ROBOTICS ENGINEERING, BS

Program Description

LSSU was the first university in the nation to institute an accredited B.S. degree program in Robotics Engineering Technology in 1985. Since the 1990s, robotics has been offered as a concentration or minor within LSSU's engineering and engineering technology degree programs. With the maturing of robotics technology, the B.S. degree program in Robotics Engineering was developed at LSSU to meet the demand for engineers to design and implement robotics systems for industrial automation. Students in the program will also be introduced to mobile robotics technology and its application in warehousing, military, health care, and human assistance.

Similar to other engineering programs, this Robotics Engineering program will build upon a solid foundation of courses in mathematics, sciences, English, humanities and the social sciences. In addition to the theoretical background presented in the program's courses by full-time faculty members in small class settings, the students will also have numerous opportunities to work hands-on in lab courses. They will have many opportunities to work with millions of dollars' worth of industry standard equipment including various types of industrial robots, PLCs vision systems, conveying systems, simulation software, end-of-arm tools, and sensors. This facility was recognized by the Technology Accreditation Commission of ABET as one of the most complete and advanced facilities of its kind in the country.

For several decades LSSU has been preparing graduates for industries involved in the design and implementation of automated systems for manufacturing. The demand for LSSU graduates with specialization in robotics has been well established over multiple decades. Industrial robotics and systems integration companies specifically seek out robotics engineering talent from LSSU. Over the years, this has resulted in substantially more job offers for the graduates (with nationally competitive salaries) than the number of graduates. Robotics Engineering graduates are employed in several types of industries involving manufacturing, autonomous vehicles, prosthetics design and build, or service robotics (hospitals, military, healthcare, rehabilitation, etc.).

There is an explosive growth in the application of robotics in the manufacturing industries and in the human service areas. LSSU will continue to successfully prepare graduates to meet the growing demand for technical talent in robotics.

Program Learning Outcomes

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- Communicate effectively with a range of audiences
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- Acquire and apply new knowledge as needed, using appropriate learning strategies

Degree Requirements

Code	Title	Hours
Robotics Engineering Core		
EGEE 125	Digital Fundamentals	4
EGEE 210	Circuit Analysis	4
EGEM 220	Statics	3
EGME 141	Solid Modeling	3
EGNR 101	Introduction to Engineering	2
EGNR 140	Linear Alg Num Apps Engineers	2
EGNR 265	C Programming	3
EGNR 340	Numerical Methods Engineers	1
EGNR 490	Sp Topics in Engr. (Topic)	4
EGRS 215	Introduction to Robotics	2
EGRS 365	Programmable Logic Controllers	3
EGRS 372	Mobile Robotics	4
EGRS 430	Sys Integration/Machine Vision	4
EGRS 381	Robotics Technology Lab	1
EGRS 385	Robotics Engineering	3
EGRS 460	Control Systems	4
EGRS 435	Automated Manufacturing System	2
EGRS 481	Manufacturing Automation Lab	1
CHEM 115	General Chemistry I	5
MATH 151	Calculus I	4
MATH 152	Calculus II	4
MATH 251	Calculus III	4
MATH 308	Probability and Math Stats	3
MATH 310	Differential Equations	3
PHYS 231	Appl Phys Engineer/Scientist I	4
PHYS 232	App Phy Engineer Scientist II	4
Total Hours		**81**

Senior Year Experience

Complete one of the following sequences:

Code	Title	Hours
Industrial Project		**6**
EGNR 491	Engineering Design Project I	
EGNR 495	Engineering Design Project II	
Cooperative Project		**12**
EGNR 250	Cooperative Education	
EGNR 450	Cooperative Educ Project I	
EGNR 451	Cooperative Educ Project II	
EGNR 491	Engineering Design Project I	
Research Project		**8**
EGNR 260	Engineering Research Methods	
EGNR 460	Engrg Research Project I	
EGNR 461	Engrg Research Project II	

Electives

Code	Title	Hours
Technical Electives		
Select a minimum of six credits from the following:		6
CSCI 281	Intro to UNIX and Networking (or higher level CSCI)	
EGEE 250	Microcontroller Fundamentals (or higher level EGEE)	
EGEM 320	Dynamics	
EGET 310	Electronic Manufacturing Processes	
EGME 225	Mechanics of Materials (or higher level EGME)	
EGMT 216	CAM with CNC Applications	
EGNR 261	Energy Systems/Sustainability (or higher level EGNR)	
EGRS 461	Design of Control Systems	
Support Electives		
Select a minimum of three credits from the following:		3
BUSN 231	Business Communications (or higher level BUSN)	
CSCI 201	Data Structures and Algorithms (or higher level CSCI)	
ECON 302	Managerial Economics (or higher level ECON)	
EGME 110	Manufacturing Processes	
MATH 215	Fund Concepts of Mathematics (or higher level MATH)	
MGMT 280	Intro Management Info Systems (or higher level MGMT)	
or coursework from the Technical Electives		
Free Electives		4
Total Hours		**13**

General Education: All LSSU bachelor's degree candidates must complete the LSSU General Education Requirements.

A minimum of 124 credits (at the 100 level or higher) must be earned for graduation with a cumulative gpa of 2.00 or higher. A gpa of 2.00 or higher is also required in your Major, as well as in your General Education Requirements.