Computer-Aided Technology - Unmanned Vehicle Systems (AAS)

Associate in Applied Science

Minimum of 60 credit hours

The Unmanned Vehicle System (UVS) Option will equip students with the skillset required to operate ground, aerial, and marine vehicles. Students will receive hands-on experience in the classroom and in the field. Students will learn how to fly safely in the National Airspace while abiding by current regulations. With the use of 3D fabrication equipment, student will have the opportunity to design attachments and accessories for these systems. The potential commercial uses of unmanned vehicle systems is endless, to include aerial photography and video, search and rescue, disaster response, digital mapping, photogrammetry, remote sensing and many others.

Course Sequence

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Course Name</th>
<th>Credits</th>
<th>Type</th>
<th>Min Gd</th>
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<tbody>
<tr>
<td>SCL 1001</td>
<td>Success in College and Life</td>
<td>1</td>
<td>Life Skills</td>
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<tr>
<td>CAT 1113</td>
<td>Unmanned Vehicle Systems</td>
<td>3</td>
<td>Major</td>
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<tr>
<td>CAT 1133</td>
<td>Airspace and Regulations</td>
<td>3</td>
<td>Major</td>
<td></td>
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<tr>
<td>CS 1103</td>
<td>Introduction to Computers and Applications</td>
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<td>Major</td>
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<tr>
<td>ENGL 1113</td>
<td>English Composition I</td>
<td>3</td>
<td>Gen Ed</td>
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<td>MATH 1513</td>
<td>College Algebra for Business, Life Sciences and Social Sciences</td>
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Suggested Freshman 2nd Semester

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<tbody>
<tr>
<td>CAT 1123</td>
<td>UVS Operations</td>
<td>3</td>
<td>Major</td>
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<tr>
<td>CAT 1214</td>
<td>Computer Aided Design (CAD)</td>
<td>4</td>
<td>Major</td>
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<tr>
<td>CAT 1313</td>
<td>Introduction to Geographic Information System (GIS)</td>
<td>3</td>
<td>Major</td>
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<tr>
<td>MATH 1613</td>
<td>Trigonometry</td>
<td>3</td>
<td>Support</td>
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<td>CAT GEN COMM</td>
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Suggested Sophomore 1st Semester

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<tr>
<td>CAT 123</td>
<td>Introduction to Spatial Technology</td>
<td>3</td>
<td>Major</td>
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<tr>
<td>CAT 2123</td>
<td>Digital Fabrication</td>
<td>3</td>
<td>Major</td>
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<tr>
<td>HIST 1483</td>
<td>U.S. History to The Civil War</td>
<td>OR</td>
<td>Gen Ed</td>
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<tr>
<td>HIST 1493</td>
<td>U.S. History Since The Civil War</td>
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<td>Design Project</td>
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<td>Major</td>
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<td>CS 1143</td>
<td>Beginning Programming</td>
<td>3</td>
<td>Major</td>
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<tr>
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<td>American Federal Government</td>
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Course Grouping

Major Courses: (32 credit hours) Computer-Aided Technology: CAT 1113, CAT 1123, CAT 1133, CAT 1214, CAT 1313, CAT 1323, CAT 2123, CAT 2924, CS 1103, CS 1143

General Education Courses: (18 credit hours)

English: ENGL 1113, *Any course that meets Oklahoma State Regents for Higher Education requirements for a general education Communications; (OSRHE: ENGL 1213, ENGL 1233, COM 1123, COM 2213)

History: HIST 1483 or HIST 1493

Mathematics: MATH 1513, MATH 1613

Political Science: POLSC 1113

Life Skills Courses: (1 credit hour) Life Skills: SCL 1001

Support Courses: (9 credit hours)

Electives: Any CAT, CS, DCP or ENGR course, Any courses from DMD list: DMD 1153, DMD 2143, DMD 2153, DMD 2163, DMD 2253, DMD 2533, DMD 2633, DMD 2733, DMD 2783. Other courses may be approved by the Program Faculty.

Program Notes

Notes: This Technical and Occupational program is designed to prepare students to enter the job force following completion. See Technical and Occupational Programs in the general information section of the catalog.
CAT 1113 - Unmanned Vehicle Systems
Prerequisites: Math 0103 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits Students will be introduced to the history, missions, capabilities, types, configurations, subsystems, and the disciplines needed for UVS development and operation.

CAT 1123 - UVS Operations
Prerequisites: CAT 1113
3 Credits Students will demonstrate the proper way to operate Unmanned Vehicle Systems. This includes pre-mission check list, missing planning and logging, safety/liability consideration and emergency procedures. Students will be working in the field and in the classroom conducting simulated and real life missions.

CAT 1133 - Airspace and Regulations
Prerequisites: Math 0203 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The course will examine the components and objectives of the National Airspace System. Emphasis will be placed on regulations pertaining to UAS flight operations.

CAT 1214 - Computer Aided Design (CAD)
Prerequisites: Math 0103 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
4 Credits The student will learn and demonstrate the proper use of computer-aided design software as a design tool in fields such as Engineering, Architectural and Multimedia. Emphasis will be on computer-aided design fundamentals such as creating, editing and printing of 2D computer-aided design documents. The student will demonstrate his or her understanding of the structure, use and development of computer-aided design documents by correctly creating, using and storing computer-aided design documents. This course satisfies the computer proficiency requirement.

CAT 1313 - Introduction to Geographic Information System (GIS)
Prerequisites: Math 0103 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits Students will learn fundamental concepts in Geographic Information System (GIS). The student will be introduced to introductory content on typical business and technical applications, data, software, and techniques used to accomplish GIS projects. Students receive hands-on experience with global positioning system (GPS) hardware and ArcGIS software. This course satisfies the computer proficiency requirement.

CAT 1323 - Introduction to Spatial Technology
Prerequisites: Math 0103 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The course focuses on technologies being used to locate, inventory and analyze locations, Geographic Information Systems, Global Positioning Systems, telemetry and photogrammetry and a brief introduction to Satellite-Based Remote Sensing.

CAT 2123 - Digital Fabrication
Prerequisites: MATH 0203 or Adequate math placement test score; CAT 1214 or CAT 1253 or CAT 2543.
3 Credits The course is an in-depth exploration of the world of digital fabrication. Students will create projects by utilizing fabrication equipment such as 3D scanning, 3D Printers, Computer Numerical Control (CNC) machines and metrology tools.

CAT 2924 - Design Project
Prerequisites: 15 hours of CAT credits
4 Credits In this capstone course of the Computer-Aided Technology Program the student will demonstrate the collected knowledge, skills and techniques acquired in the program courses by creating and presenting a representative project to a panel of students, instructors and representatives from industry. The project must be an original design of the student. The project must reflect the standards relative to the project’s nature and the program emphasis. The student must assemble and create components, choose the proper presentation medium, and present the project in a professional manner. This course satisfies the computer proficiency requirement.

CAT GEN COMM - OSRHE Approved Gen Ed Communications or English Course
3 Credits Students should select one 3 credit course: ENG 1213, ENG 1223, COM 1112, or COM 2213.

CS 1103 - Introduction to Computers and Applications
Prerequisites: Math 0103 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits This hands-on course affords students a basic understanding of computers and their application. Upon completion of this course, the student will be able to demonstrate the ability to use a computer operating system, an office suite, productivity tools, as well as the Internet at an introductory level. Advanced Standing is available. This course satisfies the computer proficiency requirement.

CS 1143 - Beginning Programming
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; Math 0303 or adequate math placement test score or by evaluation. § Criteria for evaluation is in division office.
3 Credits Designed for Computer Science majors, this course affords students a basic understanding of computer programming. Students will utilize accepted programming concepts and perform number system conversions and arithmetic. In addition, they will design and code structured modular programs using design tools such as hierarchy charts, flowcharts, and pseudocode. This course satisfies the computer proficiency requirement.

ENGL 1113 - English Composition I
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions.

FA UVS SUPP ELEC - UVS Faculty Approved Support Electives
9 Credits Faculty approved electives: Any CAT, CS, DCP or ENGR course or any of the following DMD courses: DMD-2113, DMD-2153, DMD-2163, DMD-2253, DMD-2532, DMD-2633, DMD-2733, DMD-2763, and other courses may be approved by the Program Faculty.

HIST 1483 - U.S. History to The Civil War
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental
operations in their society and help resolve conflict in society based on the student’s search for change, precedents, and conflict in the American past. A general education requirement.

HIST 1493 - U.S. History Since The Civil War
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits After analyzing events in American history from 1870 to the present in such areas as political reform, industrialization, urbanization, ethnic acculturation and war, the student will be able to identify meaningful changes in his society, identify equal rights in that society, and help resolve conflict in this society based on the students search for change, equal rights and conflicts in the American past.

MATH 1513 - College Algebra for Business, Life Sciences and Social Sciences
Prerequisites: MATH 0403 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will demonstrate an understanding of the general concepts of relation and function and specifically of polynomial, exponential, and logarithmic functions; the ability to solve systems of equations by utilizing matrices and determinants; and the ability to solve practical problems using algebra.

MATH 1613 - Trigonometry
Prerequisites: Pre or Corequisite: MATH 1513 or MATH 1533 or adequate math placement test score and ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will evaluate trigonometric functions and their inverses, graph trigonometric functions, prove trigonometric identities, solve trigonometric equations, solve problems involving triangles and indirect measurement, use trigonometric forms of complex numbers, and identify and graph polar curves.

POLSC 1113 - American Federal Government
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits A study of the principles, structure, processes and functions of the United States federal government.

SCL 1001 - Success in College and Life
Prerequisites: ENGL 0106 or adequate reading/writing assessment scores