GEOPHYSICS PH.D.

Admission Requirements
Complete the following admission requirements:

- Complete a master's degree in geology, geophysics or an appropriate field of physical science or engineering.

ADMISSION TO PH.D. GEOPHYSICS PROGRAM DIRECTLY FROM A BACHELOR'S PROGRAM
Entering graduate students whose highest earned degree is the baccalaureate are normally admitted as Master of Science candidates. However, exceptionally able and accomplished students in this category are eligible for direct admission to the Ph.D. program. For direct admission from the baccalaureate to the Ph.D. program, a student must receive approval from the graduate admission committee and also meet one of three criteria:

1. At least one first-authored manuscript published, accepted or submitted for publication in a peer-reviewed scientific journal.
2. Receipt of an NSF, NIH or similar prestigious pre-doctoral fellowship.
3. Demonstrated research proficiency AND either
   - attained a GPA of at least 3.5 in mathematics and science courses at the undergraduate level, or
   - scored at or above the 80th percentile in two of three categories in the GRE.
   The requirement of demonstrated research proficiency can be waived for exceptionally promising students. In this case, the student is required to complete a research or review paper focusing on a thesis-related topic approved by the graduate advising committee. The paper should be roughly 4,000-5,000 words and must be submitted and approved by the advising committee within the first three semesters to maintain Ph.D. status. Failure will result in changing the student's status to M.S. candidate.

After admission, M.S. candidates may, in exceptional cases, petition for conversion to the Ph.D. program if they satisfy one of the above criteria. Such petitions must be approved both by the student's current (M.S.) and proposed (Ph.D.) advisory committee and the department director or designee.

Program Requirements

Minimum Requirements for Geophysics Ph.D.: 18 thesis credits

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>GEOS F631</td>
<td>Foundations of Geophysics</td>
<td>4</td>
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<tr>
<td>GEOS F682</td>
<td>Geoscience Seminar (fall semester)</td>
<td>1</td>
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Complete 6 credits from relevant graduate-level courses agreed by the advisory committee, or select one of the following concentrations:

Solid-Earth Geophysics
- Complete 6 credits from the following:
  - GEOS F604 Seismology
  - GEOS F605 Geochronology
  - GEOS F626 Applied Seismology
  - GEOS F669 Geodetic Methods and Modeling
  - GEOS F671 Volcano Seismology

Snow, Ice and Permafrost Geophysics
- Complete 6 credits from the following:
  - PHYS F614 Ice Physics
  - GEOS F615 Sea Ice
  - GEOS F616 Permafrost
  - GEOS F617 Glaciers

Remote Sensing
- Complete 6 credits from the following:
  - ATM F613 Atmospheric Radiation
  - GEOS F622 Digital Image Processing in the Geosciences
  - GEOS F639 InSar and Its Applications
  - GEOS F654 Visible and Infrared Remote Sensing
  - GEOS F657 Microwave Remote Sensing

Advanced Skills Categories
- Complete 3 credits each in two of the following four categories:
  - Digital Signal Analysis and Remote Sensing
    - GEOS F622 Digital Image Processing in the Geosciences
    - GEOS F654 Visible and Infrared Remote Sensing
    - GEOS F657 Microwave Remote Sensing
  - Statistics and Parameter Estimation
    - GEOS F627 Inverse Problems and Parameter Estimation
    - STAT F401 Regression and Analysis of Variance
    - STAT F461 Applied Multivariate Statistics
    - ATM F610 Analysis Methods in Meteorology and Climate
  - Mathematical Methods
    - MATH F432 Introduction to Partial Differential Equations
    - MATH F614 Numerical Linear Algebra
    - MATH F615 Numerical Analysis of Differential Equations
    - MATH F661 Optimization
    - ME F601 Finite Element Analysis in Engineering

Skills course
- One graduate-level advanced skills course approved by the student's advisory committee

Ph.D. Degree Requirements
- Complete the Ph.D. degree requirements. Complete and pass a written and oral comprehensive examination. Complete and submit a written thesis proposal for approval.
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<tr>
<th>Description</th>
<th>Credits</th>
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<tr>
<td>Complete a research program as arranged with the graduate advisory committee.</td>
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<tr>
<td>Complete 18 credits of thesis, write a thesis and pass an oral defense of thesis.</td>
<td>18</td>
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<tr>
<td><strong>Total Credits</strong></td>
<td><strong>35</strong></td>
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