

## M.S. in Applied Physics, SCSU

### Curriculum Description and Course Map



The M.S. in Applied Physics is a 36-credit master's program designed to address high-tech workforce needs in the State of Connecticut. The program has two focus areas from which students will choose one. The two options are: (1) Materials Science/Nanotechnology and (2) Optics/Optical Instrumentation. A course map for the required courses in the program is shown in the table below. The departmental abbreviations used are PHY= Physics, CHE=Chemistry, CSC=Computer Science, and MBA=Business Administration.

#### Required Courses for the Program (24 credits):

<b>Core Requirements (Taken by all students)</b>	<b>PHY 507</b> – Applied Physics Graduate Seminar <b>PHY 512</b> – Methods of Theoretical Physics I <b>CHE 520</b> – Advanced Physical Chemistry I <b>CSC 541</b> – Digital Image Processing <b>MBA 500</b> – Management Process <b>MBA 505</b> – Marketing Management
<b>Materials Science/ Nano Option</b>	<b>PHY 519</b> – Nanotech I: Fundamentals of Nanoscience <b>PHY 521</b> – Nanotech II: Characterization of Nanomaterials
<b>Optics/Optical Instrumentation Option</b>	<b>PHY 530</b> – Optics and Detector Physics <b>PHY 531</b> – Interferometric Methods in Imaging and Precision Measurement

After the core and focus area courses, the student will complete two *Elective Courses* from the following list (6 credits). Elective courses may also come from the focus area option not chosen by the student.

- **PHY 513** – Methods of Theoretical Physics II
- **PHY 522** – Nanoscale Fabrication and Synthesis
- **CSC 551** – Pattern Recognition
- **CSC 561** – Scientific Visualization
- **CHE 532** – Advanced Inorganic Chemistry
- **MBA 507** – Legal Issues in Business & Management
- **MBA 510** – Project Management
- **MBA 512** – Strategic Factors in Marketing
- **MBA 515** – International Entrepreneurship
- **MBA 537** – Product Management
- **MBA 538** – Marketing Analysis and Measurement
- **MBA 548** – Operations Management

**Thesis option (6 credits).** If the student selects the thesis option, a two-semester sequence of PHY 590, 591 (Thesis Research I and II) would be used to complete the 36 credit requirement. The student would be required to complete a Master's Thesis and to defend the thesis orally before a 3-member committee approved by the Graduate Program Coordinator.

**Research Project (3 to 6 credits).** In this option, the student would be required to complete either a project with a local company or an on-campus research project for 3 to 6 credits. For off-campus projects, the student would have a project supervisor at a company and an on-campus advisor/instructor. For either option, the student would register for PHY 580 (Special Project). If a given project is for only 3 credits, then either a second 3-credit project or another graduate course from the approved list of electives would complete the 36 credit requirement. The student would be required to give a presentation summarizing the project(s) in the Physics Department. In linking students with off-campus projects, we would primarily work with the Connecticut Optics and Photonics Association and the Connecticut Space Grant College Consortium, the Applied Physics Advisory Board and other faculty connections with Connecticut industry as opportunities arise.

**Internship Requirement (not for course credit).** Either a summer or 1-semester internship project, separate from the above, must be completed for graduation. The student will work in an industry setting with an industry supervisor. We anticipate a mix of funded and non-funded options for such internships, depending on details of the project and needs of the student.