AERT-AEROSPACE TECHNOLOGY (AERT)

AERT 105. Aerospace Engineering PLTW
4 Credits (2+4P)
Introduce the student to Aerospace Engineering (AE) concepts and history. Studied topics include History of Flight, Aerodynamics, Rocket Science, Orbital Physics, Systems Engineering and Life Support/Environmental Systems. Restricted to: Community Colleges only.

AERT 111. Basic Electricity and Electronics
3 Credits (2+2P)
Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated fiber optics, and industrial application topics. Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: ELT 105

AERT 121. Introduction to the Aerospace Workplace
4 Credits (2+4P)
The course covers space history, regulations, controls, aerospace industry terminology and acronyms as well as hands-on activities related to tools, procedures, and standard practices. Restricted to: Community Colleges only.

AERT 122. Aerospace Safety and Quality
3 Credits (2+2P)
Covers identification of hazards, personal protective equipment, safe practices, and protection of personnel, property, and equipment in the aerospace environment. Basic principles of quality assurance engineering and quality control relating to work processes will be discussed. Restricted to: Community Colleges only.

AERT 145. Introduction to Drone-UAS Technology
3 Credits (3)
Introduction to drone or Unmanned Aircraft System (UAS) technology and its applications in architecture, engineering, construction, film, media, and other related industries. Best practices, training, permissions, licensing, and documentation requirements will be explored. Obtaining, working with, and managing data obtained by drones will be emphasized. Emerging technologies and future applications will be introduced. Restricted to Dona Ana Campus only.
Learning Outcomes
1. Describe applications of drone technology by industry.
2. Recognize types of drone data.
3. Provide examples of how drone data can be used in project visualization.
4. Identify standard drone features.
5. Utilize related applications, software, and hardware successfully.
6. Demonstrate professional practices.
7. Describe training, permissions, licensing, and documentation requirements.
8. Identify best practices of UAV use.
9. Process and produce imagery and videos from drone data. 1
10. Perform basic data processing. 1
11. Manage point cloud data. 1
12. Create 3D meshes from drone data. 1
13. Explore emerging technologies and future applications.

AERT 195. Introduction to Drone - UAS Equipment Operation and Maintenance
4 Credits (4)
Introduction to drone or Unmanned Aircraft System (UAS) equipment operation and maintenance. Flying and maneuvering drones will be practiced. Pre-flight, in-flight, and post-flight procedures will be emphasized. Drone maintenance will be introduced. Restricted to Dona Ana campus only.
Prerequisite: AERT 145.
Learning Outcomes
1. Describe related safety practices and procedures.
2. Discuss related communications requirements.
3. Demonstrate launch preparation steps.
4. Create a basic flight plan.
5. Demonstrate proper preflight, inflight, and post-flight procedures.
6. Describe standard flight operations.
7. Perform basic drone flight and maneuvers.
8. Identify elements of maintenance and inspection programs.
9. Describe related FAA requirements. 1
10. Demonstrate proper equipment and battery maintenance. 1
11. Describe proper parts and material control.

AERT 211. Electromechanical Devices
4 Credits (2+4P)
Theory and application of electromechanical devices and digital control circuits. Includes AD and DA converters, pneumatics, hydraulics, programmable logic controllers, DC, AC and stepper motors, and servomechanisms. Crosslisted with: MAT 240.
Prerequisite(s): ELT 160.

AERT 212. Materials and Processes (Basic Metallurgy)
3 Credits (2+2P)
Basic Metallurgy: Aluminum and its alloys (Alclad), hardening, tempering, annealing, anodizing, magnetism, titanium, copper, stainless steel, surgical steel, safety wire, iron rust. Metallurgical Processes: Welding and soldering. Inspection Fundamentals: Eddy currents, magnetic particles (ferrous and non-ferrous metals), ultrasonic, x-ray, visual, corrosion and corrosion control, and vacuum bagging. Restricted to: Community Colleges only.

AERT 213. Aerospace Fluid Systems
3 Credits (2+2P)
This course includes a familiarization of fluid system components, characteristics, and applications. Cryogenic and hypergolic materials and high pressure systems are also covered. Restricted to: Community Colleges only.

AERT 214. Aerospace Systems
3 Credits (2+2P)
This course provides an introduction to expendable and reusable spacecraft systems including hydraulic, pneumatic, electrical, propulsion, mechanical, HVAC, and ECLSS (Environmental Control and Life Support System). How systems interact with computer and data acquisition systems is also covered. Restricted to: Community Colleges only.

AERT 221. Inspection Requirements and Planning Metrology
3 Credits (2+2P)
Course teaches the benefits of inspection, quality control, material conditions. Also covers measurements, including temperature, ultrasonic, vibration and more. Restricted to: Community Colleges only.

AERT 222. Electromechanical Systems
3 Credits (2+2P)

Principles and applications of preventive and corrective maintenance procedures on industrial production machines using systems technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams. Crosslisted with: MAT 245. **Prerequisite(s)/Corequisite(s):** AERT 221 or MAT 240. Prerequisite(s): ELT 160.

AERT 224. Aerospace Tests and Measurements
3 Credits (2+2P)
This course covers electrical and mechanical testing procedures (primarily non-destructive testing), equipment, measurements, and instrumentation involved in aerospace systems. Verification of tool and equipment calibration is also covered.
Prerequisite(s)/Corequisite(s): AERT 221. Restricted to: Community Colleges only.

AERT 225. Cooperative Experience
1-3 Credits (1-3)
Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.

AERT 245. Remote Pilot Certificate Test Preparation
3 Credits (3)
Preparation course for the FAA Unmanned Aircraft General – Small (UAG) aeronautical knowledge exam. Overview of applicable regulations, restrictions, procedures, and operations will be provided. Process for obtaining an FAA Tracking Number (FTN), registering for the FAA Unmanned Aircraft General – Small (UAG) aeronautical knowledge exam, and certificate registration requirements will be explored. Restricted to Dona Ana campus only.
Prerequisite: AERT 195.
Learning Outcomes
1. Demonstrate increased knowledge related to topics covered in the FAA UAG exam.
2. Demonstrate increased skills related to topics covered in the FAA UAG exam.
3. Demonstrate increased abilities related to topics covered in the FAA UAG exam.
4. Describe processes related to obtaining a FAA Unmanned Aircraft General – Small (UAG) aeronautical certificate.
5. Practice certification test-taking skills.

AERT 255. Special Topics
1-4 Credits (1-4)
Specific topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

AERT 290. Independent Study
1-3 Credits (1-3)
Individual studies in areas directly related to aerospace. Consent of instructor required. Restricted to: Community Colleges only.