Mechatronics Engineering Technology

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Mechatronics engineering technology is an emerging field that blends mechanical engineering, electrical engineering and computer science. Mechatronics is an evolutionary design development that requires horizontal integration between various engineering disciplines, as well as vertical integration between design and manufacturing. Many of the components, controls and systems used in mechatronics have been utilized in industry for many years. These mature technologies, combined with technological advances, provide many employment opportunities.

Mission Statement
The mission of the Bachelor of Science in Mechatronics Engineering Technology is to prepare graduates for technically oriented careers in which they apply mathematical and scientific principles to the design, development and operational evaluation of automated systems (computer-controlled with embedded electronics, sensors and actuators). This degree is a significant component of the University's commitment to building character and careers of our students-integrating teamwork/leadership skills and preparing students for lifelong learning and assuming personal responsibility for applying the highest professional and ethical standards to global issues related to the field.

Program Objectives
Educational program objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. These objectives are based on the needs of the program's constituencies (Commonwealth of Pennsylvania, employers, advisory board, alumni, students and faculty).

1. Communicate effectively in the professional environment in individual and group situations.
2. Translate customer requirements and effectively integrate multiple mechanical and electrical systems.
3. Participate in lifelong learning to stay technically current in the profession.
4. Specify, design, deploy, implement, troubleshoot and maintain mechatronic systems.
5. Apply appropriate strategies to maintain professional, ethical and social responsibilities in the workplace and include a respect for diversity.
6. Work effectively in individual and group-oriented settings.
7. Analyze the produced system and formulate its economic impacts on the overall organization.
8. Apply safety to all aspects of work.

Student Outcomes
The mechatronics engineering technology program prepares graduates to:

1. Select and apply the knowledge, techniques, skills and modern tools in mechatronics engineering technology.
2. Apply concepts of circuit analysis, analog and digital electronics, automation and controls, motors, electric drives, power systems, instrumentation and computers to aid in the design, characterization, analysis and troubleshooting of mechatronics systems.
3. Use advanced principles of statics, dynamics, fluid mechanics, strength of materials, engineering materials, engineering standards and manufacturing processes to aid in the design, characterization, analysis and troubleshooting of mechatronics systems.
4. Use differential and integral calculus in the characterization and analysis of mechatronics systems.
5. Apply problem-solving skills, including the ability to identify problems, conduct experiments, gather data, analyze data and produce results.
6. Use appropriate computer languages and application software that pertain to mechatronics engineering technology systems.
7. Function effectively as either a member or a leader on a technical team.
8. Apply written, oral and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.
9. Understand the need for an ability to engage in self-directed continuing professional development.
10. Address professional and ethical responsibilities, including respect for diversity.
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11. Explain and analyze the impact of engineering technology solutions in a societal and global context.
12. Apply commitment to quality, timeliness and continuous improvement.
13. Design a system component or process to meet desired needs within realistic constraints such as economic, environmental and/or social.

Enrollment Trends Over the Past Five Academic Years by Semester

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Headcount</th>
<th>New Students</th>
<th>New Transfers</th>
<th>New Freshmen</th>
<th>Graduates</th>
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National Accreditation
The Bachelor of Science in Mechatronics Engineering Technology has been developed in accordance with the Engineering Technology Accreditation Commission (ETAC) of the Accreditation Board for Engineering Technology (ABET) criteria for accrediting engineering technology programs. ABET is the premier accreditation body for engineering and engineering technology programs throughout the world. In addition to the ABET criteria, the degree program had an industrial advisory board that contributed to the development of the program, and continues to be involved regularly in the growth of the program. Cal U is pursuing accreditation through ETAC of ABET. In addition to the ABET accreditation process, PASSHE BOG Policy 1993-01, will ensure continued effectiveness.

Employment Opportunities
Mechatronics engineering technologists work with "smart" devices that incorporate mechanical, electrical, computer and software components, such as robots, automated guided systems and computer-integrated manufacturing equipment. Mechatronics is a high-tech field -- and it's growing fast. The Pennsylvania Department of Labor and Industry has identified mechatronics as a "high-priority" occupation. It projects as many as 300 to 600 job openings per year through 2020.