Present

GEOPHYSICS

The following are major requirements for the B.S. in Geophysics. All students majoring in Geophysics are normally required to take this core curriculum.

1. Lower-division requirements
   a) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   b) PHYS 040A, PHYS 040B, PHYS 040C
   c) CHEM 001A, CHEM 001B
   d) GEO 001, GEO 003/Biol 010, GEO 030

2. Upper-division requirements
   a) PHYS 130A, PHYS 135A
   b) One course from PHYS 130B, PHYS 135B, PHYS 136, PHYS 177
   c) GEO 101, GEO 116, GEO 118, GEO 140, GEO 144
   d) Four (4) units of upper-division geosciences to be taken in consultation with faculty advisor.
   e) GEO 002, PHYS 040D, and PHYS 040E are recommended

Proposed

GEOPHYSICS

The following are major requirements for the B.S. in Geophysics. All students majoring in Geophysics are normally required to take this core curriculum.

1. Lower-division requirements (69 units)
   a) CHEM 001A, CHEM 001B, CHEM 001C
   b) GEO 001, GEO 030
   c) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   d) PHYS 040A, PHYS 040B, PHYS 040C, PHYS 40D, PHYS 40E

2. Upper-division requirements (53-54 units)
   a) GEO 116, GEO 140, GEO 145
   b) Two of GEO 144, PHYS 111, PHYS 177
   c) PHYS 130A, PHYS 130B, PHYS 135A, PHYS 135B, PHYS 136
   d) PHYS 139L or 4 units of PHYS 142L
   e) Eight (8) units of upper-division physical science courses which may include up to 4 units of Senior Thesis (GEO 195A, GEO 195B, GEO 195C) or up to 8 units of Independent Internship (GEO 198-I).

Justification for changes in Geophysics Major:

Geophysics is a diverse discipline that spans the spectrum from geologists who apply simple physics techniques to their study of the earth to physicists who develop techniques to study the earth. The former requires a strong background in geology and familiarity with the principles of physics, while the latter requires a strong background in physics and mathematics and some familiarity with geology. The existing geophysics major attempts to find a middle ground between these two, which fundamentally has left both types of students less prepared for their career goal. We propose to modify the current Geophysics degree to provide a more extensive background in physics and reduce the training in geology. This will address the needs of students who need a quantitative, rigorous background. We will also propose to add a geophysics option to the Geology degree. This will provide a geologist with additional training in physics and geophysics. These changes will address the two needs outlined above with two different programs.

Course changes in Geophysics Degree: The Physics 130 and 135 series provides students with essential training in classical mechanics and electromagnetic theory. Physics 136 covers electromagnetic waves, which are used extensively in geophysics for probing the earth. The basic equations and methods for wave analysis are also used in seismology (Geo 144). Physics 177 is included in order to give students background in applied computation
methods. Geo 116 (structural geology) provides students with the basics of geologic structures in 3 dimensions, which all geophysical methods interrogate. Geo 140 (physics of the Earth) and Phys 111 (astrophysics) provide basic knowledge of earth and space with emphasis on the application of physics to these systems. Some practical training in applications of physics to the study of systems is required through the inclusion of laboratory-based courses Geo 145 (shallow subsurface imaging), Phys 139L (electronics for scientists), and Phys 142L (advanced physics laboratory). With the addition of 5 new physics courses to the Geophysics Major, it is necessary to reduce the number of geology courses required. The courses eliminated involve training in paleontology (Geo 003), sedimentology and stratigraphy (Geo 118), and field mapping (Geo 101).

Effective: Fall 2003

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