Karst Geology of the Mammoth Cave System and surrounding area
Karst Field Studies at
Western Kentucky Universit and Mammoth Cave National Park
July13-18, 2025

This course will focus on:

- **Karst landforms and their relation to underlying geology.**
- **Role of groundwater in cave development and landscape evolution.**
- **Geological and hydrogeological controls on cave morphology**
- **Geological history of the Mammoth Cave System**

Course Overview: Karst terrains are among the most dynamic and fragile landscapes on Earth, where geo- and biochemical, hydrological, and geological processes operate on multiple timescales. This course explores the unique setting of the Mammoth Cave System—a globally significant example of a fluvio-karst system. This course combines lectures, surface and subsurface field trips, and discussion-based learning to provide an integrated understanding of karst science, with Mammoth Cave and the surrounding area as a natural laboratory**.**

This multi-day course will take place at Cave Research Foundation's Hamilton Valley Field Station located just outside of Mammoth Cave National Park. See http://karstfieldstudies.com/logistics.php for additional information about housing. Participants must be in reasonably good physical condition to negotiate the cave passages and surface hikes which are a major component of this course. Morning class sessions begin at 8:30 am and break at Noon for lunch. Afternoon sessions will begin at 1:00 pm and will typically return from field sites by 5:00 pm. There will be a two-hour break for dinner. There will be some evening sessions that feature guest speakers.

Syllabus

Expectations: Part of the course content delivery will take place in the field, both on the surface and underground so participation in all class activities is a must. Participants that are enrolled in the course for college credit must participate in ALL course activities to receive credit.

Requirement for Undergraduate or Graduate Credit: Participants who are taking the course for academic credit (undergraduate and graduate) must complete an independent research paper, to be submitted to instructor by the end of the summer term. Research projects may be conducted on a variety of topics related to karst geology and do not need to be specific to Mammoth Cave. During the week of the course the instructor will create time to discuss possible topics.

What To Expect: Participants are expected to provide their own caving equipment: helmet, 3 sources of light (to include a headlamp), sturdy boots with aggressive tread, kneepads, gloves, and cave pack. It is important that participants be in good physical condition. Some trips will require that we eat lunch in the cave. Participants should be prepared for lunch in the field, and be prepared to remove any and all trash / waste. We will practice the principles of Leave No Trace. We will place the utmost focus on the safety of each individual in the course through teamwork, and we will collectively focus on the protection and

preservation of the natural environment of the cave. In addition to the cave environment participants should also be prepared for hiking through the woods which could expose them to hot/humid weather, poison ivy, ticks, mosquitoes, and venomous snakes.

Participants are also required to follow all safe caving practices! The first priority for all participants in the course is caving safety. It is imperative that all safe caving rules are followed. There will be no tolerance for cavers who are not following instructions and putting their safety or the safety of others at risk. The second priority of the course is resource protection. We have been given a unique opportunity to visit places in Mammoth Cave and other caves. We will take every precaution to protect all cave resources and to have as little impact on the cave as possible. Once again, there will be zero tolerance for participants who are not respecting the resource protection policy. Ultimately, the reason for the course is a focus on education. We will focus on teamwork, and building friendships throughout the week. We fully expect to have a great time together

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Schedule

Sunday 6pm Meet and Greet

Meet at the Conference Room at Hamilton Valley to meet your instructor and fellow participants, as well as representatives of Western Kentucky University, Mammoth Cave National Park, and the Cave Research Foundation. We will spend 1-2 hours introducing ourselves, preparing participants for the coming week, orienting everyone to Hamilton Valley, Mammoth Cave National Park, and the surrounding area, and addressing any questions and/or concerns. This will also provide participants that have arranged to stay at Hamilton Valley the opportunity to check into their rooms. The Meet & Greet is mandatory for all participants – not just for those staying at Hamilton Valley! By addressing questions/concerns, gear-related issues, etc. on Sunday night, we can avoid dealing with these issues on Monday and delaying cave trips. Following the Meet & Greet students often collaborate on meal planning for the week, and travel to a nearby grocery store to obtain supplies for the week. Each participant is responsible for their meals during the course.

Monday:
Morning lecture: **Introduction to karst landscapes and the Mammoth Cave region.**
Afternoon Field trip: Introduction to Mammoth Cave geology on the Historic Tour of the Mammoth Cave System. Monday evening speaker & discussion

Tuesday:
Morning lecture: **Hydrogeology of Mammoth Cave and surrounding region**
Afternoon field trip: Surface hydrology tour from the Chester Uplands, Dripping Springs Escarpment, Cedar Sink, River Styx, Echo River/Accessory, and Turnhole Springs. Tuesday evening speaker & discussion

Wednesday
Morning lecture: **Geological controls in the Mammoth Cave System and surrounding area**
Afternoon field trip: Field exercise in Adwell and Dogwood Caves (Hamilton Valley property)
Wednesday evening, interpretation of field data and comparison of two caves.

Thursday:
Morning Lecture: **Speleogenesis and Cave morphologies**
Afternoon field trip: Carmichael Entrance to Cathedral Domes
Thursday evening speaker and discussion

Friday:

Morning lecture: **Comparison of Mammoth Cave to other significant cave systems in the world. Why is Mammoth Cave the Longest in the World?** Afternoon field trip: Great Onyx Cave. Friday evening cookout