

Table of Contents

Aviation Technologies..... 1

Aviation Technologies

Whether general aviation aircraft or transport, modern aircraft require highly trained technicians to manage hardware, troubleshoot systems and maintain airframe structures and powerplants. The Aviation Technologies program is ranked among the best in the country and was developed with input from industry representatives and the Federal Aviation Administration (FAA) to provide the requisite skills and broad educational experience necessary in today's competitive environment. Optional paths within the major provide a great deal of flexibility in preparing for a career in the aviation industry. Students may pursue the FAA approved airframe and powerplant certificate in a five or seven semester sequence of coursework or they may include the airframe and powerplant certificate, with additional coursework, as part of their four-year bachelor's degree in Aviation Technologies.

The Bachelor of Science degree program in Aviation Technologies is designed to enhance technical training students have received in aviation maintenance, aviation flight, or electronics. This technical training may be acquired through SIU, at other post-secondary institutions, in the military, or in the case of aviation maintenance, at other FAA approved maintenance or flight schools

Aviation Technologies has signed a number of Program Articulation Agreements with aviation-related community college degree programs to facilitate the transfer of these particular community college aviation students to SIU. The community colleges with which SIU has signed such an agreement include: Southwestern Illinois College (IL), Rock Valley College (IL), and Indian Hills Community College (IA).

Many students entering the Aviation Technologies program are encouraged to have completed an appropriate associate degree or its equivalent under the provisions of the Capstone Option (see below for additional information). Students may choose from four specializations: Aircraft Maintenance, Helicopter Maintenance, Aviation Electronics, and Aircraft Maintenance Management.

Courses in each of these areas have been selected and designed to provide the student with optimum exposure to theory in the classroom and develop practical, hands-on skills both in the hangar and in specially-designed, task-dedicated laboratories. The Aviation Technologies facilities, located at Southern Illinois Airport between Carbondale and Murphysboro, Illinois, provides students with more than 14 million dollars of the best available equipment including fixed and rotary wing aircraft, airline-type cockpit procedure trainers (CPT's), an advanced composite structures laboratory and computer laboratory. Students should expect to spend \$500 to \$1,000 for a tool kit. In addition to university tuition and fees, lab fees are assessed for the lab portions of appropriate courses.

Bachelor of Science (B.S.) in Aviation Technologies

Aircraft Maintenance Specialization

The aircraft maintenance specialization provides students the opportunity to advance their technical knowledge and skills in flight management systems, advance composites, advance propulsion systems, and supply chain logistics. Additional elective courses complement this specialization.

B.S. Aviation Technologies - Aircraft Maintenance Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Requirements for Aircraft Maintenance Specialization	40
Core Requirements ¹	7
AVT 305; AVT 310	
Specialization Requirements ²	15
AVT 405; AVT 410; AVT 416; AVT 380; AVT 390	
Specialization Electives	18
AVT 301 AND AVT 302, AVT 303, AVT 304 AND AVT 306, AVT 321, AVT 327, AVT 470; AVM 376, TRM 364; or advisor approved electives.	
Technical or Career Electives - An Associate in Applied Science degree or equivalent certification in Aviation Maintenance (Airframe and Powerplant) from an accredited college, community college, or technical institute meets this requirement. ³	41
Total	120

¹ All Aviation Technologies courses require a minimum grade of C.

² All Aviation Technologies courses requires a minimum grade of C.

³ All Aviation Technologies courses require a minimum grade of C.

Aviation Electronics Specialization

The Aviation Electronics (Avionics) specialization provides students the opportunity to advance their technical knowledge and skills in analog and digital circuits, digital data, flight line maintenance, and troubleshooting skills in aviation electronics.

B.S. Aviation Technologies - Aviation Electronics Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Requirements for Aviation Electronics Specialization	39

Degree Requirements	Credit Hours
Core Requirements ¹	7
AVT 305; AVT 310	
Specialization Requirements ²	20
AVT 321; AVT 317; AVT 318; AVT 405; AVT 327	
AVT 465	
Specialization Electives ³	12
AVT 301 & AVT 302, AVT 303, AVT 304 & AVT 306, AVT 380, AVT 390, AVT 410, AVT 416, AVT 470; AVM 376, TRM 364; or advisor approved electives.	
Technical or Career Electives	42
An Associate in Applied Science degree or equivalent certification in Aviation Maintenance (Airframe and/or Airframe and Powerplant) or Electronics from an accredited college, community college, or technical institute meets this requirement.	
Total	120

¹ All Aviation Technologies courses require a minimum grade of C

² All Aviation Technologies courses require a minimum grade of C

³ All Aviation Technologies courses require a minimum grade of C

Aviation Maintenance Management Specialization

The Aviation Maintenance Management specialization is an online degree completion program that allows professionals in the aviation and electronics industries to complete their bachelor degree while working full time. This specialization is ideally suited for individuals who fall into at least one of the following categories:

1. Completed an FAA Part 147 Aircraft Maintenance Technician School
2. Currently hold Airframe and/or Powerplant certification, or equivalent
3. Completed an associate degree in aircraft maintenance, electronics, or aviation flight
4. Has equivalent civilian or military work experience

The Aviation Maintenance Management curriculum allows students to advance their knowledge in the subjects of avionics communication and navigation systems; aircraft supply chain logistics; aircraft reliability, maintainability and fault prediction; aviation project management; aerospace financial practices, and other technical subjects.

B.S. Aviation Technologies - Aviation Maintenance Management Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Requirements for Aviation Maintenance Management Specialization	30
AVT 329	3
AVT 470	3
AVT 475	3
AVT 478	3
AVT 380	3
AVT 485	3
AVT 488	3
AVT 390	3
IMAE 470A	3
IMAE 450 or TRM 470	3
Aviation Technologies Internship/Cooperative Experience	12
AVT 319 / AVT 320 or AVT 358 or approved electives	
Technical or Career Electives ¹	39
Total	120

¹ An Associate in Applied Science degree or equivalent certification in Aviation Maintenance (Airframe and Powerplant), aviation flight, or electronics from an accredited college, community college, or technical institute meets this requirement.

Helicopter Maintenance Specialization

The helicopter maintenance specialization provides students who have completed an FAA approved airframe and/or powerplant program with the opportunity to advance technical skills in helicopter theory, maintenance and overhaul, and inspection. Additional elective courses complement this specialization.

B.S. Aviation Technologies - Helicopter Maintenance Specialization Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Requirements for Helicopter Maintenance Specialization	43
Core Requirements	7
AVT 305; AVT 310	
Specialization Requirements ¹	18
AVT 301; AVT 304	
AVT 302; AVT 306	
Specialization Electives ²	18
AVT 303, AVT 321, AVT 327, AVT 380, AVT 390, AVT 405, AVT 410, AVT 416, AVT 470; AVM 376, TRM 364; or advisor approved electives.	
Technical or Career Electives ³	38
An Associate in Applied Science degree or equivalent certification in Aviation Maintenance (Airframe and Powerplant) from an accredited college, community college, or technical institute meets this requirement.	
Total	120

¹ All Aviation Technologies courses require a minimum grade of C.

² All Aviation Technologies courses require a minimum grade of C.

³ All Aviation Technologies courses require a minimum grade of C.

Aircraft Product Support Minor

The minor in Aircraft Product Support is a multi-disciplinary minor offered by the Aviation Management and the Aviation Technologies programs. The purpose of this minor is to provide additional preparation for students who wish to enter the field of aircraft product support with aerospace manufacturers, suppliers, airlines, the military and related aviation/aerospace industry segments. The courses required to complete this minor include: AVM 301 or AVM 376, AVM 461, AVT 380, AVT 390, AVT 470, and one additional approved course from either Aviation Management or Aviation Technologies degree programs. All prerequisites for these courses must be fulfilled prior to enrollment in each course. All students who wish to enroll in this minor must do so through either the Aviation Management advisor or the Aviation Technologies advisor. Aviation Management students must complete AVM 301 in their major. Aviation Technologies students may complete AVM 376 in their major.

Unmanned Aircraft Systems Minor

The Unmanned Aircraft Systems minors provides SIU students the opportunity to advance their technical knowledge in unmanned aircraft systems design, operations, maintenance and management. The Unmanned Aircraft Systems minor is available to all SIU-C degree programs. The courses required to complete this minor include: AVT 338, AVT 339, AVT 440, AVT 441, and AVT 442. All prerequisites for these courses must be fulfilled prior to enrollment in each course. All students who wish to enroll in this minor must do so through the Aviation Technologies advisor.

FAA Approved Airframe and Powerplant Certificates

FAA Approved Airframe and Powerplant Certificates Requirements

Degree Requirements	Credit Hours
First Semester: MATH, AVT 101, AVT 110, AVT 111, AVT 113	18
Second Semester: AVT 112, AVT 116, AVT 204, AVT 206, AVT 214, AVT 340	20
Third Semester: AVT 211, AVT 212, AVT 213, AVT 310	14
Fourth Semester: AVT 305, AVT 316, AVT 345	12
Total	64

Airframe and/or Powerplant Maintenance Certificates

The University's Undergraduate Certificates in Airframe and/or Powerplant Maintenance will be issued upon completion the respective coursework. Additional coursework may be required for FAA certification.

Undergraduate Certificate in Airframe & Powerplant Maintenance with Credit Hours

- MATH 125 Technical Math (4)
- AVT 212 Fuel Metering Systems (3)
- AVT 101 Applied Science (3)
- AVT 213 Engine Electrical, Ignition, and Starting Systems (4)
- AVT 110 Aircraft Structures (3)
- AVT 214 Aircraft Propellers (3)
- AVT 112 Aircraft Electricity (4)
- AVT 305 Cabin Env. & Jet Trans Sys. (4)
- AVT 111 Materials Processing (5)
- AVT 310 Electrical Systems (3)
- AVT 113 Federal Aviation Regs (3)
- AVT 116 Aircraft Instruments (3)
- AVT 316 Jet Prop. Power Plant (4)
- AVT 340 Aircraft Inspection and Rigging (4)
- AVT 204 Aircraft Hydraulics (3)
- AVT 345 Power Plant Inspection and Testing (4)
- AVT 206 Metals Processing (3)

- AVT 211 Reciprocating Powerplant (4)

Total credit hours. 64

1. *All Aviation Technologies coursework requires an average of C or higher for graduation.*
2. *Courses that are part of the Chapter 14 of the Code of Federal Regulations part 147 curriculum require a minimum passing grade of 70%.*

Undergraduate Certificate in Airframe Maintenance with Credit Hours

- AVT 110 Aircraft Structures (3)
- AVT 305 Cabin Env. & Jet Transport Sys. (4)
- AVT 116 Aircraft Instruments (3)
- AVT 310 Electrical Systems (3)
- AVT 340 Aircraft Inspection and Rigging (4)
- AVT 204 Aircraft Hydraulics (3)
- AVT 206 Metals Processing (3)

Total credit hours. 23

1. *All Aviation Technologies coursework requires an average of C or higher for graduation.*
2. *Courses that are part of the Chapter 14 of the Code of Federal Regulations part 147 curriculum require a minimum passing grade of 70%.*

Undergraduate Certificate in Powerplant Maintenance with Credit Hours

- AVT 211 Reciprocating Powerplant (4)
- AVT 212 Fuel Metering Systems (3)
- AVT 316 Jet Prop. Power Plant (4)
- AVT 213 Engine Electrical, Ignition, and Starting Systems (4)
- AVT 345 Power Plant Inspection and Testing (4)
- AVT 214 Aircraft Propellers (3)

Total credit hours. 22

1. *All Aviation Technologies coursework requires an average of C or higher for graduation.*
2. *Courses that are part of the Chapter 14 of the Code of Federal Regulations part 147 curriculum require a minimum passing grade of 70%.*

Capstone Option for Transfer Students

The SIU Capstone Option may be available to eligible students who have earned an associates degree or the equivalent. The Capstone Option reduces the University Core Curriculum requirements from 39 to 30 hours, therefore reducing the time to degree completion. The Capstone Option allows qualified students to fulfill their degree requirements by completing no more than 60 semester hours of coursework beyond their associate degree. See the Capstone Option section for more information on this option.

Aviation Technologies Courses

AVT101 - Applied Science Students will understand and demonstrate the application of physical laws including weight and balance, pressure, force, motion, mechanical advantage, heat and sound. The student will interpret blueprints and schematic diagrams, perform basic mechanical drawing using drawing

instruments to accomplish orthographic projections, sections and dimensioning of working drawings. Hydraulic tubes, hoses and fittings will be studied. Course fee: \$60. Credit Hours: 3

AVT110 - Aircraft Structures Students will be able to identify and select materials employed in aircraft construction. Using appropriate FAR's, they will demonstrate competence in repair of honeycomb, fiberglass, welded, wood, or fabric aircraft members. The student will inspect aircraft members for defects and, if necessary, inspect completed repairs for airworthy condition. Course fee: \$85. Credit Hours: 3

AVT111 - Materials Processing Students will be able to identify, select, and inspect aircraft hardware and materials. They will be able to select and apply appropriate cleaning materials and to implement corrosion controls. They will become proficient in the use of precision measurement equipment and related inspection tools. Course fee: \$60. Credit Hours: 5

AVT112 - Aircraft Electricity Students will have basic knowledge of electricity generation, AC and DC circuitries, and controls. They will be able to solve problems associated with electrical measurement (AC and DC), circuit interpretations and inspection, aircraft electrical load analysis, circuit malfunctions, circuit or component servicing, and basic aircraft electronics. Prerequisite: AVT 101, MATH 108 or 125. Course fee: \$75. Credit Hours: 4

AVT113 - Federal Aviation Regulations Students will be able to select and use FAA technical and legal publications in order to perform the duties of an aircraft technician. Course fee: \$65. Credit Hours: 3

AVT116 - Aircraft Instruments Students will have a knowledge of operation, installation, marking, and interpretation of aircraft instruments. They will be able to install, adjust, and calibrate these instruments in accordance with FAA and manufacturers' recommendations. Students will also study aircraft communications, light signals, and runway light systems. Prerequisite: AVT 101. Course fee: \$50. Credit Hours: 3

AVT199 - Individual Study Provides students with the opportunity to develop a special program of study to fit a particular need not met by other offerings. Enrollment provides access to the resources and facilities of the entire institution. Each student will work under the supervision of a sponsoring staff member. Special approval needed from the department. Credit Hours: 1-10

AVT204 - Aircraft Hydraulics Students will have a knowledge of fluid theory and applied physics which relates to aircraft hydraulics. They will know the theory of operation, maintenance requirements, and adjustments of various hydraulic components and systems. They will be able to test, inspect, troubleshoot, and service hydraulic systems in accordance with technical specifications. Prerequisite: AVT 101, MATH 108 or 125. Course fee: \$100. Credit Hours: 3

AVT206 - Metals Processing Students will be able to make appropriate sheet metal repairs using correct repair procedures, tools, and materials. They will be required to demonstrate correct use of and interpretation of structural repair diagrams and correct interpretation of charts and tables from AC 43, 13-1B pertaining to materials and methods. Prerequisite: AVT 101, 111, 113, MATH 108 or 125. Course fee: \$80. Credit Hours: 3

AVT211 - Reciprocating Powerplant Students will have a knowledge of construction, operation, and timing mechanisms associated with aircraft reciprocating powerplants. They will be able to disassemble, clean, measure, inspect, and reassemble a powerplant to airworthy condition in accordance with appropriate FAA and manufacturers' regulations and practices. Prerequisite: AVT 101, 111, 113, MATH 108 or 125. Lab fee: \$100. Credit Hours: 4

AVT212 - Fuel Metering Systems Students will be able to demonstrate their competence in identifying fuels, oils, and related system components including carburetors, understanding the operating principles of each. They will be able to inspect, adjust, troubleshoot, and overhaul these components according to manufacturers' and federal regulations. Prerequisite: AVT 101, 111, 113, MATH 108 or 125. Course fee: \$120. Credit Hours: 3

AVT213 - Engine Electrical, Ignition, and Starting Systems Students will gain a knowledge of engine electrical systems including AC and DC power generation, voltage regulation, and current regulation. Students will gain knowledge of engine ignition systems and starting systems for both turbine and reciprocating engines. Prerequisite: AVT 111, 112. Course fee: \$65. Credit Hours: 4

AVT214 - Propellers Students will have a knowledge of the physical laws and design characteristics governing propeller operation. They will be able to identify components, troubleshoot, and adjust fixed and variable pitch propellers. They will maintain fixed pitch propellers, and governor systems for variable pitch propellers in accordance with FAA and manufacturers' standards. They will have a knowledge of various powerplant instrument systems. Course fee: \$50. Credit Hours: 3

AVT258 - Aviation-Technology Work Experience Credit granted for prior aviation technologies related job skills, work experience, management-worker relations and supervisory experience while employed in the aviation industry. Credit will be established by program evaluation. This credit may be applied only to the technical or career electives requirement of the aviation technologies degree, unless otherwise determined by the program. Credit Hours: 1-30

AVT259 - Aviation-Technology Occupational Education Credit A designation for credit granted for past occupational educational experiences related to the student's educational objectives in aviation technologies. Credit will be established by program evaluation. This credit may be applied only to the technical or career electives requirement of the aviation technologies degree, unless otherwise determined by the program chair of Aviation Technologies. Credit Hours: 1-60

AVT301 - Helicopter Theory and General Maintenance Practice The student will have an in-depth knowledge of rotary wing aerodynamics, main and tail rotor systems, rotor blades, primary and secondary controls, and general maintenance practices to include inspection and nondestructive testing. Lecture three hours. Prerequisite: FAA certificate with airframe and powerplant ratings. Departmental approval required. Credit Hours: 3

AVT302 - Helicopter General Maintenance Laboratory The student will perform general maintenance on rotary wing main rotor systems, tail rotor systems, flight and powerplant control systems to include malfunction analysis, tracking, static and dynamic balancing, rigging, and repair. Co-requisite: AVT 301. Course fee: \$40. Credit Hours: 6

AVT303 - Technical Evolution of Aviation This course will introduce the student to aviation's rich heritage. The coursework will include numerous reading and research assignments to provide the student opportunity to become well acquainted with events, persons and technological developments that have permitted aviation to become what it is today. Emphasis will be placed on the "cause and effect" of selected aviation-related events. Credit Hours: 3

AVT304 - Helicopter Power Train and Inspection The student will have in-depth knowledge of the operation, function, and inspection of all rotational components of a rotary wing aircraft to include transmission, gear boxes, drive trains, and drive shafts. Prerequisite: AVT 301. Credit Hours: 3

AVT305 - Cabin Environment and Jet Transport Systems Students will understand the operation of and be able to identify the components of flight controls, landing gear, fuel, anti-icing, fire detection, water and waste systems, and environmental systems of current jet transport aircraft. They will have knowledge of procedures for aircraft ground handling, APU operation and system servicing. Prerequisite: AVT 212, 213, 310. Course fee: \$120. Credit Hours: 4

AVT306 - Helicopter Power Train Laboratory The student will perform all functions of overhaul concerned with rotary wing transmissions, gear boxes, and drive trains. The student will demonstrate skill in disassembly, inspection, discrepancy analyzation, reassembly, and non-destructive testing. Co-requisite: AVT 304. Course fee: \$40. Credit Hours: 6

AVT310 - Aircraft Electrical Systems Students will have a knowledge of the operation, repair, inspection and service of small and large aircraft electrical systems to include understanding and/or use of maintenance manuals, inspection manuals, schematic diagrams, and electrical systems components. Prerequisite: AVT 112, approved math course. Special approval needed from the advisor. Course fee: \$65. Credit Hours: 3

AVT316 - Jet Propulsion Powerplant Students will be able to apply and understand physics laws related to jet engines; identify and understand the operation of jet engines and their components; inspect, check, repair, troubleshoot and adjust jet engines and accessories; analyze engine performance and

interpret operational charts, graphs and tables. Prerequisite: AVT 111, 212. Course fee: \$55. Credit Hours: 4

AVT317 - Introduction to Aviation Electronics An introduction to electron devices used in analog and digital electronics equipment. Device operation analyzed from theoretical perspective and applied to circuits for power supplies, amplifiers, control devices, and communication data bussing. Course is writing intensive and reflects the College's Communication-Across-the-Curriculum initiative. Prerequisite: AVT 112, ENGL 101. Course fee: \$60. Credit Hours: 3

AVT318 - Aviation Electronics Control Systems Coursework is based upon theory and application of analog and digital control systems. Topics include transducers, control input devices, instrument panel displays and feedback sensor circuits. Data recording and monitoring systems will also be presented. Lecture two hours, laboratory two hours. Prerequisite: AVT 317. Course fee: \$60. Credit Hours: 3

AVT319 - Aviation Technologies Internship Each student will be assigned to a program approved work site engaged in activities related to the student's academic program and career objectives. The student will be assigned to an unpaid internship position and will perform duties and services in an instructional setting as previously arranged with the sponsoring work site supervisor. Prior program approval, supervisor evaluations and student reports are required. Hours and credits to be individually arranged. Mandatory Pass/Fail. Special approval needed from the department. Credit Hours: 1-15

AVT320 - Aviation Technologies Cooperative Education Students will participate in a program approved cooperative education program that includes formal instruction, training, and/or career related work experience. Students may receive a salary or wages and will engage in pre-arranged work assignments related to their academic program and career objectives. Program faculty evaluations, cooperating agency student performance evaluations, and student reports are required. Hours and credit to be individually arranged. Special approval needed from the department. Credit Hours: 1-12

AVT321 - Radio Theory and Practice Students will have knowledge of Advanced Radio Theory and Practice including Federal Communications Commission requirements for aircraft station licenses, aeronautical ground stations, and radio telephone operator's privileges and limitations. Prerequisite: AVT 317. Credit Hours: 3

AVT327 - Aircraft Communication This course will introduce the student to the theory of operation of traditional aircraft communication and navigation equipment including VHF transceivers, VOR receivers, ILS receivers, ADF receivers, transponders and DMEs. RADAR and ADS-B theory will also be discussed as navigation systems. The systems presented will be discussed to the block diagram level highlighting communications principles. Due to the integrated WiFi and other passenger systems, the theory WiFi networking and routing will be studied along with basic principles of the Linux operating system. Lecture/Laboratory. Prerequisite: AVT 318 or concurrent enrollment. Course fee: \$60. Credit Hours: 3

AVT329 - Introduction to Avionics Systems This distance learning course is designed to introduce students to aircraft avionics systems. Starting with the history of avionics to current and future systems. Students will review system theories and operational use of communications, navigation, GPS, satellite communications, weather, ADS-B, Next generation airways systems, flight management systems, pitot/static systems, autopilot theory and space flight systems. Credit Hours: 3

AVT338 - Unmanned Aircraft Systems (UAS) Basic Electricity Students will gain a base knowledge of electron theory, electricity generation, AC and DC circuitries, controls and solid-state devices and battery theory. They will be able to solve problems associated with electrical measurement (AC and DC), interpret circuit schematic drawings, service batteries and perform basic electrical system troubleshooting. Lab fee: \$25. Credit Hours: 5

AVT339 - Electronics for Unmanned Aircraft Systems (UAS) Students will gain an understanding of electronics essential to UAS operation. Topics include semiconductor theory, diodes, transistors, motor drives, voltage regulators and radio receivers. Digital systems will also be studied through the topics of digital number systems, logic gates, Boolean logic, memory devices, CPUs, analog-to-digital conversion and data communications. An introduction to programming devices for monitoring and control is covered. Labs will be used to reinforce lecture materials. \$40 course fee. Lecture and Laboratory. Prerequisite: AVT 338. Credit Hours: 3

AVT340 - Aircraft Inspection and Rigging Students will be able to perform an annual inspection of an aircraft, demonstrate knowledge of FAR's, AD's, classifying repairs and specific service problems; complete the required maintenance forms, records, and reports; demonstrate knowledge of flight control rigging and rotorcraft fundamentals. Prerequisite: AVT 110, 112, 116. Course fee: \$50. Credit Hours: 4. Credit Hours: 4

AVT345 - Powerplant Inspection and Testing Students will be able to perform periodic inspection of powerplants. They will demonstrate their knowledge of FAR and application of FAA AD's, Service Bulletins, and proper use of inspection equipment. They will use knowledge learned in the powerplant curriculum to perform malfunction analysis of powerplant and related systems and perform engine running requirements of powerplant subjects. Live equipment is used on a return to service basis. Prerequisite: AVT 214, 316. Course fee: \$120. Credit Hours: 4

AVT350 - Technical Subjects in Aviation Technologies In-depth competency, skill development and exploration of innovative techniques and procedures used in Aviation Technologies. Study of program approved topics or projects may include workshops, short courses, seminars, research or independent study. Special approval needed from the department. Credit Hours: 1-32

AVT358 - Aviation Technologies Advanced Work Experience Credit granted for prior aviation technologies or electronic related job skills, work experience, management worker relations and supervisory experience of progressively higher levels of responsibility. AVT 358 credit will be awarded for substantial experience in the industry. Credit will be established by program evaluation. Credit Hours: 1-12

AVT380 - Aerospace Supply Chain Logistics This course is a study of the logistics of efficiently scheduling, producing, transporting, storing, and supplying components and hardware in the context of the aerospace industry. Students will learn to improve efficiencies in supply chain logistics as correlated with advancements in management information system technology in order to facilitate the delivery of the desired goods and services to the correct location at the proper time. Credit Hours: 3

AVT390 - Management Information Systems for Aerospace Applications Provides an understanding of various types of Management Information Systems (MIS) currently used in Aerospace Support, focusing on the planning, implementation, and evaluation of these. Through this course, the student will become familiar with MIS applications relevant to aerospace product support activities, learn to evaluate the strengths and weaknesses of various systems designs, develop problem solving and critical thinking skills as apposite to logistics applications, and acquire knowledge of basic database management, design, and security. Credit Hours: 3

AVT405 - Flight Management Systems Using industry type computer instruction and flight simulation trainers, students will develop knowledge of the operation and management of autopilots, auto throttles, inertial reference systems, electronic instrument systems, and flight management computers on advanced technology aircraft. Not for graduate credit. Prerequisite: AVT 305; or AF 207A, B. Course fee: \$125. Credit Hours: 3

AVT410 - Advanced Composites Topics include the theory and application of advanced composite materials used in modern aircraft structures and engine components. Students will evaluate structures and implement various methods of repair and maintenance using both cold and heated application methods. Not for graduate credit. Prerequisite: AVT 110. Course fee: \$60. Credit Hours: 3

AVT416 - Advanced Propulsion Systems A study of advanced turbine powerplants and their control systems. Students will demonstrate an understanding of the operation and construction of integrated composite engines and analyze digital control systems. Topics include the interfacing of powerplant controls and monitoring systems, aircraft electronic data bussing and indicating displays. Not for graduate credit. Prerequisite: AVT 316. Course fee: \$125. Credit Hours: 3

AVT422 - Aviation Radar Systems Introduces the student to applications of airborne radar equipment, including weather detection and tracking. The student will gain an understanding of installation techniques, system performance specification, operational analysis and troubleshooting. Not for graduate credit. Prerequisite: AVT 317. Co-requisite: AVT 318. Credit Hours: 3

AVT440 - Unmanned Aircraft Systems The purpose of this course is to provide an overview of Unmanned Aircraft Systems (UAS). Topics that will be discussed include the history of UAS, regulations, specific implications related to industry and society, employment opportunities, ethics, and the necessary basic components required to operate a UAS. In addition, the student will be provided opportunities for hands-on experience with UAS principles of flight and operation principles via simulation and other activities. Credit Hours: 3

AVT441 - Unmanned Aircraft Systems (UAS) Guidance, Control and Stabilization Students will learn the design, operation and basic troubleshooting of UAS guidance, control and stabilization systems. The course explores the operational principles of the global positioning system (GPS), and how it is integrated into large and small UAS. Students will study both analog and digital line-of-sight control systems in small UAS (sUAS), and the satellite based digital control systems used in large UAS. They will also gain a thorough understanding of UAS gyroscopic stabilization systems. \$150 Lab fee. Prerequisite: AVT 339. Credit Hours: 3

AVT442 - Unmanned Aircraft Systems (UAS) Application Students will gain an in-depth understanding of existing and near-term future UAS applications. The course is a combination of lecture and hands-on UAS experience. The lecture explores all mainstream UAS applications focusing on the end product, equipment (hardware and software), operational techniques and governing regulations. Hands-on UAS experience will allow the student to personally fly five commercial UAS application missions with a commercial-quality quad-copter and imaging system. \$10 Lab fee. Prerequisite: AVT 440. Credit Hours: 3

AVT465 - Digital Data Bussing and Electronic Flight Instrument Systems (EFIS) This course will introduce digital data bus systems, control protocols and exchange formats. Students will study electronic flight instrumentation systems, engine indication and alerting systems found on various general, business, and air transport category aircraft while becoming familiar with the use of integrated test equipment to evaluate, test, and troubleshoot software routines for digital information transfer. Students will interpret blueprints and schematic diagrams to construct complex digital data bus harnesses to aircraft specifications. Not for graduate credit. Co-requisite: AVT 318. Course fee: \$125. Credit Hours: 5

AVT470 - Reliability, Maintainability, and Fault Prediction and Analysis Students will develop an understanding of the concepts of reliability, maintainability and failure modes to a level which facilitates fault prediction and the analysis of logistical systems. The topics of logic symbols, fault tree analysis, statistical analysis, fault criticality and engineering for reliability and maintainability will be presented as these relate to the maintenance and logistical management of aerospace hardware. Credit Hours: 3

AVT475 - Aerospace Lean Manufacturing and Maintenance Practices This course introduces current and future aerospace manufacturing and maintenance professionals to lean manufacturing and maintenance principles and management strategies. Course emphasis is placed on the practical application of lean practices in real-world aerospace manufacturing and maintenance production facilities. Focus includes the history of lean, a detailed study of the Toyota Production System, defining and eliminating production waste, continuous production improvement strategies, just in time production control, 5S workplace organization and an introduction to Six Sigma quality control principles. Credit Hours: 3

AVT478 - Aircraft Business and Industry Financial Practices This class introduces current and future aerospace manufacturing and maintenance professionals to aviation business and finance. This course covers business and economic theory as it applies to a wide range of aviation businesses. Topics of study include a survey of the aviation industry, the application of economic principles to industry forecasts, business finance, and aviation in a global marketplace. Credit Hours: 3

AVT485 - Aerospace Maintenance Shop Operations This course will give the student an in depth sampling of professional practices used within aerospace maintenance facilities and how they pertain to ongoing day to day operations. The exploration will include perspectives from a general aviation maintenance shop, a corporate aviation maintenance shop, an aircraft manufacturer's shop and an airline maintenance shop. Topics may include but not limited to: OSHA safety standards, aircraft ground handling, lifting, storing, fueling, personnel training, manufacturing processes, record keeping, etc. No prerequisites required. Credit Hours: 3

AVT488 - Advanced Aerospace Safety Procedures This course is an introduction to safety management systems that are becoming prevalent and required in the aviation industry. Topics will

include the history of SMS, FAA guidelines pertaining to SMS, development and implementation of an SMS and the documentation and record keeping required. Credit Hours: 3

Aviation Technologies Faculty

Barker, James, Assistant Professor, M.S., Southern Illinois University Carbondale, 2020; 2020.

Burgener, Michael A., Associate Professor, M.B.A., The Citadel, Charleston, SC. 2001; 2002.

Chen, Wai Song, Assistant Lecturer, M.P.A., Southern Illinois University Carbondale, 2016; 2020.

Fanning, Harry B., II, Lecturer, M.B.A., Lindenwood University, 1989; 2014.

Felton, Michael, Assistant Instructor, B.S., Southern Illinois University Carbondale, 2023; 2024.

Harrison, Matthew W., Associate Professor, M.S.ED., Southern Illinois University Carbondale, 2008; 2004.

Hebel, Martin, Associate Professor, M.S.ED., Southern Illinois University Carbondale, 1998; 1998.

Johnson, Karen J., Associate Professor, Ph.D., Southern Illinois University Carbondale, 2020; 2005.

Morris, Donald, Associate Professor, M.A.S., Embry Riddle Aeronautical University, 2013; 2012.

Emeriti Faculty

Rodriguez, Charles L., Assistant Professor, Emeritus, Ph.D., Southern Illinois University Carbondale, 1997; 1977.

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