ROBOTICS (BS)

The BS in Robotics program prepares students for careers working with robots and other cyber-physical systems. These systems involve both physical hardware components and software-based computation and control.

Program Requirements	Quarter Hours
Liberal Studies Requirements	76
Major Requirements	108
Open Electives	8
Total hours required	**192**

Learning Outcomes

- Model a computational problem, select appropriate algorithms and data structures for a solution, justify the correctness of the algorithm, and implement an application solving the problem.
- Analyze and select an algorithm based on system effects.
- Prototype and implement a functional robotic solution to a problem.
- Select the hardware (e.g., sensor, actuators, controllers, etc.) and integrate feedback control algorithms to implement a cyber-physical system.

Liberal Studies Requirements

Liberal Studies Requirements

Honors program requirements can be found in the individual Colleges & Schools section of the University Catalog. Select the appropriate college or school, followed by Undergraduate Academics and scroll down.

First Year Program		Hours
Chicago Quarter		
LSP 110 or LSP 111	DISCOVER CHICAGO or EXPLORE CHICAGO	4
Focal Point		
LSP 112	FOCAL POINT SEMINAR	4
Writing		
WRD 103	COMPOSITION AND RHETORIC I [1]	4
WRD 104	COMPOSITION AND RHETORIC II [1]	4
Quantitative Reasoning		
Not Required		
Sophomore Year		
Race, Power, and Resistance		
LSP 200	SEMINAR ON RACE, POWER, AND RESISTANCE	4
Junior Year		
Experiential Learning		
CSE 393	CYBER-PHYSICAL SYSTEMS ENGINEERING PRACTICUM I	4
Senior Year		
Capstone		
Required in major [1]		

[1] Students must earn a C- or better in this course.

Learning Domains

Arts and Literature (AL) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/arts-and-literature/)
- 3 Courses Required

Historical Inquiry (HI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/historical-inquiry/)
- 2 Courses Required

Math and Computing (MC) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/math-and-computing/)
- Not Required

Philosophical Inquiry (PI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/philosophical-inquiry/)
- 2 Course Required

Religious Dimensions (RD) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/religious-dimensions/)
- 2 Course Required

Scientific Inquiry (SI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/scientific-inquiry/)
- 1 Lab Course Required

Social, Cultural, and Behavioral Inquiry (SCBI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/social-cultural-and-behavioral-inquiry/)
- 3 Courses Required

Note

Specified required courses within Liberal Studies may have grade minimums (e.g. C- or better). Please consult your advisor or your college and major requirements.

Courses offered in the student's primary major cannot be taken to fulfill LSP Domain requirements. If students double major, LSP Domain courses may double count for both LSP credit and the second major. Students who choose to take an experiential learning course offered by the major may count it either as a general elective or the Experiential Learning requirement.

In meeting learning domain requirements, no more than one course that is outside the student's major and is cross-listed with a course within the student's major, can be applied to count for LSP domain credit. This policy does not apply to those who are pursuing a double major or earning BFA or BM degrees.

Major Requirements

Major Requirements

First Year

Course	Title	Quarter Hours
CSC 241	INTRODUCTION TO COMPUTER SCIENCE I [1]	4
CSC 242	INTRODUCTION TO COMPUTER SCIENCE II	4
CSE 101	ROBOT PROTOTYPING	4
MAT 140	DISCRETE MATHEMATICS I	4
MAT 150	CALCULUS I	4
MAT 151	CALCULUS II	4

[1] Students with one semester programming experience may take CSC 243 and one(1) Major Elective in lieu of CSC 241 and CSC 242.

Second Year

Course	Title	Quarter Hours
CSC 300	DATA STRUCTURES I	4
CSC 301	DATA STRUCTURES II	4
CSC 373	COMPUTER SYSTEMS I	4
CSE 332	ANALOG AND DIGITAL CIRCUITS	4
CSE 333	DIGITAL SIGNAL PROCESSING	4
CSE 299	HARDWARE PROJECTS	4
WRD 204	TECHNICAL WRITING	4

Third Year

Course	Title	Quarter Hours
CSC 374	COMPUTER SYSTEMS II	4
CSE 351	EMBEDDED SYSTEMS I	4
CSE 361	MATHEMATICAL FOUNDATIONS OF AUTONOMOUS SYSTEMS	4
CSE 375	INTRODUCTION TO ROBOTICS	4
MAT 220	APPLIED LINEAR ALGEBRA	4
MAT 349	APPLIED PROBABILITY	4
CSE 302	ROBOT KINEMATICS AND DYNAMICS	4
CSE 370	PERCEPTION AND ESTIMATION	4

Fourth Year

Course	Title	Quarter Hours
CSC 380	FOUNDATIONS OF ARTIFICIAL INTELLIGENCE	4
CSE 303	PLANNING AND DECISION MAKING FOR ROBOTS	4
CSE 393	CYBER-PHYSICAL SYSTEMS ENGINEERING PRACTICUM I	4
CSE 394	CYBER-PHYSICAL SYSTEMS ENGINEERING PRACTICUM II	4
Eight (8) credit hours of Major Electives		8

Major Electives

Major electives may be selected from the following list of courses:

Course	Title	Quarter Hours
BIO 191	GENERAL BIOLOGY I FOR SCIENCE MAJORS	
BIO 192	GENERAL BIOLOGY II FOR SCIENCE MAJORS	
BIO 193	GENERAL BIOLOGY III FOR SCIENCE MAJORS	
CHE 140	UNIVERSITY CHEMISTRY I	
CHE 142	UNIVERSITY CHEMISTRY II	
CHE 144	UNIVERSITY CHEMISTRY III	
MAT 141	DISCRETE MATHEMATICS II	
MAT 152	CALCULUS III	
MAT 260	MULTIVARIABLE CALCULUS I	
MAT 261	MULTIVARIABLE CALCULUS II	
MAT 304	DIFFERENTIAL EQUATIONS	
MAT 305	GRAPH THEORY	
MAT 348	APPLIED STATISTICAL METHODS	
MAT 381	FOURIER ANALYSIS AND SPECIAL FUNCTIONS	
MAT 384	MATHEMATICAL MODELING	
MAT 385	NUMERICAL ANALYSIS I	
MAT 386	NUMERICAL ANALYSIS II	
PHY 231	LINEAR ELECTRIC CIRCUITS	
PHY 170	UNIVERSITY PHYSICS I	
PHY 171	UNIVERSITY PHYSICS II	
PHY 172	UNIVERSITY PHYSICS III	
PHY 270	UNIVERSITY PHYSICS IV	
PHY 300	METHODS OF COMPUTATIONAL AND THEORETICAL PHYSICS I	
PHY 301	METHODS OF COMPUTATIONAL AND THEORETICAL PHYSICS II	
PHY 320	ELECTRICITY AND MAGNETISM I	
PHY 321	ELECTRICITY AND MAGNETISM II	
PHY 370	ELECTRONICS	

or any 300-level CSC, CSE, CSEC, DS, SE course.

Open Electives

Open elective credit also is required to meet the minimum graduation requirement of 192 hours.

Degree Requirements

Students in this degree must meet the following requirements:

- Complete a minimum of 192 credit hours (generally 48 courses).
- Earn a grade of C- or higher in WRD 103, WRD 104, and all Major and Minor courses.
- Earn a grade of D or higher in all other Liberal Studies and Open Elective courses.
- Maintain a cumulative GPA of 2.0 or higher.