

# Winter 2024 Course List

## Undergraduate

- ROB 101: Computational Linear Algebra (Berger)
- ROB 103: Robotics Mechanisms (Yeo)
- ROB 204: Intro to Human-Robot Systems (Mavrogiannis / Robert)
- ROB 310: Robot Sensors & Signals (Gaskell / Formosa)
- ROB 320: Robot Operating Systems (Jenkins)
- ROB 330: Localization, Mapping, and Navigation (Du)
- ROB 380/EECS 367: Intro Autonomous Robotics (Jenkins, Berger)
- ROB 450: Robotics Capstone (Barton)
- ROB 498.002: Robot Control (Gregg / Panagou)
- ROB 498.009: Design for Human-Robot Interaction (Alves-Oliveira)
- ROB 498.011: Deep Learning / Robot Perception (Du / Opipari)
- ROB 498.015: Optimal Control (Tilbury/Hubicki) *Enrollment opens after 12/4. Please join waitlist.*
- EECS 467: Autonomous Robotics Laboratory (Berenson)
- MECHENG 461: Automatic Control (Rouse)
- Click [here](#) to see courses that count for Robotics upper level electives and major design experience requirements in Winter 2024.

## Graduate

### Robotics Core

- ROB 550: Robotics Systems Lab (Gaskell / Formosa)

### Sensing

- AEROSP 567: Inference Estimation and Learning (Gorodetsky)
- BIOMEDE 517: Neural Engineering (Chestek)
- CEE 575: Sensors, Data, and Smart Systems (Kerkez)
- EECS 442: Computer Vision (Park)
  - Enrollment is primarily reserved for undergraduate students. Grad enrollment with instructor consent.
- EECS 542: Advanced Topics in Computer Vision (Owens)
- EECS 556: Image Processing (Shen)
- EECS 598.10: Action and Perception (Yu)
- MECHENG 599: Data-Driven Methods for Control Systems (Inyang-Udoh)
- ROB 530 / EECS 568 / NAVARCH 568: Mobile Robotics (Ghaffari)
- ROB 599: Deep Learning/Robot Perception (Du)

### Reasoning

- EECS 486: Information Retrieval & Web Search (Mihalcea)
- EECS 545: Machine Learning (Lee)
- EECS 548 / SI 649: Info Visualization (Card)
- EECS 553: Machine Learn ECE (Scott)
- EECS 559: Optimization for Signal Processing and Machine Learning (Qu)
- EECS 592: Foundations of Artificial Intelligence (Bondi-Kelly)
- EECS 595 / LING 541 / SI 561: Natural Language Processing (Jurgens)
- EECS 598: Foundations of Large Language Models (Oymak)

- EECS 598: Machine Learning Theory (Hu)
- EECS 602: Reinforcement Learning Theory (Ying)
- EECS 692: Advanced Artificial Intelligence (Chai)
- IOE 511 / MATH 562: Continuous Optimization Methods (Berahas)
- MECHENG/ MFG / ISD 555: Design Optimization (Austin-Breneman)
- ROB 511: Mobile Manipulation Systems (Jenkins, Berger)
- ROB 599: Deep Learning/Robot Perception (Du)

## Acting

- AEROSP 470: Control of Aerospace Vehicles (Falcone)
- AEROSP 550 / CEE 571 / MECHENG 564: Linear Systems Theory (Freudenberg)
- AEROSP 551: Nonlinear Systems & Control (TBD)
- AEROSP 573: Dynamics and Control of Spacecraft (Jia-Richards)
- EECS 460: Control Systems Analysis and Design (Seiler)
- EECS 461: Embedded Control Systems (Various)
- EECS 560: Linear Systems Theory (Freudenberg)
- EECS 562: Nonlinear Systems & Control (TBD)
- EECS 565: Linear Feedback Control (Seiler)
- EECS 598: Control Theory for Biological Sensorimotor Systems (Li)
- MATSCIE 593: Soft Robotic Materials and Actuators (Pena-Francesch)
- MECHENG 461: Automatic Control (Rouse)
- MECHENG 542 / AUTO 542: Vehicle Dynamics (and Automation) (Orosz)
- ROB 498: Robot Control (Gregg / Panagou)
- ROB 510 / EECS 567 / MECHENG 567 / MFG 567: Robot Kinematics and Dynamics (Bruder)
- ROB 560: Bioinspiration (Moore)
- ROB 572: Marine Robotics (Skinner)

- ROB 599: Soft Robotics (Huang)
- ROB 511: Mobile Manipulation Systems (Jenkins, Berger)
- ROB 599: Legged Robot Control (Ding)
- ROB 599: Optimal Control (Tilbury/Hubicki) *Enrollment opens after 12/4. Please join waitlist.*

## Elective

*\*In addition to the courses listed below, any 500-level CoE course can count as an elective.*

- AEROSP 585: Aerospace Seminar (Cesnik) *Can only be taken once to count toward MS/PhD*
- CSE / ROB 543: Ethics in AI & Robotics (Kuipers)
- ECON 409: Game Theory (Peralta)
- EECS 409: Data Science Seminar (Jagadish)
- EECS 492: Intro to AI (Various)
- EECS 501: Probability & Random Processes (Ying)
- EECS 513: Flat Panel Displays (Kanicki)
- EECS 586: Design & Analysis of Algorithms (Stout)
- ELI 521: Writing for Academic Purposes I (Coleman)
- ENTR 407: Entrepreneurship Hour (Bacyinski) (can only be taken once to count toward MS/PhD)
- ENTR 500: Intro to Innovation (Crumm)
- ENTR 550: Interpersonal Skills (Fretz)
- ENTR 560: Project Management and Consulting (Cell)
- ENTR 599 – All Sections (Various)
- ISD / MFG / MECHENG 599: Foundations in Smart Additive Manufacturing (Various)
- KINESLGY 431 / MOVESCI 431: Clinical Gait Analysis (Richards)
- MATH 451: Advanced Calculus I (Kaletha)
- MATH 525 / STATS 525: Probability Theory (TBD)
- MATH 658: Nonlinear Dynamics and Geometric Mechanics (Bloch)

- MECHENG 560 / MFG 562: Modeling Dynamic Systems (Gonzalez Villasanti)
- PSYCH 614: Advanced Statistical Methods (Gonzalez)
- ROB 599: Design for Human-Robot Interaction (Alves-Oliveira)
- ROB 599: Robotics Seminar – for PhD students (Tilbury / Gillespie) *Enrollment opening soon, this is a new course still under development.*
- TCHNCLCM 610: Technical and Professional Communication (Snyder)
- TO 628: Big Data Analytics (Kumar)