

Geophysics Courses

Courses

GEOP 5163. Directed Study in Geophysics.

Directed Study in Geophysics (0-0-1) Prerequisite: Graduate standing and department approval.

Department: Geophysics

1 Credit Hour

1 Total Contact Hour

0 Lab Hours

0 Lecture Hours

1 Other Hour

Classification Restrictions:

Excluded Class: DR

GEOP 5263. Directed Study in Geophysics.

Special Problems in Geophysics (0-0-2) Prerequisites: Graduate standing and department approval.

Department: Geophysics

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

0 Lecture Hours

2 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5306. Atmospheric Processes.

Atmospheric Processes (3-0) Investigation of fundamental physical principles guiding motions of Earth's atmosphere at multiple scales, including radiation and energy balance, thermodynamics, fluid motion, boundary layers, balance of forces in the atmosphere, and their interactions to create weather and atmospheric phenomena.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5335. Intro to Remote Sensing.

An introduction to acquisition, processing, and interpretation of remote sensing data acquired from both satellites and aircraft. Applications in earth and environmental sciences are stressed as is understanding how to obtain and employ the many types of data that are available. Topics covered include basic mapping concepts, how sensors work, the structure of remote sensing data and analysis, thermal and radar techniques, data processing, and classification schemes. Laboratory work is primarily computerized exercises.

Department: Geophysics

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5336. Digital Image Processing.

Digital Image Processing (2-3) A survey of the techniques used to manipulate digital image data including atmospheric correction, geocoding, image enhancement, and classification. Data from multispectral sensors such as LANDSAT, SPOT and IRS-C as well as hyperspectral sensors such as AVIRIS are utilized. Prerequisite: GEOP 4336.

Department: Geophysics

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

Prerequisite(s): (GEOP 4336 w/D or better) OR (GEOP 5335 w/D or better)

GEOP 5350. Advanced Seismology.

Advanced Seismology explores the theoretical background of wave propagation in the earth and the new techniques being developed to determine earth structure and earthquake source processes. Many classic problems in introductory mathematical seismology (stress-strain, reflection coefficients, ray theory, earthquake location, etc.) will be reviewed, plus the character and interpretation of seismograms.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOP 5352. Geophysical Inverse Theory.

Geophysical Inverse Theory (3-0) The quantitative study of mathematical methods used to interpret geophysical measurements and determine earth structure. Techniques for both linear and non-linear geophysical problems are studied to determine the resolution and precision of a geophysical model from a given set of data.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

Prerequisite(s): (GEOP 4332 w/C or better) AND (GEOP 4334 w/C or better) AND (MATH 3323 w/C or better) AND (MATH 3323 w/C or better)

GEOP 5353. Reflection Seismic Data Proces.

Reflection Seismic Data Processing (2-2) The computer application of digital signal processing to reflection seismic data from environmental, petroleum and crustal surveys. Topics include: definition of survey geometries, data editing techniques, amplitude recovery, bandpass filtering, deconvolution, velocity analysis, F-K filtering and migration.

Department: Geophysics

3 Credit Hours

4 Total Contact Hours

2 Lab Hours

2 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

Prerequisite(s): (GEOP 4332 w/C or better) AND (GEOP 5460 w/C or better)

GEOP 5354. Seismology.

Seismology (3-0) A study of earthquake seismology, seismotectonics, and the use of seismological methods to determine earth structure. A theoretical foundation is provided by the study of wave propagation in homogenous and isotropic media from the standpoint of both ray and wave theory.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

Prerequisite(s): (MATH 4336 w/C or better AND PHYS 3351 w/C or better)

GEOP 5355. Advanced Seismic Methods.

Advanced applications of seismic methods in exploration geophysics. Course emphasizes processing of reflection and refraction data using advanced processing software. Applications to oil and gas prospecting as well as shallow engineering, environmental, and mining problems.

Department: Geophysics

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

GEOP 5356. Topics in Geophysics.

Topics in Geophysics (3-0) Study of advanced topics in the fields such as exploration geophysics, geothermics, theoretical seismology, potential fields, data analysis, environmental application, inversion, seismotectonics, crustal studies, and global tectonics. May be repeated for credit when topics vary.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5357. Well Logging.

Well Logging (2-2) The application of well logs to hydrogeologic, petroleum, and mineral studies to characterize sedimentation history and quantitatively evaluate rock and fluid properties.

Department: Geophysics

3 Credit Hours

4 Total Contact Hours

2 Lab Hours

2 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5361. Plate Tectonics.

Plate Tectonics (3-0) The application of geological and geophysical data to the description and evolution of motion between the lithospheric plates.

Topics include: relative velocities between plates, triple junctions, plate rotations, seismicity and plate boundaries, marine magnetic anomalies, paleomagnetism, plate driving mechanisms, relationship of plate tectonic processes to the geologic evolution of the western United States.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5363. Directed Study in Geophysics.

Directed Study in Geophysics (0-0-3) Prerequisites: Graduate standing and department approval.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

0 Lecture Hours

3 Other Hours

Classification Restrictions:

Excluded Class: DR

GEOP 5460. Geop App-Digital Signal Proces.

Geophysical Applications of Digital Signal Processing (3-2) Computer application of discrete signals and systems to geophysical data in one and two dimensions. Properties of the FFT, DFT, Z-transform, and continuous Fourier integral transform. Digital filter design, special analysis, deconvolution, spatial filtering of geophysical datasets. Knowledge of Fortran, C, or mathematical software package required.

Department: Geophysics

4 Credit Hours

5 Total Contact Hours

2 Lab Hours

3 Lecture Hours

0 Other Hours

GEOP 6110. Directed Study in Geophysics.

Directed Study in Geophysics (0-0-1) Prerequisites: Doctoral graduate standing and department approval.

Department: Geophysics

1 Credit Hour

1 Total Contact Hour

0 Lab Hours

0 Lecture Hours

1 Other Hour

GEOP 6210. Directed Study in Geophysics.

Directed Study in Geophysics (0-0-2) Restricted to majors: GEOL. Prerequisites: Doctoral graduate standing and department approval.

Department: Geophysics

2 Credit Hours

2 Total Contact Hours

0 Lab Hours

0 Lecture Hours

2 Other Hours

GEOP 6306. Atmospheric Processes.

Atmospheric Processes (3-0) Investigation of fundamental physical principles guiding motions of Earth's atmosphere at multiple scales, including radiation and energy balance, thermodynamics, fluid motion, boundary layers, balance of forces in the atmosphere, and their interactions to create weather and atmospheric phenomena.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOP 6310. Directed Study in Geophysics.

Directed Study in Geophysics (0-0-3) Prerequisites: Doctoral standing and department approval.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

0 Lecture Hours

3 Other Hours

GEOP 6335. Intro to Remote Sensing.

An introduction to acquisition, processing, and interpretation of remote sensing data acquired from both satellites and aircraft. Applications in earth and environmental sciences are stressed as is understanding how to obtain and employ the many types of data that are available. Topics covered include basic mapping concepts, how sensors work, the structure of remote sensing data and analysis, thermal and radar techniques, data processing, and classification schemes. Laboratory work is primarily computerized exercises. A PhD level project is required. Keywords: GIST, image analysis.

Department: Geophysics

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

GEOP 6336. Digital Image Processing.

Digital Image Processing (2-3) A survey of the techniques used to manipulate digital image data including atmospheric correction, geocoding, image enhancement, and classification. Data from multispectral sensors such as LANDSAT, SPOT, and IRS-C as well as hyperspectral sensors such as AVIRIS are utilized. A PhD level project is required.

Department: Geophysics

3 Credit Hours

5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOP 4336 w/D or better) OR (GEOP 5335 w/D or better)

GEOP 6350. Advanced Seismology.

Advanced Seismology explores the theoretical background of wave propagation in the earth and the new techniques being developed to determine earth structure and earthquake source processes. Many classic problems in introductory mathematical seismology (stress-strain, reflection coefficients, ray theory, earthquake location, etc.) will be reviewed, plus the character and interpretation of seismograms.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOP 6351. Geophysical Inverse Theory.

Geophysical Inverse Theory (3-0) The quantitative study of mathematical methods used to interpret geophysical measurements and determine earth structure. Techniques for both linear and non-linear geophysical problems are studied to determine the resolution and precision of a geophysical model from a given set of data.

Department: Geophysics

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (GEOP 4332 w/C or better) AND (GEOP 4334 w/C or better) AND (MATH 3323 w/C or better) AND (MATH 3323 w/C or better)

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5 Total Contact Hours

3 Lab Hours

2 Lecture Hours

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Department: Geophysics

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3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

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3 Credit Hours

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0 Lab Hours

3 Lecture Hours

0 Other Hours

GEOP 6357. Well Logging.

Well Logging (2-2) The application of well logs to hydrogeologic, petroleum, and mineral studies to characterize sedimentation history and quantitatively evaluate rock and fluid properties.

Department: Geophysics

3 Credit Hours

4 Total Contact Hours

2 Lab Hours

2 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of GEOL, GEOP

GEOP 6361. Plate Tectonics.

Plate Tectonics (3-0) The application of geological and geophysical data to the description and evolution of motion between the lithospheric plates.

Topics include: relative velocities between plates, triple junctions, plate rotations, seismicity and plate boundaries, marine magnetic anomalies, paleomagnetism, plate driving mechanisms, relationship of plate tectonic processes to the geologic evolution of the western United States.

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3 Credit Hours

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0 Lab Hours

3 Lecture Hours

0 Other Hours

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