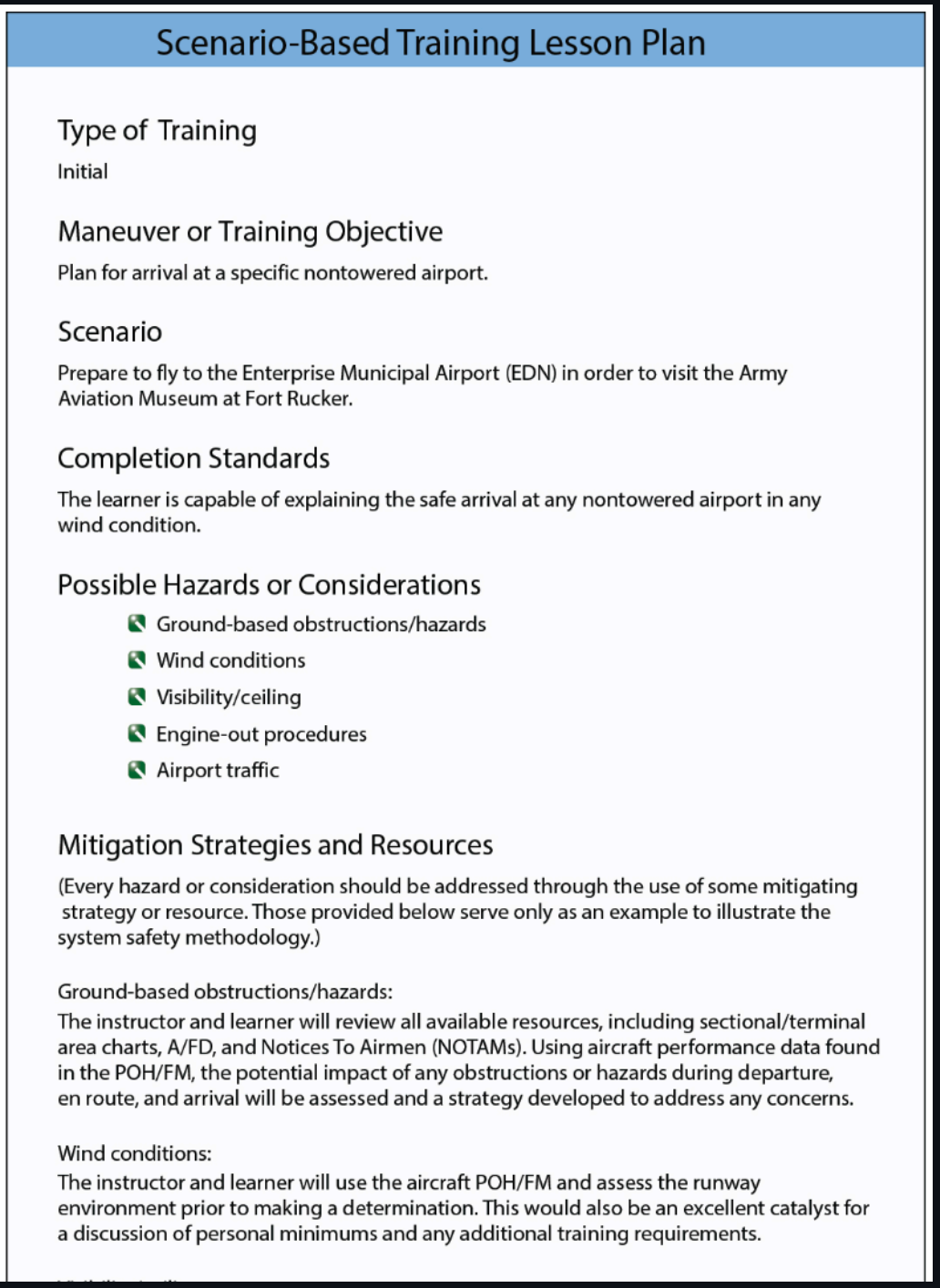
Instructional Aids & Training Technologies



- Using things like
  - Whiteboards
  - Printed materials
  - Videos
  - Interactive systems
  - Models
- Simple, clear, supports training objectives
- Hold attention, reduce barriers, speed instruction
- Plan ahead, check for accuracy

Integrated Flight Instruction

- Learners perform flight maneuvers by outside visual references and by flight instruments
- 90% of time spent outside, 10% inside
  - Emphasize "glances" down at the instruments
  - Much like a speedometer in a car
- This should be emphasized early in training (law of primacy)



Scenario-Based Training Lesson Plan

Type of Training

Initial

Maneuver or Training Objective

Plan for arrival at a specific nontowered airport.

Scenario

Prepare to fly to the Enterprise Municipal Airport (EDN) in order to visit the Army Aviation Museum at Fort Rucker.

Completion Standards

The learner is capable of explaining the safe arrival at any nontowered airport in any wind condition.

Possible Hazards or Considerations

- Ground-based obstructions/hazards
- Wind conditions
- Visibility/ceiling
- Engine-out procedures
- Airport traffic

Mitigation Strategies and Resources

(Every hazard or consideration should be addressed through the use of some mitigating strategy or resource. Those provided below serve only as an example to illustrate the system safety methodology.)

Ground-based obstructions/hazards:

The instructor and learner will review all available resources, including sectional/terminal area charts, A/FD, and Notices To Airmen (NOTAMs). Using aircraft performance data found in the POH/FM, the potential impact of any obstructions or hazards during departure, en route, and arrival will be assessed and a strategy developed to address any concerns.

Wind conditions:

The instructor and learner will use the aircraft POH/FM and assess the runway environment prior to making a determination. This would also be an excellent catalyst for a discussion of personal minimums and any additional training requirements.

Problem-Based Instruction

- Uses realistic, open-ended problems to motivate learning
- Encourages decision-making and critical thinking
- Examples:
  - Flight planning task taking your family to a particular location, given a certain weather forecast, airplane configuration, and time constraint

Summary

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