

## Minors

### Nanoscale Science and Technology - Minor

#### College of Sciences

#### Department of Physics,

#### Physical Sciences Building, Room: 403

<http://www.physics.ucf.edu>

Email: [physics@ucf.edu](mailto:physics@ucf.edu)

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This minor is designed to offer students a working knowledge of nanoscience principles and industrial applications, and to understand the societal and technology issues that may impede the adoption of nanotechnology. In addition, students are expected to develop the ability to communicate effectively, work collaboratively, and identify paths and requisite knowledge and skills for nanotechnology careers. With the service learning component built into the three core courses, students completing the minor will only need a fourth SL-designated course of their choice to receive a UCF Service-Learning certificate.

#### Admission Requirements

- None

#### Minor Requirements

- A minimum GPA of 2.0 is required in all courses used to satisfy the minor.
- Grades below "C" (2.0) in lower level courses are not accepted.
- At least 12 hours used in the minor must be earned at UCF within the Department of Physics.

#### Prerequisite Courses

- Students must satisfy each course's prerequisites before enrolling in the class. In addition, the students must have completed the following courses, which are taken by most science majors:

#### Select 1:

PHY 2048C	General Physics Using Calculus I or	4 hrs
PHY 2053C	College Physics I	4 hrs

#### Select 1:

PHY 2049C	General Physics Using Calculus II or	4 hrs
PHY 2054C	College Physics II	4 hrs

#### Select 1:

CHM 2045C	Chemistry Fundamentals I or	4 hrs
CHS 1440	Principles of Chemistry	4 hrs

#### Suggested Courses

EGN 3211	Engineering Analysis and Computation	3 hrs
COP 3223C	Introduction to Programming with C	3 hrs

#### Required Courses

(9 hrs)

- The three required courses include a 20-hour service learning component.

PHZ 3462	Nanoscience I: The Science and Societal Impacts	3 hrs
PHZ 3464	Nanoscience II: Technological Applications	3 hrs
PHZ 3466	Nanoscience III: A Virtual Laboratory	3 hrs

#### Restricted Electives

(9 hrs)

- Select three courses from the following list. One course must be chosen from the listed from the Physics department. Other electives should be taken with approval of the program director.

PHY 3802L	Intermediate Physics Laboratory	3 hrs
PHY 3101	General Physics Using Calculus III	3 hrs
PHZ 3151	Computer Methods in Physics	3 hrs
BSC 3424	Nanobiotechnology	3 hrs
OSE 3490	Nanophotonics	3 hrs
PHY 5933	Selected topics in biophysics of macromolecules	3 hrs
PHY 4604	Wave Mechanics I	3 hrs
PHY 4605	Wave Mechanics II	3 hrs
CHM 3410	Physical Chemistry I	4 hrs
CHM 5450	Polymer Chemistry	3 hrs
CHM 4610	Inorganic Chemistry	3 hrs

PHI 3626	Advanced Ethics in Science and Technology	3 hrs
PHI 4690	Ethics in Nanoscience and Nanotechnology	3 hrs
PHZ 5425C	Electron Solid Interactions	3 hrs

#### Foreign Language Requirements

- None

#### Total Semester Hours Required

- 18

#### Other Requirements

- No credit by exam (TSD, Military credit) may be used.
- Internship, Co-op, or Independent Study credit cannot be used toward the minor.
- Note: To obtain a Service-Learning certificate, four UCF-approved service-learning courses must be completed. Service-Learning courses are designated with an "SL" and can be accessed under "special groups" in the class schedule.