**CURRICULAR MAP OF COURSES AVAILABLE IN EARTH SCIENCES B.S.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  Course Number | Course Title  | PLO A: Read/ evaluate Earth Sci literature | PLO B: Present Earth Sci info | PLO C: Apply Earth Sci data | PLO D: Apply appropriate techniques/ methods | PLO E: Identify Earth Sci problems, develop solutions | PLO F: Apply other sciences | BS program required/elective |
| Earth Sciences 1100 | Planet Earth: How it works | B | B | B | B | B | B | O-prep |
| Earth Sciences 1105 | Geology of the National Parks | B | B | B |  | B | B | O-prep |
| Earth Sciences 1108 | Gemstones | B | B | B |  | B | B | O-prep |
| Earth Sciences 1121 | The Dynamic Earth  | B | B | B | B | B | B | O-prep |
| Earth Sciences 1151 | Natural Hazards | B | B | B | B | B | B | O-prep |
| Earth Sciences 2203 | Environmental Geoscience | B | B | B |  | B | B | O-prep |
| Earth Sciences 2205 | The Planets | B | B | B |  | B | B | O-prepO-PS |
| Earth Sciences 2206(&S) | Principles of Oceanography | B | B | B |  | B | B | O-prepO-SS |
| Earth Sciences 1200 | Introductory Earth Science Lab |  | B | B | B | B | B | O-prep |
| Earth Sciences 2000 | Preparation for Thesis and Careers in the Earth Sciences | B-I | B-I | B-I |  | B-I |  | R-GSR-GPR-CWE |
| Earth Sciences 2122 | Climate and Life over Billions of years on Earth | B-I | B-I | B-I | B-I | B-I |  | O-SSR-GS |
| Earth Sciences 2155 | Energy and Environment | B-I | B-I | B-I | B-I | B-I |  | O-SS |
| Earth Sciences 2203 | Environmental Geoscience | B-I | B-I | B-I | B-I | B-I |  | O-SS |
| Earth Sciences 2204 | Exploring Water Issues | B-I | B-I | B-I | B-I | B-I |  | O-SS |
| Earth Sciences 2210 | Energy, Mineral Resources, and Society | B-I | B-I | B-I | B-I | B-I |  | O-SS |
| Earth Sciences 2212 | Intro to Earth Materials | B-I | B-I | B-I | B-I | B-I |  | O-CWE |
| Earth Sciences 3411 | Water Security for the 21st Century | I | I | I | I | I |  | O-SS |
| Earth Sciences 2245 | Introductory Data Analysis for Earth and Environmental Sciences | B-I | B-I | B-I | B-I | B-I |  | R-GSR-CWER-GP |
| Earth Sciences 4194 | Group Studies | I | I | I | I | I | I |  |
| Earth Sciences 4194H | Honors Group Studies | I | I | I | I | I | I |  |
| Earth Sciences 5310 | Remote Sensing in the Earth Sciences | A | A | A | A |   | A | O-GPO-PSO-MS |
| Earth Sciences 4421 | Earth Materials | I | I | I | I | I | I | R-GSO-CWEO-CWEO-MC |
| Earth Sciences 4423 | Introductory Petrology | I | I | I | I | I | I | R-GSO-MC |
| Earth Sciences 4425 | Energy Resources and Sustainability | I | I | I | I | I | I | O-SS |
| Earth Sciences 4450 | Water, Ice, and Energy in the Earth System | I | I | I | I | I | I | R-CWEO-MSO-HG |
| Earth Sciences 4501 | Paleontology | I | I | I | I | I | I | O-MC |
| Earth Sciences 4502 | Stratigraphy and Sedimentation | I | I | I | I | I | I | R-GSO-CWEO-MC |
| Earth Sciences 4530 | Structural Geology | I | I | I | I | I | I | R-GSR-GP |
| Earth Sciences 4560 | Applied Geophysics | I | I | I | I | I | I | R-GPO-PSO-PG |
| Earth Sciences 4880 | Seminar in Geophysics | I | I | I | I | I | I |  |
| Earth Sciences 4998 | Undergraduate Research in Earth Sciences | I - A | I - A | I - A | I - A | I - A | I - A |  |
| Earth Sciences4998H | Honors Undergraduate Research in Earth Sciences | A | A | A | A | A | A |  |
| Earth Sciences4999.01 | Undergraduate Thesis in Earth Sciences | I - A | I - A | I - A | I - A | I - A | I - A | R-GSR-CWER-GP |
| Earth Sciences4999.01H | Honors Undergraduate Thesis in Earth Sciences | A | A | A | A | A | A |  |
| Earth Sciences5189.01 | Field Geology I | I - A | I - A | I - A | I - A | I - A | I - A | R-GSR-PGO-MC |
| Earth Sciences5189.02 | Field Geology II |  A | A | A |  A | A | A | R-GSO-PG |
| Earth Sciences 5191 | Internship in the Earth Sciences | I - A | I - A | I - A | I - A | I - A | I - A |  |
| Earth Sciences 5191.01 | Museum Internship | A | A | A | A | A | A |  |
| Earth Sciences5193.xx | Individual Studies | I - A | I - A | I - A | I - A | I - A | I - A |  |
| Earth Sciences5194 | Group Studies | I - A | I - A | I - A | I - A | I - A | I - A |  |
| Earth Sciences 5203 | Geo-environment and Human Health | A | A | A | A | A | A | O-CWEO-HG |
| Earth Sciences 5205 | Planetary Science | A | A | A | A | A | A | R-PS |
| Earth Sciences 5206 | Advanced Oceanography | A | A | A | A | A | A | R-MSO-CWE |
| Earth Sciences 5268 | Soils and Climate Change | A | A | A | A | A | A | O-CWEO-HG |
| Earth Sciences 5501 | Museum Databases | A | A | A | A | A | A | O-MC |
| Earth Sciences 5550 | Geomorphology | I-A | I-A | I-A | I-A | I-A | I-A | O-PSO-HG |
| Earth Sciences 5600 | Siliciclastic Depositional Systems | A | A | A | A | A | A |  |
| Earth Sciences5601.01 | Sedimentary Petrology: Sandstones | A | A | A | A | A | A |  |
| Earth Sciences5601.02 | Sedimentary Petrology: Carbonate Rocks and Shales | A | A | A | A | A | A |  |
| Earth Sciences5602.01 | Carbonate Depositional Systems I | A | A | A | A | A | A |  |
| Earth Sciences5602.02 | Carbonate Depositional Systems II | A | A | A | A | A | A | O-MS |
| Earth Sciences 5603 | Stratigraphy | A | A | A | A | A | A |  |
| Earth Sciences 5604 | Sequence Stratigraphy | A | A | A | A | A | A |  |
| Earth Sciences 5605 | Paleoceanography | A | A | A | A | A | A |  |
| Earth Sciences 5613 | Micropaleontology | A | A | A | A | A | A |  |
| Earth Sciences 5614 | Paleobiology | A | A | A | A | A | A |  |
| Earth Sciences 5615 | Paleoecology | A | A | A | A | A | A |  |
| Earth Sciences 5617 | Petrology of Earth and Planets | A | A | A | A | A | A |  |
| Earth Sciences 5618 | Advanced Historical Geology | A | A | A | A | A | A |  |
| Earth Sciences 5621 | Introduction to Geochemistry | A | A | A | A | A | A | O-CWEO-HG |
| Earth Sciences 5622 | Stable Isotope Biogeochemistry | A | A | A | A | A | A | O-MS |
| Earth Sciences 5625 | Igneous Petrology | A | A | A | A | A | A |  |
| Earth Sciences 5627 | Global Biogeochemical Cycles | A | A | A | A | A | A |  |
| Earth Sciences 5628 | Environmental Isotope Geochemistry | A | A | A | A | A | A |  |
| Earth Sciences 5629 | Principles of Petrology | A | A | A | A | A | A |  |
| Earth Sciences 5636 | Advanced Topics in Mineralogy and Crystallography | A | A | A | A | A | A |  |
| Earth Sciences 5641 | Geostatistics | A | A | A | A | A | A | O-GP |
| Earth Sciences 5642 | Geomathematical Analysis | A | A | A | A | A | A |  |
| Earth Sciences 5644 | Tectonic Evolution of Continents | A | A | A | A | A | A |  |
| Earth Sciences 5645 | Advanced Structural Geology | A | A | A | A | A | A |  |
| Earth Sciences 5646 | Geodynamics | A | A | A | A | A | A | O-GPO-PS |
| Earth Sciences 5650 | Glaciology | A | A | A | A | A | A | O-CWE |
| Earth Sciences 5651 | Hydrogeology | A | A | A | A | A | A | O-CWEO-GPR-HG |
| Earth Sciences 5655 | Land Surface Hydrology | A | A | A | A | A | A | O-CWEO-HG |
| Earth Sciences 5660 | Geology of Metallic Deposits | A | A | A | A | A | A |  |
| Earth Sciences 5661 | Petroleum Geology | A | A | A | A | A | A | O-PG |
| Earth Sciences 5663 | Global Change and Sustainability in the Earth System | A | A | A | A | A | A | O-SS |
| Earth Sciences 5670 | General and Economic Geology of Selected Areas | A | A | A | A | A | A |  |
| Earth Sciences 5676 | Elemental Chemical Analysis using Inductively Coupled Plasma Optical Emission and Mass Spectrometry | A | A | A | A | A | A |  |
| Earth Sciences 5680 | Deep Earth Geophysics | A | A | A | A | A | A | O-GPO-PS |
| Earth Sciences 5687 | Borehole Geophysics | A | A | A | A | A | A | O-GPO-PG |
| Earth Sciences 5703 | Principles of Biostratigraphy | A | A | A | A | A | A |  |
| Earth Sciences 5713 | Taxonomy and Phylogeny in the Fossil Record | A | A | A | A | A | A |  |
| Earth Sciences 5714 | Biometry | A | A | A | A | A | A |  |
| Earth Sciences 5717 | Critical Issues in World Freshwater Resources | A | A | A | A | A | A |  |
| Earth Sciences 5718 | Aquatic Geochemistry | A | A | A | A | A | A |  |
| Earth Sciences 5719 | Environmental Organic Geochemistry | A | A | A | A | A | A |  |
| Earth Sciences 5746 | Seminar in Rheological Properties of Solids | A | A | A | A | A | A |  |
| Earth Sciences 5751 | Quantitative Ground-Water Flow Modeling | A | A | A | A | A | A | O-PGO-HG |
| Earth Sciences 5752 | Contaminants in Aqueous Systems | A | A | A | A | A | A |  |
| Earth Sciences 5754 | Risk Assessment and Management in Earth Systems | A | A | A | A | A | A |  |
| Earth Sciences 5757 | Artificial Intelligence in Earth Sciences | A | A | A | A | A | A | O-GP |
| Earth Sciences 5779 | Seminar in Physical Properties of Minerals and Rocks | A | A | A | A | A | A |  |
| Earth Sciences 5780 | Reflection Seismology | A | A | A | A | A | A | O-MSO-PG |
| Earth Sciences 5781 | Gravity Exploration | A | A | A | A | A | A |  |
| Earth Sciences 5782 | Magnetic Exploration | A | A | A | A | A | A |  |
| Geod Sci 5781 | Geodesy and Geodynamics | A | A | A | A | A | A | O-GPO-PS |
| Earth Sciences 5797.20 | Exploring Environmental and Human Health Issues in Japan  | A | A | A | A | A | A | O-CWE |
| Electives from other departments (Geog, AtmosSC, EEOB, ENR, Chem, Math, etc.) |  |  |  |  |  | I-A |  |

Program Learning Goals:

A) Students critically read and evaluate Earth Science literature

B) Students present Earth Science information in a clear and logical manner, both orally and in writing.

C) Students apply knowledge of Earth Science data to understand the dynamic physical, chemical, and biological processes of the Earth and its history.

D) Students apply knowledge of appropriate techniques, field methods, field mapping, and numerical methods to measure, portray, analyze, and interpret Earth Science data in specific subdisciplines.

E) Students identify Earth Science problems and develop solutions.

F) Students apply knowledge of modern applications from chemistry, physics, biology, mathematics, statistics, and computing to the solution of Earth Science problems.

Key: B = Beginning level; I = Intermediate level; A = Advanced level

Program Course Listing:

R- Required

O - one of multiple option

prep - preparation (all BS programs)

SS – science of sustainability (all BS programs)

GS – Geological Sciences subprogram

CWE- Climate Water Environment subprogram

GP- Geophysics subprogram

MS – Marine Science certificate

PS- Planetary Science certificate

HG- Hydrogeology certificate

MC – Museum Curation certificate

PG- Petroleum Geology certificate