Aviation (AVIT)

Courses

AVIT 100. Aviation Orientation. 1 Credit.
This course is required for all aviation majors. Its purpose is to prepare new students for their university and professional careers by discussing students' responsibilities and options concerning the aviation industry. Aviation career options will be explored. Academic and airport requirements and procedures will be covered. F.S.

AVIT 102. Introduction to Aviation. 5 Credits.
The course will develop the student's knowledge and skills that are needed to safely exercise the privileges and responsibilities of a Private Pilot. Course content includes instruction in aerodynamics, aircraft systems, FAA regulations, U.S. Airspace System, weight and balance, aircraft performance, aviation weather, flight publications, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites or Corequisites: ATSC 110 and a minimum GPA of 2.6. F.S,SS.

AVIT 103. Introduction to Air Traffic Management. 2 Credits.
This introductory course allows all aviation majors the opportunity to explore the Air Traffic Operations through the simulated role of an Air Traffic Controller in a Terminal RADAR Approach Control (TRACON) environment, or a Control Tower facility. This course follow the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. Students will have a hands-on experience of working departures and arrivals in a simulated RADAR, or Tower, facility. They will be introduced to the Air Traffic Management System and National Airspace System, Navigational Aids, Separation Minima between Aircraft, and a general orientation to the world of Air Traffic Operations. This realistic look at the profession of an Air Traffic Controller will enhance any aviation enthusiast's dream of working air traffic. An Air Traffic lab is required. F.S,SS.

AVIT 105. Essentials of Flight. 3 Credits.
This course will provide the student with a survey of knowledge in both Visual Flight Rules and Instrument Flight Rules in aviation. F.

AVIT 126. Introduction to UAS Operations. 2 Credits.
This course of instruction introduces the student to the history of Unmanned Aircraft Systems and their current and future development for use in a burgeoning civil industry. Specific blocks deal with aircraft, ground, communications, launch and recovery systems while emphasizing the human integration into the overall system. F.S.

AVIT 142. Introduction to Aviation-Helicopter. 5 Credits.
This course develops the knowledge needed to safely exercise the privileges and responsibilities of a Private Pilot. Course content includes instruction in helicopter aerodynamics, helicopter systems, FAA regulations, U.S. airspace system, weight and balance, helicopter performance, aviation weather, flight publications, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. Prerequisite: A minimum GPA of 2.6. Corequisite: AVIT 143. Prerequisite or Corequisite: ATSC 110 and ATSC 110L. F.

AVIT 143. Private Pilot-Helicopter Certification Lab. 1 Credit.
This course develops the knowledge needed to safely exercise the privileges and responsibilities a Private Pilot. Course content includes instruction in helicopter aerodynamics, helicopter systems, FAA regulations, U.S. airspace system, weight and balance, helicopter performance, aviation weather, flight publications, radio navigation, cross-country planning and navigation, basic flight physiology, and flight safety. Prerequisite: A minimum GPA of 2.6. Corequisite: AVIT 143. Prerequisite or Corequisite: ATSC 110 and ATSC 110L. F.S.

AVIT 208. Aviation Safety. 3 Credits.
This course provides the student with a detailed introduction into aspects of aviation safety, aviation safety programs, risk management, and the associated components of pilot psychology, physiology, human factors, and accident review and investigation. Prerequisite: A minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 102 or AVIT 142. F.S,SS.

AVIT 221. Basic Attitude Instrument Flying. 3 Credits.
This course begins with a discussion of Aeronautical Decision Making (ADM), Airworthiness Requirements for flight, Human Factors and night flight. The course proceeds to an in-depth study of pilot/static and gyro instruments and Basic Attitude Instrument Flying. In addition, there will be a discussion of the operation, interpretation, and practical use of VOR, ADF, DME, GPS, RMI, and HSI, as well as an introduction to Electronic Instrument Flight Displays (Glass Flight Decks). The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisite: AVIT 102 and a minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 100. F.S,SS.

AVIT 222. IFR Regulations and Procedures. 3 Credits.
This course will provide the student with a detailed study of the regulations, procedures, and publications necessary for operating IFR in the national airspace system. Terminal and enroute procedures will be studied in detail. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites: AVIT 221 and a minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 208. F.S,SS.

AVIT 238. UAS Operator Certification. 3 Credits.
This course will develop the student's knowledge and skill needed to manage and operate small unmanned aircraft systems. Course content includes the Federal Aviation Regulations, airspace authorization criteria, and operational approval requirements. Mission employment skills will be acquired through both classroom and hands-on flight activities. Flight activities will include launch and recovery operations, emergency procedures, and mission planning and execution. Students must complete the appropriate UAS flight lessons to satisfactorily complete the course. Prerequisites: AVIT 126 and a minimum GPA of 2.6. F.S,SS.

AVIT 239. Autonomous Fundamentals. 2 Credits.
This course provides an overview of the current state of remotely piloted, unmanned, and autonomous systems and current commercially available systems. Moving beyond the constraints of aerial applications, the course will review common characteristics and features employed by autonomous systems across all domains (air, ground, and sea) while exploring the challenges of blending man and machine responses in dynamic operational environments. Prerequisites: AVIT 126 and a minimum GPA of 2.6. F.

AVIT 240. UAS Enabling Concepts. 3 Credits.
This course provides an in-depth survey of the enabling concepts critical to successful remotely piloted, unmanned aircraft, and autonomous system operations and provide the learner with an appreciation of the complexities of fully-realized autonomous system operations. Prerequisites: AVIT 239 and a minimum GPA of 2.6. S.

AVIT 241. Commercial Helicopter. 4 Credits.
This course provides a study of commercial helicopter systems, including turbine engines, drive trains, fuel, hydraulic, electrical, and basic flight instruments. Navigation aids, commercial regulations, and advanced helicopter aerodynamics will also be studied. Basic Attitude Instrument flying will be introduced and will include the interpretation and practical use of instrument navigation systems. Prerequisites: AVIT 142 and a minimum GPA of 2.6. S.

AVIT 242. Introduction to Commercial Flying-Helicopter Lab. 1 Credit.
This lab course is the beginning of a student's commercial helicopter flight training and is structured to improve and refine aeronautical decision making skills and aircraft control technique. The night flying experience requirements for a FAA Commercial Pilot certificate with Rotorcraft-Helicopter category and class ratings will also be obtained. Prerequisites: AVIT 142 and AVIT 143; minimum GPA of 2.6. S/U grading. F.S.SS.

AVIT 247. R44 Helicopter Transition Lab. 1 Credit.
This lab course provides the training necessary to operate a Robinson R44 helicopter as pilot-in-command, including flight experience in the R44 helicopter. Prerequisite: Minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 241. S/U grading. On demand.

AVIT 250. Human Factors. 2 Credits.
This course introduces the student to issues influencing human performance in the complex operational aviation environments. Theory and practical applications of cognitive processing, decision-making, interpersonal interaction and communication will be presented. This course also provides an introduction to design elements intended to optimize man-machine interaction. Prerequisite: Minimum GPA of 2.6. F.S,SS.
AVIT 260. Control Tower Operations I. 4 Credits.
The Control Tower Operations I provides an orientation to basic fundamental Clearance Delivery (CD) and Ground Control (GC) operations and procedures. Tower interaction with other Air Traffic and non-Air Traffic agencies is also part of this course. This course follows the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. To complete this course, students must demonstrate their basic knowledge of the CD/GC function of Control Tower operations through written and performance examinations. An Air Traffic lab is required. Prerequisites: AVIT 103 and a minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 100. F,S.

AVIT 261. RADAR Operations I. 4 Credits.
This course provides students with basic RADAR training and knowledge of separation requirements and procedures of Air Traffic Terminal RADAR Operations. Student evaluations are based on demonstrated application of acquired controller skills utilizing Air Traffic simulation. Scenarios progress in difficulty. This course follows the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. To complete this course, students must, in addition to normal academic requirements, successfully complete an intermediate RADAR simulation scenario without assistance. An Air Traffic lab is required. Prerequisites: AVIT 103 and a minimum GPA of 2.6. F,S,SS.

AVIT 276. OSHA Safety Standards for Industry. 3 Credits.
This course covers OSHA Standards, policies, and procedures in general industry. Topics include scope and application of the OSHA General Industry Standards, general industry principles and special emphasis on those areas in general industry, which are most hazardous. Prerequisite: Minimum GPA of 2.6. On demand.

AVIT 309. Flight Physiology. 3 Credits.
In this course, human physiological responses to the stresses of flight environment will be examined in-depth. Topics include decompression, hypoxia, spatial disorientation, altered pressure environments, acceleration and fatigue. The students will experience altered pressure environments during laboratory flights in the UND Aerospace altitude chamber. Prerequisites: AVIT 250; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 310. Public Safety Aviation. 3 Credits.
This course develops the student's knowledge related to the organization, operations, tactics and techniques related to air support operations within law enforcement, fire protection and resource protection agencies. Specific topics include: Airborne law enforcement patrol, surveillance and special operations (SWAT); fire operations including fire chemistry and behavior, fire department organization and tactics, airborne firefighting equipment, fire extinguishment tactics and air ambulance operations; and, resource protection air operations including wildlife surveys, hunting and fishing enforcement patrols, search and rescue and operations from unimproved landing sites and seaplane operations. Prerequisite: AVIT 102 or AVIT 142 or consent of instructor; minimum GPA of 2.6. S.

AVIT 311. Safety Management System (SMS). 3 Credits.
This course provides instruction and practical application of Safety Management Systems (SMS) and how SMS relates to Accident Prevention Program Management. Students receive the necessary instruction required to design, develop, implement, manage, and foster an effective organizational level SMS and accident prevention program. Course topics include theory and application of SMS program elements. Prerequisites: AVIT 208 and a minimum GPA of 2.6. S.

AVIT 312. Aircraft Accident Investigation. 3 Credits.
This course is a detailed evaluation of the methods and procedures involved in aircraft accident investigation including the organization, duties, and procedures of the Aircraft Accident Board. Prerequisites: AVIT 208, AVIT 250, and a minimum GPA of 2.6. S.

AVIT 313. Aviation Insurance. 3 Credits.
This course is an introduction to the basic principles of insurance and risk applicable to general aviation aircraft owners, fixed base operators, and airport management personnel. It includes an in-depth review of the aviation insurance industry in the United States, including market analysis and types of aviation insurers. Prerequisite: Minimum GPA of 2.6. F.

AVIT 320. Airline Career Planning. 2 Credits.
This course introduces the student to operations and quality of life issues related to working in a large flight department or air carrier environment. The material is not limited to one specific area of a professional pilot's career, but will seek to cover far reaching issues and provide the student with a wide perspective of what to expect as an airline pilot. Specific topics include: airline style interviews, training formats, working agreements, collective bargaining, bidding, scheduling, seniority, travel benefits, personal finance and other similar quality of life issues that will be encountered as a professional pilot. This course introduces the student to specific regulations pertaining to airline pilots, such as duty, rest and flight time restrictions. Prerequisites: AVIT 222 and a minimum GPA of 2.6. On demand.

AVIT 323. Aerodynamics - Airplanes. 3 Credits.
This course will provide the student a study of the physical principles of airplane aerodynamics, thereby fostering an appreciation of the factors affecting aircraft performance, stability and control, and special flight conditions often experienced by commercial pilots of fixed-wing aircraft. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisite: AVIT 222; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 324. Aircraft Systems. 3 Credits.
This course provides an in-depth study of reciprocating engine, propeller, electrical, environmental, hydraulic, pneumatic, fuel, ignition, lubrication, and pressurization systems. Prerequisite: Open to Aviation majors and minors only; minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 221. F,S,SS.

AVIT 325. Multi-Engine Systems and Procedures. 2 Credits.
This course is designed to develop the knowledge and skills necessary to safely and proficiently exercise the privileges and responsibilities of a Commercial Pilot with a Multi-engine rating. Included are discussions concerning Aeronautical Decision Making of multi-engine aircraft systems, aerodynamics, Crew Resource Management, weight and balance, aircraft performance, and abnormal/emergency procedures. The course also includes a scenario based introduction to U.S. Title 14 Code of Federal Regulations (CFR) governing common carriage commercial operations. The student must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites: AVIT 323 and AVIT 324; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 327. Gas Turbine Engines. 2 Credits.
This course will provide an in-depth introduction to the turbine engine through the study of its development, theory of operation and the function of turbine engine components. Prerequisites: AVIT 142 or AVIT 324; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 331. UAS Flight Systems. 3 Credits.
This course of instruction introduces the student to the systems common to Unmanned Aircraft with focus on those that differ significantly from their manned counterparts. Specific emphasis is placed upon autopilot systems and their integration with flight controls and airborne communications systems. Prerequisites: AVIT 126, AVIT 324, and a minimum GPA of 2.6. Corequisite: AVIT 332. F,S.

AVIT 332. UAS Ground Systems. 3 Credits.
This course introduces the student to those subsystems that comprise the unmanned aircraft system (UAS) ground control and mission planning system. The launch and recovery systems typical of current UAS are also covered. Prerequisites: AVIT 126, AVIT 324, and a minimum GPA of 2.6. Corequisite: AVIT 331. F,S.

AVIT 333. UAS Remote Sensing. 4 Credits.
This course presents the theory and operations of common sensors used by the operators of unmanned aircraft systems. Theory is combined with operational scenarios in order to provide the student with the ability to match specific sensors with anticipated missions. Prerequisites: AVIT 126, AVIT 324, and a minimum GPA of 2.6. F,S.

AVIT 337. Survey of Unmanned Aircraft Systems. 2 Credits.
Course content includes aircraft operating software, launch and recovery operations, payload operations, normal and emergency procedures, and mission planning and execution. It also includes a flight simulation component to provide exposure to the duties and responsibilities of UAS flight crew members but does not provide proficiency or certification on a specific UAS platform. Prerequisites: AVIT 102 and a minimum GPA of 2.6. F,S,SS.
AVIT 342. IFR Regulations and Procedures-Helicopter. 3 Credits.
This helicopter course provides a detailed study of the regulations, procedures, and publications necessary to operate a helicopter IFR in the national airspace system. Terminal and enroute procedures will be studied in detail. Prerequisite: AVIT 241 and a minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 242. F,S.

AVIT 343. Instrument Rating-Helicopter Certification Lab. 1 Credit.
This lab course provides the training required to obtain an Instrument-Helicopter rating and to safely operate a helicopter as pilot-in-command under IFR in the national airspace system. It includes basic instrument flying, radio navigation, and glass cockpit procedures. Prerequisite: AVIT 242 and a minimum GPA of 2.6. Prerequisite or Corequisite: AVIT 342. S/U grading. F,S,SS.

AVIT 362. Advanced Tower Operations II. 4 Credits.
Students will build on the knowledge gained in AVIT 260 Control Tower Operations I. Utilizing the 3D tower simulator, the students are taught the basic, advanced, and fundamental Control Tower operations, including structure, procedures, theories of airspace/traffic management. This course follows the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. To complete this course, students will be required to demonstrate their basic knowledge of Control Tower operations written examinations and performance scenarios in the 3D tower simulator. An Air Traffic Lab. Prerequisites: AVIT 260 and a minimum GPA of 2.6. F,S.

AVIT 363. RADAR Operations II. 4 Credits.
This course provides students with advanced RADAR training and knowledge of separation requirements and procedures of Air Traffic Terminal RADAR operations. Using advanced Air Traffic techniques, uncontrolled airport, military, and emergency operations are introduced. Student evaluations are based on demonstrated application of acquired controller skills utilizing RADAR simulation. Scenarios progress in difficulty. This course follows the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. To complete this course, students must, in addition to normal academic requirements, successfully complete required advanced RADAR simulation scenarios without assistance. An Air Traffic lab is required. Prerequisites: AVIT 102 and AVIT 261; minimum GPA of 2.6. F,S.

AVIT 372. Global Perspectives in Aviation History. 3 Credits.
This course investigates aviation's effects on global culture, commerce, and politics throughout its history by examining original historical sources and evidence from significant events in aviation. After taking this class, students will be more aware of their own and other cultural frameworks and biases and be able to use that perspective effectively as aviation professionals in a global industry. Prerequisite: Minimum GPA of 2.6. On demand.

AVIT 386. Conventional Aircraft Operations. 1 Credit.
Provides the necessary ground school and dual flight instruction for an endorsement for operation of tailwheel-type airplanes. Allows the student to acquire the knowledge and skills necessary for operation of the tailwheel aircraft on the ground and in flight. Prerequisites: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.6. S/U grading. F,S,SS.

AVIT 389. Introduction to Aerobatic Flight. 1 Credit.
To introduce, analyze and fly some of the more advanced flight maneuvers defined as aerobatics. Basic aerobatic maneuvers will be flown during the course including loops, spins, rolls, and inverted flight, with advanced variations and combinations of maneuvers demonstrated in flight. Prerequisite: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.6. S/U grading. F,S,SS.

AVIT 397. Cooperative Education. 1-2 Credits.
A practical work experience with an employer closely associated with the student's academic area. Arranged by mutual agreement between student, aviation department, and employer. A maximum of four cooperative education credits may be applied toward the total credits needed to complete degree requirements. Co-op credits may not be substituted for any required course within the student's major. Prerequisites: Acceptance into a co-op position with cooperating industry and approval of the aviation department; open to aviation majors and minors only. Repeatable to 8 credits. S/U grading. F,S,SS.

AVIT 399. Special Aerospace Topics. 1-12 Credits.
Special Aerospace Topics. Prerequisites: AVIT 102; open to Aviation majors and minors only; minimum GPA of 2.6. Repeatable to 12 credits. S/U grading. F,S,SS.

AVIT 402. Airport Planning and Administration. 3 Credits.
This is the first of a two course curriculum in airport administration. This initial course provides an introduction to the complex elements of airport planning and its importance in achieving a successful airport operation. Course content includes a study of the duties and responsibilities of the airport manager with a special emphasis on the Federal Air Regulations governing the operation and administration of commercial service airports within the United States. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.6. F,S.

AVIT 403. Aerospace Law. 3 Credits.
This course is designed to introduce the student to the United States legal system and the development of air law. The course will cover a broad range of topics related to aviation operations including constitutional law, administrative law, Federal Aviation Administration enforcement actions, aircraft ownership issues, products liability law, criminal law, contract law, and international law. Course activities include case reading, argument, and legal research. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.6. F,S,SS.

AVIT 405. Airline Operations and Management. 3 Credits.
This course examines the four major areas of air carrier operations, including ground, technical, flight and system operations, as well as airline economics, utilizing a management simulation tool. There is an intensive examination of regional, point-to-point and network carrier operations. Student management teams make weekly decisions in seven categories: Overall Strategy; Marketing; Operations Management; Human Resource Development; Finance; Asset Management; and Behavioral Elements. A portion of each class time is devoted to simulation activities, and the reading assignments focus on management decisions pertinent to the topic assigned, relying in part on current industry events, with an emphasis on ethical decision making. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.6. F,S,SS.

AVIT 407. General Aviation Operations and Management. 3 Credits.
Aspects of the operation and management of corporate flight departments, fixed-base operations, air cargo operations, and fractional ownership programs will be discussed. Pertinent regulations including FAR parts 91 and 135 will be studied. Aircraft and equipment evaluations will be conducted. Prerequisites: Junior or Senior status, open to Aviation majors and minors only, and a minimum GPA of 2.6. F,S,SS.

AVIT 408. Fleet Planning and Aircraft Acquisition. 4 Credits.
This course will analyze the needs and missions of various business flight departments, provide insight into aircraft selection, and explore the details of aircraft acquisition. A broad range of issues will be discussed, including finance options, insurance coverage, and fleet management. Prerequisites: AVIT 102 or AVIT 142 or AVIT 407, and a minimum GPA of 2.6. F.

AVIT 411. International and Long Range Navigation. 3 Credits.
This course provides an understanding of global charting systems, great circle routes and waypoint plotting. Problems and methods of international flight and modern systems of long range navigation are studied as well as methods and systems of computing, communicating and displaying navigation information. This course also gives the student a familiarization with the international airspace structure including Required Navigation Performance (RNP) standards, Minimum Navigation Performance Specification (MNPS) operations and Reduced Vertical Separation Standards (RVSM). Prerequisites: AVIT 241 or AVIT 325; open to aviation majors and minors only; minimum GPA of 2.6. F,S.

AVIT 412. Aviation Safety Analysis. 3 Credits.
This course will examine the various techniques and processes used to assess and predict organizational risk as it pertains to aviation operations. The role of quality assurance within a Safety Management System (SMS) will be also explored. An introduction to specific aviation safety assurance programs will be conducted and will include safety surveys and formalized observations. Prerequisites: AVIT 311 and a minimum GPA of 2.6. S.
AVIT 414. Certified Flight Instructor Certification. 5 Credits.
Provides the student with a detailed study of the responsibilities and teaching concerns of a flight instructor. The course is divided into two major sections: fundamentals of teaching and learning, including effective teaching methods, learning process, consideration of flight training syllabi, effective evaluations, and flight instructor responsibilities; the second section is concerned with the analysis of the flight maneuvers involved with Private Pilot, Commercial Pilot and Flight Instructor Certificates. The course will also provide practical teaching experiences. The student must complete the associated flight lessons in the CFI Flight Course to satisfactorily complete the course. Prerequisites: AVIT 325 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 415. Instrument Flight Instructor. 4 Credits.
Provides the student with an in-depth study of the responsibilities and techniques to be used as an Instrument Flight Instructor. This course will also include additional study of instrument flight, charts, publications and regulations pertaining to the IFR environment, further develop the student's knowledge of Technically Advanced Aircraft and provide practical teaching experience. The student must complete the associated flight lessons in the Instrument Flight Instructor course to satisfactorily complete the course. Prerequisites: AVIT 414 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 416. Multi-Engine Flight Instructor. 2 Credits.
This course provides an understanding of the fundamentals of teaching in a multi-engine airplane. The course will include multi-engine aerodynamics and performance, analysis of multi-engine operations, single-engine operations and procedures, flight instructor responsibilities, flight safety concerns and instrument flight maneuvers in multi-engine airplanes. The student must complete the associated flight lessons in the Multi-engine Airplane CFI course to satisfactorily complete the course. Prerequisites: AVIT 415 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 419. sUAS Commercial Operations. 4 Credits.
This course will develop the student’s knowledge and skill needed to manage and operate small unmanned aircraft systems in a commercial operation. Course content includes airspace authorization criteria, operational approval requirements, mission planning, data acquisition, and post processing of data. Mission employment skills will be acquired through both classroom and hands-on flight activities. Flight activities will include scenario based mission planning and execution. Students must complete the appropriate sUAS flight lessons to satisfactorily complete the course. Prerequisites: AVIT 411 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 421. Advanced Aerodynamics. 3 Credits.
Beginning with a brief review of low speed aerodynamics, the course provides a study of the terminology and aerodynamics fundamentals associated with transonic and supersonic flight. Prerequisites: AVIT 325 and Junior or Senior status or consent of the instructor; open to aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 428. Transport Category Aircraft Systems. 4 Credits.
This course provides an in-depth study of the complex systems of today's air transport jet aircraft with an emphasis on the Canadian Regional Jet aircraft. It provides a review of all primary systems, to include both normal and abnormal operations. The course also provides the necessary background for Regional Jet simulator training to be presented in a later course. A course fee is charged for access to the Canadian Regional Jet virtual flight deck. Prerequisites: AVIT 325 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 429. Turboprop Operations. 4 Credits.
This course will provide an introduction to turboprop aircraft systems and procedures. Emphasis will be placed on the systems and operational procedures for a specific model of turboprop aircraft utilized by regional airlines. Course content and presentation will be similar to air carrier initial training. The course will provide a synopsis of the turboprop industry including any recent developments. Prerequisites: AVIT 325 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. On demand.

AVIT 430. Crew Resource Management. 3 Credits.
This course will provide an in-depth study of Crew Resource Management which involves having a thorough understanding of crew communications, teamwork, leadership, "followership," decision-making, and situational awareness. In addition, the student will learn how to properly utilize all available resources in order to conduct a safe and efficient flight. This course will also examine the benefits of diversity, and the role diversity plays in the modern aerospace industry. Prerequisites: AVIT 250 and either AVIT 342 or AVIT 325; Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. F,S.

AVIT 438. UAS Operations. 4 Credits.
This course of instruction will develop the student’s knowledge and skills that are needed to safely employ unmanned aircraft systems. Course content includes aircraft operating software, launch and recovery operations, payload operations, normal and emergency procedures, and mission planning and execution. Specific emphasis will be placed upon aircraft and payload selection based upon proposed mission analysis. Students must complete the appropriate flight lessons to satisfactorily complete the course. Prerequisites: AVIT 126, AVIT 325, AVIT 331, AVIT 332, AVIT 337 and a minimum GPA of 2.6. F,S,SS.

AVIT 442. Airport Operations and Administration. 3 Credits.
This course is the second of a two course curriculum in airport administration. It is an advanced course emphasizing the further development of the skills and understanding of the operation and management of commercial service airports of all sizes. The content focuses upon the practical application of airport manager skills and includes educational tours of operating airports. The program stresses the airport manager's role in relations with tenants, public officials, and patrons through the honing of individual writing and public speaking skills. Prerequisites: AVIT 402 and Junior or Senior status; open to Aviation majors and minors only; minimum GPA of 2.6. S.

AVIT 444. Helicopter Advanced Operations. 4 Credits.
This course provides advanced study of helicopter aerodynamics and performance as applied to commercial helicopter operations in varying extreme environmental field conditions, including mountain, off-shore (saltwater), desert, arctic and tropical operations. Specific helicopter missions are studied, including agriculture, long-line, off-shore and night vision goggle operations. Prerequisite: AVIT 241 and AVIT 242; minimum GPA of 2.6. F.

AVIT 445. Commercial Pilot-Helicopter Certification Lab. 1 Credit.
This lab course is a continuation of commercial helicopter flight training and is completed after the student has obtained the Instrument-Helicopter rating. This course further refines the aeronautical decision making and flight proficiency skills necessary to obtain the Commercial Pilot Rotorcraft-Helicopter rating. Prerequisite: AVIT 343 and a minimum GPA of 2.6. S/U grading. F,S,SS.

AVIT 450. Counter UAS Applications. 3 Credits.
Counter UAS application is designed to educate and explore the emerging threat of unmanned aircraft systems to the nation’s airspace and infrastructure. This course will be divided into four sections (overview, detect, identify and defeat), to cover all current and future lines of effort in a unified approach to counter UAS. Prerequisites: AVIT 240 and a minimum GPA of 2.6. F.

AVIT 464. Control Tower/Radar Operations III. 4 Credits.
This course teaches advanced tower and RADAR operations and procedures combined. Students will learn about and practice military overhead maneuvers, arrivals and departures from uncontrolled airports, below Basic VFR minima operations, IFR operations, nighttime operations, in-flight and ground emergencies, bomb threat procedures, and special operations (runway incursions, hot cargo, and hijacking procedures). This course follows the applicable required Federal Aviation Administration’s learning objectives set forth in their Air Traffic Basics Course. To complete this course, students must demonstrate their knowledge of the preceding Control Tower and RADAR courses, in addition to this course's content. An Air Traffic lab is required. Prerequisites: AVIT 362, AVIT 363, and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.6. F,S,SS.
AVIT 465. Control Tower/RADAR Operations IV. 4 Credits.
This is the capstone course for the Air Traffic Management program focusing on the interaction between the Tower, Terminal RADAR, and Enroute Facilities. The course provides students with highly advanced instruction on the ATM system, publications, Federal Aviation Regulations, separation standards, airspace utility, aircraft types and characteristics, fundamentals of navigation, pilot's environment, flight assistance and emergencies, special operations, wake turbulence, weather, communications, and teamwork. Instruction is delivered through classroom lecture, group discussions and scenarios with hands-on practice. This course follows the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. To complete this course, students must successfully complete the FAA AT Basic Exam and the required advanced simulation scenarios without assistance. An Air Traffic lab is required. Prerequisites: AVIT 464 and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 468. Non-RADAR Environment. 4 Credits.
This course stresses the comprehensive knowledge of non-RADAR Air Traffic procedures, to include: airspace utilization, flight plans, general control procedures, board management, initial departure separation, IFR clearances to departing aircraft, communication requirements, and separation standards. Class scenarios will emphasize both enroute and terminal structures. This course follows the applicable required Federal Aviation Administration's learning objectives set forth in their Air Traffic Basics Course. To complete this course, the student shall be required to demonstrate and apply the skills and knowledge required to successfully complete a non-RADAR performance exercise. An Air Traffic lab is required. Prerequisites: AVIT 260 and MATH 93; open to aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 476. Risk Management. 3 Credits.
Risk Management. Prerequisite: Minimum GPA of 2.6. On demand.

AVIT 480. Advanced Aircraft Operations. 3 Credits.
The topics of study include high speed and high altitude aerodynamics, physiological aspects of high altitude flight, considerations associated with operations near high speed buffet boundaries, effects of turbulence on high speed aircraft, the effects of maneuvering load factors, FAR Part 25 takeoff and landing performance, along with the general study of applied systems management. The student must complete the associated flight lessons to satisfactorily complete the course. No concurrent enrollment allowed with other aviation flight courses. Prerequisites: AVIT 415, AVIT 421, AVIT 428, and Junior or Senior status; open to aviation majors and minors only; minimum GPA of 2.6. F,S,SS.

AVIT 485. Aviation Senior Capstone. 3 Credits.
This course will explore contemporary and ethical issues in the aviation industry. Students will work in multi-disciplinary teams to examine and solve issues related to global aviation, environmental concerns, technology advances, aviation safety and security practices, labor issues and aviation economics. Students will be required to demonstrate an understanding of information literacy and advanced communications through coursework. Prerequisites: AVIT 403, senior status, and a minimum GPA of 2.6. F,S.

AVIT 490. Methods and Materials in Teaching Aviation I. 2 Credits.
This course will acquaint the student with resources and software used in classroom teaching specific to aviation. Topics covered include teaching with technology, utilizing instructional aids, motivating students, marketing a program and a career exploration in aviation education. Students will also gain the experience of managing the Aerospace Learning Center. Prerequisite: AVIT 414 or consent of instructor; open to Aviation majors and minors only; minimum GPA of 2.6. Repeatable to 6 credits. On demand.

AVIT 491. Methods and Materials in Teaching Aviation II. 2 Credits.
This course will be a continuation of the work started in Aviation 490 by providing the student with additional opportunities in the use of resources and software used in classroom teaching specific to aviation. Additional emphasis will be placed on the development of course syllabi and lesson plans, delivering classroom lessons, and the critique, evaluation, and assessment of student and instructor performance. Students will also gain the experience of managing the Aerospace Learning Center. Prerequisites: AVIT 414 and Junior or Senior status or consent of instructor; open to Aviation majors and minors only; minimum GPA of 2.6. On demand.

AVIT 497. Aviation Internship, 1-4 Credits.
Aviation internship will provide a student with the actual, on-the-job exposure of a particular area of interest the student has within the aviation industry. Internships will be available in airport management, general aviation management, on both the manufacturer and fixed-base operator level and within the weather modification industry. The weather modification internship will be available only with the necessary federal funding or contractor support. A maximum of 4 credits will be allowed toward graduation. Prerequisites will vary depending on the area of the internship. Prerequisites: Junior or senior standing with a minimum GPA of 2.6 required; open to Aviation majors and minors only; prerequisites will vary depending on the area of the internship. Repeatable to 6 credits. F,S,SS.

AVIT 498. Advanced UAS Operations. 1-3 Credits.
This course is designed to develop advanced knowledge and skill in a specific area of expertise in UAS operations such as Original Equipment Manufacturer (OEM) certification, industry certifications, or special training on Autonomous platforms, payloads, and support equipment. Prerequisites: AVIT 438 or AVIT 419; a minimum GPA of 2.6. Repeatable to 6 credits. On demand.

AVIT 499. Readings in Aviation. 1-3 Credits.
Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. Prerequisites: Senior standing; open to aviation majors and minors only; minimum GPA of 2.6. Repeatable to 8 credits. F,S,SS.

AVIT 501. General Issues in Aviation/Aerospace. 3 Credits.
This course is designed to introduce students to graduate school, library resources, and faculty research interests. Students will explore the historical, current and future issues related to their own interest areas in the aerospace industry. F,S.

AVIT 502. Aviation Economics. 3 Credits.
An in-depth examination of the economic aspects of the air transportation industry, with microeconomic analysis applied to decision making in the airplane, general and corporate aviation, and airports. Topics include: basic economics of air transport supply and demand; demand forecasting; cost drivers; yield, revenue and capacity management; regulatory issues; political influences; and unique economic characters of international commercial aviation.

AVIT 503. Statistics. 3 Credits.
This course is an in-depth study of inferential statistics with emphasis on the analysis of variance models and subsequent comparison procedures. In addition, the course will include coverage of correlation and multiple regression techniques as data analytic tools. Also, coverage of survey construction and analysis of survey data will be presented. Course content will be presented within the context of aviation and psychology examples. (Psychology 541: Advanced Univariate Statistics can be substituted for AVIT 503). Prerequisite: An introductory statistics course or calculus course.

AVIT 504. Research Methods. 3 Credits.
Methods and procedures of development, design and analysis related to aviation industry research. Topics include problem identification, review of literature, research design, and data analysis. This course is designed to give an overview of quantitative, qualitative and mixed-method approaches research design. The course includes the experience of critically evaluating research projects and developing a research project based on the principles discussed in class. Prerequisites: AVIT 501, and AVIT 503 or PSYC 541. F.

AVIT 505. Qualitative Research Methods. 3 Credits.
Examination and analysis of qualitative research design with particular emphasis on approaches relevant to problems in Aerospace Studies or related fields. Students will design a qualitative research project.

AVIT 506. Quantitative Research Methods. 3 Credits.
The purpose of this course is to provide students the opportunity to acquire knowledge and skills necessary to apply quantitative research methods in research. Students will design a quantitative research project. Prerequisite: A graduate level Statistics course.

AVIT 507. Advanced Research Methods. 3 Credits.
This course will be a thorough discussion of the different methodologies utilized in theoretical and applied research. Experimental and quasi-experimental design, and topical areas of survey methodology data mining, simulations, and techniques for dissertation designs. Prerequisites: AVIT 503, AVIT 505, and AVIT 506.
AVIT 510. Aviation Public Policy and Regulations. 3 Credits.
This course will examine and discuss the initiation, formulation and implementation of public policies that affect the various segments of the aviation industry. Various regulatory areas within the aviation industry, such as scheduled air carriers, general aviation, airport operations, air traffic management, and international agreements, will be analyzed. On demand.

AVIT 511. Aviation Information Technology. 3 Credits.
This course is an introduction to information systems essential to an aviation business professional. It will provide an overview of current and emerging technologies in various database, data communication and e-commerce systems.

AVIT 512. Aviation Environmental Issues. 3 Credits.
This course examines current environmental issues within the aviation industry in the context of historical environmentalism, current laws and regulations, and emerging research findings. A broad survey of earth systems precedes a focused examination of contemporary aviation environmental issues.

AVIT 513. Aviation Safety Management Systems. 3 Credits.
An in-depth study of aviation safety management concepts and principles as they relate to effective safety programs within the airlines, corporate aviation, general aviation and airports.

AVIT 514. Aviation Management Theory. 3 Credits.
An in-depth review of organizations in the aviation industry, their structures, environments and leadership as it relates to human behavior. Topics include organizational design, climate and the interactions with individuals, groups, and different organizational structures within the airline, general aviation, corporate aviation and airport organizations.

AVIT 515. Human Factors and Ergonomics: Human Perceptions in Information Systems Design. 3 Credits.
Human perception and information processing will be discussed in relation to information system design requirements to optimize human performance. The Ergonomics components will highlight human-centered design of equipment, devices and processes that conforms to the human body (anthropometry) and its cognitive abilities within the aviation/aerospace environment. Topics include information systems design with regard to compatibility, perception, attention, situation awareness and decision processes. Applications to current workstation design will allow students to have a greater understanding of human centered design goals. On demand.

AVIT 516. Training System Design. 3 Credits.
The process of memory, learning, and judgment will be related to instructional design strategies in the aviation industry, where heavy use of simulation is used in the training and evaluation of aviation professionals. Topics include instructional design and assessment concepts, simulation design and decision making skills. Class presentations include operational problem-solving group work as well as research paper reviews.

AVIT 517. Airline Labor Relations and Law. 3 Credits.
This course will examine and discuss the application and impact of the Railway Labor Act as it pertains to air carrier labor operations. Topics of study will include labor history, organization, alternative dispute resolution, collective bargaining, and emerging labor trends. On demand.

AVIT 518. Human Error. 3 Credits.
The objective of this course is to develop a deeper understanding of the human error and its impact upon human performance in variety of fields. Prerequisite: Graduate Admission, S.

AVIT 520. Strategic Airport Planning. 3 Credits.
This course will explore the elements of airport planning within the public administration domain. Emphasis will be placed on individual airport's strategic plans, how airports operate efficiently and effectively with changing regulations and economic fluctuations in the global marketplace.

AVIT 521. Ethics in Aerospace. 3 Credits.
The course will introduce ethical concepts and frameworks used in professional decision-making. Students will engage with faculty and outside speakers to weigh decisions in the applicable ethical frameworks. Students participation will include graded elements of formal case presentations, class discussion sessions, essay examinations and review of scholarly and trade journal articles. The course will have a strong emphasis on research project design to assess dynamics of ethical decision-making in different populations, as well as exploring educational opportunities in the aerospace industry.

AVIT 522. UAS Management. 3 Credits.
This course provides a series of lectures or presentations by visiting lecturers or faculty on various themes related to Unmanned Aircraft Systems (UAS). Prerequisite: Graduate Student Status, F, odd years.

AVIT 523. Aviation Safety Data Analysis. 3 Credits.
The objective of this course is to obtain an understanding of various safety programs conducted throughout the aviation industry and examine the underlying analytical techniques associated with each program. Prerequisite: Graduate student status. SS.

AVIT 524. Air Traffic Management. 3 Credits.
This course will explore the elements of Air Traffic and Next Gen. There will be a discussion on how air traffic control works and the evolution of the Air Traffic Management of the National Airspace System in the US and abroad. Emphasis will be on the current day issues and how Air Traffic Management is changing not only in the US but in Canada, Europe and worldwide. Prerequisite: Admission (or conditional admission) to the Aviation Master of Science, The Aerospace PhD program, or consent of the instructor. S, odd years.

AVIT 525. Legal Issues in Aviation. 3 Credits.
The course will introduce legal concepts and frameworks of the United States’ legal system. Issues particular to the aviation industry will be discussed. Students will engage in formal case presentations and discussions to gain an understanding of the legal issues faced in the aerospace industry. Prerequisite: Admission (or conditional admission) to the Aviation Master of Science program, the Aerospace PhD program, or consent of the instructor. SS, even years.

AVIT 526. UAS and the Law. 3 Credits.
This course introduces students to the laws and policies governing UAS operations including flight regulations, remote sensing issues, and data and cybersecurity issues related to UAS. The class scope of inquiry includes US and international law and examines both civil and military use. On demand.

AVIT 587. Supervised Field Work. 1-3 Credits.
Used primarily for individualized field placement so that the student may acquire practical experiences in the aviation industry. Prerequisite: Consent of graduate director. Repeatable to 6 credits. S/U grading.

AVIT 590. Aviation Seminar. 1-3 Credits.
A series of lectures presented by visiting lecturers and the faculty. Repeatable to 9 credits.

AVIT 591. Readings in Aviation. 1-3 Credits.
Readings in selected Aerospace Studies topics, with written and/or oral reports. Prerequisite: Consent of instructor. Repeatable to 6 credits.

AVIT 593. Individual Research in Aviation. 1-3 Credits.
Individual student projects designed to develop advanced knowledge in a specific area of expertise. A written report is required. May be repeated for up to 6 credits for Master's and up to 12 credits for Ph.D. Repeatable to 6 credits.

AVIT 595. Aviation Capstone. 3 Credits.
The Capstone course integrates, extends and applies knowledge learned in earlier Aviation courses and research projects. The course also undertakes an in-depth study of management theories relevant to the aviation industry and how leaders apply these theories in practice. Students will have the opportunity to demonstrate their knowledge and leadership abilities by working in teams to design and develop a solution to a current aviation problem, which will be assigned by the instructor. This effort will culminate in an on-campus presentation to the faculty and invited industry experts. Prerequisite: AVIT 504 or permission of instructor.

AVIT 996. Continuing Enrollment. 1-12 Credits.
Repeatable. S/U grading.

AVIT 997. Independent Study. 2 Credits.
Independent study and preparation of a written report. Prerequisite: Special Permission Only. On demand.

AVIT 998. Thesis. 4 Credits.
Preparation and defense of a thesis based on original research. Prerequisite: Admission committee approval and consent of instructor. Repeatable to 4 credits.

AVIT 999. Dissertation. 1-12 Credits.
An original research project approved by and completed under the supervision of a dissertation committee. Prerequisites: Graduate standing, approval, completion, and defense of dissertation proposal. Repeatable to 18 credits.