Department of Physics

The mission of the Department of Physics at Georgia Southern University is four-fold. First, to provide its majors with a strong, basic undergraduate physics/astronomy education that will serve them whether they pursue an advanced degree in physics, a professional career in medicine or dentistry, a career in industry or in science education. Second, to provide excellent instruction in introductory physics and astronomy to non-majors. Third, to conduct original research in physics and astronomy that is recognized at regional, national, and international levels. Fourth, to foster an interest in science in the community and the region.

ASTR 5090G Selected Topics in Astronomy
2-5 Credit Hours. 0-5 Lecture Hours. 0 Lab Hours.
A course allowing for investigation of selected topics in Astronomy; it will be taught on a one-time basis. Lecture only courses can be for two, three, or five credit hours. For laboratory courses, one credit hour will be given for every three hours spent working in lab. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.
Cross Listing(s): ASTR 5090.

ASTR 5890G Astronomy Research Experience
1-4 Credit Hours. 0-3 Lecture Hours. 0 Lab Hours.
An independent astronomy research experience in which a student will investigate a research question under the direction of a faculty member. Students will be expected to maintain a laboratory notebook, prepare a written summary of the research, and give an oral presentation at the end of the experience. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.
Prerequisite(s): Permission of instructor required.
Cross Listing(s): ASTR 5890.

PHYS 5090G Selected Topics in Physics
2-4 Credit Hours. 0-4 Lecture Hours. 0-6 Lab Hours.
A course allowing for investigation of selected topics in Physics; it will be taught on a one-time basis. Lecture only course can be for two, three, or five credit hours. For laboratory courses, one credit hour will be given for every three hours spent working in lab. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.
Prerequisite(s): A minimum grade of "C" in PHYS 1112 or PHYS 2212.
Cross Listing(s): ASTR 5090, ASTR 5090G, PHYS 5090.

PHYS 5151G Classical Mechanics
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
Provides physics majors and students of applied mathematics and engineering with the fundamentals of analytical mechanics. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.
Prerequisite(s): MATH 3230 and a minimum grade of "C" in PHYS 2211 and PHYS 2212.
Cross Listing(s): PHYS 5151.

PHYS 5152G Classical E and M Theory
5 Credit Hours. 5 Lecture Hours. 0 Lab Hours.
Provides physics majors and students of applied mathematics and engineering with the fundamentals of electromagnetic field theory. Graduate students will be given an extra assignment determined by the instructor that undergraduates will not be required to do.
Prerequisite(s): PHYS 5151.
Cross Listing(s): PHYS 5152.
PHYS 6231 Thin-Film Coating
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course will cover the physics and chemistry of thin film coating. Topics covered will include thermal, optical, electric, and mechanical properties of multilayer metallic coatings and coating manufacturing techniques. Special topics will be given by experts from local coating industry.
Prerequisite(s): PHYS 6237 with a minimum grade of "C".

PHYS 6237 Applied Quantum Mechanics
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course is designed to review Schrödinger’s theory of quantum mechanics for application in modern devices and systems. Topics covered are quantum statistics, multi-electron atoms, molecules, one and two dimension system, and neon particle system. Calculation techniques introduced are matrix diagonalization, perturbation theory, variational method, time-dependent perturbation theory to apply to optical absorption, and nonlinear optical properties of materials.

PHYS 6730 Master of Science in Physical Science Internship
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course is the required internship for the Masters of Science in Physics Science degree. Students will apply their skills and knowledge to a current problem in a professional setting, either on campus or at the site of a participating sponsor.

PHYS 7120 Conceptual Physics II
3 Credit Hours. 0 Lecture Hours. 0 Lab Hours.

PHYS 7330 Principles and Practice of Pre-clinical Drug Development
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course introduces key issues and aspects of developing a new small molecule or biological drug, with focus on the guidelines from regulatory agencies on the data required for the Investigational New Drug (IND) application. Major issues in Pharmacology, Toxicology, Safety Pharmacology, Pharmacokinetics and Chemistry, Manufacturing and Control (CMC) sections of the IND submission process are described. Practices of laboratory animal efficacy models, pharmacokinetics models, toxicology study protocols, master batch record generation and the concepts of Good Laboratory Practice (GLP)/Good Manufacturing Practices (GMP) will be covered, with particular emphasis on the Code of Federal Regulations Title 21 part 58, 210 and 211.
Prerequisite(s): CHEM 5333 with a minimum grade of "C".

PHYS 7630 Graduate Seminar
3 Credit Hours. 3 Lecture Hours. 0 Lab Hours.
This course will consist of formal seminars and informal sessions on current topics of interest to the program as presented by visiting lecturers, local researchers, and students. All MS-APS students must attend a set number of seminars each term they are enrolled in the program. Thesis track students in their final semester will prepare a comprehensive presentation on their thesis research as well as submit a report reviewing the topics covered during the seminar series.

PHYS 7999 Thesis
1-3 Credit Hours. 0 Lecture Hours. 0 Lab Hours.
Results of an individual, independent research project will be presented as a thesis in partial fulfillment of the Master of Science in Physical Science degree. The thesis requires defense of the design, execution, analysis, and interpretation of the research project.