

Undergraduate

Mechatronics and Robotics Engineering

SIUE

School of Engineering
Department of Mechanical and Industrial Engineering

Degrees Available at SIUE

- Bachelor of Science, Mechatronics and Robotics Engineering

Mechatronics and Robotics Engineering at SIUE

Students in the mechatronics and robotics engineering program create intelligent devices by combining mechanical and electrical engineering principles. Graduates from this program are shaping the future by designing smarter cars, autonomous farm equipment, robots for the manufacturing industry and much more. These devices have mechanical and electrical components, sensors and computer software - all working together, harmoniously.

As automation and robotics increase around us, so does the need for engineers with specialized knowledge of these topics. The field of mechatronics and robotics engineering emerged out of this need to develop the best possible design while seamlessly merging mechanical and electronics knowledge. Mechatronics and robotics engineers have the interdisciplinary knowledge necessary to oversee the design and development of such intelligent devices from beginning to end, rather than completing mechanical, electrical and control designs separately.

While there are a few Bachelor of Science (BS) programs in mechatronics and/or robotics in the U.S. and several abroad, SIUE is the only such program in the state of Illinois.

Career Opportunities

Mechatronics and robotics engineers find jobs in companies that design, develop and manufacture intelligent devices, systems and equipment for medical, automotive, communication, agriculture, construction and entertainment industries. Some examples of these are:

- Mobile or industrial robots
- Quadcopters and drones
- Autonomous vehicles
- High-tech prosthetic limbs
- Consumer electronics
- Space and defense
- Smart home, smart city and smart planet

Graduates from the mechatronics and robotics engineering program may also pursue a graduate degree in mechanical, electrical or computer engineering.

Hands-On Learning

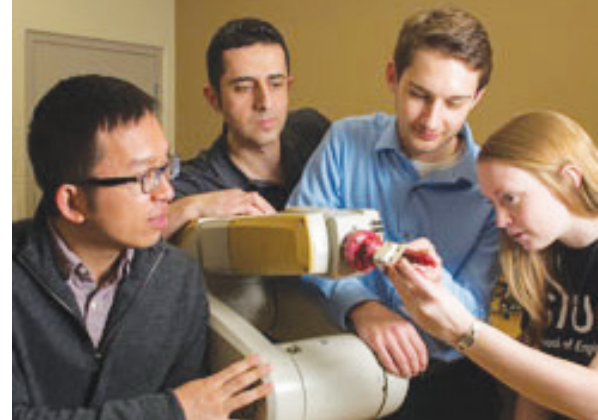
Students have multiple opportunities to engage in experiential learning. The mechatronics and robotics engineering curriculum includes a number of classes with substantial laboratory components where our students apply their knowledge of engineering science in a variety of hands-on experiments. Students also participate in a two-semester senior design course, which allows them to practice teamwork and critical analysis, and to apply their creativity in a design and fabrication project with real-life applications in mind.

At SIUE, students also have the opportunity to participate in mechatronics and robotics engineering work experience and cooperative education, or they can choose to participate in a study abroad program. Our students also have the option to engage in mechatronics and robotics engineering research with faculty members through the Undergraduate Research and Creative Activities (URCA) program.

Admission Requirements

To be admitted to the Bachelor of Science program, students must:

- Complete all Academic Development courses required by the University.
- Complete any courses to address high school deficiencies.
- Be eligible to enroll in MATH 125 Pre-calculus, or higher.
- Maintain a cumulative GPA or at least 2.0 on a 4.0 scale.



Faculty

Sohyung Cho, PhD

2000, Pennsylvania State University

Keqin Gu, PhD

1988, Georgia Institute of Technology

Nima Lotfi, PhD

2016, Missouri University of Science and Technology

Tim York, PhD

2014, Washington University in St. Louis

Mingshao Zhang, PhD

2016, Stevens Institute of Technology

SOUTHERN ILLINOIS UNIVERSITY
EDWARDSVILLE

SCHOOL OF ENGINEERING

Sample Curriculum for the Bachelor of Science in Mechatronics and Robotics Engineering

Fall Semester

Spring Semester

| | Fall Semester | Spring Semester |
|---------------|--|--|
| Year 1 | IE 106 Engineering Problem Solving (NFS) 3 CHEM 131 Engineering Chemistry (BPS) 4 CHEM 135 Engineering Chemistry Lab (EL) 1 ENG 101 English Composition I 3 MATH 150 Calculus I (BPS, FQR) 5 FST 101 Succeeding & Engaging at SIUE 1 Total Credits 17 | ENG 102 English Composition II 3 CS 145 Intro to Computing for Engineers 3 MATH 152 Calculus II (BPS) 5 PHYS 141 Physics I for Engineering (BPS) 3 PHYS 151L University Physics I Lab (EL) 1 Total Credits 15 |
| Year 2 | ACS 103 Interpersonal Communications (EUSC) 3 CE 240 Statics 3 ECE 210 Circuit Analysis I 3 MATH 250 Calculus III (BPS) 4 PHYS 142 Physics II for Engineering (BPS) 3 PHYS 152L University Physics II Lab (EL) 1 Total Credits 17 | ME 262 Dynamics 3 CE 242 Mechanics of Solids 3 ECE 211 Circuit Analysis II 4 ECON 111 Principles of Macroeconomics (BSS) 3 MATH 305 Differential Equations I (BPS) 3 Application for Upper Division 0 Total Credits 16 |
| Year 3 | ECE 282 Digital System Design 4 ME 356 Dynamic Systems Modeling 3 ME 354 Numerical Simulation 1 MRE 380 Design of Machine Elements 3 Math 321 Linear Algebra 3 Breadth Fine & Performing Arts (BFPA) 3 Total Credits 17 | MRE 358 Introduction to Mechatronics 3 MRE 320 Sensors and Actuators 3 ME 450* Automatic Control 3 ECE 381 Microcontroller 3 PHIL 323 Engineering, Ethics & Professionalism (BHUM) 3 Total Credits 15 |
| Year 4 | MRE 454 Robotics, Dynamics & Controls 3 MRE 480 Design in Mechatronics & Robotics I 2 MRE Technical Elective I 3 IE 345 Engineering Economic Analysis 3 Interdisciplinary Studies (IS) / Experience Global Cultures (EGC) 3 Health Experience (EH) 0-2 Total Credits 14-16 | MRE Technical Elective II 3 MRE 477 Computer-Integ Manufacturing Systems 3 MRE 481 Design in Mechatronics & Robotics II 2 Breadth Life Science (BLS) 3 STAT 380 Statistics for Application (BICS) 3 Total Credits 14 |
| | | Total Hours 125-127 |

NOTES – ME 450 may be substituted by the two-course series ECE 365 (control systems) and ECE 465 (control systems design).

Transfer Students: To maximize your transfer experience, complete the **bold** course requirements pre-transfer and satisfy either the Illinois Articulation Initiative (IAI) General Ed Core or receive an AA, AS or AAT (early childhood, special ed or math) degree from an IAI community college. If minor requirements are shown, discuss careful course selection with the academic advising contact listed. Visit siue.edu/transfer to find course equivalency guides.

Graduation Requirements

Degree requirements include the following:

- A cumulative GPA of 2.0 or higher in engineering courses
- A cumulative GPA of 2.0 or higher is required for mechatronics and robotics engineering courses numbered above 299
- Completion of all departmental and University requirements
- Completion of a senior assignment as part of MRE 480 (design in mechatronics and robotics I) and MRE 481 (design in mechatronics and robotics II)

Contact Information

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