



*Sample Training Syllabus
for
Initial and Transition
Fixed-Wing Ultralights*



Developed by the EAA Ultralight and Light-Sport Aircraft Council

WELCOME

Welcome to our EAA ultralight community and congratulations on your decision to fly ultralights. Ultralight flying is one of the purest and most enjoyable ways to experience the joys of flying. We are truly fortunate in the United States to have limited Federal Aviation Regulations governing our ultralight sport. This limited regulatory environment provides tremendous freedoms and privileges to fly our ultralights. These freedoms, however, come with great responsibility if we are to preserve our sport for the next generation of ultralighters. It is incumbent upon all of us to receive proper training, keep our flying skills sharpened, and to always ensure the safety of other individuals in the airspace as well as on the ground. We are all ambassadors to our sport!

The EAA Ultralight and Light-Sport Aircraft Council has developed this recommended training syllabus for those individuals interested in initial ultralight flight training and pilots transitioning to ultralights from other aircraft.

On behalf of the Ultralight and Light-Sport Aircraft Council and the entire EAA staff, thank you for your decision to invest in ultralight flight training! We are confident that proper flight training is your best insurance policy and flight plan to many years of enjoyable and safe flying.

Have fun!

EAA Ultralight and Light-Sport Aircraft Council
EAA.org/ULSAC

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MESSAGE TO STUDENTS

Flying ultralights has proven to be a safe recreational aviation activity when the ultralight pilot has been properly trained and flies in accordance with recommended safety practices. EAA highly recommends that anyone interested in flying ultralights receive flight instruction from a qualified instructor who is knowledgeable of the unique flight characteristics and operational aspects of ultralights.

The most important recommendation EAA can make to a new student is to find a qualified flight instructor and obtain dual flight instruction in a two-place airplane with low mass and high drag ultralight-type flight characteristics.

This guide provides two training syllabuses: Initial Ultralight Training (for those individuals with no flying experience) and Transition Ultralight Training (for existing pilots transitioning to ultralights from heavier aircraft). The ultralight transition training will cover the significantly different flight characteristics between larger, heavier aircraft and the lightweight, high-drag, low-inertia, slow-flying ultralight-type aircraft.

There are many sources of information available that may answer your questions on getting started, such as EAA.org/Ultralights, other ultralight pilots, EAA chapters, social media ultralight groups, ultralight manufacturers, and the internet. Other great resources include the EAA Flight Advisor program (for test flying ultralights) and the EAA Technical Counselor program (for building ultralights).

Although the FAA does not require flight training to fly an ultralight, flight training is an investment in the student's knowledge and ability. Trying to fly without proper instruction could be disastrous!

FINDING A FLIGHT INSTRUCTOR

One of the most important aspects of learning to fly an ultralight is to find a flight instructor who has the qualifications and a training aircraft. The flight instructor must have a good understanding of ultralight vehicle flight characteristics. The training aircraft should have ultralight-like flight characteristics also.

Here are a few suggestions to locate a flight instructor:

- Directory of flight instructors training sport pilots, EAA.org/Instructors
- Letter of deviation authority holders (LODA), EAA.org/LodaHolders
- Local EAA chapter network, EAA.org/FindAChapter
- Flying clubs, EAA.org/FlyingClubs

- Other ultralight pilots
- Ultralight manufacturer’s dealer network and dedicated websites on ultralights and light-sport aircraft
- National Association of Flight Instructors (NAFI), Instructair.com
- Society of Aviation Flight Educators (SAFE), SafePilots.org
- Social media ultralight groups on Facebook, etc.
- Visit a local airport and ask about instructors

MESSAGE TO FLIGHT INSTRUCTORS

FAA certified flight instructors (CFI) are a key link in ultralight pilot flight training. EAA encourages any CFI to become familiar with the flight characteristics of ultralights and make themselves available to potential new students seeking training to safely learn to fly an ultralight.

The FAA has no ultralight pilot or ultralight vehicle certification requirements. As a result, there are many ultralight pilots over the years who either trained themselves or had minimal training. While some pilots have succeeded in this manner, EAA strongly discourages it. These training syllabus recommendations are for both students and instructors.

TRAINING COMPLETION STANDARDS

EAA is recommending that ultralight pilots receive training to a proficiency standard similar to a sport pilot for each phase of training. However, the instructor must consider the type of ultralight the student will fly and the type of environment they will be flying in, and adjust the training so it is relevant and conducted as safely as possible.

EAA ULTRALIGHT VEHICLE REGISTRATION

Vehicle registration should be done with all ultralight vehicles. EAA assigns a vehicle registration number that begins with the letter “E”; an example is “E001AB.” Once the vehicle registration number is assigned, it can be placed on the vehicle and used to show you are complying with the self-regulation intent of FAR Part 103. It also works great for radio communication purposes. Registration can be completed online at EAA.org/UltralightRegistration.

EAA MEMBERSHIP

EAA is a membership organization that has developed and administers ultralight self-regulation programs in accordance with the intent of FAR 103. EAA members are a community of passionate enthusiasts that promotes and supports recreational

flying. If you are not already a member of EAA, we ask that you consider joining to support EAA's mission to grow participation in aviation.

EAA is pleased to furnish this sample training syllabus and hopes it will provide a pathway to many years of safe and enjoyable ultralight flying. EAA encourages and promotes safe and responsible ultralight flying activities.

EAA membership is \$40 a year, which includes the *EAA Sport Aviation* magazine. Call 1-800-JOIN-EAA to become a member.

For additional information:

EAA, P.O. Box 3086, Oshkosh, WI 54903, 920-426-6831, EAA.org/Ultralights

INITIAL ULTRALIGHT TRAINING SYLLABUS

This sample training syllabus was created with the building-block method, in which the student will accomplish the lesson in the syllabus at a pace customized for their flying skills (proficiency-based). A particular training phase may contain one or more lessons, depending on the ability of the student to complete the standards specified for each phase. No time estimates are given; the student should endeavor to spend the time necessary to master each skill.

Note: Throughout this syllabus, an emphasis on good aeronautical decision-making, proper risk management, and the principals of single pilot resource management will be incorporated into the training.

Note: Pre-solo sport pilot training is used as the basis for ultralight training, but with additional information provided as pertains to ultralights.

Prerequisites for Those Persons Receiving Ultralight Training

There are no prerequisites for those students who desire to fly only ultralights.

Teaching Aids

All students are provided with a list of recommended study publications tailored to their specific training needs. The following teaching tools may also be used:

- Model aircraft
- Internet-based graphics and videos

Record-Keeping

- Logbook
- Sport pilot training records (if applicable)

PHASE 1: INTRODUCTION TO FLIGHT

Objectives:

- Introduce student to preflight inspection and operational procedures
- Flight in a light aircraft
- The basics of control

Discussion Topics:

- Privileges and limitations of FAR Part 103
- AC 103-7 and applicable portions of AC 103-6
- Location and use of emergency equipment

- Use of checklists
- Two-stroke engine principles (as required)
 - o Operations
 - o Performance limitations
 - o Preflight procedures
- Four-stroke engine principles (as required)
 - o Operations
 - o Performance limitations
 - o Preflight procedures
- Ultralight airworthiness
- Fuel and electrical systems
- Preflight planning
- Flight qualities of high-drag, low-mass pusher aircraft
- Entry and exit procedures
- Communications radio and intercom system
- Positive exchange of controls
- Clearing turns and traffic avoidance
- Flight/engine instruments and their purpose

Introduce:

- Preflight procedures with an emphasis on explaining various parts and uses of the ultralight
- Proper aircraft entry and exit procedures
- Starting procedures
- Radio communications
- Taxi procedures and practices
- Pre-takeoff checklist
- Takeoff and climb procedures
- Effect and use of primary flight controls and trim
- Straight and level flight
- Climbs and descents, emphasis on power/pitch relationship
- Turns with emphasis on adverse yaw and rudder use
- Collision avoidance procedures
- Parking and securing of the aircraft
- Post-flight procedures

Completion Standards of Phase 1:

- Display a basic understanding of aircraft systems, two- or four-stroke engine operations, use of checklist for pre- and post-flight procedures
- Display a basic understanding of aircraft control

- Student is capable of controlling the aircraft in cruise, descents, climbs, and turns, with minimal instructor input

PHASE 2: FOUR FUNDAMENTALS OF FLIGHT

Objectives:

- Provide more detailed aerodynamics instruction, including the four fundamentals, angle of attack, and pitch/power concepts
- Emphasis on straight and level flight, climbs, descents, and turns
- Introduce aeronautical decision-making (ADM) skills

Discussion Topics:

- Basic aerodynamics
- Introduce the four fundamentals
- Explain angle of attack
- Discuss pitch/power concepts
- Explain and emphasize the concepts of proper ultralight handling
- Straight and level flight
- Climbs/descents
- Coordinated turns
- Takeoff and landing procedures
- Discuss ADM skills
- Apply ADM skills to this flight
- Fitness for flight (IM SAFE)
- Aeronautical decision-making
- Micro-meteorology: emphasis on the effect of gusty crosswinds, rotors, localized and mechanical turbulence on light aircraft
- Wake turbulence avoidance
- Ultralight airworthiness
- Ultralight engine performance limitations
- Weight and balance
- Instructor and student roles in actual emergency during training

Review:

- Engine starting, engine limitations
- Use of checklists
- Pre-takeoff checklist
- Normal takeoff procedures
- Visual scanning and collision avoidance

- Post-flight procedures
- Emergency equipment

Introduce:

- Crosswind taxi
- Crosswind takeoff
- Straight and level flight, including the use of trim
- Aircraft configuration changes
- Speeds associated with pattern positions
- Normal approach and landing

Completion Standards of Phase 2:

- Student can explain all ultralight and engine limitations
- Student can explain steps of preflight while using checklist
- Smooth engine start
- Student can explain run-up procedure while using checklist
- Increased proficiency with taxi procedures and flight controls
- Student can explain the basic knowledge of takeoffs and landings

PHASE 3: COORDINATION AND INTEGRATION

Objectives:

- Develop student's ability to apply coordinated control inputs and reinforce the relationship between attitude and instrumentation
- Familiarize the student with advanced crosswind techniques

Discussion Topics:

- Aborted takeoffs and go-around procedures, including judgment and planning
- Collision avoidance procedures
- Importance of coordinated flight
- Traffic pattern procedures, normal approach and landings
- Precautions regarding high sink rates during slower than usual approach speeds
- The need for proper procedures in gusty/turbulent approaches and landings
- Precautions regarding proper round-out altitude and flair control
- Crosswind techniques and their uses
- Maneuvering speeds

Review:

- Taxi techniques
- Straight and level flight
- Turns
- Climbs and descents

Introduce:

- Takeoff and climb-out procedures
- Approach and landing procedures
- Slips to landings
- Aborted takeoffs
- Constant airspeed climbs
- Constant airspeed descents
- Turns to headings
- Square pattern
- Traffic pattern entry and departure procedures
- Go-around procedures

Completion Standards of Phase 3:

- Ability to taxi in varying conditions without assistance
- Student understands the concept of coordinated flight and can fly the aircraft in a coordinated manner with minimal instructor assistance
- Student can conduct a stabilized approach without instructor assistance
- Student can explain aborted takeoff and go-around procedures, judgment and planning

PHASE 4: SLOW FLIGHT, STALLS, LANDINGS**Objectives:**

- Introduce student to slow flight and stall characteristics
- Help student understand landing sequence and techniques

Discussion Topics:

- Fundamentals of slow flight and stalls
- Spin awareness and avoidance
- Weight and balance and stall/spin cautions
- Fundamentals of control during landings sequence
- Emergency landing procedures

Review:

- Constant airspeed climbs and descents
- Turns to headings
- Practice area familiarization

Introduce:

- Flight at various speeds from cruise to slow flight
- Maneuvering during slow flight, emphasizing correct use of rudder to negate adverse yaw at slow airspeeds
- Power-off stalls and recovery
- Power-on stalls and recovery
- Emergency landing procedures
- Landing practice sequence

Completion Standards of Phase 4:

- Demonstrates an understanding of stall and recovery techniques
- Demonstrates an understanding of slow flight technique
- Demonstrates an understanding of basic landing technique and can land aircraft with minimum instructor assistance

PHASE 5: STEEP TURNS, GROUND REFERENCE MANEUVERS,
PROGRESS EVALUATION

Objectives:

- Introduce student to performance maneuvers
- Introduce student to additional ground reference maneuvers

Discussion Topics:

- Steep turns if applicable
- Fundamentals of ground reference maneuvers
- Wake turbulence avoidance
- Crabbing versus slipping

Review:

- All subjects and maneuvers to this point

Introduce:

- Steep turns
- S-turns

- Turns around a point
- Forward slips to land

Completion Standards of Phase 5:

- Ability to maintain specific ground track during ground reference maneuvers
- Demonstrates an understanding of steep turn technique
- Displays skills and knowledge consistent with the completion standards of Phases 1-5

PHASE 6: EMERGENCY PROCEDURES, LANDING PRACTICE

Objectives:

- To gain an understanding of emergency operations and to increase understanding of slow flight and stall recovery

Discussion Topics:

- Types of possible emergencies
- Use of all available resources and equipment in emergency situations
- Precautions regarding engine-out during takeoff/climb, proper pitch/yaw input, and turn back to runway maneuver
- Best glide speeds
- Engine-out procedures
- Precautions regarding high sink rates during slower than usual approach speeds, and the need for proper procedures in gusty/turbulent approaches and landings
- Precautions regarding proper round-out altitude and flair control
- Go-around procedures and precautions
- Emergency landings
- Equipment failure and partial flight control loss procedures
- Flight into/during low-visibility conditions (IMC)

Review:

- Maneuvering during slow flight
- Stall recovery
- Spin avoidance

Introduce:

- Systems and equipment malfunctions
- Emergency procedures using both memory and checklist
- Emergency descent

- Emergency approach and landings
- Forward slips to landing

Completion Standards of Phase 6:

- Display increased proficiency with control of ultralight
- Perform unassisted takeoffs and landings
- Demonstrate a basic understanding of emergency procedures

PHASE 7: MANEUVERS REVIEW

Objectives:

- Review material learned in previous lessons and increase comfort level with the ultralight in various flight regimes

Discussion Topics:

- Privileges and limitations of ultralight pilots

Review:

- Normal and crosswind takeoffs and landings
- Stall recoveries
- Steep turns
- Slow flight maneuvering
- Ground reference maneuvers
- Emergency procedures

Completion Standards of Phase 7:

- Demonstrate increased proficiency during maneuvers
- Altitude airspeed and heading within PTS standards during straight and level flight

PHASE 8: TRAFFIC PATTERN REVIEW, LANDING PRACTICE

Objectives:

- Review and perfect traffic pattern operations, practice takeoffs and landings

Discussion Topics:

- Basic navigation
- National airspace basics
- Traffic patterns and radio phraseology
- Controlled/uncontrolled field operations

Review:

- Normal and crosswind takeoff and climb
- Traffic pattern operations
- Normal and crosswind approach and landings
- Privileges and limitations of FAR Part 103
- AC 103-7 and applicable portions of AC 103-6

Introduce:

- Traffic pattern engine-out procedures

Completion Standards of Phase 8:

- Ability to perform takeoffs and landings with no instructor input
- Stays within traffic pattern and maintains adequate ground track

PHASE 9: COMPLETION**Objectives:**

- Review previous Phases 1-8 until proficient in ALL maneuvers and knowledge

Note:

At the completion of the ultralight training program, the student will be encouraged to continue their aviation training and possibly pursue a pilot certificate.

TRANSITION PILOT ULTRALIGHT TRAINING SYLLABUS

This training syllabus can guide pilots to successfully transition into flying a high-drag, low-mass (ultralight-type) aircraft. An ultralight may have a pusher engine configuration and is two-cycle powered, which makes for an aircraft with significant operational differences compared to conventional aircraft. This syllabus was constructed using the building-block method, in which the student will accomplish the lesson phase in the syllabus at a pace customized for their flying skills. A particular training session may contain one or more phases, depending on the ability of the student to complete the standards specified for each lesson. No time estimates are given; the student should endeavor to spend the time necessary to master each skill.

Prerequisites for Those Persons Receiving Ultralight Training

- Previous flying experience as pilot in command student pilot, or other flying knowledge and skills acceptable to the instructor

PHASE 1: INTRODUCTION TO ULTRALIGHTS

Objectives:

- Introduce student to preflight inspection procedures and flight in a ultralight-type aircraft
- Emphasis on characteristics of high-drag, low-mass (ultralight-type) tractor or pusher aircraft

Discussion Topics:

- Ultralight construction and preflight procedures
- Rotax or other engine operations and preflight procedures
- Flight qualities of high-drag, low-mass pusher aircraft
- Fuel and electrical system
- Communications radio and intercom system
- Entry and exit procedures
- Positive exchange of controls
- Clearing turns and traffic avoidance
- Location and use of emergency equipment

Introduce:

- Ground operations
- Starting procedures
- Taxi techniques
- Pre-takeoff check

- Flight operations
- Takeoff and climb procedures
- Effect and use of primary flight controls and trim
- Straight and level and cruise
- Climbs and descents, emphasis on power/pitch relationship
- Turns, emphasis on adverse yaw and rudder use
- Slow flight and stalls
- Parking and securing of the aircraft
- Post-flight procedures

Completion Standards of Phase 1:

- Student displays a basic understanding of ultralight-type aircraft systems, preflight flight and post-flight procedures
- Student is capable of controlling the aircraft in cruise, descents, climbs, and turns with no instructor input

PHASE 2: EMERGENCY PROCEDURES, TAKEOFFS, AND LANDINGS

Objectives:

- To acquaint the student with typical engine failure scenarios, equipment failures, and take-off and landing procedures

Discussion Topics:

- Precautions regarding engine-out during take-off/climb and proper pitch/yaw input
- Best glide speeds
- Engine-out procedures
- Precautions regarding high sink rates during slower than usual approach speeds, and the need for proper procedures in gusty/turbulent approaches and landings
- Precautions regarding proper round-out altitude and flair control
- Precautions regarding improper use of flap system, go-around procedures and precautions

Introduce:

- Emergency landings
- Equipment failure and partial flight control loss procedures
- Takeoff and climb-out procedures
- Approach and landing procedures
- Slips to landings

Completion Standards of Phase 2:

- Student displays a basic understanding of emergency landing procedures, and loss of equipment or flight control procedures
- Student is able to take off and land with no instructor input

PHASE 3: CROSSWIND CONTROL AND TAKE-OFF/LANDING PRACTICE

Objectives:

- Acquaint the student with advanced crosswind technique needed for flight in ultralight-type aircraft
- Takeoff/landing practice

Discussion Topics:

- Micro-meteorology with emphasis on the effect of gusty crosswinds, rotors, localized and mechanical turbulence on light aircraft
- Wake turbulence avoidance
- Review the precautions regarding high sink rates during slower than usual approach speeds, and the need for proper procedures in gusty/turbulent approaches and landings
- Review the precautions regarding proper round-out altitude and flair control
- Crosswind techniques and their uses, with emphasis on sideslips
- Maneuvering speeds

Introduce:

- Crosswind techniques
- Soft-field and short-field techniques

Completion Standards of Phase 3:

- Student displays a basic understanding of crosswind technique needed for flight in ultralight-type aircraft

PHASE 4: COMPLETION

Objectives:

- Review previous Phases 1-3 until proficient