

# **BL3000: JUNIOR HONOURS FIELD COURSE**

**Orielton Aug. 24<sup>th</sup> – Aug. 31<sup>st</sup> 2016**

**(Please bring this course booklet with you!)**

School of Biology  
University St Andrews

**Module Organisers:  
Dr Andrew Blight & Prof David M Paterson**



**Firstly**, Orielton will be your welcome to Honours, and your first chance to amass marks toward your final degree. The course is varied and interesting but how much you learn will depend on your planning and commitment. A great advantage of leaving St Andrews is the lack of distraction from other pressures and the ability to spend time concentrating on a single area of work. We hope you enjoy this freedom.

The following booklet contains some notes for guidance and you should **pay close attention to the safety information** contained at the back of the booklet. Copies of the Natural Environment Research Council's (NERC) fieldwork guidelines are also available in each laboratory and from staff, or from this link: [www.nerc.ac.uk/about/policy/safety/procedures/guidance-fieldwork/](http://www.nerc.ac.uk/about/policy/safety/procedures/guidance-fieldwork/)

The Student Handbook (produced for students) is also available at: [www.st-andrews.ac.uk/studenthandbook](http://www.st-andrews.ac.uk/studenthandbook). This webpage outlines University regulations in more detail and should answer any additional questions you might have that are not outlined in this module handbook.

If you are unsure about anything to do with the module and are looking for advice or guidance please contact Dr Andrew Blight ([ajb34@st-andrews.ac.uk](mailto:ajb34@st-andrews.ac.uk)).

**Absence:** If for any reason you are unable to attend the course you must let us know as soon as possible. You must also complete a Self-Certificate of Absence via the following link: [www.st-andrews.ac.uk/students/rules/selfcertification/](http://www.st-andrews.ac.uk/students/rules/selfcertification/) and contact Student services ([studentservices@st-andrews.ac.uk](mailto:studentservices@st-andrews.ac.uk)) for further advice.

**Struggling?** If you find that things have gone horribly wrong and that you cannot cope with the workload, please talk to someone. You can contact Dr Andrew Blight ([ajb34@st-andrews.ac.uk](mailto:ajb34@st-andrews.ac.uk)) and/or help is at hand from Student Services (1st floor in the Union Building, [studentservices@st-andrews.ac.uk](mailto:studentservices@st-andrews.ac.uk) telephone: 01334 462720).

### **Travel and local information:**

Please note that the University does not provide transport to the course and that students are free to plan their own transport arrangements and might consider some joint travel plans to reduce costs. If you are thinking of arranging joint transport please do so as early as possible to avoid disappointment. A young person's rail card is often worthwhile. Local information and travel details can be found at [www.field-studies-council.org/centres/orielton.aspx](http://www.field-studies-council.org/centres/orielton.aspx). It is advisable to arrange you travel sooner rather than later to avoid last minute high prices.

**Please let the centre know when you will be arriving.** Once they have this information we can arrange to collect you at the train station if needed (Pembroke). Orielton Field, Centre, Pembroke, Pembrokeshire SA71 5EZ, Tel: 0845 330 7372. Likewise, if you plan to drive please also let the centre staff know.

### **Costs:**

*The cost of the course is heavily subsidized by the University but students are asked to pay £100 towards upkeep for the week. We will contact you with details on how to make an online payment using the University online payment services.*

### Course Content:

The aim of the course is to provide you with an introduction to working in the field and developing relevant academic skills such as: the design of experiments; logistic planning; the gathering-analysis-assessment of data; and the presentation of results. In addition, transferable skills such as the organisation of large working groups, small group work, working to deadlines, the application of statistics, and presenting material (oral and written) will be developed. Importantly, the course will also be an opportunity to meet and work with your new honours colleagues.

### Summary timetable:

Day		All		Tide times
<b>Wed 24<sup>th</sup> Aug</b> <b>ARRIVAL</b>	18.00 Dinner, introduction, safety	Marine ecology lecture (19.45 in Marine Laboratory)  Assessments lecture (with handouts)		
		<b>Groups A/B</b>	<b>Groups C/D</b>	
<b>Thurs 25<sup>th</sup></b>		Sheltered shore Data collation and analysis Data analysis lecture	Moderate/Exposed shore Data collation and analysis Data analysis lecture	LT – 06:05 1.6m
<b>Fri 26<sup>th</sup></b>		Moderate/Exposed shore Data collation Finish analysis Experimental design lecture	Sheltered shore Data collation Finish analysis Experimental design lecture	LT – 07:11 2.0m
<b>Sat 27<sup>th</sup></b>		Dune system Data collation and analysis Project discussions	Dune system Data collation and analysis Project discussions	LT – 08:35 2.2m
<b>Sun 28<sup>th</sup></b>		Projects start	Projects start	LT – 09:57 2.1m
<b>Mon 29<sup>th</sup></b>		Projects	Projects	LT – 11:03 1.9m
<b>Tues 30<sup>th</sup></b>		Finish Projects Presentations Final meeting.	Finish Projects Presentations Final meeting	LT – 11:56 1.5m
<b>Weds 31<sup>st</sup></b>	<b>DEPART</b>			

### Assessment:

The course is assessed on 4 pieces of work:

- Shore surveys online multiple choice quiz (back in St Andrews) (10% assessment weighting)
- Presentation of project results (to take place during the trip) (20% assessment weighting)
- Project report (23<sup>rd</sup> September 2016) (50% assessment weighting)
- Oral examination (back in St Andrews) (20% assessment weighting)

It is important to use a laboratory book to take notes as you go along, it is easy to forget the most obvious points and difficult to remember once you return to St Andrews. It will help if you keep clear, legible and

concise notes. The rapid completion of this work is for your benefit as everything will be fresh in your mind. The workload in Junior Honours can be a bit of a shock after second year, you have been warned! However, do not mistake quantity for quality, it is not necessary to write a novel, please be concise. Staff will be checking your lab books throughout the trip.

### **Project write up:**

When it comes to writing your project, remember:

*Introduction, Materials and Methods, Results, Discussion, References (5 maximum).*

Please note that the results section is not just a list of Tables and Figures but must take the reader through the salient points of the data collected in a narrative style. Start with text and not with a figure or table. Always describe the data itself: “The number of birds increased as the tide fell (Fig. 5)” NOT “Figure 5 shows that the number of birds....”. Also to be avoided- “We used a quadrat..”

We recommend you read some primary literature to get to grips with how to write a scientific report.

We would like you to keep to the following requirements when writing your project report:

<b>Section</b>	<b>Maximum number of pages</b>	<b>Other Notes</b>
Introduction	1	
Materials and methods	1	
Results	1	1 page of text, plus 5 figures <b>maximum</b>
Discussion	1	
References		<b>Maximum</b> of 5 references
Formatting		Double spaced, minimum 11pt font

**Staff:** The module this year will be led by Dr Andrew Blight ([ajb34@st-andrews.ac.uk](mailto:ajb34@st-andrews.ac.uk)). If you have any queries please contact Dr Blight. A number of members of staff will be joining you on the course and will provide you with advice and support. The centre staff are also highly experienced and have in-depth local knowledge and may give some additional help.

**Fieldwork** must be carefully carried out. In the past, field courses were principally about collecting material, returning to the laboratory and identifying the organisms. This is, thankfully, no longer the case. We now prefer to minimize disturbance and so a number of points are important:

If you can identify something in the field you **do not** need to bring a specimen back to the laboratory. Please do not remove specimens from the shore without discussing with a member of staff first. It may help to take a photograph to aid with identification so that the specimen does not have to be removed.

**Important:** Before you go out into the field please make sure that you have signed the attached risk assessment.

**Clothing and kit:**

This is a field course and you will spend extended periods outside each day. Please make sure that you bring appropriate clothing and footwear with you. Anybody not wearing appropriate attire will not be permitted into the field. Although the course takes place towards the end of the summer the weather in Pembrokeshire can be very changeable so make sure you bring warm clothing, items to cover from the sun (you should bring hats and sunscreen) and wet weather gear (if you have your own waterproofs then do bring them, however wet weather kit can also be hired from the centre). Wellington boots or walking boots are recommended on the rocky shore (although wellingtons may offer little protection from slipping on the rocks). If you have trainers please bring them for the sand dune day as these will be less damaging to the environment than wellingtons or walking boots.

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**Projects** are an important part of the work and can be ecological, behavioural, physiological or a combination of these. Most will be marine in nature but a few terrestrial or botanical ones are possible. Discuss your ideas with the staff before starting to establish whether the project is feasible. You will work in pairs (although sets of pairs can work together on different aspects of a similar project if appropriate). You should begin thinking about the project during the first few days and talk to the staff to get your ideas sorted out in advance. **Also** you may suggest your own projects and if possible we will try to help but try to be realistic and bear in mind that equipment is limited and relatively unsophisticated (e.g. the influence of UV radiation on single point mutation is out!). Try and establish a question which can be answered by your work and remember to consider statistics and replication when designing your experiment (you will get a stats lecture before-hand to help). During the projects, groups **MUST** sign in and out from the laboratories and ensure that your plans are known by staff and that pick-up times have been arranged and entered on the board provided. Do not climb cliffs or trees etc. and you must treat the coastal environment with respect, don't go sampling on a wave swept shore beneath the breakers! All students must also read and sign the risk assessment forms appended to this booklet.

**Useful items to bring:**

- A hand lens and penknife may also be useful tools to aid on shore identification.
- Your statistics course notes would also be useful.
- If you have your own portable computer, we recommend that you bring it. *We assume that everyone will use R to carry out their analysis, please make sure you have this on your laptops prior to arriving at Orielton.*
- Small torch
- Lunch box for sandwiches and a thermos flask

**Please bring a shore guide with you if you can, we have a limited number (certainly not enough for one each). The following are recommended:**

Collins Complete Guide to British Coastal Wildlife by Paul Sterry and Andrew Cleave (Paperback, 2012)

RSPB Handbook of the Seashore by Mya Plass (Paperback, 2013).

**General notes:** Keep the laboratory tidy and make sure specimens are labeled and dated.

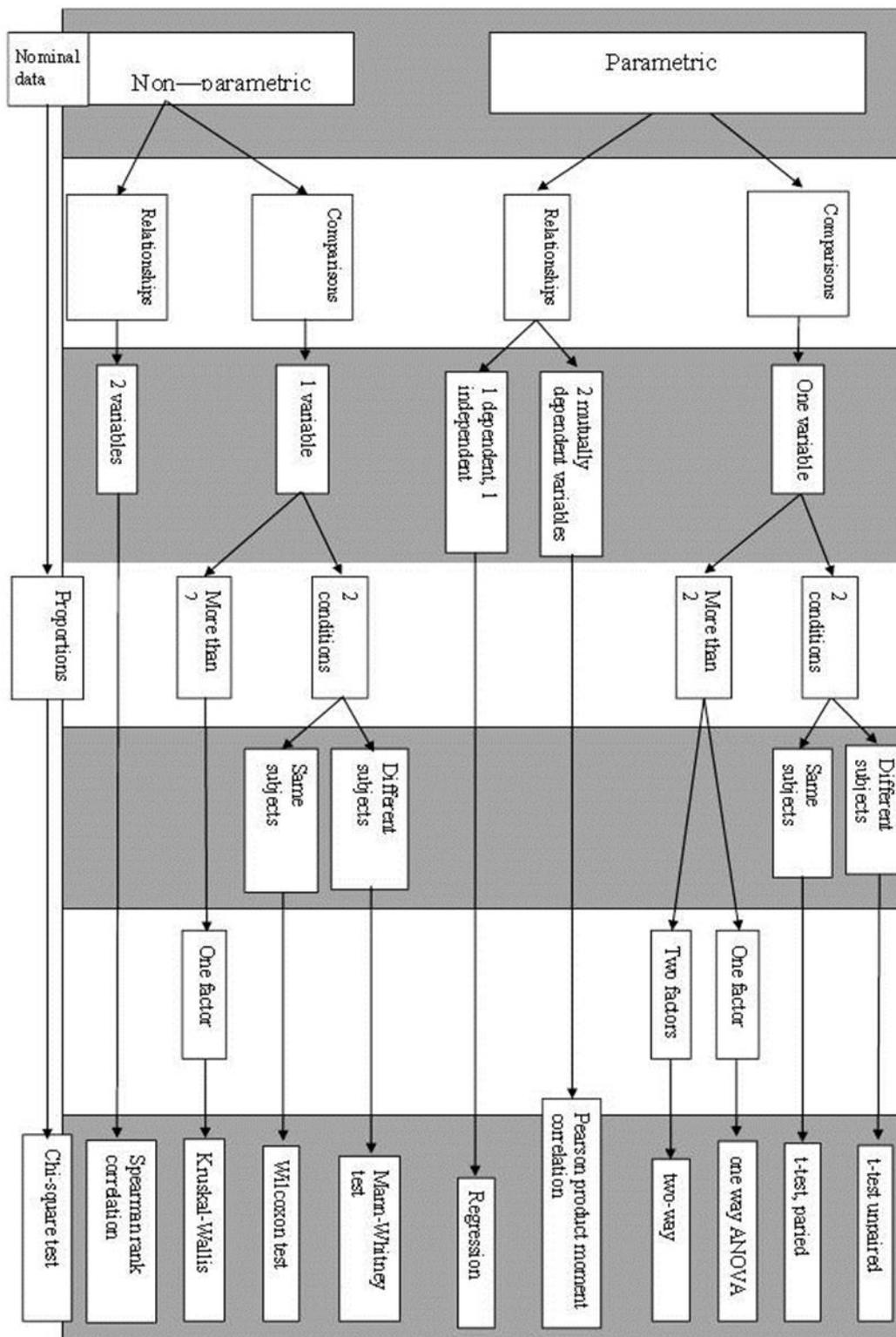
Try not to spill salt water on equipment and/or books. We will bring a small library with us, but please return the books after you are finished with them so that others can use them.



### List of potential projects:

- Diversity of strand line plant communities on rocky and sandy shores and the factors that influence plant distribution within these communities.
- Flow resistance of macrophytes related to shore height, aspect and exposure.
- Gastropod feeding selectivity (warning: collect snails for project a few days before needed, they should have empty guts, only 2 days otherwise they may starve!).
- Colonisation of intertidal macrophytes by epiphyton. Patterns, abundance, species etc.
- Epizoic algae on intertidal gastropods (limpets).
- Attachment strength of intertidal macrophytes in relation to aspect, exposure and species.
- Diversity and occurrence of *Polysiphonia*, *Ceramium* or other selected genus (e.g. *Ectocarpus*).
- Orientation of barnacles, in relation to usual variables.
- Bladders on wracks - size and distribution effects in relation to shore characteristics. Crab or starfish: feeding preferences.
- Crab aggression, different species (best done in the field!).
- Diversity of plant/animal communities in small rock pools, in relation to height, or exposure, pool size, substratum etc. (keep it simple!).
- Diversity of particular groups- e.g. molluscs, or crustaceans.
- Activity rhythms in relation to tides e.g. in collembolans in rock pools (*Anurida maritima*) in periwinkles on weeds and rocks
- Limpet shape/size in relation to heights up shore, aspect, exposure; differences for 3 main species, and reasons why.
- Solitary and colonial-habits of *Anemonia* in relation to pool size etc. Substratum preferences, or salinity tolerances, of *Anemonia* and *Actinia*.
- Diversity of animals in algal holdfasts in relation to shore exposure.
- Botanical survey of woodland types.
- Influence of trampling on dune path development.
- Distribution of snails in sand-dune systems.
- Predator avoidance behaviour of shrimps
- Diversity of macrofauna found in different morphological types of red algae.

(NB: more may be added on site)



Guide to assist you when choosing which statistical test to use.

## **Learning outcomes:**

- Acquire knowledge of the structure and functioning of particular marine environments and their biodiversity
- Participate in field and laboratory work to develop skills and expertise in sampling, identification of species, ecological appraisal, environmental monitoring and management of marine and coastal environments
- Measure and summarise the relevance of ecological processes
- Identify selected coastal plants and animals
- Apply a quantitative approach to field science (Laboratory books, field books, practical report and exam)
- Complete an independent research project based on the collection and analysis of primary data
- Acquire a range of personal and professional transferable skills in project design and management, team-working, report writing, statistics, literature searches, IT and communication and presentation
- Be able to consider the balance of natural and anthropogenic impacts on coastal and marine ecosystems in a holistic context
- Demonstrate enhanced ability to collect, analyse and organise information and ideas and to convey those ideas clearly and fluently, in written, spoken and graphic forms
- Demonstrate enhanced ability to select and use the appropriate level, style and means of communication and to apply scholarly conventions
- Demonstrate enhanced ability to communicate visual, spatial, and statistical information
- Gain appreciation of the importance of marine activities to coastal communities
- Demonstrate ability to evaluate opinions, draw conclusions and to reflect critically on the justifications for those conclusions
- Work safely under lab and field conditions

The learning outcomes can therefore be summarised as fundamental and applied scientific knowledge and skills with clear specialisations in marine biology, marine ecosystems and coastal ecology, skills in data analysis, socio-cultural experience, and improvement in using scientific research and presentation skills. Identify individual and collective goals and responsibilities in a research group and collaborate within the group to maximise output.

**SCHOOL OF BIOLOGY**

**RISK ASSESSMENT FOR FIELDWORK ACTIVITIES**

**Location of Fieldwork Activity:** Field course: Orielton field centre, Wales.

**Description of Fieldwork Activity:**

- Survey of sand dune systems
- Survey of intertidal rocky shores
- Field work in the form of group projects

**Description of significant hazards:** (e.g. work at height, water, cliffs, changeable weather conditions, lone working, etc.)

- Exposure during bad weather
- Personal injury through fall on rocks
- Wave impact
- Sunburn/Exposure

**Groups who may be at risk:** Staff/students with disabilities (X); Technicians (X); Postgraduates (X); Undergraduates (X); Inexperienced staff (X); Academic staff (X); Lone workers ( ); Visitors ( ); Members of the public ( ); Others (specify) ( )

**List existing controls and decide whether these precautions are adequate or more are required**

- Has adequate information, instruction and training been given? Yes
- Are adequate systems or procedures in place? Yes
- Check that -Standards set by legal requirements are being met.
  - Generally accepted standards are in place Yes
  - Precautions represent good practice Yes
  - Precautions reduce risk as far as reasonably practicable Yes

**List outstanding risks and the action to be taken where it is reasonably practicable to do more**

Fall on rocks - Reduce risk by advice on footwear and clothing, no high heels, avoid treacherous slopes, and assess conditions suitable underfoot for class to go ahead. Safety kit (first aid, rope, communication) always available. Log times of departure and return with team member at base. Do not allow individuals to become separated from the group.

Wave impact - Never work within reach of breaking waves over rock e.g. within spray zone of exposed shore. Wave-watcher for each group working near the waterline, even under calm conditions. Be aware of changing tidal conditions.

Exposure - Ensure everyone uses suitable clothing. Refuse to allow individuals without proper apparel to take part. Issue guidance on clothing requirements: e.g. stout boots, waterproofs, etc. Keep thermal blanket in emergency kit within reach of working parties in poor weather. In extreme or deteriorating conditions, cancel trip or shorten outdoor work. Pay attention to the conditions of co-workers for any signs of acute discomfort, loss of concentration, feeling, etc. Ensure workers know to report any feeling of serious discomfort.

Sunburn - Advise use of sunblock and protective headgear.

Snakebite - Adders are rare but present on the dune system. They are rarely seen and avoid human contact. If you do see one do not disturb or interfere with it.

**Laboratory work:** Apply COSHH procedures when working in the field laboratories.

Signature of Assessor .....Date

*(School Field Safety Officer/Supervisor/Project Leader/Module Organiser)*

Name of Assessor:.... Dr Andrew Blight .....Date ..April 2016

Signature of Fieldworker.....

Name of Fieldworker (Block capitals, please) .....