

Concentrations in Physics Major

As a part of its BS Degree in Physics, the Department of Physics and Astronomy offers the following Concentrations in Physics Major:

- **Concentration in Biological Physics**
- **Concentration in Computational Physics**
- **Concentration in Nanophysics**

General Conditions:

All three concentrations are only available in combination with the BS degree. The concentrations require at least additional 11 credit hours (i.e. in addition to the 45 credit hours of 2000+ PHYS coursework already required), which may include some courses in other departments. Other courses may be substituted for the concentration as approved by the Department on a case-by-case basis. The Senior Thesis must be done in a field related to the Concentration (as approved by the Department); the Senior Thesis is normally associated with 8 credit hours of PHYS 3995 Independent Research; for all Concentration, it requires at minimum PHYS 3100 Senior Seminar (2 credit hours) in a field related to the Concentration (Senior Seminar will be preferably taken in the Fall Quarter of the Senior year).

Concentration	Biological Physics
A: Required PHYS courses:	PHYS 4100 Foundations of Biophysics (cross-listed with BIOP 4100) (4 credits)
B: A minimum of 7 additional credit hours from the following list:	PHYS 2110 Introduction to Computational Physics (3 credits) PHYS 2300 Physics of the Body (3 credits) PHYS 2341 Medical Imaging Physics (3 credits) PHYS 3711 Optics (4 credits) BIOL 2120 Cell Structure and Function (4 credits) (prerequisites: BIOL 1010 and 1011 and CHEM 1010) BIOL 3150 Intracellular Dynamics (4 credits) (prerequisite: BIOL 2120) BIOL 3160 Biophysics: Ion Channels and Disease (3 credits) (prerequisite: BIOL 2120) BIOL 3640 Introductory Neurobiology (4 credits) (prerequisite: BIOL 2120) BIOP 4150 Cellular Biophysics (4 credits) CHEM 2011 Analysis Equilibrium Systems (3 credits) (prerequisite CHEM 1010) CHEM 3610 Physical Chemistry I (3 credits) (prerequisite CHEM 1010 and CHEM 2011)
Note: At least one course from this list must be a BIOL or CHEM course.	

Concentration	Computational Physics
A: Required physics courses:	PHYS 2110 Intro to Computational Physics (3 credits)
B: A minimum of 8 additional credit hours from the following list:	COMP 1671 Intro to Computer Science I (4 credits) COMP 1672 Intro to Computer Science II (4 credits) COMP 1673 Intro to Computer Science III (4 credits)
Note:	

Concentration	Nanophysics
A: Required physics courses:	PHYS 4411 Advanced Condensed Matter Physics I (3 credits)
B: A minimum of 8 additional credit hours from the following list:	ENGR 3200 Intro to Nanotechnology (4 credits) ENGR 3210 Intro Nano-Electro-Mechanics (4 credits) ENGR 3215 NEMS and Nanofabrication Lab (4 credits) (prerequisite ENGR 3210) PHYS 4100 (cross-listed with BIOP 4100 Foundations of Biophysics) (4 credits) PHYS 4412 Advanced Condensed Matter Physics II (3 credits)
Note: At least one course from this list must be an ENGR course.	