Robotics and Automation Major

Degree Type: B.S.

Minimum Credits Required: 120

University Degree Requirements

For complete details on these and other university degree requirements, refer to the Degree and Graduation Requirements (https://catalog.ndsu.edu/academic-policies/undergraduate-policies/degree-and-graduation/) section in the University Catalog.

1. Minimum of 120 semester credits (some programs may exceed this minimum).
2. Complete the University General Education requirements.
3. Minimum institutional GPA of 2.00 based on work taken at NDSU.
4. Minimum of 30 credits in resident at NDSU.
5. Minimum of 36 upper level credits (courses numbered 300 or higher).
6. Students with transfer credit must meet the NDSU 30 credits in residence (#4). Of these 30 credits in residence, a minimum of 15 credits must be in courses numbered 300 or above, and 15 credits must be in the student's declared major curricula.

University General Education Requirements

A list of university approved general education courses along with the administrative policies governing the requirement and the categories is available

Code	Title	Credits
Category C: Communication		12
Category R: Quantitative Reasoning		3
Category S: Science and Technology		10
Category A: Humanities and Fine Arts		6
Category B: Social and Behavioral Sciences		6
Category W: Wellness		2
Category D: Cultural Diversity		
Category G: Global Perspectives		
Category L: Digital Literacy		
Total Credits		**39**

Major Requirements

Code	Title	Credits
Major Core Requirements		
CSCI 160	Computer Science I [1]	4
CSCI 228	Computing Fundamentals in Python II	3
ENGL 321	Writing in the Technical Professions	3
ENGR 321	Introduction to Robotics	3
ENGR 327	Ethics, Engineering, and Technology	3
IMSE 380	CAD/CAM for Manufacturing [1]	3
MATH 129	Basic Linear Algebra [1]	3
MATH 146	Applied Calculus I [1]	4
PHYS 211	College Physics I	3
PHYS 211L	College Physics I Laboratory	1
PHYS 212	College Physics II	3
ROB 111	Fundamentals of Robotics [1]	2
ROB 210	Mechanics of Machines for Robotics [1]	4
ROB 220	Applied Circuits and Electrical Troubleshooting [1]	3
ROB 230	Programmable Logic Controllers 1 [1]	3
ROB 361	Applied Automation Challenge 1 [1]	3

ROB 362	Applied Automation Challenge 2 [1]	3
ROB 390	AI & Machine Learning for Robotics [1]	3
ROB 430	Systems Automation [1]	3
ROB 440	Industrial Automation Sensors and Logic [1]	3
ROB 450	Troubleshooting and Diagnostics [1]	3
ROB 461	Capstone I [1]	3
ROB 462	Capstone II [1]	3
Track Requirement		
Select either the Mechanical track or the Programming track to complete the major requirements. The technical electives will vary depending on the track selected.		27
Total Credits		**96**

[1] A grade of C or better is required for all ROB prefix courses in the core and the tracks, and also in CSCI 160, IME 380, and all required MATH prefix courses.

Mechanical Track

Code	Title	Credits
ME 212	Fundamentals of Visual Communication for Engineers	3
ROB 310	Robotic Mechanisms & EOAT [1]	3
ROB 312	Fluid Power Systems Design [1]	3
ROB 370	Electric Drives & Motors for Automation [1]	3
ROB 380	Industrial Standards Safety & Risk Assessment [1]	3
Technical Electives: Any course from the Programming Track or from courses defined in the Technical Elective List below: [1]		12
Total Credits		**27**

Programming Track

Code	Title	Credits
CSCI 213	Modern Software Development With AI Tools	3
ROB 311	Industrial Robot Programming and Integration [1]	3
ROB 330	Programmable Logic Controllers 2 [1]	3
ROB 340	Vision & Sensing Fundamentals [1]	3
ROB 350	Digital Twin & Virtual Commissioning [1]	3
Technical Electives: Any course from the Mechanical Track or from courses defined in the Technical Elective List below: [1]		12
Total Credits		**27**

Technical Electives List

Code	Title	Credits
ROB 320	Field Service Practicum [1]	3
ROB 360	Automation Cybersecurity [1]	3
ROB 420	Course ROB 420 Not Found [1]	3
ROB 464	Robotics in Agriculture [1]	3
ROB 465	CAN-Bus in Robotics and Automation	3