DEPARTMENT OF PHYSICS AND ASTRONOMY

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Website: physics.gmu.edu

The Department of Physics and Astronomy is dedicated to the dissemination and advancement of physics and astronomy through instruction, research, and outreach.

The department provides rigorous training for physics and astronomy students and prepares them to be successful, confident, and versatile in their ability to apply physics and astronomy principles within any chosen field. The department also aims to deliver and instill a broad-based understanding of general physics and astronomy principles and practices to the wider university community through our Mason Core (general education) courses. Our student-centric curriculum and instruction use a mixture of traditional and current pedagogical techniques informed by on-going educational research. It is our goal to help students to develop versatility and creativity through repeated analytical practices and problem-solving training in their coursework and faculty-led research projects.

Research in the department focuses on pushing the frontiers of physics and astronomy in a broad range of topics using theoretical, experimental, observational, and computational approaches. The department maintains many active collaborations with scientists across different disciplines within the university community and with other national and international institutions. The department believes strongly in incorporating both graduate as well as undergraduate students in our research programs. It is our goal to see students arriving with an enthusiasm and curiosity for physics and astronomy and leaving as true scientists ready to conduct their own scientific investigations.

Undergraduate Programs

The department offers the Physics, BS and the Astronomy, BS. Also available are the Physics Minor, the Astronomy Minor, and the Renewable Energy Interdisciplinary Minor.

Undergraduate Research Opportunities

The department offers many opportunities for undergraduate students to get involved with research. Students should consult with faculty working on research topics of interest to them, based on their exploration of the department’s website (http://physics.gmu.edu).

Bachelor’s/Accelerated Master’s Degree

Information regarding this program can be found in the Physics, BS/ Accelerated Masters section of this catalog.

Physics for Non-majors

PHYS 243 College Physics (Mason Core), PHYS 244 College Physics Lab (Mason Core), PHYS 245 College Physics (Mason Core), and PHYS 246 College Physics Lab (Mason Core) are recommended for biology, geology, and premedical students, and mathematics students who seek a BA degree. PHYS 101 Light and Sound in Our World, PHYS 102 Sports Physics, PHYS 103 Physics and Everyday Phenomena I (Mason Core), and PHYS 104 Physics and Everyday Phenomena II (Mason Core) are intended for non-science majors. PHYS 160 University Physics I (Mason Core), PHYS 161 University Physics I Laboratory (Mason Core), PHYS 260 University Physics II (Mason Core), PHYS 261 University Physics II Laboratory (Mason Core), PHYS 265 Advanced University Physics I Laboratory, PHYS 262 University Physics III (Mason Core), and PHYS 263 University Physics III Laboratory (Mason Core) constitute a calculus-based sequence in general physics to be taken by physics and engineering majors, and chemistry, computer science, and mathematics students who are pursuing a BS degree. Students may receive credit for only one of the following three sequences:

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<tr>
<th>Course Combination</th>
<th>Credits</th>
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<tr>
<td>PHYS 243 College Physics (Mason Core) &amp; PHYS 244</td>
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<tr>
<td>College Physics Lab (Mason Core)</td>
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<tr>
<td>PHYS 245 College Physics (Mason Core) &amp; PHYS 246</td>
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<tr>
<td>College Physics (Mason Core)</td>
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<td>PHYS 103 Physics and Everyday Phenomena I (Mason Core)</td>
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<td>&amp; PHYS 104 Physics and Everyday Phenomena II (Mason Core)</td>
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<td>PHYS 160 University Physics I (Mason Core) &amp; PHYS 161</td>
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<tr>
<td>University Physics I Laboratory</td>
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<td>&amp; PHYS 260 University Physics II (Mason Core)</td>
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<td>&amp; PHYS 262 University Physics II Laboratory (Mason Core)</td>
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<td>&amp; PHYS 263 University Physics III (Mason Core)</td>
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<td>&amp; University Physics III Laboratory (Mason Core)</td>
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Graduate Programs

This department offers the Applied and Engineering Physics, MS. The department also supports the Energy and Sustainability concentration in the Interdisciplinary Studies, MAIS. Additionally, the department offers a Physics, PhD. These graduate programs are strongly supported by the extensive research activities of the faculty, including many collaborations with scientists and engineers at regional government laboratories.

Faculty

Department Faculty

Professors
Barrete, Becker, Dworzecka, Kan, Lohner, Mishin, Rubin, Satija, Satyapal, Sauer, So, Summers, Trefil, Yang, Zhang

Associate Professors
Camelli, Cressman, Marzougui, Nikolic, Rosenberg, Sheng, Tian, Weigel, Weingartner, Zhao

Assistant Professors
Yigit, Vora

Term Associate Professor
Djordjevic, Geller, Gllozzi, Orter, Wyczalkowski

Term Assistant Professors
Belle, Dreyfus, Ericson

Emeriti
Ceperley, Ehrlich, Ellsworth, Evans, Lieb, Mielczarek
Research Faculty
Bilitza, Dere, Duxbury, Huang, Mariska, Meier, Odstrcil, Poland, Purja Pun, Richards

Requirements & Policies

Requirements
Writing Intensive Requirement
George Mason requires all undergraduate students to complete at least one course designated as “writing intensive” in their majors at the 300-level or above. Students majoring in physics fulfill this requirement by successfully completing PHYS 407 Senior Laboratory in Modern Physics (Mason Core). Astronomy majors fulfill the requirement by completing ASTR 402 RS: Methods of Observational Astronomy (Mason Core).

Teacher Licensure
Students who wish to become teachers should consult the College of Education and Human Development section of this catalog and attend an information session early in their undergraduate career. For more information, visit the Graduate School of Education’s website (https://gse.gmu.edu).

Programs
• Applied and Engineering Physics, MS
• Astronomy Minor
• Astronomy, BS
• Physics Minor
• Physics, BS
• Physics, PhD
• Renewable Energy Interdisciplinary Minor