Faculty

Kevin Giovanetti
Professor, Physics
Dr. Giovanetti has an active research program in experimental Particle and Nuclear Physics. His work in electronics and computing motivated his interest in robotics. While not an expert he enjoys the field immensely and happily supports students exploring this technology.

Ralph Grove
Professor, Computer Science
Dr. Grove teaches courses in Intelligent Systems and Artificial Intelligence.

Jacquelyn K. Nagel
Assistant Professor, Engineering
Dr. J. Nagel has field and research experience with industrial automation and manufacturing robotics, and her primary interest is the role and design of sensors for automation. She advises engineering capstone projects and participates in youth outreach programs related to robotics.

Robert Nagel
Assistant Professor, Engineering
Dr. R. Nagel has performed research in the area of automated system design, and he actively advises engineering capstone projects related to robotics.

Gabriel Niculescu
Associate Professor, Physics
When not teaching physics classes or doing research in nuclear and particle physics, Dr. Niculescu is working to find and implement new ways to introduce more (and more, and more) robotics in the K-12+ curriculum.

Nathan Sprague
Assistant Professor, Computer Science
Dr. Sprague has research interests in the areas of machine learning and computer vision. He teaches courses in Artificial Intelligence and Robotics, serves as the faculty advisor for the JMU Robotics Club, and is the Robotics Minor Advisor.

Anthony Teate
Professor, Integrated Science and Technology
Dr. Teate teaches courses in the Information and Knowledge Management concentration and the Intelligence Analysis program within ISAT. His primary interest in robotics is in UAVs and programming robots for autonomous behavior.

For more information or to declare a Robotics minor please contact:

Dr. Nathan Sprague
Minor Coordinator
(540) 568-3312
spragunr@jmu.edu

www.jmu.edu/robotics
The interdisciplinary minor in Robotics is intended to offer STEM majors and other students with an interest in science and technology a fundamental understanding of scientific and technical issues involved in the design, construction and application of robots.

Students will have a basic understanding of robot control systems, sensors, motion, circuits and the overall design of robots.

Students will be able to design and develop autonomous robots and robot control software.

Students will develop an understanding of how advances in robotics technology can be used in diverse real-life applications.

Students will learn to work on an interdisciplinary team developing a technical product.

If you would like an initial introduction to the field of robotics, consider taking a section of SCI 101/104 with a focus on robotics. This section of the course will introduce basic concepts of robotics and give you a chance to work hands-on with simple robots. It will also satisfy general education requirements in cluster 3. Seats are reserved in this section, when it is offered, for students who have an interest in the minor. Not all sections focus on robotics. Contact the minor advisor to learn more. Some majors require a specific track through general education, so please discuss this option with your major advisor as well.

### Required Courses

#### Basic Preparation

- Choose one of the following:
  - CS 139. Programming Fundamentals
  - CS 149. Programming Fundamentals (Accelerated)
  - ISAT 252. Programming and Problem Solving

- Choose one of the following:
  - MATH 232 or 235. Calculus I
  - ISAT 151. Topics in Applied Calculus in ISAT

- Choose one of the following:
  - ISCI 101 and 104. Physics, Chemistry and the Human Experience
  - PHYS 240 + Lab. University Physics I (with any Physics Lab)
  - ISAT 152. Topics in Applied Physics in ISAT

#### Core Course

- Choose one of the following:
  - CS 354. Introduction to Autonomous Robotics
  - PHYS 386. Robots: Structure and Theory

#### Electives

- Choose at least six credits from the following:
  - CS/ISAT 344. Intelligent Systems
  - CS 444. Artificial Intelligence
  - ENGR 471. Mechatronics
  - ISAT 331. Automation in Manufacturing
  - MATH 238. Linear Algebra and Differential Equations
  - MATH 248. Numerical Methods
  - MATH 341. Nonlinear Dynamics and Chaos
  - PHYS 371. Introduction to Digital Electronics
  - PHYS 372. Microcontrollers and Their Applications

#### Robotics Project Course

- CISE 481. Robotics Project Summary

### Organizations

#### JMU Robotics Club

The JMU Robotics Club is open to anyone at JMU with an interest in programming autonomous mobile robots. Club activities involve learning about robotics and programming robots to do amazing things. We meet weekly during the academic year in ISAT-CS 2002. Contact Dr. Sprague or visit the club's web-page for more information: http://w3.cs.jmu.edu/spragunr/robowiki/.

#### FIRST LEGO League

JMU is the host in Virginia and DC for this international robotics program that engages 9-14 year olds in annual robotics competitions. Each year FLL teams design and build custom robots using the Lego Mindstorms platform in order to compete in regional tournaments in November and an exciting championship tournament at JMU in December. JMU students help to organize and staff the tournaments. For more information or to volunteer visit http://www.vadclfl.org.