| Crse ID | Course | Instructor(s) | Credits | Robotics Requirement | Enforced Prerequisites | Advisory Prerequisites | Typically Offered | Enrollment Notes |
|---|---|---|---|---|---|---|---|---|
| | ENGR 100.850: Robot Mechanisms | Yeo, Derrick | 4 | CoE Core: Introduction to Engineering | | | Fall, Winter | |
| 050006 | ROB 101: Computational Linear Algebra | Berger, Jamie | 4 | Linear Algebra | | | Fall, Winter | Section 012 and 883 are reserved for first-year students. Section 011 and 882 are open for general enrollment. Once seats in 011 and 882 have been filled, interested students should join the Wolverine Access waitlist. After all students have had a chance to enroll, we will begin issuing permissions to students from the waitlist. |
| 050177 | ROB 203: Robotics Mechanisms | Yeo, Derrick | 2 | General Elective | No credit in ENGR 100, topic "Robotics Mechanisms (topic ID 29)". | ROB 101 | Fall, Winter | Students who were enrolled in ENGR 100.850 should not enroll in this course. |
| 050641 | ROB 204: Intro to Human-Robot Systems | Robert, Lionel Yeo, Derrick | 4 | Teamwork in Robotics | (ROB 102 or ENGR 101 or EECS 183 or ENGR 151 or EECS 180); and ENGR 100; and preceded or accompanied by: (ROB 101 or MATH 214 or MATH 217 or MATH 417 or MATH 419). Minimum grade requirement of "C-" for enforced prerequisite. | | Fall, Winter | All seats are reserved for robotics majors. Remaining seats will become available at 8AM on Monday, December 9th. |
| 051649 | ROB 298.201: Calculus for the Modern Engineer  ROB 298.202 is for students who would like to enroll in the hybrid version of this course. | Grizzle, Jessy | 4 | Student-dependent, speak with an academic advisor | ROB 101 Computational Linear Algebra. Math 214, 217, and other linear algebra courses are insufficient because prior experience using Julia and Jupyter notebooks to solve large-scale problems is a must for the pilot offering. This may be relaxed in future terms. | | Second offering | ROB 298.202 is for students who would like to enroll in the hybrid version of this course. |
| 051649 | ROB 298.215/216: Robot Dynamics and Simulation | Gillespie, Brent Fazeli, Nima | 4 | Discipline Breadth: Dynamics and Mechanics | (ROB 101 or MATH 214) and PHYSICS 140; and preceded or accompanied by: (ROB 298.201 or MATH 216) | | First offering | |
| 050937 | ROB 310: Robot Sensors and Signals | Aubin, Cameron | 4 | Robotics Undergrad Core | ROB 204 and (EECS 215 or BIOMEDE 211). Minimum grade requirement of "C-" for enforced prerequisite. | ROB 101 and ROB 203 | Winter | Students will not be able to enroll in ROB 204 and the 300-level core robotics courses concurrently. If a student is on an accelerated timeline and taking these courses concurrently is the only way to complete requirements in time, the student should reach out to the instructor of the 300-level course they wish to enroll in for a permission to register. Once permission from the instructor is received, the student can forward that email to robotics-sso@umich.edu, we will confirm enrollment in ROB 204 and issue a permission to the requested 300-level course. |
| 050751 | ROB 311: How to Build Robots and Make Them Move | Formosa, Greg | 4 | Robotics Undergrad Core | ROB 204. Minimum grade requirement of "C-" for enforced prerequisite. | (EECS 215 or PHYSICS 240 or PHYSICS 260 or MECHENG 240 or BIOMEDE 231) and ROB 310. | Fall | Students will not be able to enroll in ROB 204 and the 300-level core robotics courses concurrently. If a student is on an accelerated timeline and taking these courses concurrently is the only way to complete requirements in time, the student should reach out to the instructor of the 300-level course they wish to enroll in for a permission to register. Once permission from the instructor is received, the student can forward that email to robotics-sso@umich.edu, we will confirm enrollment in ROB 204 and issue a permission to the requested 300-level course. |
| 050642 | ROB 320: Robot Operating Systems | Jenkins, Chad | 4 | Robotics Undergrad Core | ROB 204 and EECS 280. Minimum grade requirement of "C-" for enforced prerequisite.  Credit Exclusions: Only 1 course may earn credit from ROB 320, ROB 380, ROB 511, and EECS 367. | | Winter | Students will not be able to enroll in ROB 204 and the 300-level core robotics courses concurrently. If a student is on an accelerated timeline and taking these courses concurrently is the only way to complete requirements in time, the student should reach out to the instructor of the 300-level course they wish to enroll in for a permission to register. Once permission from the instructor is received, the student can forward that email to robotics-sso@umich.edu, we will confirm enrollment in ROB 204 and issue a permission to the requested 300-level course. |
| 050753 | ROB 340: Human-Robot Interaction | Alves-Oliveira, Patricia Du, Xiaoxiao | 4 | Robotics Undergrad Core | ROB 204. Minimum grade requirement of "C-" for enforced prerequisite. | ROB 311 | First offering | Students will not be able to enroll in ROB 204 and the 300-level core robotics courses concurrently. If a student is on an accelerated timeline and taking these courses concurrently is the only way to complete requirements in time, the student should reach out to the instructor of the 300-level course they wish to enroll in for a permission to register. Once permission from the instructor is received, the student can forward that email to robotics-sso@umich.edu, we will confirm enrollment in ROB 204 and issue a permission to the requested 300-level course. |
| 048880 | ROB 380 / EECS 367: Introduction to Autonomous Robotics | Jenkins, Chad | 4 | Does not fulfill an undergraduate requirement  ROB majors should enroll in ROB 320 | EECS 281 and (MATH 214 or MATH 217 or MATH 296 or MATH 417 or MATH 419 or ROB 101); No OP/F. Enrollment in one minor elective allowed for Computer Science Minors. Minimum grade requirement of "C" for enforced prerequisite.  Credit Exclusions: Only 1 course may earn credit from ROB 320, ROB 380, ROB 511, and EECS 367. | | Winter | |
| 051530 | ROB 435 / IOE 435: Quantifying Human Motion Through Wearable Sensors | Stirling, Leia | 3 | Upper Level Elective Sensing | (ROB 101 or MATH 214) and IOE 265 and (IOE 333 or ROB 204); No OP/F. Minimum grade requirement of "C-" for enforced prerequisites. | | Winter | This course is owned by IOE. If you meet the prerequisites for the course but the course is full, please add yourself to the electronic waitlist via Wolverine Access. |
| 051418 | ROB 450: Robotics Capstone | Barton, Kira Ceron, Steven | 4 | Major Design Elective | Junior standing or senior standing and TCHNCLCM 350 and (ONE of ROB 310 or ROB 311 or ROB 320 or ROB 330 or ROB 340); No OP/F. Minimum grade requirement of "C" for enforced prerequisites. | | Winter | |
| | ROB 490: Directed Study | Variable | 1-6 | General Elective, Flexible Techical Elective by Petition Only | | | Fall, Winter | Students interested in enrolling in ROB 490: Directed Study will need to complete the ROB 490 Proposal Form. Students will automatically receive an email with their submitted responses and will be instructed, via the submission confirmation page, to forward that email to the faculty member who will be supervising their work. Once confirmed, students will send the email thread to robotics-sso@umich.edu. We will confirm and issue the student a permission to enroll. |
| 050773 | ROB 498.001: Robot Learning for Control and Planning | Berenson, Dmitry | 3 | Upper Level Elective | | Linear Algebra (ROB 101 or Math 214 or Math 217) and EECS 281 | Winter | Undergraduate offering, Graduate students should enroll in ROB 599 offering |

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| 050773 | ROB 498.002: Autonomous Vehicles | Girard, Anouck | 3 | Upper Level Elective | | Linear algebra (ROB 101 or Math 214, or equivalent) and Programming (ROB 320 or EECS 281 or equivalent); Advisory Prerequisites: Calculus (Math 215 or Math 216 or equivalent), Dynamics (ME 240 or equivalent), some exposure to Controls is helpful | Winter | Undergraduate offering, Graduate students should enroll in ROB 599 offering |
| 050773 | ROB 498.003: 3D Robot Perception | Bucher, Bernadette | 3 | Upper Level Elective | | No prior computer vision experience is required, and many components will be redundant with any standard introduction to computer vision course.  Students are expected to be (or become on their own time) proficient in Python.  Prior courses in linear algebra, calculus, and probability theory are highly recommended. | Winter | Undergraduate offering, Graduate students should enroll in ROB 599 offering |
| 050773 | ROB 498.004/005: Deep Learning for Robot Perception | Du, Xiaoxiao Opipari, Anthony | 4 | Upper Level Elective | | Prior experience with the Python programming language is recommended. Familiarity with gradients and how to calculate them from vector calculus. Familiarity with random variables and probability distributions from probability theory. Familiarity with concepts from machine learning (e.g. EECS 445) will be helpful. | Winter | Undergraduate offering, Graduate students should enroll in ROB 599 offering |
| 050773 | ROB 498.007: Soft Robotics | Huang, Xiaonan | 3 | Upper Level Elective | | Mechatronics, solid mechanics, entry-level materials science course. | Winter | Undergraduate offering, Graduate students should enroll in ROB 599 offering |
| 046003 | ROB 501: Mathematics for Robotics | Ozay, Necmiye | 4 | Robotics Grad Core | Graduate standing or permission of instructor. | Differential equations and matrix algebra recommended. | Fall | |
| 012187 | ROB 510 / EECS 567 / MFG 567 / MECHENG 567: Robot Kinematics and Dynamics | Gregg, Robert | 3 | Acting | | Graduate standing or permission of instructor | Winter | |
| 049819 | ROB 511: Advanced Robot Operating Systems | Jenkins, Chad | 3 | Acting; Reasoning | Credit exclusions: Only 1 course may earn credit from ROB 320, ROB 380, ROB 511, and EECS 367. | Linear Algebra (Math 214, MATH 217, MATH 417, MATH 419 or equivalent) and Programming (EECS 280, EECS 402, ROB 502 or equivalent) | Winter | |
| 047241 | ROB 517 / BIOMEDE 517: Sensing and Machine Learning for Neural Interfaces | Chestek, Cindy | 3 | Upper Level Elective Sensing | (BIOMEDE 211 or EECS 215 or EECS 314) and (EECS 216) and (MATH 216) and (ENGR 101 or EECS 183 or EECS 180 or EECS 280); No OP/F or Graduate Standing. Minimum grade requirement of "B" for enforced prerequisite. | | Winter | |
| 043602 | ROB 530 / NAVARCH 568 / EECS 568: Mobile Robotics: Methods and Algorithms | Ghaffari, Maani | 4 | Upper Level Elective Sensing | | Graduate standing or permission of instructor. | Fall, Winter | |
| 046004 | ROB 550: Robotic Systems Laboratory | Gaskell, Peter | 4 | Robotics Grad Core | Graduate standing or permission of instructor. | | Fall, Winter | |
| 051494 | ROB 560: Bio-Inspired Robotic Design | Moore, Talia | 4 | Upper Level Elective Acting | | ROB 550 | Winter | |
| 047946 | ROB 599.001: Robot Learning for Control and Planning | Berenson, Dmitry | 3 | Acting; Reasoning | | Linear Algebra (ROB 101 or Math 214 or Math 217) and EECS 281 | Winter | Graduate offering, Undergraduate students should enroll in ROB 498 offering |
| 047946 | ROB 599.002: Autonomous Vehicles | Girard, Anouck | 3 | Acting; Sensing | Highly recommended: Linear algebra (ROB 101 or Math 214, or equivalent) and Programming (ROB 320 or EECS 281 or equivalent) | Calculus (Math 215 or Math 216 or equivalent), Dynamics (ME 240 or equivalent), some exposure to Controls is helpful | Winter | Graduate offering, Undergraduate students should enroll in ROB 498 offering |
| 047946 | ROB 599.003: 3D Robot Perception | Bucher, Bernadette | 3 | Sensing | | No prior computer vision experience is required, and many components will be redundant with any standard introduction to computer vision course.  Students are expected to be (or become on their own time) proficient in Python.  Prior courses in linear algebra, calculus, and probability theory are highly recommended. | Winter | Graduate offering, Undergraduate students should enroll in ROB 498 offering |
| 047946 | ROB 599.004/005: Deep Learning for Robot Perception | Du, Xiaoxiao Opipari, Anthony | 4 | Sensing; Reasoning | | Prior experience with the Python programming language is recommended. Familiarity with gradients and how to calculate them from vector calculus. Familiarity with random variables and probability distributions from probability theory. Familiarity with concepts from machine learning (e.g. EECS 445) will be helpful. | Winter | Graduate offering, Undergraduate students should enroll in ROB 498 offering |
| 047946 | ROB 599.006: Medical Robotics | Draelos, Mark Formosa, Greg | 3 | Acting | | Basic programming (Python, C++, etc.), basic mechatronics skills | Winter | |
| 047946 | ROB 599.007: Soft Robotics | Huang, Xiaonan | 3 | Acting | | Mechatronics, solid mechanics, entry-level materials science course. | Winter | Graduate offering, Undergraduate students should enroll in ROB 498 offering |
| 047946 | ROB 599.100: Robotics Seminar | Tilbury, Dawn | 1 | Required for 1st Year PhDs | | | Winter | Only 1st year Robotics PhD students are eligible to enroll. If you are a 1st year robotics PhD student, please add yourself to the waitlist and we will issue you a permission to enroll. |