

MECHATRONICS ROBOTICS ENGINEERING, B.A.SC. (CLASS OF 2029)

First Year 2025-2026

Code	Title	Units
MREN 103	Mechatronics and Robotics Design I	4.00
MREN 178	Data Structures and Algorithms	4.50
APSC 101	Engineering Design & Practice	3.20
APSC 102	Experimentation	2.00
APSC 111	Physics I	3.30
APSC 112	Physics II	3.30
APSC 131	Chemistry of Engineering Materials and Processes	3.30
APSC 143	Introduction to Computer Programming for Engineers	3.30
APSC 162	Engineering Graphics	2.50
APSC 171	Calculus I	3.30
APSC 172	Calculus II	3.30
APSC 174	Introduction To Linear Algebra	3.30
APSC 182	Applied Engineering Mechanics	1.70
APSC 199	Engineering Communications 1	0.50
Total Units		41.50

Second Year 2026-2027

Code	Title	Units
MREN 203	Mechatronics and Robotics Design II	4.00
MREN 223	Signals and Systems	4.00
MREN 230	Thermodynamics and Heat Transfer	3.75
MREN 241	Fluid Mechanics and Fluid Power	3.75
ELEC 221	Electric Circuits	4.25
ELEC 252	Electronics I	4.25
ELEC 271	Digital Systems	4.00
ELEC 274	Computer Architecture	4.00
MECH 221	Solid Mechanics I	3.50
MTHE 228	Complex Analysis	3.50
MECH 229	Kinematics and Dynamics	3.50
MTHE 237	Differential Equations for Engineering Science	3.50
Total Units		46.00

Third Year 2027-2028

Code	Title	Units
APSC 221	Economic and Business Practice	3.00
MREN 303	Mechatronics and Robotics Design III	4.00

MREN 318	Sensors and Electric Actuators	4.50
MREN 320	Industrial Automation	3.50
MREN 348	Introduction to Robotics	4.00
ELEC 326	Probability & Random Processes	3.50
ELEC 371	Microprocessor Interfacing and Embedded Systems	4.00
ELEC 372	Numerical Methods and Optimization	3.50
ELEC 353	Electronics II	3.50-4.25
	or MECH 321 Solid Mechanics II	
ELEC 373	Computer Networks	3.50-4.50
	or MECH 323 Machine Design I	
MECH 350	Automatic Control	3.50
Plus choose one (1) Complementary Studies course		3.00
Total Units		43.50-45.25

Fourth Year 2028-2029

Code	Title	Units
MREN 403	Mechatronics and Robotics Design IV	8.00
MREN 410	Intelligent Machines and Autonomous Systems	3.75

Two Complementary Studies courses

Three Free Technical Electives (Any Smith Engineering course at the 200, 300 or 400 level (timetabling permitted) and permission of the program)

Although there is no formal concentration of electives in the Mechatronics and Robotics Engineering Curriculum, the following groupings are provided in order to give students some guidance in the areas where they may wish to concentrate their studies. Students may select any five courses across all of the groupings in the 'Recommended Concentration' list in any combination (dependent on timetable) and are not limited to courses within a specific theme grouping. Please confirm course availability in the Smith Engineering calendar.

Automation

ELEC 431	Power Electronics
ELEC 436	Electric Machines and Control
MECH 465	Computer Aided Design
MECH 457	Additive Manufacturing
MECH 423	Introduction To Microsystems
ELEC 475	Computer Vision with Deep Learning

Robotics

ELEC 436	Electric Machines and Control
----------	-------------------------------



ELEC 444 Modeling and Computer Control of
Mechatronic Systems

ELEC 472 Artificial Intelligence

ELEC 475 Computer Vision with Deep Learning

ELEC 446 Autonomous Mobile Robotics

CMPE 454 Computer Graphics

Biomedical

ELEC 408 Biomedical Signal and Image Processing

MECH 393 Biomechanical Product Development

MECH 394 Frontiers in Biomechanical Engineering

MECH 478 Biomaterials

MECH 495 Ergonomics And Design

MECH 496 Musculoskeletal Biomechanics

Intelligent Systems

ELEC 425 Machine Learning and Deep Learning

CMPE 351 Advanced Data Analytics

ELEC 472 Artificial Intelligence

CMPE 325 Human-Computer Interaction

CMPE 452 Neural Networks and Genetic Algorithms

ELEC 475 Computer Vision with Deep Learning