



# GeoScience Outreach and Engagement

## Course Outline

The structure, benefits and challenges of the course, including student and client testimonials



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# Background

GeoScience Outreach and Engagement is a course for final year Honours (and taught Masters) students that has been running for several years in the School of GeoSciences, and attracts students from a wide range of degree programmes (e.g. Geology, Ecological and Environmental Sciences, Geophysics and Geography). The course is designed around the problem-based model of community engagement teaching<sup>1</sup> – where students relate to the community partner as ‘consultants’ working with a ‘client’ developing a ‘product’, where they work with community members or stakeholders to understand and address a particular problem or need (presuming that the students have, or will develop, capacities to solve these).

The course is run over two semesters, starting with a series of skills workshops and development of project ideas alongside identification of relevant clients and subsequent planning, development and delivery of the product. Typical clients span a range of organisations including schools, community groups, museums and country parks. The course students develop expertise

in community and public engagement and knowledge transfer (alongside a host of associated skills that are useful in a range of professions and further education).

The process of developing and delivering the products gives the students highly relevant hands-on workplace experience and associated skills, an opportunity that the majority have not enjoyed during their university careers to date. By doing this they have to utilise their academic skills and knowledge before they can effectively communicate and translate their disciplinary knowledge to the relevant audience, which requires a deep understanding of both their subject areas and the client’s need.

A key emphasis of the course is to develop products with a legacy, so that they can be used year on year by clients, and in many cases developed and disseminated further. Projects are as far as possible made available as learning resources and teacher guides for schools and clusters of schools, materials for professional development, videos, blogs, events etc.



# Learning and Teaching in 2020

The course can deliver on key aspects of the University of Edinburgh's Emerging Vision for Learning and Teaching:

## **Giving students agency to create their own learning:**

The course is defined by student choice - they are given responsibility to define and deliver their projects using knowledge gained from their degree programme, and develop key skills in the process.

## **Extend learning beyond the traditional knowledge centred course:**

Students gain experience and develop their knowledge in a wide range of learning environments (e.g. through service learning, entrepreneurship and outdoors education).

## **Course design for 21st century learners:**

Students make use of the most appropriate and relevant technology to successfully design and produce their products (e.g. mobile phone apps).

## **Focus on multiple learning styles and learning for life:**

Exposure to different learning styles and environments is a central tenet of the course – alongside development of reflective learning tools that are valuable in transition to the workplace and beyond.

“Living in a university ‘bubble’ can provide an individual with many academic skills, but not necessarily life skills or a wider awareness of our place within a wider societal context.

The GeoScience Outreach course encourages students to be creative and simplify their knowledge to make it accessible for a community based project.”



## Benefits & Opportunities

### Students

Students are given the opportunity to develop and deliver relevant knowledge and information, acquiring in the process a range of transferable skills and enhancing employability. Student satisfaction is very high and feedback is overwhelmingly positive.

### Teachers, pupils and the wider public

Effective dissemination results in greater knowledge and understanding of a range of topics and issues (often in subject areas that are not widely taught and understood). New partnerships are created and developed amongst and between all participants, and Scottish education is enhanced, particularly regarding implementation of Interdisciplinary Learning (IDL) in the new Curriculum for Excellence.

“I can’t believe what this course has taught me. It has really increased my skills base.”

### Participating staff and postgraduate students:

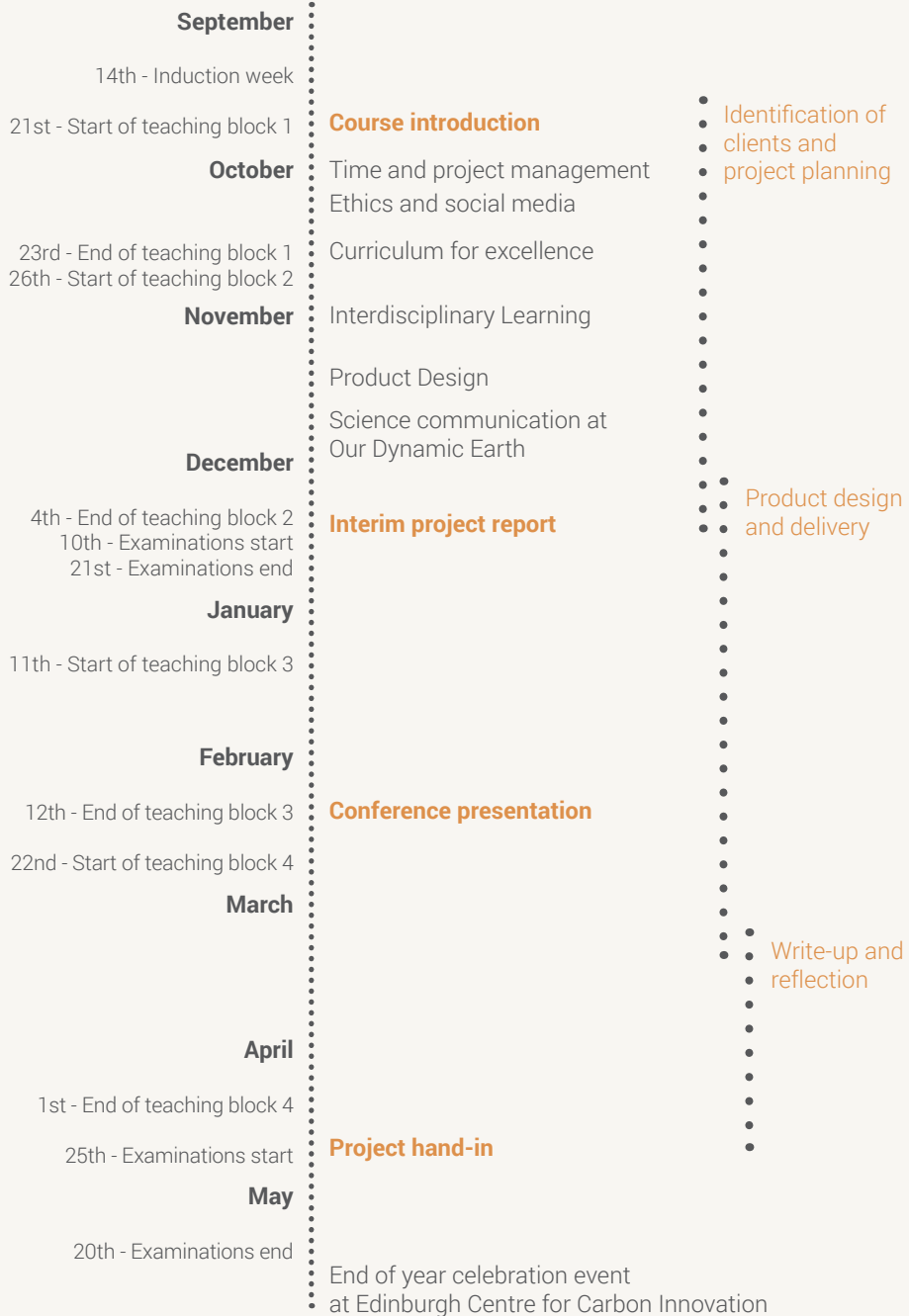
Staff and postgraduate students involved with the delivery of the course enhance their skills in disseminating and communicating their work to wider audiences. This can add value to both their teaching and funded research programmes, helping to support Pathways to Impact focused on knowledge exchange and wider dissemination of research results (relevant to the Research Excellence Framework 2020).

### University

The course is an effective way of mainstreaming community engagement, and embedding it within the curriculum (aligning with key points of the University’s strategic vision). The course also provides the opportunity to promote collaboration and interdisciplinarity across University Schools, allowing for a safe space to trial new teaching methods and linking to wider initiatives (e.g. the living labs<sup>2</sup>).

# Key dates, lectures and milestones

(Based on 2015-2016 academic year)



# Resource

- Typical staff resource is 5 and 10 hours per student for the 10 and 20 credit course respectively.
- Contact time is greater in semester 1 - particularly engaging with relevant clients and development of project ideas.
- Support in semester 2 is more ad hoc with progress updates and advice/support if required.
- Potential to support delivery of semester 1 modules across disciplines and Schools.

# Assessment

## Formative:

**(15%)** Interim report and conference presentation

## Summative:

**(40%)** Final product

**(20%)** Technical Report

**(20%)** Reflective diary/journal and project timeline

**(5%)** Personal reflective document

Students are given a series of workshops and lectures in semester 1 covering a range of topics relevant to the design, planning and delivery of their projects. During Semester 1 the students identify possible projects and clients. Design and initial delivery of the product usually commences towards the end of semester 1 (although this is flexible and to a large extent determined by the clients needs and availability).

Regarding workload spread the course is not strictly either 'short and fat' or 'long and thin' – it is a combination of both and the workload spread is largely determined by the client's needs – meaning the students have to manage their time accordingly. There are often clashes with dissertation hand-ins, exams and other courses, however students are forewarned and in most cases manage this appropriately.

# Challenges

Work done exploring the potential to disseminate and adapt the course across the University has highlighted a series of challenges to implementation (**alongside some potential enablers and solutions to overcome these**).

## Staff:

Identifying staff team members with previous experience of outreach and community engagement (or interest in and willingness to learn), and commitment to the ethos and delivery of the course are key to its success.

**This can be mitigated by utilising existing expertise and networks across the University (e.g. Beltane Public Engagement Network, Widening Participation (WP), Education and GeoSciences), and provision of training courses or resources through IAD (e.g. tools for reflection and other relevant techniques).**

## Culture:

The course is very different to more traditional styles of teaching, and requires a change in teaching methods, approaches and mindset.

**Highlighting the range of benefits (to staff, students and community) alongside the potential to generate and evidence impact linked to research will help key stakeholders realise the broad advantages of this type of teaching. Support and development opportunities for staff (including the Edinburgh Teaching Award) are also available through the IAD.**

## Resource:

There is a widespread perception that the course is expensive to both run and implement.

**Collaborative delivery of course workshops and mentoring of interdisciplinary projects will help realise economies of scale, alongside a recognition of staff effort commensurate with final year projects. Funding from relevant sources (e.g. Principal's Teaching Award Scheme) can be used to support the potential implementation of the course (e.g. Edinburgh College of Art).**

## Timing:

There is often a clash with final year projects and dissertations.

**The course could be offered in 3rd year (or across 3rd/4th years), or course deadlines could be shifted to avoid timetabling clashes.**



**Clients:** Lack of a suitable client network will hamper implementation of the course.

**Existing networks (e.g. GeoSciences, Beltane Public Engagement Network, Education and WP) have a very wide range of clients who require resources from other academic disciplines (and would benefit from interdisciplinary projects). Students are also encouraged to find their own clients (this has proved successful in the past in GeoSciences).**

**Institutional:** Designing interdisciplinary / cross-school projects and utilising resources from different schools is hindered by institutional barriers and inflexibility.

**Ad hoc networks can be used to strengthen links across schools, whilst successful interdisciplinary projects (e.g. Design for Informatics / Living Labs) are examples of how these barriers can be overcome.**

## Scalability and Transferability

There is potential to adapt this course so it can be run as part of a wide range of degree programmes across the University. Aspects of the training (i.e. the semester 1 workshops) involve generic skills development that is transferable across disciplines.

The flexibility of the projects and subject matter make it highly transferable across disciplines, and clients have expressed a desire for projects in areas outside of GeoSciences (e.g. primary schools requiring teaching materials across a range of subjects). A large proportion of previous projects have been of an interdisciplinary nature (and there have been collaborations with Architecture and Landscape Architecture in 2013) – and moving forward the GeoScience outreach programme would gain benefit from working with other Schools to

take advantage of the interdisciplinary skills available across the University.

Use of some of the key project principles (e.g. using interdisciplinary approaches to tackle issues spanning health and GeoSciences) at smaller scales is going to be trialled in the 2015/16 academic year in collaboration with Medicine, alongside accepting students from other schools (e.g. Informatics and Architecture) onto the course. There are plans to trial the course model in 2016/17 in the Schools of Art, Architecture and Landscape Architecture (potentially as a combined course spanning the two schools), and potentially Informatics and Biology.

If you are interested in running a pilot or implementing the course contact Dr Andy Cross at [andrew.cross@ed.ac.uk](mailto:andrew.cross@ed.ac.uk)


# Client Base

Development of meaningful and sustainable relationships with clients since the inception of the course has been key to its prolonged success. One of the initial challenges of the course was finding appropriate clients to match the range of student disciplines, expertise and project ideas. This was overcome by exploiting existing links to schools and community groups through on-going outreach activities, and encouraging students to suggest their own potential clients.

Many of the clients (e.g. schools) have expressed a desire and need for resources in other disciplines beyond geosciences, and are 'ready-made' clients who could be utilised by schools looking to pilot the course (or aspects of it). Strong ties with the Widening Participation programme at the University of Edinburgh also provide a resource of potential clients in Schools across Edinburgh.

The course has had a wide range of clients since its inception: 31 primary and secondary schools, 32 trusts and organisations, 12 science centres, museums and zoos, 9 local authorities and communities. The vast majority are 'repeat' clients, and there is large demand for students every year (the limiting factor being student numbers and suitability for relevant clients). Although the client list has been developed and nurtured over the years, students are encouraged to suggest their own projects and clients where appropriate.

"It has been good to take my learning out into the community and give something back."



We have well over **100**  
clients drawn from a wide  
range of organisations:

Education Sector (primary and secondary)

Schools, private and state

Scottish Government

Scottish Education

Learned Societies

Local Government, Ranger services

Community groups

Research groups

Museums, Science Centres, Arts Groups

Science Festivals

Local interest groups

Museum  
of Scotland



# Example Projects & Testimonials

## Jakob Assman

'Nothing goes to waste in nature'

**A series of educational resources developed for primary school children with complex behavioural and emotional needs. Resources focused on the organic matter cycle with lots of hands on, interactive activities.**

"My GeoScience Outreach project at Harmeny School was fun and challenging at the same time. I learned about communicating science to children and teachers, time management, how to survive a day in the classroom and - of course - how rewarding it can be!"

"I would like to thank you for the wonderful student that you assigned to us. Jakob worked extremely hard and showed great understanding of the needs of our children. He produced creative activities that fully engaged the children. I am sure you will have much to celebrate if all the students produce work of this quality"

**Linda Gowans,  
Harmeny School (Client)**



**Roseanne Smith:**  
**'The sea-level story'**

**A series of classroom resources including lesson plans and hands-on experiments for S2 students exploring the causes of sea-level change (natural and man-made) over the past 20,000 yrs.**

"The Outreach course allowed me to develop new skills in communication, leadership and time-management, and encouraged creativity and initiative in a way that other courses didn't. This, together with the experience of working in schools, really helped build my confidence throughout my final year, and helped me secure jobs at Our Dynamic Earth and the Edinburgh International Science Festival after graduating."

"Great lessons by Roseanne and my Geography colleague is enthused to incorporate the work into the S2 course"

**Steve McLeister,**  
**Boroughmuir High School (Client)**



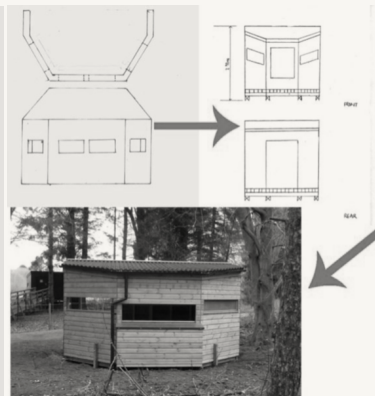
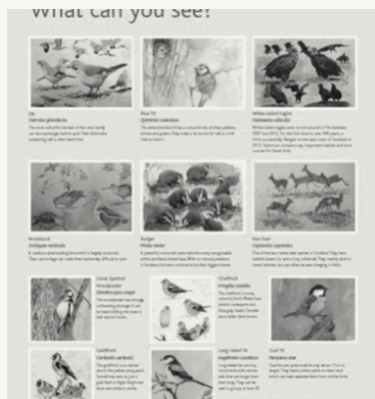
## Callum Bachell: 'Red squirrels at Tentsmuir'

**Creation of a red squirrel hide and accompanying interpretation panels for the general public at Tentsmuir National Nature Reserve, one of the best places for seeing red squirrels in the UK.**

"The course provided me with experience of working on a collaborative project between several organisations in an effort to teach the public about an important aspect of our natural heritage. This experience was invaluable when it came to applying for jobs after university, helping to land me a job in the Community Greenspace department of Perth and Kinross Council (PKC). Working alongside the ranger service, much of the work I did with PKC involved projects requiring a similar approach to the course and engaging with the public about natural sciences."

"It was a brilliant opportunity to get involved with GeoScience Outreach as a client. It meant I was able to achieve significantly more with my limited project resources whilst also providing Callum the chance to develop new and existing skills that will help him in the workplace. From the onset it was important for my purposes to have an achievable and useful resource and the end result exceeded my expectations."

**Sophie Eastwood,  
Fife Red Squirrel Project (Client and former student)**



# References

1. Heffernan, K. (2001). Fundamentals of service-learning course construction. Campus Compact. Providence, RI.
2. [www.edinburghlivinglab.org](http://www.edinburghlivinglab.org)

To run a pilot version or arrange for your students to participate in the course contact Dr Andy Cross at [andrew.cross@ed.ac.uk](mailto:andrew.cross@ed.ac.uk)

Open educational resources developed through the course can be found at TES connect: [www.tes.co.uk](http://www.tes.co.uk) and [www.open.ed.ac.uk](http://www.open.ed.ac.uk)

Links to this and other relevant case studies: [www.wiki.ed.ac.uk/display/casestudies/IAD+Case+Studies](http://www.wiki.ed.ac.uk/display/casestudies/IAD+Case+Studies)

Other opportunities for students to get involved with community engagement at Edinburgh: [www.edinburghconnected.ed.ac.uk](http://www.edinburghconnected.ed.ac.uk)



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