Class Schedule - Spring 2006

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>
</tr>
</thead>
<tbody>
<tr>
<td>10145</td>
<td>Independent Study</td>
<td></td>
<td>ARRANGED</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

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.)

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>40292</td>
<td>Laboratory-Discussion</td>
<td>BCS</td>
<td>04:00 PM - 05:20 PM</td>
<td>W</td>
<td>257 - Loomis Laboratory</td>
<td>Hubler, A</td>
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<tr>
<td>40293</td>
<td>Lecture</td>
<td>EPP</td>
<td>04:00 PM - 05:20 PM</td>
<td>T</td>
<td>144 - Loomis Laboratory</td>
<td>Pitts, K</td>
</tr>
<tr>
<td>38670</td>
<td>Lecture-Discussion</td>
<td>HM</td>
<td>04:00 PM - 05:50 PM</td>
<td>M</td>
<td>257 - Loomis Laboratory</td>
<td>Beck, D</td>
</tr>
</tbody>
</table>

Credit Hours: 1 hours
Behavior of Complex Systems
Discovery course.

EXPLORING THE BEHAVIOR OF COMPLEX SYSTEMS: CHAOS, FRACTALS AND ARTIFICIAL LIFE. 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. PHYS 199 BCS is a first-year Discovery Program course; registration is restricted to freshmen. Students should enroll in only one Discovery course; students who enroll in more than one risk being dropped from one or more of those courses. For complete course descriptions, see the Discovery Program booklet.

Credit Hours: 1 hours
Elementary Particle Physics
Discovery course.

REVOLUTIONS IN ELEMENTARY PARTICLE PHYSICS. This course for non-scientists will explore some of the greatest discoveries of the last century and look forward to future discoveries. Learn about antimatter, quarks and neutrinos. We will discuss the insights and discoveries of scientists such as Einstein, Feynman and Fermi. Some of the questions covered include: What's science and what's science fiction? How can we learn about the subatomic world? How does fundamental science influence our society? No science or math background is needed. First year Discovery Program: enrollment is restricted to freshmen. Students should enroll in only one Discovery course. Students who enroll in more than one Discovery course may be dropped from the additional Discovery courses. For a listing of these courses and for course descriptions, see the Discovery Program Booklet or http://www.provost.uiuc.edu/students/discovery.

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.
### 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.

### Honors Thermal & Quantum Phys

**HONORS SEMINAR: TOPICS IN HEAT, THERMODYNAMICS, AND MODERN PHYSICS. PREREQUISITES: PHYS 211 AND PHYS 212 AND CONCURRENT REGISTRATION IN PHYS 213 AND PHYS 214 AND CONSENT OF INSTRUCTOR. PHYS 199HT CAN BE USED TO SATISFY THE HONORS COMPONENT OF PHYS 213 AND PHYS 214.** PHYS 199HT is the honors supplement to PHYS 213/214 and is intended for those students either planning to major/minor in physics or having a strong interest in the subject. Areas to be covered during PHYS 213 include diffusion and heat conduction, the Maxwell-Boltzmann distribution and the ideal gas, the Planck distribution and radiation, free energy and the chemical potential, and quantum gases. Areas to be covered during PHYS 214 include particle scattering, photon quantum states, simple approximation methods (e.g., variational methods), particle exchange, and quantum statistics.

### Enrichment Mechanics

Section M1 (or M2 or M3 or M4) is only for students taking Spring 2006 PHYS 211 who took Fall 2005 PHYS 100.