ERTH - Earth Systems

ERTH 101IN. Earth System Sciences. 4 Credits. (3 Lec, 1 Lab) F,S,Su
Examination of basic geologic processes, Earth and planets through geologic time, internal geosystems, and surficial geosystems.

ERTH 102CS. Topics in Earth Sciences. 1 Credit. (1 Lec; 16 cr max) F,S
A series of 16 one-credit immersion courses offered on topics related to Earth processes and impacts on humanity such as natural hazards, resources, and policy issues. Choose any 3 for Core credit in Contemporary Issues in Science.

ERTH 201IN. Honors Earth System Science. 4 Credits. (3 Lec, 1 Lab) F
PREREQUISITE: Enrollment in the MSU Honors Program. This Honors course explores the complex interactions occurring at all scales between the Earth’s geosphere, biosphere, hydrosphere, atmosphere, and anthroposphere. The goal of the course is to understand the Earth as a “system” of interconnected sources of energy through deep geologic time and space.

ERTH 212RN. Yellowstone Scientific Lab. 4 Credits. (3 Lec) F
The Yellowstone region is an unparalleled laboratory for earth scientists. The volcanic, glacial, climatic, and ecological processes that shaped the region will be introduced through lecture, discussions, and projects. Recitation sections and field trips provide additional hands-on experiences.

ERTH 303. Weather and Climate. 3 Credits. (3 Lec) F
PREREQUISITE: ERTH 101IN. The climates of the continents, and their classification, characteristics and interrelationships with other factors of the physical and human environment.

ERTH 307. Principles of Geomorphology. 4 Credits. (3 Lec, 1 Lab) F
PREREQUISITE: ERTH 101IN; familiarity with spreadsheets and word-processing is assumed; Junior standing. Framework, process, system, and time as factors which control the generation of land forms. Laboratories involve field trips and map interpretation, and computer modeling.

ERTH 432R. Surface Water Resources. 3 Credits. (2 Lec, 1 Lab) On Demand
PREREQUISITE: Junior Standing, ERTH 101 and STAT 216 or STAT 332 and PHYS 205 or PHYS 211. Physical analysis of the surface portion of the hydrologic cycle: climate, evapotranspiration, precipitation, runoff, flooding, stream channels, sediment production, sediment transport and drainage basins. The surface-water resource in terms of regional supply and human use and intervention. Laboratory fee required.

ERTH 450R. Snow Dynamics and Accumulation. 4 Credits. (1 Lec, 2 Lab) S
PREREQUISITE: Ability to Ski/Board at intermediate level in back country alpine terrain. Junior or Senior standing; STAT 216, PHYS 205 or PHYS 220, and ERTH 101 or consent of instructor. Senior capstone for the Snow Science Option. The accumulation, redistribution, and metamorphism of snow as related to humans. Avalanche, recreation, agriculture, silviculture, runoff, and the alpine environment. Field studies are conducted on a regular basis under rigorous field conditions.

ERTH 455. Physiography of the U.S.. 3 Credits. (2 Lec, 1 Lab) On Demand
PREREQUISITE: Junior standing, ERTH 307. The physiographic provinces of the United States, their physical characteristics, evolution, and identification.

ERTH 484. Quaternary Environment. 3 Credits. (3 Sem) F
PREREQUISITES: ERTH 101IN and Junior standing. This course is an opportunity to learn about the history of the western US over the last 2 million years through a critical analysis of current and historic literature. It will provide an overview of the tools and approaches used to study past environmental change, significant events in the climate history of region, the geologic record of ice-age environments, including glaciation, puvial lakes, and vegetation, the evolution of the postglacial landscape, and important biotic and human events during the Holocene.

ERTH 490R. Undergraduate Research. 1-6 Credits. (1 Ind: 12 cr max) F,S,Su
Directed undergraduate research which may culminate in a research paper, journal article, or undergraduate thesis Course will address responsible conduct of research. May be repeated.

ERTH 491. Special Topics. 1-4 Credits.

ERTH 494. Seminar. 1 Credit. (1 Sem; 4 cr max) F,S
PREREQUISITE: Junior standing and as determined for each offering. Topics at the upper division level not covered in regular courses. Students participate in preparing and presenting discussion material.

ERTH 498. Internship. 2-12 Credits. (2-12 Ind; 12 cr max) On Demand
PREREQUISITE: Junior standing, consent of instructor, and approval of department head. An individualized assignment arranged with an agency, business or other organization to provide guided experience in the field.

ERTH 499. Senior Thesis/Capstone. 3 Credits. (3 Rct) F,S
PREREQUISITE: Senior standing; minimum 3.0 cum gpa; faculty recommendation. Senior thesis provides an opportunity to conduct research under the supervision of a faculty member leading to the production of a research paper ("mini-thesis") and an oral presentation to the department or at a professional meeting. Excellent preparation for graduate school and professional work.

ERTH 502. Fluvial Geomorphology. 3 Credits. (3 Lec) On Demand
PREREQUISITE: ERTH 307 or other introduction to fluvial systems or instructor permission. This course provides a foundation for understanding fluvial processes, interpreting fluvial forms, and teaches basic tools for use in watershed and river assessment. Course will cover drainage networks, channel form, and apply these concepts to a river assessment problem.

ERTH 505. Geomicrobiology. 3 Credits. (3 Sem) F
Alternate even years, to be offered even years. The course examines geophysical and microbial interactions that control earth surface processes and ultimately major biogeochemical cycles. The course focuses on how integrated approaches using geochemistry, stable isotope geochemistry, and microbial techniques are applied to research problems.

ERTH 512. Mtn & Plns Riparian Proc. 2 Credits. (2 Lec, 2 Sem) Su
PREREQUISITE: ERTH 101IN, secondary teaching certification plus two years teaching experience; recommended ERTH 516 and access to the world wide web. Riparian hydrologic and geomorphic processes with examples drawn from the mountains and plains. Ground-water recharge and discharge; Horton overflow flow; partial variable runoff areas; riparian best management practices; sapping, types of springs; sediments from slopes. K-12 riparian science education.

ERTH 516. North Rocky Mtn Geology. 2 Credits. (1 Lab) Su
PREREQUISITE: ERTH 101IN, early history and evolution (GEO 211); graduate standing; secondary teaching certification plus two years teaching experience; a computer with modem. Geologic history of Northern Rocky Mountains, and landscapes from Archean to present. Structural, tectonic, and surficial elements. Field examination of geologic evidence for history of the Gallatin Range, Bridger Range, and Yellowstone National Park. Exploration and development of teaching methods and resources for the K-12 classroom.

ERTH 551. Snow Science Seminar. 3 Credits. (2 Lec, 1 Lab) F
Alternate even years. PREREQUISITE: Graduate Standing; PHYS 211, STAT 332 or STAT 401; Interest in snow science. A mixed lecture and laboratory style course providing an in-depth examination of recent developments in snow science based upon current literature, newly published or about to be published literature, field methods and modeling regarding snow science. Topics will depend partially upon the interests of the instructor and student in the course.

ERTH 582. Quaternary Paleoecology. 3 Credits. (3 Sem) F
Alternate years, to be offered even years.
PREREQUISITE: ERTH 101IN or BIOC 170IN or equivalent. Course examines the history and development of modern biomes and the causes and consequences of long-term ecological change.

ERTH 583. Topics in Paleocology. 3 Credits. (3 Sem) F
Alternate years, to be offered odd years.
PREREQUISITE: ERTH 101IN or BIOC 170IN or equivalent. Course examines important themes in paleocology. Topics change on a yearly basis addressing needs and interests of current students. It is intended for students with an interest in ecology, paleontology and environmental history.

ERTH 584. Quaternary Envir of Western US. 3 Credits. (3 Sem) F
Alternate years, to be offered even years.
PREREQUISITE: ERTH 101 or BIOC 170 or equivalent. This graduate course examines current research and recent developments in Quaternary paleoclimatology in the western U.S. The seminar will be centered around weekly discussions of the primary literature, hands-on experience with international data bases, and class paper and presentation.

ERTH 585. Advances in Geobiology. 1 Credit. (1 Sem) F
To be offered even years. Discussion of recent developments in paleontology, paleoecology, biogeochemistry, and biogeography based on current literature and presentation of faculty and student works in progress.

ERTH 588. Professional Development. 1-3 Credits. (1-3 Lec; 3 cr max) On Demand
PREREQUISITE: Graduate standing, teaching experience and/or current employment in a school organization, consent of instructor and Dean of Graduate Studies. Courses offered on a one-time basis to fulfill professional development needs of in-service educators. A specific focus is given to each course which is appropriately subtitled. May be repeated.
ERTH 589. Graduate Consultation. 3 Credits. (3 Ind) F,S,Su
PREREQUISITE: Master's standing and approval of the Dean of Graduate Studies.
This course may be used only by students who have completed all of their course work
(and thesis if on a thesis plan) but who need additional faculty or staff time or help.

ERTH 590. Master's Thesis. 1-10 Credits. (1 Ind; max unlimited) F,S,Su
PREREQUISITE: Master's standing.

ERTH 591. Special Topics. 1-4 Credits. (1-4 Sem; 12 cr max)
PREREQUISITE: Upper division courses and others as determined for each offering.
Courses not required in any curriculum for which there is a particular one time need,
or given on a trial basis to determine acceptability and demand before requesting a
regular course number.

ERTH 592. Independent Study. 1-3 Credits. (1 Ind; 6 cr max) On Demand
PREREQUISITE: Graduate standing, consent of instructor, approval of Department
Head and Dean of Graduate Studies. Directed research and study on an individual
basis.

ERTH 594. Seminar. 1-4 Credits. (1 Sem; 4 cr max) F,S
PREREQUISITE: Graduate standing or seniors by petition. Course prerequisites
as determined for each offering. Topics offered at the graduate level which are not
covered in regular courses. Students participate in preparing and presenting discussion
material.

ERTH 598. Internship. 2-12 Credits. (2 Ind; 12 cr max) On Demand
PREREQUISITE: Graduate standing, consent of instructor and approval of
department head. An individualized assignment arranged with an agency, business or
other organization to provide guided experience in the field.

ERTH 605. History of Geological Concepts. 3 Credits. (3 Lec) F
to be offered alternate even years. PREREQUISITE: Course limited to graduate
students or senior undergraduates with permission. Weekly seminars examine
the evolution of geological thinking through an exploration of its history and
contributions to science. The course enables students to research the origin and
importance of concepts in their area of scientific specialization.

ERTH 690. Dissertation Research. 1-10 Credits. (1-10 Ind; max unlimited) F,S,Su
PREREQUISITE: Doctoral candidate standing.

ERTH 694. Doctoral Seminar. 1-3 Credits. (1-3 Sem; 6 cr max) F,S,Su
PREREQUISITE: Doctoral candidate standing.