GEOGRAPHY

Advanced Higher

Kindrogan Field Centre Residential Course
Welcome to Kindrogan education resource!

Kindrogan provides a 3, 4 or 5 day residential course. We cover the Physical and Human *Geographical Methods and Techniques* in our programme and plan each day to reflect the *Geographical Study*. Students of all abilities leave us with an improved knowledge of field-skills and an understanding of their application and analysis. We aim to provide each student with a unique, engaging and entertaining outdoor learning experience.

To find out more, contact us at Kindrogan Field Study Centre

Tel: **01250 870150**

Enquiries and administration: [enquiries.kd@field-studies-council.org](mailto:enquiries.kd@field-studies-council.org)

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# Course Outline

## 3-day programme

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning</th>
<th>Afternoon</th>
<th>Evening</th>
</tr>
</thead>
</table>
| Day 1 | Arrive midday  
Welcome and outline of the course ahead.  
- Tour of centre  
- Settle into rooms  
- Allocate waterproofs | Soil Catena Investigation  
Investigate the relationship between soil characteristics down a slope and vegetation.  
- Collect biotic and abiotic primary data.  
- Introduce classic fieldwork sampling strategies.  
- Measure three key soil profiles. | Follow-Up Session  
Students will use data collected for:  
- statistical approach  
- soil analysis  
- data presentation |
| Day 2 | Downstream River Changes  
Students undertake a river investigation to:  
- Introduce topic and create hypothesis.  
- Work as group to collect primary data from upper course river at three systematic sites.  
- Write up methodology to evaluate techniques.  
- Use different data representation techniques to process the data. | | Follow-Up Session  
Students will use data collected for:  
- Statistical approach  
- Analyse data  
- Evaluate investigation |
| Day 3 | Rural Land-Use Mapping  
A morning to map the different types of land-use found in the surrounding area. The session will progress from the simplest data collection techniques to the more complicated GIS tools and demonstrate their transferable nature to other projects. | | Depart midday |

## 4 or 5 day programme

### Additional Day

**Urban Investigation: Regenerating Dundee**
Dundee continues to exemplify regeneration, rebranding and regentrification in an urban area. Our day will take us from the successfully redeveloped Ardler estate on the outskirts of the city, into the centre of Dundee to classify the CBD zone and then out to the ongoing waterfront project. Students will:
- Investigate a case study of urban development.
- Collect quantitative and qualitative data.

### Additional Day

**Glen Shee: Impact of Tourism**
Glen Shee is home to one of Scotland’s ski sites. After an introduction to National Parks and conflict in rural landscapes, students will work in small groups to assess the impact of skiing upon the landscape. Students will:
- Collect biotic and abiotic data.
- Collect quantitative and qualitative data.

**High Ropes Adventure**
A great chance for a bit of adventure and teamwork work on our ‘Leap of Faith’, ‘Crate Climb’, ‘Flying fox’ or ‘High V’.

### Follow-Up Session

Students will use data collected for:
- Statistical approach
- Analyse data
- Evaluate investigation
LEARNING OUTCOMES

Learners will have/be able to:

✓ Knowledge and use of a variety of techniques to gather data in a physical environment.
✓ Knowledge and exemplification of the use of 1 statistical technique to process and analyse geographical data.
✓ Knowledge and exemplification of the skill of analysing information displayed on maps and diagrams.
✓ Knowledge and use of a variety of techniques of presenting information using maps and diagrams.

Data Representation techniques
COVERED
✓ Soil profiles
APPLIED
✓ Slope profiles
✓ Kite diagrams
✓ Pictogram bar graphs
STATISTICAL ANALYSIS
✓ Spearman’s Correlation

Physical Geographical Methods and Techniques
✓ Morphological mapping
✓ Vegetation sampling
✓ Slope analysis
✓ Soil profiles and characteristics

Have a look at:
British Geological Society and other partners provide a useful web-site about Britain’s geology.
www.bgs.ac.uk
The Macauley Institute is an excellent resource for school activities, information and research on soils and their related land-use.
www.macaulay.ac.uk
Vegetation land-cover is shown courtesy of the Macauley Institute.
www.macaulay.ac.uk/explorescotland/lcs_mapformat.html

 Investigate the relationship between slope changes and the vegetation as distance increases down a soil catena.

The afternoon and evening sessions introduce students to the process of completing a Geographical Study. We begin in the classroom to briefly recount the topic of soil development and plan the field work approach.

Outdoors, students work in small groups to collect biotic and abiotic data at systematic intervals. The soil catena follows an interrupted belt transect through different vegetation zones and students will collect enough data so that they will be able to morphologically map the profile of the hill profile and represent the vegetation progression.

The following class sessions give students the opportunity to sample the characteristics of the soil and statistically test its relationship against the slope vegetation.
Plan and research a geographical study
A classroom session that begins with outlining the progression that a Geographical Study follows. We briefly recount the construction of different soils and the processes occurring down a slope. Students construct their own hypothesis and decide a suitable sampling strategy.

Fieldwork measurement and recording techniques
Students work down the soil using ranging poles, clinometers and tape measures to record the slope changes. The percentage frequency of vegetation is recorded using 100sq quadrats and ID charts. Additionally, students take soil samples using soil augers for later pH sampling and soil moisture and measure a variety of soil pits along the transect.

Fieldwork measurement and recording techniques
Students complete the methodological write-up of the field techniques encountered during the day. Students scaffold their answers as a justification, set of limitations and improvements for each field technique and sampling strategy.

Production and interpretation of maps and diagrams
Students apply the best means of presenting their data to demonstrate relationships between related variables. Students are encouraged to demonstrate the strengths and weaknesses of each technique.

Statistical awareness
Spearman’s Rank Correlation coefficient is used to test the relationship between soil moisture and abundance of soft rush. Using SQA exam questions, students must thoroughly justify the application of the statistical choice and analyse the final answer.

Evaluate the learning gained through the research process
A final opportunity to review the research techniques to reach a reasoned conclusion about their effectiveness.
**Downstream River Analysis**

**LEARNING OUTCOMES**

**DATA HANDLING TOOLS**

- **GMTs**

**FURTHER SOURCES & INFORMATION**

- **LEARNERS WILL HAVE/BE ABLE TO:**
  - Knowledge and use of a variety of techniques to gather data in a physical environment.
  - Knowledge and exemplification of the use of 1 statistical technique to process and analyse geographical data.
  - Knowledge and exemplification of the skill of analysing information displayed on maps and diagrams.
  - Knowledge and use of a variety of techniques of presenting information using maps and diagrams.

**DATA REPRESENTATION TECHNIQUES**

**COVERED**

- Proportional symbols
- Box and whisker graphs

**APPLIED**

- Cross-sections & isolines
- OS and sketch map
- River profiles

**STATISTICAL ANALYSIS**

- Pearson’s product correlation

**PHYSICAL GEOGRAPHICAL METHODS AND TECHNIQUES**

- Stream analysis
- Pebble analysis
- Morphological mapping

**HAVE A LOOK AT:**

- **SEPA** include an excellent flood-risk map that demonstrates the 1:50year flood risk in all areas of Scotland alongside all imposed management schemes. [www.sepa.org.uk/flooding/flood_map.aspx](http://www.sepa.org.uk/flooding/flood_map.aspx)

- **The Meteorological Office** provides rainfall data for near your location and across the UK. [www.metoffice.gov.uk](http://www.metoffice.gov.uk)

- **British Geological Society** and other partners provide a useful web-site about Britain’s geology. [www.bgs.ac.uk](http://www.bgs.ac.uk)

**INVESTIGATE THE CHANGES IN A RIVER AS DISTANCE INCREASES DOWNSTREAM.**

A full day to cover the different variables that change as distance down a Highland river increases. We begin in the classroom with a plan of the *geographical study*, including clear aims and structured research questions. We have a choice of rivers, depending upon the weather, which allow us to combine a variety of sampling strategies for data collection.

Small groups of students can either be given data recording sheets or else allowed the challenge of creating their own. At the end of the day, everybody’s data is collated together to calculate variables that help describe the river’s efficiency.

Data representation techniques are combined with map skills to profile the day’s findings in an accessible, accurate and relevant means, with GIS skills introduced.
Summary of the day

Plan and research a geographical study
The classroom session introduces the aims and hypothesis for the day. Students build a description of the drainage basin using a range of secondary resources. Background models including Bradshaw's model and the Hjulstrum Curve as well as Hydraulic radius, Mannings ‘n’ and other downstream variables.

Fieldwork measurement and recording techniques
Students are given GPS units to locate their river section. Downstream changes are chosen using a combination of systematic and stratified sampling. A variety of equipment is used to measure pebble shape and size and downstream changes. Students must also complete a geomorphological map of the neighbouring fluvial features.

Fieldwork measurement and recording techniques
Students complete the methodological write-up of the field techniques encountered during the day. Students scaffold their answers as a justification, set of limitations and improvements for each field technique and sampling strategy.

Production and interpretation of maps and diagrams
Students are demonstrated the best practice of presenting data graphically. Students will complete a sketch map with located cross-sections and isolines. GIS will also be introduced.

Statistical awareness
Pearson’s product moment correlation coefficient is used. Using SQA exam questions, students must thoroughly justify the application of the statistical choice and analyse the final answer.

Evaluate the learning gained through the research process
A final opportunity to review the research techniques to reach a reasoned conclusion about their effectiveness.
LEARNING OUTCOMES

Learners will have/be able to:
✓ Knowledge and use of a variety of techniques to gather data in a physical environment.
✓ Knowledge and exemplification of the skill of analysing information displayed on maps and diagrams.
✓ Knowledge and use of a variety of techniques of presenting information using maps and diagrams.

Data Representation Techniques APPLIED
✓ Rural land-use mapping
✓ Choropleths
✓ Proportional symbols

Physical Geographical Methods and Techniques
✓ Rural land-use mapping

The final morning gives students the opportunity to take a variety of GPS and GIS skills further. A short class session will demonstrate the outcomes of successfully using GIS to represent land-use mapping. We will take students to a vantage point on the local hill-side. From there, students are tasked to undertake a variety of mapping options – biodiversity, land-value, geomorphological features, EQI – alongside a rural land-use map.

Returning to the classroom, students are shown how to use simple and accessible GIS skills to link different data sets to highlight relationships, graphs and patterns.

Investigate the location of rural land-use using mapping skills and GIS.

Have a look at:
Get-A-Map is the Ordnance Survey option to collect a digital map from anywhere in the UK.
www.ordnancesurvey.co.uk/getamap

Google Earth has an amazing variety of aerial photography, street map photos, distance measurements and loads more. Download it if you haven’t already.
www.google.com/earth/download-earth.html

Google Earth Graphs allow you to create situated 3-D graphs. Great fun and very geographical.
www.sgrillo.net/googleearth/gegraph.htm
Rural Land-use mapping and GIS

Summary of the day

Introduce mapping skills and GIS
A classroom session that demonstrates the outcomes and techniques of land-use mapping. Students use standardised mapping techniques and new GIS skills to produce and interpret rural maps.

Fieldwork measurement and recording techniques
Students work in small groups for the mapping exercise with a walk up Kindrogan hill to a vantage point across the Strath ardle glen. From this position, students must map out the land-use use traditional standard techniques. Groups are also given a gridded map to map a range of other values such as biodiversity, EQI and land-value. GPS units are utilised.

Production and interpretation of maps and diagrams
The follow-up takes GIS skills demonstrated earlier in the course further. Rural land-use maps and other primary data are over-layered on digital maps and images. Students learn how to create polygons, situated bar-graphs and detailed GIS annotations to demonstrate data. A rich layer of transferable skills are developed.
Glen Shee: Impact of Tourism

Learners will have/be able to:
✓ Knowledge and use of a variety of techniques to gather data in a physical environment.
✓ Knowledge and exemplification of the use of 1 statistical technique to process & analyse geographical data.
✓ Knowledge and exemplification of the skill of analysing information displayed on maps and diagrams.
✓ Knowledge and use of a variety of techniques of presenting information using maps and diagrams.

Data Representation Techniques

COVERED
✓ Soil profiles

APPLIED
✓ Belt transects for O.S. maps
✓ Kite diagrams
✓ Proportional symbols

STATISTICAL ANALYSIS
✓ Chi²
✓ Simpsons Diversity index

Geographical Methods and Techniques
✓ Morphological mapping
✓ Vegetation sampling
✓ Rural land-use mapping
✓ Environmental Quality Survey

Have a look at:
Glen Shee Ski Centre has all of its information, history and facility information on its web-site.
www.ski-glenishee.co.uk
Cairngorms National Park provides visitor information to supplement an ‘Issues’ written paper.
www.cairngorms.co.uk
Scottish National Heritage implement policy and monitor progress for rural development in the Cairngorm National Park.
www.snh.gov.uk

Investigate the impact of snow sports in the Cairngorm National Park.

The investigation introduces the case study of skiing in Glen Shee. After difficult years, Scottish ski resorts are becoming increasingly successful – and diverse – industries. The potential conflicts that exist within the varying rural land-uses form the basis of this study. At Glen Shee, students will complete a number of qualitative and quantitative data collection techniques. These will build a representation of whether the winter sports have a detrimental or positive impact upon the landscape. Additionally, students have an excellent opportunity to experience the Scottish Highlands and understand the glacial processes that took part in creating the mountain topography. The evening follow-up will include statistical analysis to describe the diversity of vegetation and whether there is an association between different areas.

High ropes Adventure Course

Students have the opportunity to put on harnesses and helmets and climb up our Leap of Faith, Crate Climb, low ropes course of the High ‘V’. This provides a brilliant piece of team work and some light relief in amongst the statistical analysis and primary data collection.
Plan and research a geographical study
A classroom session that begins with outlining the progression that a Geographical Study follows. The day also includes evidence for the ‘Geographical Issues’ paper too. The justification, location and economic history of Scottish ski slopes is introduced and OS maps interpreted.

Fieldwork measurement and recording techniques
Students visit Glen Shee ski resort and work along a belt transect comparing en-piste and off-piste areas of the slope. Students record the abundance and diversity of vegetation, climatic data and soil samples to compare the impact of skiing across the slope. Students also have an opportunity to collect questionnaires, interviews and EQ surveys.

Fieldwork measurement and recording techniques
Students complete the methodological write-up of the field techniques encountered during the day. Students scaffold their answers as a justification, set of limitations and improvements for each field technique and sampling strategy.

Production and interpretation of maps and diagrams
Students apply the best means of presenting their data to demonstrate relationships between related variables. Students are encouraged to demonstrate the strengths and weaknesses of each technique.

Statistical awareness
Chi$^2$ is used to test the association between vegetation diversity on and off piste. Using SQA exam questions, students must thoroughly justify the application of the statistical choice and analyse the final answer.

Evaluate the learning gained through the research process
A final opportunity to review the research techniques to reach a reasoned conclusion about their effectiveness.
Urban Change: Development in Dundee

Learners will have/be able to:
- Knowledge and use of a variety of techniques to gather data in a physical environment.
- Knowledge and exemplification of the use of 1 statistical technique to process and analyse geographical data.
- Knowledge and exemplification of the skill of analysing information displayed on maps and diagrams.
- Knowledge and use of a variety of techniques of presenting information using maps and diagrams.

Data Representation Techniques
COVERED
- GIS skills
APPLIED
- Flow maps
- Choropleth maps
- Proportional symbols
STATISTICAL ANALYSIS
- Chi²
- Nearest Neighbour

Geographical Methods and Techniques
- Nearest Neighbour analysis
- Questionnaire design and implementation
- Use of secondary resources
- Traffic, pedestrian E.Q. surveys

Have a look at:
Dundee waterfront Regeneration is continuing to redesign the city’s focal point.
www.dundeewaterfront.com
Google Earth has satellite imagery that is both contemporary and from the 1950s. Taken together they demonstrate the city’s development.
www.googleearth.co.uk
Dundee census material can be found in the Dundee Council web-site.
www.dundeecity.gov.uk/a2z/censusinfo

Dundee is successfully rebranding itself as the ‘City of Discoveries’. Throughout the urban area, varied development strategies have been implemented to change the identity, increase the popularity and develop the potential of the city. After introducing the history and background urban models to compare the city against, we visit three locations in Dundee. Moving from the regenerated outer-suburbs of the Ardler estate, into the inner-city Albert St and finishing at the rebranded waterfront and CBD. The day involves a variety of quantitative and qualitative primary and secondary data collection techniques. Students aim to represent Dundee’s population bases and development strategies. The afternoon and evening follow-up will assess each methodology, graphically represent the data, demonstrate GIS skills and work through two statistical techniques.
Introduction

Introduction

Field Work

Fieldwork measurement and recording techniques
We will visit three diverse locations in Dundee to compare a suburban location (Ardler estate), inner-city location (Albert St) and the regenerated and rebranded CBD (High St and Waterfront). Students use a collection of qualitative and quantitative data collection techniques.

Methodology

Fieldwork measurement and recording techniques
Students complete the methodological write-up of the field techniques encountered during the day. Students scaffold their answers as a justification, set of limitations and improvements for each field technique and sampling strategy.

Data Representation

Production and interpretation of maps and diagrams
Students apply the best means of presenting their data to demonstrate relationships between related variables. Students are encouraged to demonstrate the strengths and weaknesses of each technique.

Statistics

Statistical awareness
Chi² is used to test the association between housing types in the suburbs, inner-city and CBD. Students must thoroughly justify the application of the statistical choice and analyse the final answer.

Evaluation

Evaluate the learning gained through the research process
A final opportunity to review the research techniques to reach a reasoned conclusion about their effectiveness.

Summary of the day

Plan and research a geographical study
A classroom session that begins with outlining the progression that a Geographical Study follows. The day also includes evidence for the ‘Geographical Issues’ paper too. Dundee is introduced and compared against urban models.

Urban Change: Development in Dundee
KINDROGAN PROVIDES:

- 5 classrooms each equipped with SMART boards
- Conference room
- Accommodation for 113 ranging from single bedrooms to larger dormitories. The majority of accommodation is en-suite (plans to extend en-suite accommodation will continue this winter).
- Our dining room suited to adult learners, school groups or University appetites.
- Games room, TV lounge, drawing room lounge and library.
- Low ropes and high ropes adventure course
- Trained outdoor adventure tutors
- Appropriate insurance and awards to take students on Highland adventures.
- First class local Scottish wildlife (12 on site red squirrels)!

To find out more, contact us at Kindrogan Field Study Centre

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