

AEROSPACE TECHNOLOGY (AERO)

AERO-101 Aviation Science

3 Credits

Lecture: 2 hours per week, **Lab:** 2 hours per week

Offering: Fall Only, All Years

This course will provide a study of aeronautical mathematical applications, applied aeronautical physics principles, and drawing interpretation as required by the Federal Aviation Administration (FAA) for airframe mechanics.

AERO-110 Safety/OSHA

1 Credit

Lecture: 1 hour per week

Offering: Fall Only, All Years

This course will teach the fundamentals of health and safety in the workplace. Applicable safety regulations by OSHA and environmental requirements by the EPA will be understood. Safe handling of hazardous materials and disposal of hazardous wastes will be primary. Accident prevention will be emphasized. Instruction will also include basic first aid and fire safety. This course is designed to prepare students to safely perform the job functions of an aerospace composite technician in an accident free manner.

AERO-111 Blueprint Reading

2 Credits

Lecture: 2 hours per week

Offering: Fall and Spring Only, All Years

This course will teach basic aircraft blueprint reading skills. Topics will include lines and symbols, orthographic drawings, views, materials, form and position, title blocks, sketching, features, and sections. Students will learn a systematic approach to reading aircraft blueprints through actual manipulation of working drawings.

AERO-120 Introduction to Composites

3 Credits

Lecture: 3 hours per week

Offering: Fall Only, All Years

This course will teach the materials and processes associated with polymer composite structures, components and design. Emphasis will be placed on material properties, manufacturing processes and safety.

AERO-121 Composite Fabrication Methods/Applications

2 Credits

Lecture: 1 hour per week, **Lab:** 2 hours per week

Offering: Fall Only, All Years

This course will teach the fundamentals of several fabrication methods. Processes will be applied including hand lay-up, bonding, vacuum bagging and vacuum assisted resin transfer molding. Emphasis will also be placed on composites safety and inspection/testing of composite components.

AERO-122 Composite Finish Trim

1 Credit

Lab: 2 hours per week

Offering: Fall Only, All Years

This course will teach students an understanding of the processes used to finish trim composites parts. Topics include safety, documentation, tools, procedures and inspection. Skills learned in theory sessions are transferred to the lab through projects.

Corequisites: AERO-123, AERO-130

AERO-123 Composite Assembly

2 Credits

Lab: 4 hours per week

Offering: Fall Only, All Years

This course will teach the fundamentals of joining composite structures. Adhesive bonding as well as mechanical fasteners is covered. Safety procedures are emphasized. Essential elements of this course include the preparation of holes for mechanical fasteners and surface preparation for adhesive bonding. The course consists of theory and practical application and through hands-on projects.

Corequisites: AERO-122, AERO-130

AERO-130 Disassembly and Damage Removal Techniques

1 Credit

Lab: 2 hours per week

Offering: Fall Only, All Years

This course will teach students the knowledge required to safely and effectively prepare a part for repair. In the laboratory setting, students will learn to effectively removed finishes, disassemble and remove damaged composite material. Special attention is paid to developing students' tactile skills in all of these areas.

Corequisites: AERO-122, AERO-123

AERO-131 Composite Repair

2 Credits

Lab: 4 hours per week

Offering: Spring Only, All Years

This course provides students with the knowledge and application techniques used in general repairs with composite materials. Students complete multiple industry-based projects designed to challenge their skills with both wet lay-up and pre-impregnated composite materials.

Corequisites: AERO-133, AERO-142, AERO-143

AERO-133 Electrical Bonding Repair

1 Credit

Lab: 2 hours per week

Offering: Spring Only, All Years

This course provides students with the knowledge and skills used in electrical bonding composite repair. Students learn theory and application using secondary bonding techniques as it applied to manufacturer's specifications.

Prerequisites: AERO-110

Corequisites: AERO-131, AERO-142, AERO-143

AERO-141 Geometric Dimensioning and Tolerance**1 Credit****Lab:** 2 hours per week**Offering:** Spring Only, All Years

This course provides an understanding of the basic terms and principles of Geometric Dimensioning and Tolerance (GD&T) and its applications. The course provides students with the skills and knowledge necessary to identify GD&T symbols and how to interpret those symbols as applied to Aerospace Technology.

Prerequisites: AERO-110, AERO-111, AERO-120, AERO-121, AERO-122, AERO-123, AERO-130, MCTE-103 or an appropriate score on a placement test.

AERO-142 Composite Inspection**1 Credit****Lab:** 2 hours per week**Offering:** Spring Only, All Years

This course provides students with an understanding of the inspection process during repair procedures. Students learn the role of repair technicians in the inspection process while obtaining hands-on experience in basic Non-Destructive Testing techniques (NDT). Emphasis is placed on the importance of documentation and verification when inspecting repairs.

Prerequisites: AERO-110

Corequisites: AERO-131, AERO-133, AERO-143

AERO-143 Advanced Composite Repair**3 Credits****Lecture:** 1 hour per week, **Lab:** 4 hours per week**Offering:** Spring Only, All Years

This course provides students with hands-on experience working with structural composite repairs. Advanced repair techniques, materials and processes will be covered. Real life repairs on aircraft and on simulated aircraft parts will be accomplished utilizing industry standard equipment and materials.

Prerequisites: AERO-110

Corequisites: AERO-131, AERO-133, AERO-142

AERO-144 Basics of Quality Assurance**2 Credits****Lecture:** 2 hours per week**Offering:** Spring Only, All Years

This course will teach students the basics of bringing principles of quality assurance to the production of products or the delivery of a service to achieve quality and efficiency and to eliminate waste. This course will have projects to practice these principles.

AERO-150 Computer Numerical Control (CNC) Mill Basics**2 Credits****Lecture:** 2 hours per week**Offering:** Spring Only, All Years

This course will instruct students on the setup, programming and operation of vertical Computer Numerical Control (CNC) milling machines. Course will also touch upon the basics of programming in G-Code.

AERO-152 CNC Mill Setup and Operation**3 Credits****Lecture:** 1 hour per week, **Lab:** 4 hours per week**Offering:** Spring Only, All Years

This course will teach the setup and operation of a CNC (Computer Numerical Control) Mill including setting work and tool offsets, cutter and tool selection, calculation of speeds and feeds and machine maintenance. We will learn the basics of G-Code and applied math including Trigonometry. Learning to work safely will be emphasized. The course will be taught on Haas mills and simulators.

Corequisites: AERO-153, AERO-154

AERO-153 Aerospace CNC Mill Operation**3 Credits****Lecture:** 1 hour per week, **Lab:** 4 hours per week**Offering:** Spring Only, All Years

This course will teach the skills in operating a CNC (Computer Numerical Control) Mill, including the use of work-holding fixtures and vises, handwork, layout and inspection, along with programming with G-code. This course will teach the machining of aircraft alloys and composites.

Corequisites: AERO-152, AERO-154

AERO-154 5-Axis Mill Setup and Operation**3 Credits****Lecture:** 1 hour per week, **Lab:** 4 hours per week**Offering:** Spring Only, All Years

This course will teach the advanced skills in running CNC (Computer Numerical Control) milling machine, including multi-work coordinate setups, 5-axis, using a probe, advanced programming with G-code, and an introduction to Mastercam.

Corequisites: AERO-152, AERO-153

AERO-160 Introduction to 3-D Printing**3 Credits****Lecture:** 2 hours per week, **Lab:** 2 hours per week**Offering:** Fall Only, All Years

This course will give both theory and practical experience with 3-D printing. Students will become familiar with the function of 3-D printers, the mediums used in 3-D printing, and practical applications of this technology. Students will learn to design and produce simple parts using using appropriate software. This course will provide an understanding of 3-D printing from its origins to its future potential.

AERO-191 Visual Inspection**1 Credit****Lecture:** 0.5 hours per week, **Lab:** 1 hour per week**Offering:** Fall Only, All Years

This course will provide students with a basic knowledge and theory of visual inspection as a primary method. Students are given an overview of other nondestructive testing disciplines that complement visual inspection and they are selected based upon the application. It covers visual inspection techniques for interpretation of suspected defects with visible light, a magnifying glass, mirrors and other measuring tools when required. It includes lab time for hands-on learning to apply techniques. This course is taught in accordance with the American Society for Nondestructive Testing (ASNT) curriculum.

AERO-192 Liquid Penetrant**1 Credit**

Lecture: 0.5 hours per week, **Lab:** 1 hour per week

Offering: Fall Only, All Years

This course will provide students with a basic knowledge and theory of the liquid penetrant method. It will cover nondestructive liquid penetrant inspection techniques. Students will test for defects open to the surface in parts made of any nonporous material. This course is taught in accordance with the American Society for Nondestructive Testing (ASNT) curriculum.

AERO-193 Magnetic Particle**2 Credits**

Lecture: 1 hour per week, **Lab:** 2 hours per week

Offering: Fall Only, All Years

This course will provide students with a basic knowledge and theory of the magnetic particle method. Students will learn magnetic particle inspection methods for detecting surface and subsurface defects and other defects in ferromagnetic materials such as steel. With this method and hands-on lab time, students will learn to locate defects along with their approximate size and shape. This course is taught in accordance with the American Society for Nondestructive Testing (ASNT) curriculum.

AERO-194 Eddy Current**3 Credits**

Lecture: 2 hours per week, **Lab:** 2 hours per week

Offering: Fall Only, All Years

This course will provide students with a basic knowledge and theory of the eddy current method. Students will learn the use of electromagnetic testing equipment making it possible to locate defects in non-ferromagnetic materials (such as aluminum and stainless steel). Students will gain a basic knowledge of electromagnetic analysis through a broad spectrum of electronic test methods and hands-on lab time involving the intersection of magnetic fields and circulatory currents. This lecture/lab course satisfies a requirement as set forth by the American Society for Nondestructive Testing (ASNT) curriculum.

AERO-195 Ultrasonic**4 Credits**

Lecture: 2 hours per week, **Lab:** 4 hours per week

Offering: Fall Only, All Years

This course will provide students with a basic knowledge and theory of the ultrasonic testing method. Students will learn the use of ultrasonic detection equipment through lecture and hands-on training making it possible to locate internal defects in metal and composite materials. This course is taught in accordance with the American Society for Nondestructive Testing (ASNT) curriculum.