



Geology Fieldtrip

Faculty: Engineering

Department: Civil and Environmental Engineering (CEE)

Module name: Soils and Engineering Geology

Degree: Across all CEE programmes

Level: Year 2 Undergraduate

Format: 2 taught modules, and a 5-day field course

Approximate number of students: 90

Weighting and credit: 80% exam, 20% coursework (80% of coursework is assessed fieldwork, 20% of exam pertains to knowledge taught during fieldwork. There is a total contribution of 32%).

Module ECTS: 5

Insights colour key

Educational Developer

Inclusivity

Learning Designer

Registry

Careers

Assessment overview

The 5-day residential fieldtrip to Somerset, a part of Year 2 Soils and Engineering Geology module, is held at the beginning of the summer term and is designed to test practical geological skills, such as field sketching, geological observation, structural measurements and practical soil analysis. As part of the assessment the students perform an assessed mapping exercise, submit their field books and deliver a group presentation based on a poster.

Design decisions

Assessment rationale

The fieldtrip is aimed to introduce students to geological concepts that they may encounter in their future careers, and provide students with insight into the work that geotechnical engineers do. More broadly, it also helps students to appreciate the importance and quantity of work that goes into fields adjacent to their specialised area. The trip helps the students appreciate the challenges they may face in the future in collecting and collating data in an outdoors environment, which is an environment Civil Engineers may encounter.

Design of the field trip

The field trip lasts 5 days and takes place in Somerset. Days 1 to 3 are focused on geological observation. Day 1 is aimed to familiarise students with the basic skills required for geological fieldwork. The second day begins with a practical demonstration of a hand auger, with students invited to handle the equipment for themselves. Students get more experience with sketching on the second day, and learn about the practical side of soil mechanics. On the third day, the students travel to Meldon, where multiple man-made and geological features can be studied, including a trestle bridge, a quarry and a reservoir. Students have further practice taking geological measurements and drawing field sketches. On the fourth day, students are taken around the Minehead coast to create a geological bedrock map of an area named Culver Cliff. On the fifth day, students stop off at Portishead on the way back to London, where they complete an assessed mapping exercise with the same format as the one on the previous day.

At the end of each day, the lecturers give a short, 15-minute presentation summarising the geology the students have seen.

Design of the assessments

Assessment revolves around 3 components:

- Field notebooks
- Field maps
- Verbal presentation

Maps and notebooks are handed in at 4:00pm at the end the fifth day of fieldwork. The main emphasis of the assessment is the work done in the field, and therefore notes should be reflective of that.



Every evening after dinner, a new group of 15 students are randomly selected from the year. The team is given 3 hours to prepare a 15-minute verbal presentation, with each person speaking for 1 minute, accompanied by a paper poster which summarises the day's geology. The presentation accounts for roughly 10% of the fieldtrip's mark, with the remainder being assessed by their notebooks and field maps.

Fit with other assessment methods on the module

The Soils and Engineering Geology module is split into 3 components. The Soil Mechanics and Geotechnical Analysis components are taught in the classroom during the Autumn and Spring Term respectively. The third element is the fieldtrip. 20% of the total module mark is assessed by coursework, and 80% by an exam. The fieldtrip is considered coursework, and comprises 16% of the total module mark. There is also a mini project on geotechnical analysis, which comprises 4% of the total module mark. The exam is a single 3-hour exam sat in the summer term. It is composed of 5 equally weighted questions: 3 questions on soil mechanics, 1 question on geotechnical analysis and 1 question on engineering geology. The engineering geology question pertains to knowledge taught during the fieldtrip, and is weighted at 16% of the overall module mark. In total, this means fieldwork knowledge accounts for 32% of the total module.

Practicalities

Preparation of students

Preparation before the fieldwork
Before the fieldtrip, a personal safety risk assessment is completed for all the students, which is then signed off by the Civil Engineering Department's Health and Safety Officer. A risk assessment is also completed from a geotechnical perspective (e.g. sea defences, slope stability). Safety is also discussed at every site during the fieldtrip.

A 90-minute introductory briefing takes place around a month before the fieldtrip begins. During this briefing, students are run through risk assessments, briefed about the Civil Engineering code of conduct (expectations of the behaviour of staff and students when working outside Imperial College), and given information on health and safety, including

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information about field skills and appropriate field gear.

Preparation for assessment

Before the fieldtrip, details of the fieldtrip including the assessment requirements are distributed by email, and in the students' field guide. There are also 2 or 3 class sessions, around 2 hours each, on geological map reading, borehole drilling and interpretation, and stereonet plotting. These sessions are followed by a 1-hour practical, where students are able to briefly practice the skills taught in the lecture, with the assistance of the lecturer and GTAs (graduate teaching assistants).

Marking arrangements

The staff and GTAs individually assess each presentation and assign it a mark out of 10, before coming together as a group to discuss. Student presentations are marked based on their understanding of the geology, their presentation skills, and the quality of their poster they produce, including creativity. The students are marked as a collective group.

Assessment is weighted heavier towards the end of the week, with the mapping being weighted the greatest. Practical geology is completely novel to the students. Students learn and improve at different rates and so a flexible marking system is beneficial. The Mapping brings together the range of skills learnt during the week. In cases when it is raining heavily during the mapping day or the students are late arriving at site, more emphasis will be placed on other elements of work. It so about ensuring the students mark is a reflection of their overall effort.

Feedback arrangements

Students receive verbal feedback in the field during the fieldtrip. Students also receive generalised feedback at the end of each day, where the tutors run through a half-hour presentation on the geology seen that day and give a brief evaluation of the day's student group presentation.

Formal feedback on the marked notebook and map is given after the fieldtrip has ended. Aside from the numerical mark, the GTAs also write a short paragraph of written feedback, explaining what the student has done well and where they can improve.



The impact of COVID on the delivery

The COVID pandemic caused the postponement of the trips in the 2019/20 and 2020/21 academic years. No virtual replacement was made available during this time. The Department instead ran the postponed trips as 2 additional, identical fieldtrips on top of the ones normally scheduled during the 2021/22 and the 2022/23 academic years. These extra fieldtrips were for the then-2nd year students that missed out during 2019/20 and 2020/21 (and now take the fieldtrip in the 4th year).

Advantages of the assessment type

- It is a completely different type of assessment for the students and tests a new skill set;
- Although the fieldwork appears to be of low value, in terms of credits, one compulsory question in the exam is based solely of the fieldtrip and this takes a similar format each year. The students are given a photo and asked to do an annotated geotechnical sketch and some accompanying applied interpretation. Again a novel and unusual type of exam questions which is often praised by external examiners;
- The task aligns very well with what the students will be doing after graduation, therefore helps students develop skills needed to be successful in the industry;
- There is a good level of flexibility embedded into how the assessments are run and with considerations given to how the environment might influence students' day to day performance;

Limitations of the assessment type

- It is time consuming, but it is comprehensive;
- It can be a very fast paced environment, especially for students with specific learning needs;
- It can be difficult to move this assessment online, while VR alternatives can be built they are not suitable for every student

Advice for implementation

- It is useful to ensure that a briefing is organised after students' return from the fieldtrip to help them reflect on what they've learnt from it and incorporate it into future career thinking;
- Ensure that preparation for assessment also includes a briefing on working in groups and outlines the requirements of what the presentation is supposed to look like and how it

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will be assessed to help students appropriately direct their efforts

- A discussion around what feedback might look like, especially in the context of fast paced field work environment and the different forms and sources it might come from should help students recognise feedback events and help them make use of them better
- Consider how important time pressure is for achieving the ILOs and/ or replicating an authentic working environment. If it is one of the goals of the module then students should be helped to manage it, if it is not necessary then the value of the time pressure should be reconsidered
- Ensure suitable adjustments are made for students unable to attend for whatever reasons
- Make sure that students with specific learning needs that might struggle with certain aspects of the field work, such as note taking are appropriately supported through offering time to draft and redraft or using technology.