

# **Emergency Preparedness Program**

CFI Outline

# Ground Lesson 1: Basics of Flight

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- **Objective:** Introduce student to the basics of flight. All further training will build on the knowledge obtained from this lesson
  
- **Elements:**
  
- Principles of flight
  - Theory of lift
  - Introduce relationship between lift/thrust/drag/weight
  - Angle of attack
    - Critical angle of attack
    - How an aircraft stalls
    - Stall indications
    - Why stalls should be avoided
  
- Flight controls
  - Aileron, elevator and rudder
    - Control inputs for each
    - Associated aircraft movement for each
  - Flaps
    - Effect on aircraft lift and speed
    - How to extend and retract flaps
    - Maximum flap extended speed
  - Trim
    - Proper use of trim wheel
    - Effect on aircraft and pressure required on yoke
  - Landing gear (if applicable)
    - How to extend and retract gear
    - Maximum gear extension and retraction speed
  
- Engine controls
  - Throttle
    - Proper operation of throttle control
    - Effect on engine operation with different throttle settings
  - Fuel mixture
    - Proper operation of mixture control
    - Effect on engine operation with different mixture settings
  
- Flight instruments
  - Airspeed
  - Altimeter
  - Attitude indicator
  - Heading indicator/magnetic compass
  - Tachometer

## Ground Lesson 2: Navigation and Navigation Systems

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- **Objective:** Introduce the basics of aerial navigation and navigation systems available to pilots in the aircraft.
- **Elements:**
- Basics of navigation
  - Sectional chart
    - How to determine position
    - Landmarks
    - Obstacles
    - Airports/airspace
- Aircraft navigation systems
  - GPS (if applicable)
    - Basic use of GPS system
      - Inputting airports/waypoints
      - Flying course via magenta line
      - “Nearest Airport” function
  - Autopilot (if applicable)
    - How to enable and disable autopilot
    - How to set autopilot to correct source
      - CDI or FMS
    - How to adjust heading/altitude
- ForeFlight (if applicable)
  - Introduce basics of foreflight
    - Map page, airport page, taxi diagrams
    - Using ruler to determine distance and approximate heading to nearest airport
- Air traffic control
  - How to contact ATC
    - Location of PTT
  - What to say
    - How to tune/switch frequency
    - Identify current frequency
      - Inquire on frequency using PTT
      - Tune guard (121.5) if not currently communicating with ATC facility
    - Phraseology for declaring emergency
    - How to relay position to ATC
    - Apply previous knowledge of aircraft controls, instruments and autopilot to comply with ATC instructions

## Ground Lesson 3: Landing and Emergency Procedures

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- **Objective:** Introduce procedures for landing the aircraft, including airport identification, runway alignment, and approach procedures. Also introduce a checklist for a pilot incapacitation event
- **Elements:**
- Approach
  - Identifying airport
    - Use landmarks such as runways, hangars and other buildings to identify the airport
    - Contact ATC to confirm position of airport in relation to aircraft
  - Slowing and descending aircraft
    - Use prior knowledge of flight and throttle controls to slow the aircraft and descend to 1,000ft AGL
  - Entering traffic pattern
    - Ensure landing on runway with best wind
- Landing
  - Verify correct runway
    - Use heading indicator to validate runway once on final approach
  - Ensure proper configuration
    - Flaps and throttle setting
  - Flare
    - Proper airspeed entering flare
    - Control inputs required to land
  - Post-landing
    - How to bring aircraft to stop
    - Shutting down and securing aircraft
- Emergency scenario: pilot incapacitation
  - Pilot becomes incapacitated
    - Move pilot away from controls
      - Use seatbelt to hold pilot away from yoke
      - Ensure legs are positioned so feet are not on rudder pedals
    - Hold aircraft straight and level
      - Engage autopilot (if applicable)
    - With aircraft under control, contact ATC
    - Follow ATC instructions to nearest suitable airport
      - If ATC services are unavailable, use GPS and pilotage
    - Set up for, and land aircraft

# Simulator Lesson 1: Basic Aircraft Controls and Functions

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- **Objective:** Begin tying all of the previous ground knowledge together to make a successful simulator flight landing, and build student confidence in instruments, flight controls and procedures
  
- **Elements:**
  
- Prior to flight
  - Introduce student to the basic instruments, systems and flight controls to be used
- Starting aircraft
  - Begin on ground at airport
  - Walk student through proper startup of aircraft
- Taxiing and airport familiarity
  - Allow student to practice taxiing to runway
  - Point out essential airport references, such as markings and signs
- Takeoff
  - Walk student through a proper takeoff and climb out from airport
  - Note: while being able to take off is not the ultimate goal of this course, teaching a take off can help strengthen the knowledge and comfortability of the student in the aircraft
- Maneuvers
  - Demonstrate basic flight maneuvers
    - Climbs, turns, descents, turns to headings
  - Demonstrate advanced maneuvers
    - Power off and on stalls
    - Steep turns
    - Allows student to practice configuring aircraft for different phases of flight
- Navigation
  - Demonstrate basic functions of GPS available
  - Use sectional chart and pilotage to determine present location
- Communications
  - Instructor should act as ATC to allow student to practice proper communications in emergency situation
- Approach
  - Using pilotage and GPS, allow student to navigate to nearest suitable airport and prepare for landing
  - Determine proper runway, dependent on wind
  - Descend to traffic pattern altitude
- Landing
  - Align with proper runway
  - Use proper aircraft configuration, control inputs and power settings to land aircraft
  - Bring aircraft to stop

# Aircraft Lesson 1: Basic Aircraft Controls and Functions

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- **Objective:** Build on the previous simulator lesson and ground knowledge, and begin increasing student confidence in the aircraft
- **Elements:**
- Preflight
  - Introduce student to preflight
  - Emphasize relevant areas of preflight, including flight controls, engine controls and location of relevant instruments
- Engine startup
  - Walk student through proper checklists to start engine, placing emphasis on proper engine inputs and functions for starting
- Taxiing
  - Introduce student to taxiing, including proper inputs of rudder and brake pedals
  - Point out airport signs and markings and give brief explanations of each
- Runup
  - Allow student to perform runup using checklist
- Takeoff
  - Instructor should perform takeoff while explaining their control inputs and power applications
    - Allow student to “shadow” instructor on controls
- Climb out
  - Hand controls over to student and walk them through the process of holding airspeed using pitch
  - Walk student through level off at appropriate altitude
- Maneuvers
  - Allow student to perform basic flight maneuvers
    - Climbs, turns, descents
- Navigation
  - Using sectional chart and pilotage, have student attempt to determine current position
  - Allow student to use GPS functions to determine course back to airport
  - Instruct student to begin heading back to airport
- Approach
  - Using weather resources available, have student determine proper runway for landing
  - Walk student through proper pattern entry and components of the traffic pattern
    - Downwind, base and final
    - Introduce proper configurations and airspeeds for each pattern leg
- Landing
  - Instructor should perform landing while explaining control inputs and power applications
    - As with takeoff, allow student to “shadow” on controls
  - When speed is reduced, allow student to taxi off runway and bring aircraft back to parking area
- Shutdown and securing
  - Allow student to use checklist to shut down and secure the aircraft

## Aircraft Lesson 2: Takeoff and Landing Practice

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- **Objective:** Student will begin controlling aircraft through startup, taxi, takeoff and landing phases of flight. Builds confidence in student's landing ability and knowledge of aircraft control.
- **Elements:**
- Preflight
  - Allow student to preflight aircraft while using appropriate checklist
- Engine startup
  - Allow student to use proper checklist to start engine
- Taxiing
  - Instruct student to use current weather conditions to determine proper takeoff runway
  - Allow student to taxi to runup area associated with proper runway
- Runup
  - Allow student to perform runup using checklist
- Takeoff
  - If comfortable, allow student to perform takeoff
  - Walk student through steps to ensure proper inputs are made
- Pattern
  - Climb to traffic pattern altitude
  - Emphasize proper configurations and airspeeds at pattern segments
- Landing
  - If comfortable, allow student to perform landing
  - Walk student through steps to ensure proper inputs are made
- Continue traffic pattern until student feels comfortable with performing takeoffs and landings with minimal instructor intervention

## Aircraft Lesson 3: Emergency Scenario

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- **Objective:** To simulate an emergency situation in which the pilot becomes incapacitated. Student will return aircraft to airport and land, with minimal instructor intervention.
  
  - **Elements:**
  
  - Departure
    - Using knowledge from previous lessons, allow student to control the aircraft from startup to takeoff, and out towards practice area
  - Emergency scenario
    - Once in practice area, instructor will act as pilot who has become incapacitated
    - Student should simulate proper incapacitation actions, including securing pilot away from controls, and contacting ATC
    - Instruct student to determine position, and return to airport for landing
      - Ensure student makes correct decisions, including determining proper runway for landing, pattern entry, descent to pattern altitude, and proper aircraft configuration in pattern
    - Announce the end of scenario, and allow student to return aircraft to parking
- \*Minimal instructor intervention is the goal for this exercise\***
- Debrief
    - Discuss with student on their performance in the scenario
      - Emphasize positives on aspects student performed well in
      - Make note of mistakes student made, and what the proper action would have been