Physics

PHYS 199  **Undergraduate Open Seminar**  credit: 1 TO 5 hours.
Approved for both letter and S/U grading. May be repeated.

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>10145</td>
<td>Independent Study</td>
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<td>ARRANGED -</td>
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Independent Study
Instructor Approval Required
INDEPENDENT STUDY. To register for independent study under PHYS 199, use the PHYS 199 CRN (available from the departmental undergraduate records office) specific to the instructor with whom you have arranged to work. (You cannot register under the general CRN 10145.)

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</thead>
<tbody>
<tr>
<td>40292</td>
<td>Laboratory-Discussion</td>
<td>BCS</td>
<td>04:00 PM - 05:20 PM</td>
<td>T</td>
<td>257 - Loomis Laboratory</td>
<td>Hubler, A</td>
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Credit Hours: 1 hours
Behavior of Complex Systems
Discovery course.

EXPLORING THE BEHAVIOR OF COMPLEX SYSTEMS: CHAOS, FRACTALS AND ARTIFICIAL LIFE, 1 hour. The behavior of complicated systems with many parts will be explored with hands-on computer simulations and lab experiments. Students will experiment with lightning, turbulence, explosions, and human rhythms and use simple computer models to imitate their irregular and symmetric patterns and dynamics and will develop an intuition as to why isolated complex systems prefer harmony and symmetry whereas competing complex systems prefer chaos. Applications in business, engineering, and social sciences will be discussed. First Year Discovery Program Course. Registration restricted to freshmen. Students should enroll in only one Discovery course.

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<tr>
<td>40293</td>
<td>Laboratory-Discussion</td>
<td>ESP</td>
<td>04:00 PM - 05:20 PM</td>
<td>T</td>
<td>144 - Loomis Laboratory</td>
<td>Pitts, K</td>
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Credit Hours: 1 hours
Science and Pseudoscience
Discovery course.

SCIENCE AND PSEUDOSCIENCE, 1 hour. The world we live in continues to develop at an amazing rate, with much of that development fueled by science and technology. Despite the overwhelming impact that scientific advances have on our society, a large number of people continue to hold irrational, unsupported beliefs in things like extrasensory perception, alien abductions and psychic crime-solvers. This one hour course will take a critical look at some of these beliefs from the standpoint of scientific inquiry and exploration. We will discuss the scientific method, how science progresses and the types of argumentative fallacies that pervade the pseudoscientific community. In addition, we will discuss examples of good science, and show how the scientific method is self-correcting. Students will have an opportunity to research paranormal claims, as well as play "devil's advocate" during in-class debates. This course is aimed at nonscientists (although science majors could benefit from the course as well) with the specific goals of teaching students how to be thoughtful, skeptical consumers of information and the importance of the scientific method. First Year Discovery Program Course. Registration restricted to freshmen. Students should enroll in only one Discovery course.

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<tr>
<td>38670</td>
<td>Lecture-Discussion</td>
<td>HM</td>
<td>10:00 AM - 11:50 AM</td>
<td>M</td>
<td>139 - Loomis Laboratory</td>
<td>Makins, N</td>
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Credit Hours: 1 hours
Honors Mechanics

HONORS SEMINAR: TOPICS IN MECHANICS. PREREQUISITES: CONCURRENT REGISTRATION IN PHYS 211 AND CONSENT OF INSTRUCTOR. PHYS 199HM CAN BE USED TO SATISFY THE HONORS COMPONENT OF PHYS 211. PHYS 199HM is the honors supplement to PHYS 211 and is intended for those students intending to major in physics or who have a strong interest in the subject. Areas to be addressed include rotational and central force motion, non-inertial frames, non-linear systems and post-Newtonian mechanics. The use of simple visualization tools such as Mathematica and Excel will be encouraged.
Credit Hours: 1 hours
Honors Electricity & Magnetism
HONORS SEMINAR: TOPICS IN ELECTRICITY AND MAGNETISM. PREREQUISITES: PHYS 211, CONCURRENT REGISTRATION IN PHYS 212, AND CONSENT OF INSTRUCTOR. PHYS 199HO CAN BE USED TO SATISFY THE HONORS COMPONENT OF PHYS 212. Students investigate special topics in electricity and magnetism. Through weekly meetings (similar in format to the discussion sections of Physics 211 and 212), students will derive for themselves some of the surprising features of our post-classical physical world. For example, the need for special relativity, the existence of magnetic fields, and the origin of electromagnetic radiation are consequences of simple observations such as the constancy of the speed of light. Other topics will include the nature of Gauss' law and Maxwell's equations, potentials and superposition, amplifiers, analog computers, and the role of quantum mechanics in electrodynamics. PHYS 199HO is intended for students who have been comfortable with the level of difficulty of PHYS 211, and whose math skills are fairly strong. It allows students to confront in greater depth some of the most interesting intellectual issues in classical electrodynamics. The course will use calculus as a problem-solving tool.

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<tr>
<td>Enrichment Mechanics</td>
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<tr>
<td>Section M1 (or M2 or M3 or M4) is only for students taking Spring 2009 PHYS 211 who took Fall 2008 PHYS 100.</td>
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<tr>
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