Federal Aviation Administration, DOT

(b) Each student must demonstrate satisfactory proficiency prior to receiving an endorsement to operate an aircraft in solo flight.


APPENDIX E TO PART 141—AIRLINE TRANSPORT PILOT CERTIFICATION COURSE

1. Applicability. This appendix prescribes the minimum curriculum for an airline transport pilot certification course under this part, for the following ratings:
   (a) Airplane single-engine.
   (b) Airplane multiengine.
   (c) Rotorcraft helicopter.
   (d) Powered-lift.

2. Eligibility for enrollment. Before completing the flight portion of the airline transport pilot certification course, a person must meet the aeronautical experience requirements for an airline transport pilot certificate under part 61, subpart G of this chapter that is appropriate to the aircraft category and class rating for which the course applies, and:
   (a) Hold a commercial pilot certificate and an instrument rating, or an airline transport pilot certificate with instrument privileges;
   (b) Meet the military experience requirements under §61.73 of this chapter to qualify for a commercial pilot certificate and an instrument rating, if the person is a rated military pilot or former rated military pilot of an Armed Force of the United States; or
   (c) Hold either a foreign airline transport pilot license or foreign commercial pilot license and an instrument rating, if the person holds a pilot license issued by a contracting State to the Convention on International Civil Aviation.

3. Aeronautical knowledge areas. (a) Each approved course must include at least 40 hours of ground training on the aeronautical knowledge areas listed in paragraph (b) of this section, appropriate to the aircraft category and class rating for which the course applies.
   (b) Ground training must include the following aeronautical knowledge areas:
      (1) Applicable Federal Aviation Regulations of this chapter that relate to airline transport pilot privileges, limitations, and flight operations;
      (2) Meteorology, including knowledge of and effects of fronts, frontal characteristics, cloud formations, icing, and upper-air data;
      (3) General system of weather and NOTAM collection, dissemination, interpretation, and use;
      (4) Interpretation and use of weather charts, maps, forecasts, sequence reports, abbreviations, and symbols;
      (5) National Weather Service functions as they pertain to operations in the National Airspace System;
      (6) Windshear and microburst awareness, identification, and avoidance;
      (7) Principles of air navigation under instrument meteorological conditions in the National Airspace System;
      (8) Air traffic control procedures and pilot responsibilities as they relate to en route operations, terminal area and radar operations, and instrument departure and approach procedures;
      (9) Aircraft loading; weight and balance; use of charts, graphs, tables, formulas, and computations; and the effects on aircraft performance;
      (10) Aerodynamics relating to an aircraft’s flight characteristics and performance in normal and abnormal flight regimes;
      (11) Human factors;
      (12) Aeronautical decision making and judgment; and
      (13) Crew resource management to include crew communication and coordination.

4. Flight training. (a) Each approved course must include at least 25 hours of flight training on the approved areas of operation listed in paragraph (c) of this section appropriate to the aircraft category and class rating for which the course applies. At least 15 hours of this flight training must be instrument flight training.
   (b) For the use of flight simulators or flight training devices—
      (1) The course may include training in a flight simulator or flight training device, provided it is representative of the aircraft for which the course is approved, meets the requirements of this paragraph, and the training is given by an authorized instructor.
      (2) Training in a flight simulator that meets the requirements of §141.41(a) of this part may be credited for a maximum of 25 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.
      (3) Training in a flight training device that meets the requirements of §141.41(b) of this part may be credited for a maximum of 25 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.
      (4) Training in flight simulators or flight training devices described in paragraphs (b)(2) and (b)(3) of this section, if used in combination, may be credited for a maximum of 50 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.

5. Ground training is given by an authorized instructor.
§ 141.41(a) requires that the flight instructor training meet the following requirements:

1. Flight instructor certification course

2. A student who satisfactorily completes 2 years of study on the principles of education at a college or university may be credited with no more than 20 hours of the training required in paragraph (a)(1) of this section.

3. Each approved course must include flight training on the approved areas of operation listed in paragraph (c) of this section appropriate to the aircraft category and class rating for which the course applies:
   (1) Preflight preparation;
   (2) Preflight procedures;
   (3) Takeoff and departure phase;
   (4) In-flight maneuvers;
   (5) Instrument procedures;
   (6) Landings and approaches to landings;
   (7) Normal and abnormal procedures;
   (8) Emergency procedures; and
   (9) Postflight procedures.

4. Stage checks and end-of-course tests. (a) Each student enrolled in an airline transport pilot course must satisfactorily accomplish the stage checks and end-of-course tests, in accordance with the school’s approved training course, consisting of the approved areas of operation listed in paragraph (c) of section No. 4 of this appendix that are appropriate to the aircraft category and class rating for which the course applies.

   (b) Each student must demonstrate satisfactory proficiency prior to receiving an endorsement to operate an aircraft in solo flight.

5. Aeronautical knowledge training. (a) Each approved course must include at least the following ground training in the aeronautical knowledge areas listed in paragraph (b) of this section:
   (1) 40 hours of training if the course is for an initial issuance of a flight instructor certificate; or
   (2) 20 hours of training if the course is for an additional flight instructor rating.

   (b) Ground training must include the following aeronautical knowledge areas:
      (1) The fundamentals of instructing including—
         (i) The learning process;
         (ii) Elements of effective teaching;
         (iii) Student evaluation and testing;
         (iv) Course development;
         (v) Lesson planning; and
         (vi) Classroom training techniques.

   (c) A student who satisfactorily completes 2 years of study on the principles of education at a college or university may be credited with no more than 20 hours of the training required in paragraph (a)(1) of this section.

4. Flight training. (a) Each approved course must include at least the following flight training on the approved areas of operation of paragraph (c) of this section appropriate to the flight instructor rating for which the course applies:
   (1) 25 hours, if the course is for an airplane, rotorcraft, or powered-lift rating; and
   (2) 10 hours, which must include 10 flights, if the course is for a glider category rating.

   (b) For the use of flight simulators or flight training devices:
      (1) The course may include training in a flight simulator or flight training device, provided it is representative of the aircraft for which the course is approved, meets the requirements of this paragraph, and the training is given by an authorized instructor.
      (2) Training in a flight simulator that meets the requirements of §141.41(a) of this part, may be credited for a maximum of 10 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.

5. Aeronautical knowledge training. (a) Each approved course must include at least the following ground training in the aeronautical knowledge areas listed in paragraph (b) of this section:
   (1) 40 hours of training if the course is for an initial issuance of a flight instructor certificate; or
   (2) 20 hours of training if the course is for an additional flight instructor rating.

   (b) Ground training must include the following aeronautical knowledge areas:
      (1) The fundamentals of instructing including—
         (i) The learning process;
         (ii) Elements of effective teaching;
         (iii) Student evaluation and testing;
         (iv) Course development;
         (v) Lesson planning; and
         (vi) Classroom training techniques.

   (c) A student who satisfactorily completes 2 years of study on the principles of education at a college or university may be credited with no more than 20 hours of the training required in paragraph (a)(1) of this section.

4. Flight training. (a) Each approved course must include at least the following flight training on the approved areas of operation of paragraph (c) of this section appropriate to the flight instructor rating for which the course applies:
   (1) 25 hours, if the course is for an airplane, rotorcraft, or powered-lift rating; and
   (2) 10 hours, which must include 10 flights, if the course is for a glider category rating.

   (b) For the use of flight simulators or flight training devices:
      (1) The course may include training in a flight simulator or flight training device, provided it is representative of the aircraft for which the course is approved, meets the requirements of this paragraph, and the training is given by an authorized instructor.
      (2) Training in a flight simulator that meets the requirements of §141.41(a) of this part, may be credited for a maximum of 10 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.

5. Aeronautical knowledge training. (a) Each approved course must include at least the following ground training in the aeronautical knowledge areas listed in paragraph (b) of this section:
   (1) 40 hours of training if the course is for an initial issuance of a flight instructor certificate; or
   (2) 20 hours of training if the course is for an additional flight instructor rating.

   (b) Ground training must include the following aeronautical knowledge areas:
      (1) The fundamentals of instructing including—
         (i) The learning process;
         (ii) Elements of effective teaching;
         (iii) Student evaluation and testing;
         (iv) Course development;
         (v) Lesson planning; and
         (vi) Classroom training techniques.

   (c) A student who satisfactorily completes 2 years of study on the principles of education at a college or university may be credited with no more than 20 hours of the training required in paragraph (a)(1) of this section.

4. Flight training. (a) Each approved course must include at least the following flight training on the approved areas of operation of paragraph (c) of this section appropriate to the flight instructor rating for which the course applies:
   (1) 25 hours, if the course is for an airplane, rotorcraft, or powered-lift rating; and
   (2) 10 hours, which must include 10 flights, if the course is for a glider category rating.

   (b) For the use of flight simulators or flight training devices:
      (1) The course may include training in a flight simulator or flight training device, provided it is representative of the aircraft for which the course is approved, meets the requirements of this paragraph, and the training is given by an authorized instructor.
      (2) Training in a flight simulator that meets the requirements of §141.41(a) of this part, may be credited for a maximum of 10 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.