Robotics
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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.

Educational Goals
- 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.

Required Courses Credit Hours
Basic Preparation 1
Choose one of the following: 3-4
- CS 139. Programming Fundamentals
- CS 149. Programming Fundamentals (Accelerated)
- ISAT 252. Programming and Problem Solving 2
Choose one of the following: 4
- MATH 231 or 235. Calculus I
- ISAT 151. Topics in Applied Calculus in ISAT
Choose one of the following: 4
- GSCI 101 and 104. Physics, Chemistry and the Human Experience 3
- 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: 3
- CS 354. Introduction to Autonomous Robotics
- PHYS 386. Robots: Structure and Theory
Electives 4
Choose at least six credits from the following: 6-8
- CS/ISAT 344. Intelligent Systems
- CS 444. Artificial Intelligence
- MATH 238. Differential Equations
- MATH 248. Numerical Methods
- MATH 341. Nonlinear Dynamics and Chaos
- PHYS 371. Introduction to Digital Electronics
- PHYS 372. Microcontrollers and Their Applications
Supervised Robotics Project Course
Choose one of the following: 3-4
- CS 497. Independent Study
- ENGR 431/432. Engineering Design V and VI
- ISAT 493. Senior Capstone Project III
- PHYS 497. Topics in Physics

Supervised Robotics Project Course
Choose one of the following: 3-4

1 A basic preparation course may be waived by the minor adviser if a student has completed a comparable course or experience.
2 Must be an ISAT 252 section taught using a procedural programming language (e.g., Python).
3 Must be an approved section of GSCI 101 and GSCI 104, with a robotics theme.
4 At least one elective must be from a different department from the core course.

Russian Studies
Dr. Maria Galmarini, Co-coordinator
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Dr. Stephany Plecker, Co-coordinator
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This minor offers students a broad, cross disciplinary perspective on Russian culture, history, political institutions, economy and geography. This program deepens the students’ understanding and knowledge of the Russian and non-Russian peoples of the former Soviet Union, and prepares them for careers in teaching, government and international business.
The Russian Studies minor requires 18 credits with a minimum of six credits of Russian language. Students should take courses in at least three different disciplines from the following list:

Courses Credit Hours
ECON 301. Economies in Transition 18
GEOG 333. Russian and the Former USSR
HIST 385. The Russian Empire to 1881
HIST 386. Russia and the Soviet Union 1881-1991
HIST 474. Stalinism in Theory, Practice and Memory
HIST 475. Modern Russia
POSC 337. Russia and Post-Soviet Politics
RUS 266/GHUM 200. Russian Literature in Translation/Great Works
RUS 300. Russian Grammar and Communication
RUS 308. Introduction to Russian Civilization
RUS 315. Russian Phonetics
RUS 320. Russian Oral and Written Communication
RUS 400. Advanced Russian Conversation
RUS 405. Russian Literature of the 19th Century
RUS 406. Russian Literature of the 20th Century
RUS 438. Studies in Russian Literature

Students may include one course from the following list:
- ECON 490. Special Studies in Economics
- FL 490. Special Studies in Foreign Languages (Russian)
- GEOG 490, Senior Project II
- HIST 399. Special Studies in History
- POSC 490. Senior Tutorial in Political Science

Special topics courses can be applied to the minor with approval of the program coordinator. Students may also earn credit by studying in a program in Russia or any of the former Soviet states.

Science, Technology and Society
Dr. Kevin Borg, Coordinator
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Website: http://www.jmu.edu/sts/
Science, technology and society (STS) is an internationally recognized field of cross disciplinary study that integrates social scientific and humanistic studies to better understand the natural and human-built world. The minor offers students the opportunity to critically examine science, technology and medicine as expressions of human cultures, past and present. Students learn to scrutinize the ideas, values and materials embedded in the world they inhabit today and to relate them to other times and places. They explore how choices made within various social, economic and political structures influence the development of science, technology and medicine. They also see how the adoption and diffusion of ideas, artifacts and techniques can then influence individuals, society, politics and culture. Courses in this minor draw students together from diverse majors across the campus and encourage open inquiry into the role of science and technology in society.

http://www.jmu.edu/catalog/13