Civil Air Patrol

National Flight Academy Powered

Training Course Outline

NATIONAL FLIGHT ACADEMY POWER TRACK

FLIGHT RULES

1) National Flight Academy training f1ights shall not begin prior to sunrise.
2) NFA training aircraft (any aircraft being flown with cadets on board for the purpose of instruction) shall be on the ground no later than 30 minutes before sunset.
3) Student solo flights outside-the airport traffic pattern are not authorized.
4) All Crews will begin each day by filling out an ORM sheet. (1 per plane per day)
5) NFA Weather Minimums

a) Dual Instruction Flights

No dual flight instruction will be given at a NFA unless the weather (current and forecast for time of return) meets the following criteria:

i) For flights outside the airport traffic pattern:
   (1) Ceilings no less than 2500' AGL.
   (2) Flight visibility, no less than 3 nautical miles.
   (3) Winds no greater than 20' kts (sustained or gust) and not exceeding the aircraft's maximum demonstrated crosswind on the runway(s) to be used.

ii) Dual instruction flights 'may depart IFR (to VFR conditions) if all conditions below are met:
   (1) Each flight is individually approved by the chief flight instructor.
   (2) An IFR flight plan is filled prior to departure.
   (3) The training portion of the flight is conducted under the weather conditions mentioned above.
   (4) The weather is forecasted to be VFR for the time of return, the instructor holds an instrument instructor rating.
   (5) The instructor has current CAP Form approving instrument flight
   (6) The instructor meets FAR instrument currency requirements.

iii) For flights restricted to the airport traffic pattern:
   (1) Ceilings no less than 1500' AGL.
   (2) Flight visibility no less than 3 nautical miles.
   (3) Winds no greater than 15 kts (sustained or gust) and not exceeding a crosswind component of 10 kts on the runway(s) to be used.

b) Solo Flights

No student solo flight will be conducted at a NFA unless the weather (current and forecast for time of return) meets the following criteria:

i) Ceiling no less than 2OOO' AGL.
ii) Flight visibility no less than 5 nautical miles.
iii) Winds no greater than 10 knots (sustained or gust) and not exceeding the aircraft's maximum demonstrated crosswind on the runway(s) to be used.

6) NFA Minimum Fuel Requirements

a) NFA training flights shall not depart without sufficient fuel to fly for the scheduled training sortie time at cruise power and continue thereafter for 60 minutes at cruise power.

CADET FLIGHT ACADEMY
TRAINING STANDARDIZATION

1) Transfer of control of the aircraft must be explained to the student before every flight. The procedure **will** be a challenge/response technique. The instructor will challenge with the phrase, “I have the flight controls” and the student responds “you have the flight control”. The instructor then says “I have the flight controls.”

2) The student must sit high enough to have good visibility over the nose of the aircraft. This is approximately high enough to just see the top of the engine cowling from the normal, seated position. Use a cushion **if** necessary. The student should be sitting forward enough to make full rudder pedal deflections, but not so far forward that full aft movement of the control wheel is inhibited. Be sure that the student's seat is adjusted to the same position for each flight.

3) Explain that the rudder control is the bottom of the rudder pedal, and brakes are at the top. Heels should normally rest on the floor unless braking is desired. Ensure that the student understands that the brakes and the rudder are completely separate and independent controls.

4) Stress dividing attention from the very first flight -- check wingtip to determine pitch and bank angle, look for traffic, check pitch attitude over the nose of the aircraft, check airspeed, etc. Reiterate dividing attention during all maneuvers.

5) Insist on a continuous scan for traffic from the very first flight.

6) Perform clearing turns before EVERY practice maneuver -- stalls, steep turns, MCA, and ground reference maneuvers. Clearing turns consist of at least 180 degrees of turn (one 180, or two 90 degree turns in opposite directions) at standard rate, but no steeper than 30 degrees of bank.

7) Student should be taught to keep one hand on the throttle during all ground operations, takeoff, climb out, and all operations at low altitude.

8) Be sure the student uses a constant reference for determining pitch attitude. Putting a fist, thumb up, on top of the instrument panel works well for determining level flight attitude -- student can count how many fingers the horizon is above the panel. Different methods will work for different students, but the method chosen should be used consistently.

9) The student must know and demonstrate the correct pitch, power, and flap settings for all maneuvers without reference to the airspeed indicator.

10) During level-off from a climb, leave full power on until the desired cruise speed is reached. Trim should be used to relieve pressure on the control wheel as the aircraft accelerates. This gets the aircraft up to cruise speed quickly and minimizes level-off time, and trim and power adjustments. Teach "Pitch, Power, Trim" for all changes between level flight and climb or descents. ie: set the pitch attitude first, then when desired airspeed is reached, set the power, and finally, trim the airplane for that speed.

11) Use 65% power as the cruise power setting for local area practice. This will save fuel, require less area for accomplishing the maneuvers, and allows for quicker transition from one maneuver to another.

12) Insist the student use one hand on the control wheel for all maneuvers, including landing. Ensure the student uses a light grip on the wheel. **Do not teach the student to trim the airplane into the landing flare.** Excessive up-elevator trim, combined with lowered flaps can cause a violent pitch up movement during a go-around attempt.

13) Monitor the student's control coordination closely, and correct whenever necessary.

14) Back elevator pressure must be added in all turns, including descending turns. Errors show up in the traffic pattern as too high an airspeed at the completion of the turns.

15) Constantly monitor climbs, MCA, and power-on/off stalls for proper right rudder inputs.

16) Use V_y and full power for all climbs, and monitor pitch attitude closely.

17) Introduce stalls during minimum controllable airspeed flight by allowing the wing to "nibble" at the stall as a result of excessive pitch. This will result in a gentle stall, with little break, and an easy recovery to MCA flight. That should be followed with a series of gliding stalls that are recovered without power. Then minimum altitude loss techniques are taught through power-on recoveries.

18) From power-off stalls, proceed into teaching approach/landing stalls. Teach "Release back pressure, Power up, Pitch up, Flaps up" for recovery. Recoveries from both imminent and fully stalled conditions should be taught for all stalls.

19) Student should understand that, for a given airspeed, the pitch attitude must be lower with flaps than without flaps. This is because flaps increase the angle of attack even though pitch remains the same.

20) Before beginning serious practice in the traffic pattern, the student should master the rectangular course ground reference maneuver, and be able to maintain a straight track over the ground using both crab and side-slip techniques.

21) Teach the student to use an "aim point" to judge the angle of the final approach. If the aim point appears to be moving up in the windshield, you will land short. (If the point appears to move down, you will overshoot. Emphasize that this technique requires accurate pitch control to work with any kind of consistency.

22) Teach the student to go-around if the result of the approach is ever in any doubt. This can be reinforced if you, as the instructor, initiate a go-around during a demonstrated landing.

23) Ensure that the student considers any crosswind component into the planning of the traffic pattern, especially the turn from base leg to final. Emphasize that increasing the turn's bank angle, or trying to "rudder" the aircraft around the turn to correct for an overshoot of the final approach course is dangerous.

24) Teach the landing as a two-step process: 1.The round-out and 2.The flare. Round-out is when the aircraft's pitch is increased and the rate of descent is arrested. Flare is when the aircraft's pitch is further increased to the landing attitude. In a well executed approach and landing, these two steps occur as one continuous motion. Discourage "feeling" for the runway with alternate raising and lowering of the nose. Once the pitch attitude is increased in the round-out or flare it should not be lowered again. If the level-off is made too high, a go-around is usually called for. No attempt should be made to salvage a bad landing with power.

25) If a landing cannot be made in the first third of the runway, or in the middle third laterally, a go- around should be initiated.

26) After landing, the student should be taught to hold the elevator back pressure, and let the nose wheel lower itself to the runway as the aircraft slows. Student should be sensitive to directional control during the roll-out.

27) When practicing touch-and-goes, do not initiate the "go" until the nose wheel is on the runway, and the flaps are retracted to the takeoff position. This will help prevent loss of directional control and full-flap takeoffs. If the runway is too short to do this safely, then the runway is TOO Short.

28) Teach the student to avoid excessive braking during the roll-out. **Remember: The only turn-off you HAVE to make is the LAST turn-off**.

29) Teach only the side-slip method for crosswind landings. The "crab/kick" method requires the student to make a perfectly-timed, abrupt control movement when their attention is focused on the last few inches of altitude. Should the student "balloon," he/she will be left high in the air, with low speed and drifting away from the runway. The side-slip method establishes the proper drift correction well out on the final approach, and requires little adjustment throughout the landing.

30) Students fatigue easily with concentrated takeoff and landing practice. Continued work in the traffic pattern, hour after hour is an indication that the basics of flying the aircraft have not been mastered. It is much better to delay concentrated pattern work until the air work and ground reference maneuvers are acceptable than to rush into takeoffs and landings, hoping that things will smooth out in the pattern. They will usually get worse. Students who have mastered the air work and ground reference maneuvers, and who can fly all the maneuvers using outside attitude references require surprisingly little practice in the pattern to learn proper landing technique.

31) The flight instructor will bring to the attention of the Chief Flight Instructor, information regarding students who are having greater than normal difficulties with training, as soon as possible. Typical problems such as students prone to airsickness, or a student requiring evaluation by a different instructor, can be easier to deal with early in the program rather than near the end of the encampment.

32) As in all other CAP activities: **SAFETY IS OUR #1 GOAL**!!

COMPLETION LEVEL KEY

LEVEL 1	Student is able to participate in the maneuver as it is demonstrated by the flight instructor.
LEVEL 2	Student is able to perform the assigned maneuver with explanation, and minimum assistance from the flight instructor.
LEVEL 3	Student is able to perform the assigned maneuver with a minimum of explanation, and with no assistance from the flight instructor.
LEVEL 4	Student is able to perform the assigned maneuver to the level of competence necessary for safe, solo flight, with no explanation or assistance from the flight instructor.

LESSON 1 - DUAL FLIGHT

The first lesson consists of familiarization with the airplane and its operating procedures, the sensations of flight, local flight areas, and the use of flight controls and instruments. A one-hour round-trip flight to the practice area or nearby airport is effective in stimulating a new student's interest.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Airplane Familiarization • Pre-flight inspection - use checklist • Cockpit familiarization • A/C flight manual • A/C certificates and documents	Level 1	Approx .5 hr this lesson
2. Engine Start • Use of checklist • Safety precautions • Clearing area	Level 1	
3. Radio Operation • Audio panel & switches • Squelch operation	Level 1	
4. Taxiing • Use of throttles & brakes • Control position for windy conditions	Level 1	
5. Pre-takeoff Check • Use checklist	Level 1	
6. Takeoff. Traffic Pattern & Climb out • Area familiarization	Level 1	Stress good traffic scan right from the start.
7. Flight Controls - Four Fundamentals • Control effects & Usage • Stability • Trim • Straight & Level Pitch & bank control • Turns - medium bank (approx. 30 degrees) • Effects of power (turning tendencies) • Leveling off from climbs & descents • Climbs & descents (straight & turning) • Use of flaps	Level 1	Do by visual reference (VR) & instrument reference (IR). Do not use hood, but show all instrument reactions. Demonstrate adverse yaw. Correct way first, and then un-coordinated.
8. Traffic Pattern, Approach. Landing & Parking	Level 1	Stress correct landing attitude on each landing.
9. Post-Flight Discussion		"Good flight" - ALWAYS!
10. Preview Next Lesson • Review straight & level, turns, climbs & descents. Introduce steep turns. slow-flight & power-off stalls		Most students can climb, descend & turn at end of lesson 1.

LESSON 2 - DUAL FLIGHT

At the end of the second lesson, the student should be able to perform the four basic maneuvers (straight & level, turns, climbs, and descents) with minimum assistance and slow-flight and power-off stalls under the direction of the instructor.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Pre-Flight Discussion		Limit all IR training to a time permitting basis.
2. Pre-Flight Inspection	Level 2	
3. Engine Start	Level 2	
4. Radio Operation	Level 2	
5. Taxiing	Level 2	
6. Pre- Takeoff Check	Level 2	
7. Takeoff and Departure • Departure & level off procedures	Level 2	Re-emphasize good traffic scan techniques.
8. Climbing Turns	Level 2	VR & IR to predetermined altitude
9. Straight & Level	Level 2	VR&IR
10. Medium Turns	Level 2	VR&IR
11 Steep Turns	Level 1	Warm-up with 45 degree of bank, then 50 - 60 degrees.
12. Airspeed & Configuration Changes	Level 1	Use this to lead into MCA & stalls.
13 Slow Flight/Minimum Controllable Airspeed (MCA)	Level 1	Without flaps at first, then with different flap settings up to full flaps.
14. Power-Off Stalls	Level 1	Start with recoveries without power, and then show how power reduces the altitude lost.
15. Descents & Gliding Turns	Level 2	
16. Traffic Pattern, Approach, Landing & Parking	Level 2	Stress the correct landing attitude on every landing.
17. Post-Flight Discussion		
18. Preview Next Lesson • Review previous maneuvers. • Introduce approach/landing stalls.		

LESSON 3 - DUAL FLIGHT

At the completion of this lesson, the student should perform the four basic flight maneuvers with a reasonable degree of proficiency, and should accomplish slow-flight and power-off stalls with minimum assistance from the instructor. The student should be responsible for pre-flight inspection, starting procedures, radio communication, taxiing, and parking without direction from the instructor, except in unusual or unfamiliar situations.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Preflight Discussion		Limit all IR training to a time permitting basis.
2. Preflight, Starting Engine, & Taxiing	Level 3	
3. Takeoff & Departure	Level 2	
4. Climbs & Climbing Turns	Level 2	
5. Level-off from Climbs and Descents	Level 3	
6. Straight & Level, Medium-bank Turns	Level 3	
7. Airspeed & Configuration Changes	Level 2	Re-emphasize good traffic scan techniques.
8. Minimum Controllable Airspeed	Level 2	VR & IR to predetermined altitude.
9. Power-off Stalls	Level 2	VR&IR
10. Approach/Landing Stalls	Level 1	VR&IR
11. Descents & Descending Turns	Level 3	Warm-up with 45 degree of bank. then 50 - 60 degrees.
12. Traffic Pattern, Approach, Landing & Parking	Level 2	Use this to lead into MCA & stalls.
13. Post-flight Discussion		Without flaps at first, then with different flap settings up to full flaps.
14. Preview Next Lesson Power-on Stalls • Ground Reference Maneuvers • Landing Approaches • Forced Landings & Emergencies		Start with recoveries without power, and then show how power reduces the altitude lost.

LESSON 4 - DUAL FLIGHT

Upon completion of this lesson the student should have the ability to recognize and recover from stalls with 1ittle or no assistance from the instructor, fly prescribed patterns by ground references, and execute a traffic pattern and landing approach with the instructor's direction.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Pre-flight Discussion		Emphasize the need for good altitude, heading & airspeed control during all maneuvers.
2. Preflight Inspection, Starting Engine, & Taxiing	Level 3	
3. Takeoff (Normal & X-wind) & Departure	Level 2	
4. Straight & Level, Med. Turns, Climbs, & Descents	Level 3	VR&IR
5. Steep Turns	Level 2	Use 45 degrees of bank.
6. Minimum Controllable Airspeed	Level 3	
7. Approach/Landing Stalls	Level 2	
8. Power-on Stalls	Level 2	Use power-on stalls to intro, takeoff//departure stalls.
9. Takeoff/Departure Stalls	Level 1	Emphasize minimum altitude loss during recovery.
10. Emergency Procedures • Forced Landings • System Emergencies	Level 1	Use memorized, "immediate action" checklist, and printed checklists.
11. Ground Reference Maneuvers • Parallel Track (road or section line) • Rectangular Course • S-turns Across a Road	Level 2	Instructor demo if needed. Show effects of wind on ground track and turn radius.
12. Traffic Pattern, Approach, Landing, Parking	Level 2	
13. Post-flight Discussion		
14. Preview Next Lesson • Traffic Pattern • Takeoffs & Landings • Emergency Procedures		

LESSON 5 - DUAL FLIGHT

This lesson is a review of the flight maneuvers and procedures already covered in preparation for concentrated work on traffic patterns, takeoffs, and landings. Reasonable proficiency in coordination, airspeed control, and ground reference maneuvers should be achieved prior to the completion of this lesson.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Pre-flight Discussion		
2. Pre-flight Inspection, Starting Engine	Level 4	
3. Takeoff (Normal & X-wind) & Departure	Level 3	
4. Straight & Level, Med. Turns, Climbs, Descents	Level 4	VR& IR
5. Steep Turns	Level 3	
6. Minimum Controllable Airspeed	Level 3	VR & IR Relate recovery technique to go-around
7. Approach/Landing Stalls	Level 3	Imminent and full stalls
8. Ground Reference Maneuvers • Crabs and Slips	Level 3	Demonstrate crab then slip. Explain differences, and uses.
9. Takeoff/Departure Stalls	Level 2	
10. Emergency Procedures • Forced Landings • System Emergencies	Level 2	Re-emphasize pitch vs. airspeed. Do at various flap and approach power settings.
11. Glides & Descents	Level 4	
12. Traffic Pattern, Approach, & Landing	Level 2	1 or 2 times as time permits.
13. Parking and Shutdown	Level 4	
14. Post-flight Discussion		
15. Preview Next Lesson • Takeoffs & Landings (Normal & X-wind) • Accelerated Stalls • Go-Arounds • Wake Turbulence Avoidance		

LESSON 6 - DUAL FLIGHT

- The first half of this lesson is a review of previous flight maneuvers, and accelerated stalls are introduced. Concentrated takeoffs and landings should begin in the second half of this lesson.
- At the completion of this lesson the student should demonstrate a high degree of proficiency in all flight maneuvers, and be able to make takeoffs and landings with minimal assistance from the instructor.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Pre-flight Discussion		Emphasize precision in airspeed & altitude control.
2. Takeoff (Normal & X-wind) & Departure	Level 4	
3. Steep Turns	Level 4	
4. Minimum Controllable Airspeed & Approach/Landing Stalls	Level 4	Do Approach/Landing. Stalls out of MCA.
5. Ground Reference Maneuvers • Rectangular Course	Level 4	Relate rectangular course to the traffic pattern.
6. Takeoff/Departure Stalls	Level 3	Imminent and full stalls.
7. Accelerated Stalls	Level 2	
8. Emergency Procedures • Forced Landings	Level 3	Simulated in the traffic pattern.
9. Traffic Pattern	Level 3	Emphasize communications and traffic vigilance.
10. Wake Turbulence Avoidance	Level 3	
11. Approach & Landing (Normal & X-wind)	Level 3	
12. Go-Arounds & Balked Landing	Level 4	
13. Post-flight Discussion		
14. Preview Next Lesson • Slips to landings • Emergency Procedures		

LESSON 7 - DUAL FLIGHT

At the completion of this lesson the student should be able to make unassisted takeoffs and landings (even in light crosswinds), and accurately fly the traffic pattern. A short review of previous flight maneuvers is introduced to break up the monotony of traffic pattern flying.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Pre-flight Discussion		
2. Takeoffs (Normal & X-wind)	Level 4	
3. Approach/Landing Stalls	Level 4	
4. Accelerated Stalls	Level 3	
5. Emergency Procedures	Level 4	
• Partial Power Loss		
• Complete Power Loss		
• Electrical Failure		
• Aborted Takeoffs		
6. Forward Slips to Landing	Level 3	During no-flap landings simulating electrical failure.
7. Takeoffs & Landings	Level 4	Beware of student fatigue.
8. Wake Turbulence Avoidance	Level 4	
9. Post-flight Discussion		Critique this flight with first solo in mind for next lesson.
10. Preview Next Lesson		
• Accelerated Stalls		
• Forward Slips to Landing		
• Emergency Procedures		

LESSON 8 - DUAL AND SOLO FLIGHT

At the conclusion of the dual portion of this lesson, the student should have achieved a reasonably high degree of proficiency in all flight training maneuvers, and be able to make consistent, safe takeoffs and landings without instructor assistance or direction. Student should also be capable of recovering from poor approaches and bad bounces during landing. He/she should have demonstrated the ability to solve all ordinary problems encountered during local flights.

OPERATION	COMPLETION LEVEL	COMMENTS
1. Pre-flight Discussion		
2. Takeoffs (Normal & X-wind)	Level 4	
3. Accelerated Stalls	Level 4	
4. Emergency Procedures	Level 4	
• Forced Landings		
5. Takeoffs & Landings	Level 4	
6. Forward Slips to Landing	Level 4	During no-flap landings only.
7. SOLO FLIGHT		CONGRATULATIONS!
8. Post-Flight Discussion		Student rests. Instructor critiques student's performance, encouraging continued flight instruction towards private certificate.

FLIGHT INSTRUCTION LOG														
STUDENT:					INSTRUCTOR:									
Flight #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LESSON #														
Pre-flight Inspection														
Engine start, Taxi and Run-up														
Radio Operations and Communications														
Takeoff (Normal)														
Crosswind Takeoff														
Climbs and Level-off														
Straight and Level														
Turns (Shallow and Medium)														
Steep Turns (50-60 degrees of bank)														
Descents (Glides) and Level-off														
Slow Flight and Minimum Controllable Airspeed														
Power-off Stalls and Approach/Landing Stalls														
Power-on Stalls and Takeoff/Departure Stalls														
Accelerated Stalls														
Emergency Procedures and Forced Landings														
Ground Reference Maneuvers														
Landings (Normal)														
Crosswind Landings														
Go-Arounds and Balked Landing Recovery														
Slips (side-slips and Forward slips) to Landing														
Use of Flaps														
Basic Instrument Flight														
Parking, Shutdown and Securing Aircraft														
Vigilance, collision & wake turbulence avoidance														
Judgment														
Use of Checklists														
Flight Time (This Flight)														
Total Flight Time														
Fill in the completion level the student has attained for each maneuver. A lesson is not completed until the required completion level for each maneuver in that lesson has been attained.														

Flight #	INSTRUCTORS COMMENTS	OBJECTIVES FOR NEXT FLIGHT *	Instructor's Signature Student's Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
* Include the number of the lesson to be flown and/or specific maneuvers to be accomplished in continuation of the same lesson.			