

# Robotics Engineering - B.S.

The Robotics Engineering bachelor's degree program provides a broad based foundation in current and evolving areas of robotics, automation and mechatronics engineering. The program focuses on the dynamics of the industry in robotic and mechatronics systems and applications.

Our immersive, lab-based approach integrates technology and engineering applications with contemporary developments in the field.

Upon completion of the program, graduates are expected to:

- Apply knowledge of mathematics, science, engineering and technology as required by the field of robotics engineering.
- Use engineering processes to analyze problems, formulate solutions, conduct simulations and experiments and interpret data.
- Apply written, oral, and graphical communication for the engineering field with consideration for ethical and global concerns.
- Use techniques, skills, industry related tools and technical literature to complete projects, analyze, and interpret data to formulate solutions to engineering problems.
- Integrate knowledge, tools, and problem solving skills to implement the testing of solutions to engineering problems.

Through our experiential education options, you'll have the opportunity to gain work experience at a variety of industry partnership sites.

## Robotics Engineering

A four-year program leading to the bachelor of science degree

### Engineering Foundations

ENGN1015	Introduction to Engineering	3
ENGN2001	Digital Logic Design	4
ENGN2009	C Programming for Engineering	4

### Major Courses

ENGN2025	Applied Mechanics I: Statics	3
ENGN2035	Programmable Logic Controllers	3
ENGN2045	Computer Vision	3
ENGN2062	Artificial Intelligence	3
ENGN2085	Introduction to Embedded Systems	3
ENGN2101	Linear Circuit Theory	3
ENGN2102	Linear Circuit Theory Lab	1
ENGN2205	Microcontrollers	3
ENGN3005	Operational Amplifiers and Linear Circuits	3
ENGN3025	Applied Mechanics II: Dynamics	3
ENGN3053	Strength of Materials	3
ENGN3075	Applied Fluid Mechanics	3
ENGN3302	Robotics	3
ENGN3303	Industrial Robotics	3
ENGN3350	Mechatronics	3
ENGN4075	Robotics & Automation I	3
ENGN4080	Robotics & Automation II	3

### Applied/Experiential Learning

Choose 6 credits from the following:		6
DEE3999	Directed Experiential Education <sup>D</sup>	
TECX4099	College of Engineering & Design Internship <sup>IC</sup>	
TECX4190	Technical Solutions Design Project	

### Related Professional Studies

CAR0010	Career Management	1
FYS1020	First-Year Seminar	1
IDES3100	Parametric Engineering Design	3

### A&S Core Experience

Communications Foundation Courses		9
ENG1020	Rhetoric & Composition I	
ENG1021	Rhetoric & Composition II	
ENG1030	Communication Skills	
Integrative Learning		6
Two ILS courses, one at the 2000 level, and one at the 4000 level		
Arts and Humanities		6
PHIL3240	Ethics: A Global Perspective	
One course from ART, HIST, HUM, LIT, or REL		
Mathematics		6
MATH1040	Calculus I (or higher, based on student's placement) <sup>*</sup>	
MATH2040	Calculus II	
Science		4

PHY1011 & PHY1016	General Physics I and General Physics I Laboratory	
OR		
PHY2011 & PHY2016	Physics I and Physics I Laboratory	
Social Sciences		6
Two courses from different disciplines: ANTH, ECON, GEND, LEAD, PSCI, PSYC, RES or SOC		
A&S Electives		6
Two courses with an EASC attribute		
<b>Free Electives <sup>#</sup></b>		
9 credits selected from 1000-4999 numbered offerings within the university		9
<b>Total Credits</b>		<b>123.0</b>

<sup>\*</sup> Students that do not place in MATH1040 Calculus I, will need to take an extra course(s), MATH1020 Fundamentals of Algebra, and/or MATH1030 Precalculus, as prerequisite(s). If needed one, or both, will count as an A&S elective(s).

<sup>D</sup> Directed Experiential Education (DEE) opportunities are based on project availability with community partners and student eligibility. For more information, visit Experiential Education & Career Services (EE&CS).

<sup>IC</sup> Typically, internships require a minimum of six credits. Students interested in a 9 or 12-credit internship can apply additional experiential learning and free elective credits, if available. Students are strongly encouraged to contact a faculty adviser before scheduling internship and free elective credits.

<sup>#</sup> In addition to classes, free elective credits may be applied to a number of options such as internship, study abroad, Directed Experiential Education courses and courses in a specialization or minor as relevant. For Accelerated Master's program students, up to three graduate-level courses may apply. Students are strongly encouraged to contact a faculty advisor before scheduling free elective credits.

NOTE: Students must pass MATH0010 Pre-Algebra or have equivalent placement scores to enroll in required math course(s).

Note: Students must pass ENG0001 Writing Workshop or have equivalent placement scores to enroll in ILS 2000 level courses

In collaboration with academic colleges across all JWU campuses, JWU Global Study Abroad programs offer a variety of international options for major, minor, arts and sciences, and elective credit at many affordable price points for students during the academic year, break periods, and summer. Faculty-led, exchange, affiliate, and direct-enroll programs range in duration from one week to a full semester or full year. Financial aid may be applied and scholarships are available. Visit the study abroad website for information, program descriptions and online applications. Where will you go?