

ENVIRONMENTAL SCIENCES (ENVS)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes (https://csprd.louisville.edu/psp/ps_class/EMPLOYEE/PSFT_CS/c/COMMUNITY_ACCESS.CLASS_SEARCH./x/?state=62dab551a0d600a5e8237359c50704e59007&duo_code=sjUx20STj21bWVEu03Z1VRIamfxp00V).

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (<https://louisville.edu/bursar/tuitionfee/university-fees/>).

ENVS 200. The Global Environment - S 3 Units

Term Typically Offered: Fall, Spring, Summer

Description: An introduction to the global physical environment, emphasizing the evolution and interaction of Earth's atmosphere, hydrosphere, lithosphere and biosphere; emphasizing energy and material cycles, and global change. An integrative spatial approach guided by scientific processes is used to study these interactions. Questions of global sustainability are addressed in the increasingly complex interactions between humans and their environment.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 218. The Global Environment Lab - SL 1 Unit

Term Typically Offered: Fall, Spring

Corequisite(s): ENVS 200.

Description: An introduction to the global environment, emphasizing the evolution and interaction of the Earth's atmosphere, hydrosphere, lithosphere and biosphere; energy and material cycles, and global change. The lab is designed to expand upon concepts covered in the ENVS 200 lecture course through a series of activities which emphasize a wide range of topics related to interpreting maps, weather and climate processes, tectonic processes and landforms. These activities include interactive exercises that utilize a variety of online tools and resources.

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ENVS 219. Introduction to Weather and Climate Lab - SL 1 Unit

Term Typically Offered: Fall, Spring

Corequisite(s): ENVS 220 or PHYS 220.

Description: A lab designed to provide real-world examples of atmospheric processes through analysis and problem solving using basic concepts and physical principles relevant to the atmosphere. For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 220. Introduction to Weather and Climate - S 3 Units

Term Typically Offered: Fall, Spring

Description: The topics to be covered in this course include season, temperature, pressure, wind and moisture of the atmosphere, storm system such as mid-latitude cyclones, thunderstorms, tornadoes and hurricanes, the weather forecast process, and climate change. For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 301. Geology for Scientists and Engineers 3 Units

Term Typically Offered: Spring Only

Description: A fundamental study of geological processes as applied to solid earth materials, structures, landforms, water resources and geologic hazards. The course includes introduction to the geology of Kentucky and impact of human activities on earth's surface and biosphere.

Note: Intended primarily for science and engineering majors.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 305. Introduction to Weather Analysis 3 Units

Term Typically Offered: Fall Only

Prerequisite(s): ENVS 200 or ENVS 220 or PHYS 220.

Description: Introduction to common analysis techniques used to diagnose and predict the evolution of weather systems with an emphasis on the use of observations and numerical weather prediction models. Students will learn to decode meteorological observations, manually create their own weather maps, and produce forecasts for various weather events.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 360. Global Environmental Change 3 Units

Term Typically Offered: Spring Odd Years

Description: This course provides an introduction to the biophysical and climatological changes occurring in the Earth system and discusses the implications of these changes on human society and ecosystems worldwide.

Note: While there are no prerequisites for this course, a general physical or environmental introductory course is recommended (for example, ENVS 200, ANTH 202, BIOL 240, PHYS 220).

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 363. Climate Science 3 Units

Term Typically Offered: Spring Only

Prerequisite(s): ENVS 200 or ENVS 220/PHYS 220.

Description: The scientific study of climate elements and controls emphasizing the global distribution of climate types and factors that give rise to their distribution.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 365. Biogeography 3 Units Term Typically Offered: Fall Only Prerequisite(s): ENVS 200, ENVS 220, or ENVS 301. Description: Study of environmental factors and the mechanisms of succession, dispersal, and migration as they relate to the character and geographical distribution of natural vegetation. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)	ENVS 390. Special Topics 3 Units Term Typically Offered: Fall, Spring Description: Investigation of topics in environmental sciences or related discipline that are not offered in regular courses. Topics will be announced in Schedule of Courses. Note: May be repeated for different topics up to a limit of 12 hours. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)
ENVS 366. Dynamic Meteorology 3 Units Term Typically Offered: Fall Even Years Prerequisite(s): ENVS 370. Description: An introduction to the forces responsible for atmospheric motion and the equations governing that motion, including a discussion of various forms of atmospheric balance. Other topics include dimensional analysis and vorticity/circulation theorems. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)	ENVS 399. Senior Honors Seminar - WR 3 Units Prerequisite(s): Junior standing; admission to the departmental honors program. Description: Investigation of a major scientific or social issue within the field of geosciences. Note: Approved for the Arts and Sciences upper-level requirement in written communication (WR). For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)
ENVS 367. Geomorphology 3 Units Term Typically Offered: Spring Only Prerequisite(s): ENVS 200 or ENVS 301. Description: Study of the relationship of climate and tectonics to Earth-surface processes and the development of landforms and landscapes. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)	ENVS 430. Practicum in Geography and Geosciences Education 1 Unit Term Typically Offered: Fall, Spring Prerequisite(s): Permission of instructor. Description: For STEM Undergraduate Teaching Assistants (UTAs) who have been selected to participate in the NSF-STEP-funded PRIMES project as peer mentors and undergraduate teaching assistants (UTA) in undergraduate STEM courses. This practicum course is intended to provide a pedagogical foundation for successfully engaging with students in the classes to which each UTA is assigned. Note: May be repeated for a maximum of 3 credit hours. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)
ENVS 370. Thermodynamic Meteorology 3 Units Term Typically Offered: Spring Only Prerequisite(s): MATH 205 and ENVS 305. Description: A study of classical thermodynamic principles and their relationship to atmospheric processes on various scales with a central focus on moist processes and the analysis of thermodynamic charts. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)	ENVS 452. Physical Meteorology 3 Units Term Typically Offered: Fall Even Years Prerequisite(s): ENVS 370. Description: This course covers three main topics: the physics of cloud and precipitation development, the basics of atmospheric radiative transfer, and radar meteorology. Items to be covered during the cloud physics portion of the course include the macroscopic properties of clouds, the physics governing the formation and growth of individual cloud droplets, and the processes responsible for the conversation of cloud droplets into precipitation-sized hydrometeors. The radiative transfer portion will cover the basics of electromagnetic radiation, the blackbody approximation, and basic radiative transfer formulas. The final topic, radar meteorology, utilizes principles from the previous two topics. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)
ENVS 376. Storm Observation Field Course 3 Units Term Typically Offered: Summer Only Prerequisite(s): Permission of instructor This course focuses on prediction, analysis, and observation of deep convective storms. Description: A portion of this course involves traveling throughout the Grain Plains in search of severe storms. In the event of quiescent weather, the trip may include professional development destinations such as the National Weather Center in Norman, OK or the National Center for Atmospheric Research in Boulder, CO. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)	
ENVS 381. Natural Hazards 3 Units Prerequisite(s): ENVS 200 or ENVS 220. Description: Environmental significance of major natural hazards including earthquakes, volcanic eruptions, landslides, flooding, severe weather, and climate change; discussion of reduction and mitigation strategies of the hazards. For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)	

ENVS 465. Mesoscale Meteorology**3 Units****Term Typically Offered:** Spring Odd Years**Prerequisite(s):** ENVS 370.

Description: This course will introduce students to the physical processes responsible for mesoscale phenomena, with an emphasis on convective storms and their associated hazards. We will examine the differences between the mesoscale and synoptic scale as well as the linkages between the two. Students will also participate in the analysis and prediction of these events in a real-world setting.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 469. Synoptic Meteorology**3 Units****Term Typically Offered:** Spring Even Years

Prerequisite(s): ENVS 370 This course focuses on the application of theory to predict the formation and evolution of common weather features such as troughs, ridges, fronts, and low/high pressure systems.

Description: Special focus will be given to the prediction of the future state of the atmosphere using numerical models.

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ENVS 564. Hydrology**3 Units****Term Typically Offered:** Fall Only**Prerequisite(s):** ENVS 200 or ENVS 301.

Description: Advanced study of the hydrologic cycle, drainage basin analysis, stream flow and flooding, pollution and utilization of water resources.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 570. Water Resource Management**3 Units****Term Typically Offered:** Spring Only**Prerequisite(s):** GEOG 558.

Description: Water resources form a critical component of any socioeconomic or environmental system. This course provides an analysis of water resource issues impacting these systems including flood and drought hazards, surface and groundwater quantity/quality issues, and energy development. Water legislation and policy aspects are further integrated with these issues at various spatial scales, including case studies from within the US and across international boundaries that lead to conflict. At the outcome of this course students will develop a basic water resource management plan for a watershed in Kentucky.

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ENVS 571. GIS and Water Resources**3 Units****Term Typically Offered:** Spring Only

Prerequisite(s): GEOG 558 A study of the application of Geographic Information Science techniques in water resources research and management including: digital mapping of water resources, watershed delineation and modeling atmospheric, surface and groundwater processes.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 590. Selected Topics in Geosciences**3 Units****Prerequisite(s):** Consent of instructor.

Description: A detailed investigation of some restricted topic of geology or related discipline. Topic to be announced in Schedule of Courses.

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ENVS 663. Climate and Environmental Change**3 Units**

Description: Global and regional climate change is one of the most pressing issues of our time. The science of climate change has employed a great diversity of techniques to unravel the Earth's climate history on multiple time scales. There now exists a considerable body of knowledge as to the magnitudes and rates of climate and environmental change. However, while the physical basis of the global climate system and its variation are well resolved, there is debate as to the nature of human intervention in the global climate system and consequences of climate change on the natural and human-made environment. As time moves forward, issues connected to all facets of climate change will become increasingly important particularly in terms of human occupancy and the sustainability of the planet. What is currently missing from debates connected to climate change is an agreed upon understanding the linkages between the physical basis of the global climate system and its connection to human affairs.

For class offerings for a specific term, refer to the Schedule of Classes (<http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm>)

ENVS 691. Research and Independent Study**1-6 Units**

Description: Individual investigation of topic(s) with the approval and supervision of a faculty member.

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