Class Schedule - Spring 2006

Physics

PHYS 598  **Special Topics in Physics**  credit: 1 TO 4 hours.
Lecture course in topics of current interest. Several subjects are announced in each Class Schedule. Among them are semiconductor physics, magnetic resonance, surface physics, lattice dynamics, band theory of solids, crystal imperfections, nuclear structure, field theory, elementary particle physics, advanced statistical mechanics, plasma theory, astrophysics, atmospheric physics, group theory and applications. Prerequisite: Determined for each offering; see Class Schedule.

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<th>CRN</th>
<th>Type</th>
<th>Section</th>
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<tr>
<td>36788</td>
<td>Lecture</td>
<td>MMB</td>
<td>01:00 PM - 02:20 PM</td>
<td>TR</td>
<td>158 - Loomis Laboratory</td>
<td>Stone, M</td>
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Credit Hours: 4 hours
Math Methods in Physics II
MATHEMATICAL METHODS IN PHYSICS. A continuation of PHYS 598MMA focusing on further core techniques widely used in the physical sciences. Emphasis is on applications, and a broad range of illustrative examples will be explored. Students do not need to have taken PHYS 598MMA. Primary topics include: complex variables (analyticity, Cauchy's theorem, residue calculus, conformal mappings, integral transforms, asymptotic techniques, Riemann surfaces); group theory in classical and quantum systems (discrete and continuous groups, representation theory, physical applications of topology); tensors in physics (Cartesian tensors, curved spaces, elementary Riemannian geometry).

| 36792| Lecture| PB      | 09:00 AM - 10:20 AM | TR   | 158 - Loomis Laboratory | Ha, T      |

Credit Hours: 4 hours
Physical Biology
PHYSICAL BIOLOGY: FROM SINGLE MOLECULES TO SYSTEMS BIOLOGY. Requirements: Some basic knowledge of biology is needed. If you know the difference between protein, DNA, and RNA, and the central dogma of molecular biology, and know what replication, transcription, translation are, you are probably ready to take the course. We will teach higher level biology on a need to know basis. We also assume that you are familiar with the introductory level calculus-based physics plus some concepts in statistical physics and differential equations etc. Who is the course for?: This is primarily for those who are doing graduate and undergraduate level research in biological physics and related fields. This would also be a very useful course for those who are working on their Ph.D in other disciplines within physics such as condensed matter physics, and are interested in doing postgraduate research in bio-related fields. Both theorists and experimentalists should benefit although the presentation and materials will be rather biased toward experimental research. What will be taught?: There will be about ten papers handed out to the students in the first lecture, most of which will be rather difficult to read and understand without spending exorbitant amount of time for beginning graduate students. The goal here is that the students will become sufficiently familiar with the field such that after the semester is over, contemporary papers of these types will be easily digested. The course will be roughly grouped into three parts. Part I: Single molecule studies of nucleic acids enzymes, macromolecular folding, and cytoskeleton motors. Part II: Intermediate level including collective phenomena, cell mechanics, etc. Part III: Systems biology including genetic circuit and switch, and noise & robustness in gene expression etc.