Physics

**PHYS 598  **Special Topics in Physics  **credit: 1 TO 4 hours.**
Subject offerings of new and developing areas of knowledge in physics intended to augment the existing curriculum. See Class Schedule or departmental course information for topics and prerequisites. May be repeated in the same or separate terms if topics vary.

<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>34934</td>
<td>Lecture-Discussion</td>
<td>MN</td>
<td>01:00 PM - 02:20 PM</td>
<td>TR</td>
<td>136 - Loomis Laboratory</td>
<td>Mason, N</td>
</tr>
<tr>
<td>34941</td>
<td>Lecture</td>
<td>PTD</td>
<td>04:00 PM - 05:20 PM</td>
<td>MW</td>
<td>144 - Loomis Laboratory</td>
<td>Leggett, A</td>
</tr>
</tbody>
</table>

Credit Hours: 4 hours

Mesoscopics and Nanoscience

**MAJOR TOPICS IN MESOSCOPICS AND NANOPHYSICS.** This course is intended to familiarize students with important current topics in condensed matter physics at the meso- and nano-scale. We will focus on low-dimensional transport phenomena, with an emphasis on experimental problems and results. Likely topics will include: fundamentals of 1D transport, quantum dots, single-electron transistors, carbon nanotubes, graphene, nano-superconductivity, nano-magnetism, nano-electro-mechanical systems, and qubits. Fabrication and measurement techniques will be integrated into the discussions. The course format will be alternate days of lecture and student-led discussions of seminal publications. Course work will consist of weekly reports on several PRL-level journal articles, and two longer class presentations.

Credit Hours: 4 hours

Physics in Two Dimensions

**PHYSICS IN TWO DIMENSIONS.** This course is intended as an introduction to some of the peculiarities of physics in systems which are effectively two-dimensional. It will emphasize the comparison of theory with experiment, especially in those cases in which the two apparently do not agree. Specimen topics include the question of long-range order in two dimensions, weak localization, the (integral and fractional) quantum Hall effect, the apparently metallic behavior seen in Si MOSFETs and other quasi-two-dimensional systems, and the general idea of topological quantum computation and some of its proposed implementations.