



FSC Outdoor Classroom for Scotland
Advanced Higher Programmes

Our standard courses are fixed length with clearly stated outcomes and links with SQA Arrangements.

Environmental Biology
3 days

Please visit
<http://www.field-studies-council.org/outdoorclassroom/scotland/advancedhigherbiology.aspx>
for alternative Advanced Higher programmes

OVERVIEW

This three day programme is designed to meet the needs of the Advanced Higher *Environmental Biology* unit, and will cover many of the fieldwork techniques that students will need to master for their examination, and can contribute to the *Biological Investigation* unit.

This is a short course that packs a lot of biology into a limited amount of time. Students will leave with a greater understanding of fieldwork and the skills needed to complete a biological investigation. Students will develop core skills of independent and co-operative learning and working, critical thinking and the ability to communicate clearly and confidently

PROGRAMME LENGTH

3 Days (2 nights with 6 teaching sessions)

Start days: Monday, Wednesday or Friday

Groups would normally arrive in time to be taught in the afternoon of the first day and would then be taught on that evening and for one full day subsequently. Groups depart immediately after the morning session on the day of departure.

Day 1	Day 2	Day 3
Arrive Afternoon & evening sessions	Morning, afternoon & evening sessions	Morning session Depart after Lunch

PROGRAMME CONTENT

Investigations will include:

- Biological sampling methods
- Data collection using a range of observation, measurement and recording fieldwork techniques
- Analysis, presentation and interpretation of data – including statistical tests

All the techniques will be presented within the context of investigating local habitats and species, including:

- Soil ecosystems
- Succession in a hydrosere,
- Freshwater ecosystems – species identification, abiotic/biotic effects, pollution
- Exotic species - biodiversity and conservation

ARRANGEMENT LINKS:

During this programme students will cover the following aspects of the *Environmental Biology* Unit:

Circulation in ecosystems:

- (2) Circulation of nutrients
 - (i) 'Decomposition'

Interactions in ecosystems

- (1) Biotic Interactions
 - (iii) Competition – exploitation competition and interference competition.
- (3) The costs, benefits and consequences of interactions
 - (i) Interaction between species – positive, negative and neutral interspecific interactions
 - (ii) Interactions with the environment- responses to variants in environmental conditions

Human impact on the environment

Changes to ecosystems

- (i) Changes in complexity- autogenic succession and effecting external factors
- (iv) Pollution- biodegradable and toxic pollutants and the use of indicators in pollution monitoring

TIMETABLE

DAY	MORNING	AFTERNOON	EVENING
1	<p>Arrival (approx. 12 - 1pm)</p> <p>Welcome and outline the challenges ahead</p> <p>Tour of centre Settle into rooms Allocate kit (i.e. waterproofs)</p> <p>Introduction to Fieldwork Introductory discussion to explore:</p> <ul style="list-style-type: none"> • The importance of fieldwork in biology • Biological sampling methods and techniques- including random, systematic and stratified sampling • Aims of the three day course 	<p>Freshwater Pollution Study Students will undertake a freshwater investigation to:</p> <ul style="list-style-type: none"> • Identify the factors contributing to freshwater pollution • Collect biotic data – identify and collection of biological indicator species at and below a point pollution source • Collect abiotic data – measure nitrate, conductivity, pH and dissolved oxygen levels at and below a point pollution source 	<p>Follow up session Students will use data collected in the previous session to:</p> <ul style="list-style-type: none"> • Collate group data • Calculate Trent Biotic Index to assess water quality • Use Simpson’s Diversity Index and Jacards Similarity Index • Present findings in graphs, mirror bar-graphs and tables and discuss the limitations
2	<p>Succession of a Hydrosere Students will undertake a fieldwork study to:</p> <ul style="list-style-type: none"> • Discuss the concept of primary and secondary succession • Identify biotic and abiotic factors and how these change from water to dry land, along with indicator species and climax/plagioclimax communities • Collect data along a line transect using systematic, interrupted sampling 	<p>Follow up session Students will use data collected in the previous session to:</p> <ul style="list-style-type: none"> • Calculate the moisture percentage in the soil samples taken • Produce kit diagrams showing the abundance of species and associated abiotic data • Calculate diversity using Simpson-Yule method 	<p>Exotic Species study Preparation Students will set pitfall traps in birch woodland and <i>Rhododendrum ponticum</i> in preparation for day three exotic species study</p>
3	<p>Exotic Species study Students will undertake an exotic species study using <i>Rhododendrum ponticum</i> and soil and invertebrate communities in Kindrogan wood to:</p> <ul style="list-style-type: none"> • Discuss the effect of exotic species and conservation • Identify invertebrates found in pitfall traps • Measure soil pH. Soil moisture, light intensity and relative humidity • Sample leaf litter and tree beating • Discuss and evaluate fieldwork techniques used 	<p>Lunch and Depart</p>	

Please note: to ensure safe and quality learning experiences for students the timetable may alter depending on weather conditions and local factors at centres.

FSC KINDROGAN

Located in rural Perthshire, at the edge of the Cairngorms National Park FSC Kindrogan is 11 miles from Pitlochry's mainline train station and close to the A9. The Centre itself is set in wooded grounds on the banks of the River Ardle and lies within easy reach of some of the most inspiring landforms in the Scottish Highlands and a rich range of wildlife habitats.



KD

Kindrogan

Tel: 01250 870150

TO BOOK THIS PROGRAMME, SIMPLY:

1. Choose the time of the year you would like to attend
2. Check availability online or contact FSC Kindrogan

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The FSC prides itself on being flexible. If you can't find a programme to meet your exact requirements a course specifically tailored to meet your needs can be developed. To discuss this, contact the centre of your choice. Fees will depend on what time of year you would like to visit and your length of stay, but will be more expensive than FSC programmes at peak periods.