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THE UNIVERSITY
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at CHAPEL HILL

COLLEGE OF ARTS & SCIENCES

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Administrative Board of the College of Arts & Sciences
Office of General Education
CB #3510
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JMU Geology Field Course in Ireland- Summer

Dear Colleagues:

The Department of Geology and the Study Abroad Office are submitting a proposal to add James Madison University's Geology Field Course in Ireland to the UNC approved list of study abroad programs.

Program overview

This six week faculty-led summer study abroad program is a geology field course offered in western Ireland by JMU's Department of Geology and Environmental Science. Students are enrolled in JMU's GEOL 399: Field Geology course (6 credits), a capstone course for geoscience majors. By completing this program, UNC Geology majors earn transfer credit for GEOL 601 and GEOL 602 and they satisfy the geology field camp requirement.

More information about the program can be found online:

<http://www.jmu.edu/international/abroad/programs/jmu-ireland-geology.shtml>

Program Dates

The Summer 2015 program ran from May 19 – June 28, 2015. The dates for 2016 and beyond will be similar.

Program rationale

UNC Geology majors must complete a field camp as part of their degree. UNC does not offer a field camp; therefore, all students are required to fulfill the requirement through another university. Some of these opportunities are domestic, though the JMU field camp is international, allowing students to satisfy the field camp requirement while also having an international experience. Western Ireland is an ideal location for this program because it exposes diverse geology in a small area and students are able to conduct projects in unique natural environments. When students are not working on their projects, they have time for leisure activities and cultural visits to nearby towns, such as Galway.

Many UNC students have participated in this field camp through the Study Abroad Office petition process. Students, faculty, and staff will be best served if the program is added to the approved list.

Location

The program is based in the village of Clonbur in County Galway in Western Ireland, about an hour north of Galway. Most of the course is housed in the Petersburg Outdoor Education Centre (a traditional Irish government-run outdoor education center). The course also travels to Doolin to spend a week in the karst limestone of the Burren and then to Portstewart for a couple of days.

Students interact with the staff and visitors of the center as well as the residents of Clonbur, providing the program participants with a cultural experience.

Resident Director

Dr. Steven Whitmeyer from the Department of Geology and Environmental Science at JMU leads the program and teaches the course. Dr. Whitmeyer's CV can be found online: <https://www.jmu.edu/geology/people/all-people/whitmeyer-steve.shtml>

Additionally, faculty and graduate students from the Department of Earth and Ocean Sciences at the National University of Ireland, Galway (one of UNC's student exchange partners), regularly participate. More information about the department can be found online: <http://www.nuigalway.ie:81/eos/>

UNC professor, Drew Coleman, led the field course from 1997-2000 when he was a professor at Boston University. Steven Whitmeyer served as his graduate teaching assistant on the program. Dr. Whitmeyer took over the course when he joined the faculty at JMU.

Given UNC's involvement with this program, including Dr. Coleman having led the course and trained the current RD, a Study Abroad Office staff member will not undertake a site visit at this time. Additionally, UNC students have participated on this program for the past several years and have given positive reviews.

Eligibility

In accordance with JMU's eligibility guidelines, applicants must be at least juniors with a minimum GPA of 2.0 and have completed the equivalent of JMU's GEOL 110, GEOL 230, and GEOL 280. Applications including an academic recommendation, short essay, and official transcripts are submitted to JMU for review. The academic recommendation carries the most weight, as fellow Geology professors will be best suited to comment on a student's suitability to participate on this type of program. The Geology Department recognizes that it is not unusual for a Geology major to have a GPA less than 3.0.

Accommodation

Students stay in hostels and residence halls. Several meals are provided through the program each week.

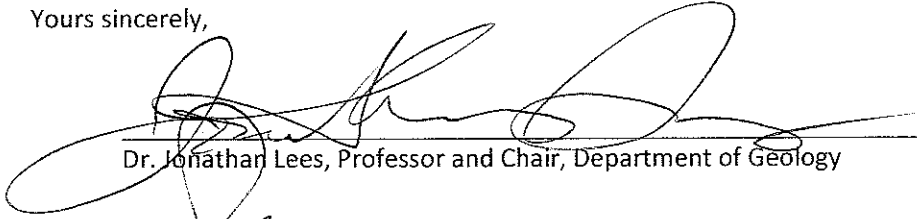
Safety and Health

According to the State Department website's country description for Ireland, Ireland remains largely free of terrorist incidents and has a low rate of violent crime. The most common issue Americans face in Ireland, if any, is that of pickpockets around areas frequented by tourists in cities such as Dublin. Modern medical facilities and highly skilled medical practitioners are available in Ireland.

Students are warned that the field course is physically intensive and includes hiking steep terrain several days per week. JMU's policy and are also covered by HTH Worldwide Insurance through UNC's policy.

We are happy to provide any further information that you may need to evaluate this proposal.

Yours sincerely,



Dr. Jonathan Lees, Professor and Chair, Department of Geology

Aug 19, 2015

Date



Dr. Robert Miles, Associate Dean: Study Abroad and International Exchanges

08.27.15

Date

Addendum to the Study Abroad Proposal for: **JMU Geology Field Course in Ireland- Summer**

The historical and cultural component of the JMU Geology Field Course in Ireland includes the following:

- **Lectures** in the first week of the course by Irish experts on Irish history and regional landscape and its influence on human habitation and Irish culture.
- **“Connemara Culture Day”** includes a tour and lecture about the human history within the Connemara region of western Ireland, including history on the Famine years of the 19th Century. This is led by Michael Gibbons - an internationally recognized expert on Irish history and archeology. The culture day also includes a visit to the Connemara Marble Industries quarry and factory. While geologic, this is also an indigenous industry that has had considerable economic impact on Ireland over the last two centuries. Some of this stone appears in the Senate Chamber of the Pennsylvania State Capitol building in Harrisburg.
- **Optional trips** to Kylemore Abbey and Croagh Patrick, a mountain that is the site of a mountain overlooking Clew Bay, the site of many religious pilgrimages. At the end of the course, students also have the opportunity to visit Giant's Causeway and Carrick-a-Rede, the former site of a small monastery, on the north Antrim coast.

James Madison University Geology Field Course in Ireland

Geology and Environmental Science: GEOL 399

May 19 – June 28, 2015 6 credits

Faculty

- Dr. Steven Whitmeyer, James Madison University. Specializing in structural geology, tectonics, and geospatial techniques. Weeks 1-4.
- Dr. Stephen Leslie, James Madison University. Specializing in stratigraphy and paleontology. Week 1.
- Dr. Eric Pyle, James Madison University. Specializing in metamorphic petrology. Weeks 2-4.
- Prof. Martin Feely, National University of Ireland, Galway. Specializing in petrology, mineralogy, and fluid inclusion geochemistry. Assorted days, weeks 2-4.
- Dr. Margaret (Beth) McMillan, University of Arkansas, Little Rock. Specializing in landscape evolution and GIS. Weeks 3-4.
- Dr. Adam Lewis, North Dakota State University. Specializing in glacial geology. Weeks 4-5.
- Dr. Steve Baedke, James Madison University. Specializing in aqueous geochemistry and hydrology. Weeks 5-6.
- Dr. L. Scott Eaton, James Madison University. Specializing in geomorphology. Weeks 5-6.
- Dr. John Haynes, James Madison University. Specializing in stratigraphy and petroleum geology. Week 6.
- Dr. Tiernan Henry, National University of Ireland, Galway. Specializing in hydrogeology. Assorted days, week 6.
- Teaching Assistants: Lena Cole, Kirsten Siebach

Course Description and Objectives

The Geology Field Course in Ireland is the James Madison University Department of Geology and Environmental Science capstone course for geoscience majors. After completing the field course, you will be qualified to work for an industry, government, or academic employer who needs you to travel to an isolated field area, assess the local bedrock and surficial geology, natural resources, natural hazards, environmental conditions, *etc.*, write a project report, draft a publishable map, compile a database, and return home safely. The main objective is for you to become confident at scientific observation and interpretation of geological problems in the field. You will learn to recognize and interpret a wide variety of rocks, structures, geomorphic, and hydrologic features. Methods of mapmaking, data recording, and report preparation are emphasized. Projects from one to five days' duration are conducted in regions where igneous, metamorphic, and sedimentary rocks, surficial deposits, and karst features are well-exposed.

Specific learning objectives include:

1. Develop competence in a variety of geologic field methods and techniques.
2. Demonstrate confidence with taking field measurements and collecting field data.
3. Develop habits of mind towards constructing geologic maps and supporting materials (cross-sections, stereonet, documentation) to high quality standards.
4. Develop and enhance the capacity to work independently "to do" geology with a professional skill set.

Prerequisites

Physical and historical geology, mineralogy, stratigraphy/sedimentology, structural geology, and petrology are strongly recommended. This means that we expect you to have a working knowledge of common rocks and minerals, some idea of stress and strain and what they can do to rocks, and basic stratigraphic and sedimentologic concepts. But otherwise we presume that we are all starting from the same level. PLEASE ASK ONE OF THE INSTRUCTORS or the Teaching Assistant if you have forgotten/misunderstood/never heard of anything mentioned in class. Everyone forgets some of the things they once knew and it's much better for us to deal with these as we go rather than attempt to build a body of knowledge on shaky foundations.

Attendance is required at all lectures and on all field outings unless you have a legitimate (i.e. medical) reason! If you legitimately miss a class or field exercise, we will arrange for you to do make-up work. NOTE that you will be expected to prepare much of the written material, including clean maps and reports, in the evenings after dinner (a typical day has us in field from 8am-5pm, and in the classroom from 7pm-9pm). We do not give you work to do on your weekly day off, as the instructors will be busy grading your completed work.

Grading

Your final grade will be based on field trip reports and notes, group and independent mapping projects, and assessment projects. All group projects will include a 10% "Participation and Professionalism" grade, which recognizes each individual's contribution to the success of the group's scientific endeavors. Points are gained by being an effective team-player, collaborating appropriately, being punctual, considerate, *etc.* Points are lost for hostile/harassing behavior, non- or grudging participation, tardiness, abandonment of responsibilities, *etc.*

The weighting of projects will be roughly as follows below, but is subject to change depending on weather and/or field conditions. Projects are due by 5 am on the morning after the last scheduled day for each project, unless announced otherwise by the faculty.

| | | |
|------------|--|-----|
| Weeks 1-4: | Lough Fee stratigraphy and mapping project | 15% |
| | Fountain Hill mapping project | 10% |
| | Digital mapping and South Mayo tectonics project | 15% |
| | Independent mapping project | 20% |
| Weeks 5-6: | Glacial Geomorph. or Environ./Hydro project | 20% |
| | Sed. Systems or Hydro/Karst project | 20% |

Projects submitted after the deadline will receive a 25% deduction from the project score.

Reference Texts

General field geology texts: Compton: "Geology in the Field",
Coe: "Geological Field Techniques",
or equivalent.

Readings from selected texts and journal articles will be available on location (e.g. reference list at end of syllabus). You are welcome (and encouraged) to peruse these at your leisure and encouraged to scan some of them prior to arriving on location in Ireland.

Academic and Personal Conduct

All students registered in GEOL 399 are students of James Madison University for the duration of the course, and are subject to the JMU Honor Code (<http://www.jmu.edu/honor/code.html>) and other JMU codes of conduct. We are required to report cases of suspected academic misconduct to the JMU Dean's Office. Penalties for violations of the Honor Code may include immediate suspension or expulsion from the course. Thus, if the conduct of any student is considered by the JMU Field Course faculty or staff to be particularly egregious, you may be removed from the course immediately.

Specific to this course: You should share data only when instructed to do so in collaborative exercises. Otherwise, never read another student's written work nor copy their measurements, maps, or field notes. Do not alter or embellish your own field measurements after the fact.

Drinking: The legal age for drinking alcohol in Ireland is 18. However, students are subject to JMU regulations FOR THE FULL DURATION OF THE COURSE (including the field trip to Northern Ireland). If you drink, you must do so maturely and in moderation, and you are not to disturb the peace of the dorms or the local community. Alcohol is NOT allowed at any of the lodging facilities for the field course: this includes the Petersburg Outdoor Education Centre (POEC), the condos in Doolin, and the hostel in Portstewart. Alcohol is NOT allowed in any vehicles used for the JMU field course. If you violate any of these regulations, cause a serious disturbance, become a danger to yourself or fellow students, or are unable to function effectively due to a hangover, you will be given one warning and then sent home immediately after a second offense.

Smoking: Smoking is not permitted inside the POEC house, in the vehicles, or at the outcrop. Note that all public establishments (including pubs) are smoke-free in Ireland.

Drugs: Recreational drugs that are illegal in the U.S. are also illegal in Ireland. If arrested for a drug offense you will be expelled from the course, and you will be responsible for arranging your own legal representation and/or bail. The Gardai (police) are not required to read you Miranda rights and may detain and/or deport you if you are a non-EU citizen.

Sexual conduct: JMU defines sexual harassment as follows: Sexual harassment is unwanted sexual or gender based behavior that occurs when one person has formal or informal power over the other. Please read the JMU policy at <http://www.jmu.edu/assaultprev/Harassment.shtml>. Sexual conduct is harassing when it is unsolicited and unwelcome or offensive. The fact that a person may accept the conduct does not mean that he or she welcomes it. Consensual sexual conduct must be kept private. "Overnight guests" are not permitted in dorms, even if roommates do not explicitly object. For the safety and security of all, anyone not directly involved with the camp MUST NOT be invited into the house, especially after dark, no matter how friendly they may be. If you ask a local person to walk you home, please explain that they must stop at the gate.

Peace and quiet: Petersburg Outdoor Education Center is a serenely beautiful place. Please respect your fellow students' right to enjoy the tranquility. Prior to all working days, excessive noise must be curtailed between 11:00pm and 7am. The kitchen is off-limits during these hours.

Camp life

Breakfast is self-served, and students make their own lunch sandwich before departing. Meal set-up and clean up is done by students on a roster. Efficiency in the morning is essential.

Personal laundry is done on a weekly roster, and you must provide your own detergent (powder only). Please do not break the handles of the front-loader washing machines, which are on a time-switch. Wait two minutes after turning power off and the doors will open without effort. Breaking a handle will cause a back-up in everyone's laundry schedule and thus make you very unpopular. Expect your wash to take over 1 hour due to the environmentally friendly, water conserving nature of front-loaders. Also, washers in Ireland tend to run hotter than you are used to in the States, so be careful of colors bleeding. Dryers with a condenser must have the water tray changed after (sometimes during) each use. Blue jeans may not be tumble-dried – hang them out to dry. There is a weekly laundry of bed linen and towels done by Petersburg staff. Remember - you need to bring your own sheets and towels. Comforters (duvets) are provided.

Email is available during evenings and free days only, via a wireless connection. Note that this is a rural, slow connection (sorry – best we can do in a small town in western Ireland). Phones are not available on location at Petersburg (except for emergency use). There are pay phones in Clonbur – a 2 km walk. Many students purchase international phone cards in order to call home from pay phones.

Many US cell phones will not work in Europe, which uses a different system (GSM). If you currently have AT&T or T-Mobile as your carrier, your phone will likely work in Ireland, but calls home may be very expensive. You should check in advance on international rates. You can also use Google Voice with your global-ready cell phone, or purchase a pay-as-you-go phone on your arrival. These have gotten quite inexpensive, and the “top-ups” can be purchased in most grocery stores or from dedicated vending machines. If you have had an account in good standing with your cell-phone provider for at least 6 months, you can ask them for an “unlock” code so that you can use a SIM card acquired locally.

On free days, you may sleep in and eat breakfast at your leisure. You may eat out provided you give advanced notice to the kitchen staff. Any day trips on free days are organized by students and need to be cleared with the faculty. The teaching staff can provide ground transportation, provided we have advanced notice and a (mostly) full van of students. Kayaking, caving, gorge walking, and some other activities can be arranged (by students) with advance consultation with Petersburg staff. There usually is an extra fee for activities directed by Petersburg staff.

Short list of geological references

- Baxter, S. and Feely, M. 2002. Magma mixing and mingling textures in granitoids: examples from the Galway Granite, Connemara, Ireland. *Mineralogy and Petrology*, 76, 63-74.
- Bowen, D.Q., Phillips, F.M., McCabe, A.M., Knutz, P.C., Sykes, G.A. 2002. New data for the last glacial maximum in Great Britain and Ireland. *Quaternary Science Reviews*, 21, 89-101.
- Cliff, P.D. and Ryan, P.D. 1994. Geochemical evolution of an Ordovician island arc, South Mayo, Ireland. *Journal of the Geological Society, London*, 151, 329-342.
- Cliff, R.A., Yardley, B.W.D. and Bussy, F.R. 1996. U-Pb and Rb-Sr geochronology of magmatism and metamorphism in the Dalradian of Connemara, western Ireland. *Journal of the Geological Society, London*, 153, 109-120.
- Cox, R., Zentner, D.B., Kirchner, B.J., and Cook, M.S. 2012. Boulder ridges on the Aran Islands (Ireland): Recent movements caused by storm waves, not tsunamis. *Journal of Geology*, 120, 249-272.
- Draut, A.E. and Clift, P.D. 2001. Geochemical evolution of arc magmatism during arc-continent collision,

- South Mayo, Ireland. *Geology*, 29, 543-546.
- El-Desouky, M., Feely, M. and Mohr, P. 1996. Diorite-granite magma mixing along the axis of the Galway Granite batholith, Ireland. *Journal of the Geological Society, London*, 153, 361-374.
- Feely, M., Coleman, D., Baxter, S. and Miller, B. 2003. U-Pb zircon geochronology of the Galway Granite, Connemara, Ireland: implications for the timing of late Caledonian tectonic and magmatic events and for correlations with Acadian plutonism in New England. *Atlantic Geology*, 39, 175-184.
- Feely, M., Selby, D., Conliffe, J. & Judge, M. 2007. Re-Os geochronology and fluid inclusion microthermometry of molybdenite mineralization in late-Caledonian Omey Granite, western Ireland. *Applied Earth Science*, 116, 143-149.
- Feely, M., Selby, D., Hunt, J. & Conliffe, J. (2010). Long-lived granite-related molybdenite mineralisation at Connemara, western Irish Caledonides, *Geological Magazine*, 147, 886-894.
- Friedrich, A.M., Bowring, S.A., Martin, M. and Hodges, K.V. 1999. Short-lived continental magmatic arc at Connemara, western Irish Caledonides: Implications for the age of the Grampian orogeny. *Geology*, 27, 27-30.
- Gillespie, P.A., Walsh, J.J., Waterson, J., Bonson, C.G. and Manocochi, T. 2001. Scaling relationships of joint and vein arrays from The Burren, Co. Clare, Ireland. *Journal of Structural Geology*, 23, 183-201.
- Johnson, E.J., Sutherland, C., Amelia, M., Logan, V., Samson, S.D., and Feely, M. 2011. Emplacement conditions of a porphyritic felsite dyke and timing of motion along the Coolin fault at Ben Levy, Co. Galway. *Irish Journal of Earth Sciences*, 29, p. 1-13, doi: 10.3318/IJES.2011.29.1
- Klemperer, S.L., Ryan, P.D. and Snyder, D.B. 1991. A deep seismic reflection transect across the Irish Caledonides. *Journal of the Geological Society, London*, 148, 149-164.
- Leake, B.E. 1989. The metagabbros, orthogneisses and paragneisses of the Connemara complex, western Ireland. *Journal of the Geological Society, London*, 146, 575-596.
- May, C.L., Eaton, L.S., and Whitmeyer, S.J. 2009. Integrating student-led research in fluvial geomorphology into traditional field courses: A case study from James Madison University's field course in Ireland. In Whitmeyer, S.J., Mogk, D., and Pyle, E.J. (eds) *Field Geology Education: Historical Perspectives and Modern Approaches*, GSA Special Paper 461, p. 195-204, doi: 10.1130/2009.2461(17).
- Praeger, R.L. 1937. *The way that I went: An Irishman in Ireland*. Hodges, Figgis, Dublin. 394 p.
- Ryan, P.D. and Dewey, J.F. 1991. A geological and tectonic cross-section of the Caledonides of western Ireland. *Journal of the Geological Society, London*, 148, 173-180.
- Smethurst, M.A., MacNiocaill, C. and Ryan, P.D. 1994. Oroclinal bending in the Caledonides of western Ireland. *Journal of the Geological Society, London*, 151, 315-328.
- Tanner, P.W.G., Dempster, T.J. and Dickin, A.P. 1989. Time of docking of the Connemara terrane with the Delaney Dome Formation, western Ireland. *Journal of the Geological Society, London*, 146, 389-392.
- Whitmeyer, S.J., Nicoletti, J., and De Paor, D.G. 2010. The Digital Revolution in Geologic Mapping. *GSA Today*, 20, 4-10, doi: 10.1130/GSATG70A.1.
- Williams, D.M. and Hall, A.M. 2004. Cliff-top megaclast deposits of Ireland, a record of extreme waves in the North Atlantic – storms or tsunamis? *Marine Geology*, 206, 101-107.
- Williams, D.M. and Harper, D.A.T. 1991. End-Silurian modification of Ordovician terranes in western Ireland. *Journal of the Geological Society, London*, 148, 165-171.
- Williams, D.M., Harkin, J., Armstrong, H.A. and Higgs, K.T. 1994. A late Caledonian mélange in Ireland: implications for tectonic models. *Journal of the Geological Society, London*, 151, 307-314.
- Yardley, B.W.D., Barber, J.P. and Gray, J.R. 1987. The metamorphism of the Dalradian rocks of Western Ireland and its relation to the tectonic setting. *Philosophical Transactions of the Royal Society of London A*, 321, 243-270.