Maryland Robotics Center: Graduate Program

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Center Website: www.robotics.umd.edu
Maryland Robotics Center
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• Housed in the Institute for Systems Research
• Consists of twenty-one labs
• Consists of thirty-five participating faculty members from eight academic departments
• Current activities cover most facets of robotics
# Graduate Program Requirements

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<tr>
<th>Master of Engineering (M. Eng.)</th>
<th>10 courses (including 4 core courses and 6 technical electives)</th>
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<td>No thesis/no research</td>
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<td>No comprehensive exam</td>
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<td>30 credits</td>
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<tr>
<th>Graduate Certificate in Engineering (GCEN)</th>
<th>4 core courses</th>
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<td>12 credits</td>
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Graduate programs administered through the Office of Advanced Engineering Education (OAEE)  
www.oaee.umd.edu
Why Our Program?

• Our program is interdisciplinary in nature and emphasizes systems thinking

• Offers flexibility of concentration in a variety of areas

• Courses which cover Artificial Intelligence, Computer Vision, Motion Planning, Space and Planetary, Robotics, Robot Kinematics and Dynamics, Control, Networked Robotic Systems, Robotics at Micro and Nano Scale

• Courses are taught by faculty and professionals at the forefront of advances in robotics
Curriculum

• Students are able to tailor their program within one or more of four areas of specialization to gain expertise based on the latest breakthroughs in robotics.

• Curriculum is designed to cover fundamental and applied topics in design, modeling, and control of robotic systems as well as planning and perception for autonomous robots.
Areas of Specialization

• Optimization, Decision Making and Algorithms
• Performance Analysis and Design Methods
• Modeling, Systems and Control
• Sensing, Vision and Perception
Core Courses (required)

- **ENPM808T**  
  Perception for Autonomous Robots  **SPRING**

- **ENPM808C**  
  Planning for Autonomous Robots  **SPRING**

- **ENPM808M**  
  Introduction to Robot Modeling  **FALL**

- **ENPM808Q**  
  Control of Robotic Systems  **FALL**
Technical Electives

Decision Making, Optimization and Algorithms

- CMSC 651 Analysis of Algorithms
- CMSC712 Distributed Algorithms and Verification
- CMSC722 Artificial Intelligence Planning
- ENAE681 or ENME610 Engineering Optimization
- ENME607 Engineering Decision Making
- ENEE662 Convex Optimization
Technical Electives

Performance Analysis and Design Methods

- ENME600 Engineering Design Methods
- ENME695 Failure Mechanisms and Reliability
- ENAE697 Space Human Factors and Life Support
- ENSE621 Systems Concepts, Issues, and Processes
Technical Electives

Sensing, Vision and Perception

CMSC733 Computer Processing of Pictorial Information
CMSC734 Information Visualization
ENEE631 Digital Image and Video Processing
ENEE633 Statistical Pattern Recognition
ENEE731 Image Understanding
Technical Electives

Modeling, Systems and Control

- ENME675 A Mathematical Introduction to Robotics
- ENME605 Advanced Systems Control
- ENEE660 System Theory
- ENME664 Dynamics
- ENEE661 Nonlinear Control Systems
- ENEE664 Optimal Control
- ENEE765 Adaptive Control
- ENAE692 Introduction to Space Robotics
New Technical Electives

- ENPM 808P Manufacturing Automation  **SPRING 2016**
- ENPM 808J Rehabilitation Robotics  **SUMMER 2016**
- ENPM 808K Human-Robot Interaction  **FALL 2016**
- ENPM 808F Robot Learning  **FALL 2016**
ENME 808: Independent Study as Technical Elective

• Opportunity to do an independent study project on a topic relevant to student’s academic program that is either not available in a timely manner through a listed course or at all.
• The independent study topic must be approved by both the supervising faculty and the student’s academic advisor.
Admission Requirements

• A bachelor’s degree in engineering from an accredited institution
• Courses in mathematics (Calculus I, II, III, and Differential Equations)
• 3.0 GPA or better
• Graduate Record Exam (GRE) is NOT required
• TOEFL, IELTS or PTE scores are required for international students
• Official copies of transcripts
• Three letters of reference
Evidence of English Proficiency

• Students who hold a degree from the U.S., United Kingdom, Anglophone Africa, Anglophone Canada, Ireland, Australia, New Zealand, Singapore, and the Commonwealth Caribbean are not required to submit TOEFL, IELTS or PTE scores.

• US citizens or permanent residents with foreign credentials whose native language is not English and who do not hold a degree from an institution in the US or one of the Anglophone countries and areas listed above are required to submit TOEFL, IELTS or PTE scores.

• Minimum TOEFL and IELTS requirements: http://globalmaryland.umd.edu/sites/default/files/ies/EnglishRequirements.pdf
Application Deadlines

DOMESTIC DEADLINES
SPRING – December 15
SUMMER – May 1
FALL – August 1

INTERNATIONAL DEADLINES
SPRING – October 15
FALL – February 1