

# Course Catalog - Fall 2006

## Aviation

### 090 ***Orientation Refresher*** Credit: 0 hours.

Course provides the student with additional aeronautical experience to develop the required proficiency to successfully complete the objectives of a flight course, pilot certificate, or aircraft rating. The flight hours may be divided between dual instruction or solo flight as required to meet the student's needs. The amount of dual vs. solo time and aircraft to be used will be determined by the chief pilot. Students enrolled in this course will also participate in up to 5 hours of research flight experiments. Approved for S/U grading only. Prerequisite: Consent of director. May be repeated.

### 100 ***Intro to Aviation*** Credit: 1 hours.

A weekly class for students who are new to the Institute of Aviation. Provides an overview of field as well as institution-specific information. Approved for both letter and S/U grading.

### 101 ***Private Pilot, I*** Credit: 3 hours.

The first of a two course sequence to prepare for FAA Private Pilot certification. Includes classroom instruction on aerodynamics, airplane systems, airport and airplane operations, federal regulations and airplane safety. Also includes 26.4 hours of flight training and 3 hours in a flight simulator in the flight laboratory. Students enrolling in this course will also participate in up to 5 hours of research flight experiments. Private Pilot certification requires the completion of AVI 120. Prerequisite: Consent of director.

### 120 ***Private Pilot, II*** Credit: 3 hours.

Second of a two course sequence to prepare for FAA Private Pilot certification. Includes classroom instruction on airplane operation, navigation, night flying and meteorology. Includes 34.5 hours of flight training and 3 hours in a flight simulator in the flight laboratory. Students enrolling in this course will also participate in up to 5 hours of research flight experiments. Students successfully completing final examinations will be issued a Private Pilot certificate. Credit is not given for both AVI 120 and AVI 121. Prerequisite: AVI 101 and consent of director.

### 121 ***Private Pilot, Requalification*** Credit: 2 hours.

Forty-five classroom hour transitional course for students entering the Institute with a Private Pilot certificate who desire to continue in the Commercial-instrument sequence (AVI 130 through 210/211). Includes instruction on airplane operations, navigation, and meteorology. Includes 17 hours of flight training and 3 hours in a flight simulator in the flight laboratory. Students enrolling in this course will also participate in up to 5 hours of research flight experiments. Credit is not given for both AVI 120 and AVI 121. Prerequisite: Private Pilot certificate (with a minimum of 60 hours of flight), and consent of director.

### 130 ***Commercial - Instrument, I*** Credit: 3 hours.

First of a two course sequence to prepare the private pilot for the instrument rating; reviews cross-country flight with an emphasis on instrument approaches and enroute instrument procedures; includes 45 hours classroom instruction on instrument flying, navigation, aircraft instruments, and regulations. Includes 28.2 hours of flight training and 8 hours in a flight simulator in the flight laboratory. Students enrolling in this course will also participate in up to 5 hours of research flight experiments. Issuance of the instrument rating requires completion of AVI 140. Prerequisite: AVI 120 or AVI 121, and consent of director.

### 140 ***Commercial - Instrument, II*** Credit: 3 hours.

Second of a two course sequence to prepare the private pilot for the instrument rating. Includes forty-five hours classroom instruction on advanced maneuvers, aerodynamics, navigation, and aircraft systems. Includes 30.2 hours of flight training and 8 hours in a flight simulator in the flight laboratory. Students enrolling in this course will also participate in up to 5 hours of research flight experiments. Prerequisite: AVI 130 and consent of director.

### 184 ***Aircraft Systems for Pilots*** Credit: 3 hours.

Basic aircraft systems, their components, and theory of operation. Familiarization of Federal Aviation Administration maintenance rules and regulations applicable to pilots.

**199 Undergraduate Open Seminar** Credit: 1 to 5 hours.  
May be repeated.

**200 Commercial Pilot, I** Credit: 4 hours.

Advanced course in preparation toward the FAA Commercial Pilot Certification. Includes 39.5 hours of flight (22.5 hours dual, 15.5 hours solo, and 1.5 hour flight exam), and 6 hours in a Flight Training Device. Includes 45 hours of classroom instruction covering cross country procedures, appropriate federal aviation regulations, maintenance inspections, and pilot responsibilities. Emphasis is on complex airplane operation and instrument flying procedures. Successful completion is required prior to enrolling in AVI 210 (or AVI 211). Students enrolling in this course will also participate in up to 5 hours of aviation research experiments conducted by Institute of Aviation staff. Prerequisite: Successful completion of AVI 140 and consent of director.

**210 Commercial Pilot, II** Credit: 4 hours.

Final course in a series of advanced lecture/flight courses in preparation for the FAA Commercial Pilot Certificate with Instrument Rating. Includes 38.7 hours of flight (21.5 hours dual, 15.7 hours solo, 1.5 hour flight exam), and 7 hours in a Flight Training Device. Includes 45 hours of classroom instruction covering cross country procedures appropriate federal aviation regulations, commercial maneuvers, and pilot responsibilities. Emphasis is on complex airplane operation and commercial maneuvers. Students enrolling in this course will also participate in up to 5 hours of aviation research experiments conducted by Institute of Aviation staff. Credit is not given for both AVI 210 and AVI 211. Prerequisite: Successful completion of AVI 200 and consent of director.

**211 Commercial Pilot, II - M.E.** Credit: 3 hours.

Final course in a series of advanced lecture/flight courses in preparation for the FAA Commercial Pilot certificate with both the Instrument rating and multi-engine ratings. Includes 45 hours classroom instruction on IFR and VFR cross-country, and VFR commercial maneuvers. Includes 35 hours of flight instruction and training (23 hours multi-engine airplane and 12 hours single-engine airplane) and 2 hours in a flight simulator in the flight laboratory. Includes three flight exams for qualified individuals. Students enrolling in this course will also participate in up to 5 hours of research flight experiments conducted by Institute of Aviation staff. Credit is not given for both AVI 210 and AVI 211. Prerequisite: AVI 200, recommendation from AVI 200 instructor, and consent of director

**225 Aviation Weather** Credit: 3 hours.

Provides knowledge of weather related to aviation operations for aviation professionals. Includes interpretation of aviation reports, charts, forecasts, other weather information, and human factor issues related to safe weather decision making in numerous scenarios and applications. Prerequisite: AVI 120 or AVI 121.

**320 Flight Instructor-Airplane** Credit: 3 hours.

Prepares the commercial pilot for an FAA Flight Instructor (Airplane) certificate. Includes forty-five hours classroom instruction on fundamentals of teaching, student motivation, blocks to learning, stress, cognitive approaches to learning, flight instructor duties/responsibilities, lesson planning and development, aerodynamics, and pertinent federal aviation regulations. Includes 22 hours of flight training and instruction and three hours in flight simulator teaching techniques in the flight laboratory. Also includes a one hour flight check for course completion. Students enrolling in this course will also participate in up to 5 hours of research flight experiments Prerequisite: Commercial Pilot certificate with instrument rating and consent of director.

**322 Instrument Flight Instructor** Credit: 1 hours.

Provides the instruction and supervised training for the addition of the Instrument-Airplane rating to the Flight Instructor certificate. Reviews instrument operations with an emphasis on the instructional aspects of these operations. Includes five hours of flight simulator instruction, eleven hours of flight instruction and supervised training, four hours of discussion and a one hour flight test. Students enrolling in this course will also participate in up to 5 hours of research flight experiments. Prerequisite: Commercial Pilot certificate with instrument rating; flight instructor-airplane certificate or concurrent enrollment in AVI 320; and consent of director.

**324 All Attitude Orientation** Credit: 0 hours.

Primary focus of this course is to teach the recovery of an airplane from emergency inflight attitudes. Teaches the safe handling of an aircraft in all attitudes of flight through the use of various acrobatic maneuvers including loops, snap rolls, slow rolls, Immelmans, Cuban eights, spins, and similar maneuvers, plus takeoff and landing procedures in a tailwheel airplane. Ten flight hours. Students enrolling in this course will also participate in up to five hours of research flight experiments conducted by the Institute of Aviation staff. Approved for S/U grading only. Prerequisite:

AVI 101 and 120 or the Private Pilot certificate and consent of director.

**350 Practice Teaching-Airplane** Credit: 3 hours.

Practice teaching using classroom, audiovisual materials, flight simulators, and airplanes; prepares the certified flight instructor to teach in all modes of aviation education. A minimum of 2 hours of classroom lecture, 3 hours of simulator instruction, and from 1 to 19 hours of airplane instruction is given by the student; an additional 20 hours of classroom lecture-discussion clarifies and explains the proper methods of aviation instruction Prerequisite: AVI 320 and flight instructor certificate; junior standing; recommendation from AVI 320 flight instructor; and consent of director.

**358 Human Factors** Credit: 4 hours.

Same as IE 340, and PSYC 358. See PSYC 358.

**380 Multiengine Land** Credit: 1 hours.

Prepares the commercial pilot for an FAA multiengine land airplane rating; 18 hours of discussion and 15 hours of flight in a multiengine airplane (13 hours dual instruction, one-half hour solo, plus 1.5 hours check ride for qualified individuals). Students enrolling in this course will also participate in up to 5 hours of research flight experiments conducted by Institute of Aviation staff. Prerequisite: Commercial Pilot certificate and consent of director.

**381 Cockpit Resource Management** Credit: 3 hours.

Examines societal/cultural, industry, governmental regulatory agency, organizational, group, and individual influences on cockpit behavior and cockpit resource management. Two 90 minute lecture/discussion and one two-hour laboratory/flight periods each week. Laboratory and flight sections use multi-engine flight simulators and multi-engine aircraft. Students will gain experience flying preplanned scenarios in both aircraft and simulators. Materials from lecture/discussions will be emphasized in flights. Prerequisite: Multi-engine instrument rating; junior standing and consent of director.

**384 Jet Aircraft System and Ops, I** Credit: 3 hours.

Operator-oriented study of modern turbo- prop and pure turbine aircraft systems and operation procedures, including aerodynamic performance, fault diagnosis and troubleshooting procedures, and emergency procedures. Prerequisite: AVI 184, AVI 200, or consent of instructor.

**391 Special Flight Ratings** Credit: 0 hours.

Consists of aeronautical experience that can be used for special FAA certificates and/or ratings such as Airline Transport Pilot or Rotorcraft-helicopter. Course may also be used for specialized flight such as advanced multi-engine operations. Sixteen hours of discussion and a variable number of hours of flight instruction (dual and/or solo) to meet the individual needs of the student. Students enrolling in this course will also participate in up to five hours of research flight experiments conducted by the Institute of Aviation staff. Approved for S/U grading only. Prerequisite: Pilot certificate, and consent of director.

**392 Flight Instructor CFII and ME** Credit: 3 hours.

Provides the instruction and supervised training for the addition of the Instrument Airplane and Airplane Multiengine ratings to the Flight Instructor certificate. Reviews instrument operations and multiengine operations with an emphasis on the instructional aspects of these operations. Includes 25 hours of instruction and 45 hours classroom. Prerequisite: AVI 320 and AVI 380. Students may not receive credit for this course and for AVI 322.

**393 Turboprop Pilot Orientation** Credit: 3 hours.

Introduction to multi-engine turboprop airplane operations. Forty-five hours of lecture-discussion, and 16 hours (as pilot and co-pilot) of simulated flight in a Frasca 242T Turboprop aircraft simulator or equivalent. Includes turbine engine theory and operation, normal and emergence procedures, performance calculations, and crew coordination Prerequisite: AVI 184, AVI 380, AVI 381, and consent of director.

**429 Hum Comp Interaction Lab** Credit: 4 hours.

Same as IE 446, and PSYC 429. See PSYC 429.

**441 Interactive Sys Model and Des** Credit: 3 or 4 hours.

Same as IE 441. See IE 441.

**447 Human Error** Credit: 3 or 4 hours.

Theoretical basis of human error plus methods for analysis, modeling and prediction in applied settings. Also covers methods for error reduction and error recovery. Same as PSYC 457. Prerequisite: PSYC 358 or ME 340, or consent of instructor.

**455 Aviation Accident Analysis** Credit: 2 to 4 hours.

Fundamental concepts of aviation safety augmentation with emphasis on accident prevention through accident investigation, casualty reduction through crashworthy design, and safety enhancement resulting from litigation; accident investigation techniques and crash survival design factors 3 undergraduate hours. 2 or 4 graduate hours. Prerequisite: AVI 101 or consent of instructor.

**456 Hum Perf and Eng Psych** Credit: 3 or 4 hours.

Same as IE 445, and PSYC 456. See PSYC 456.

**495 Aviation Psychology** Credit: 2 to 4 hours.

Integrates the disciplines of psychology and aviation, discussing the relevance of the psychology of perception, cognition, learning, stress, decision making, and group processes to a variety of aviation concerns related to topics such as cockpit design, pilot error, pilot training, crew communications, and air traffic control. Field trips will be taken to laboratories at Beckman or to Willard Airport. Same as PSYC 497. 3 undergraduate hours. 2 or 4 graduate hours. Prerequisite: Introductory Psychology. An upper level course in human factors (PSYC 358 or PSYC 456) is recommended but not required.

**497 Special Topics in Aviation** Credit: 2 to 4 hours.

Special topics in the field of aviation. May be repeated in subsequent terms only when separate topics are offered to a maximum of 12 hours. Prerequisite: AVI 495 or equivalent and junior standing; or consent of instructor.

**527 Engineering Psychology** Credit: 4 hours.

Same as PSYC 527. See PSYC 527.

**542 Cooperative Problem Solving** Credit: 4 hours.

Same as IE 542. See IE 542.

**590 Individual Research** Credit: 0 to 16 hours.

For graduate students who wish to conduct research on special problems not included in graduate thesis. Approved for S/U grading only. May be repeated to a maximum of 32 hours. Prerequisite: Graduate standing and consent of instructor.

**597 Human Factors Seminar** Credit: 0 to 8 hours.

Provides an overview of current faculty research interests, a survey of human factors research methods, and in depth instruction and exercise on the process of H.F. research including literature search, experimental design, statistical analysis, and scientific report writing. Approved for S/U grading only. Course may be repeated up to a maximum of 16 hours, but no more than 8 hours within a term. Prerequisite: Consent of instructor, graduate standing.

**599 Thesis Research** Credit: 0 to 16 hours.

Thesis research. May be repeated to a maximum of 36 hours. Prerequisite: Graduate standing and consent of instructor.