Swansea University
Prifysgol Abertawe

FACULTY OF SCIENCE AND ENGINEERING

UNDERGRADUATE STUDENT HANDBOOK

YEAR 2 (FHEQ LEVEL 5)

BSC MARINE BIOLOGY

DEGREE PROGRAMMES

SUBJECT SPECIFIC
PART TWO OF TWO
MODULE AND COURSE STRUCTURE
2023-24

DISCLAIMER

The Faculty of Science and Engineering has made all reasonable efforts to ensure that the information contained within this publication is accurate and up-to-date when published but can accept no responsibility for any errors or omissions.

The Faculty of Science and Engineering reserves the right to revise, alter or discontinue degree programmes or modules and to amend regulations and procedures at any time, but every effort will be made to notify interested parties.

It should be noted that not every module listed in this handbook may be available every year, and changes may be made to the details of the modules. You are advised to contact the Faculty of Science and Engineering directly if you require further information.

The 23-24 academic year begins on 25 September 2023

Full term dates can be found here

DATES OF 23-24 TERMS

25 September 2023 – 15 December 2023

8 January 2024 – 22 March 2024

15 April 2024 – 07 June 2024

SEMESTER 1

25 September 2023 – 29 January 2024

SEMESTER 2

29 January 2024 – 07 June 2024

SUMMER

10 June 2024 – 20 September 2024

IMPORTANT

Swansea University and the Faculty of Science of Engineering takes any form of **academic misconduct** very seriously. In order to maintain academic integrity and ensure that the quality of an Award from Swansea University is not diminished, it is important to ensure that all students are judged on their ability. No student should have an unfair advantage over another as a result of academic misconduct - whether this is in the form of **Plagiarism**, **Collusion** or **Commissioning**.

It is important that you are aware of the **guidelines** governing Academic Misconduct within the University/Faculty of Science and Engineering and the possible implications. The Faculty of Science and Engineering will not take intent into consideration and in relation to an allegation of academic misconduct - there can be no defence that the offence was committed unintentionally or accidentally.

Please ensure that you read the University webpages covering the topic – procedural guidance here and further information here. You should also read the Faculty Part One handbook fully, in particular the pages that concern Academic Misconduct/Academic Integrity.

Welcome to the Faculty of Science and Engineering!

Whether you are a new or a returning student, we could not be happier to be on this journey with you.

At Swansea University and in the Faculty of Science and Engineering, we believe in working in partnership with students. We work hard to break down barriers and value the contribution of everyone.

Our goal is an inclusive community where everyone is respected, and everyone's contributions are valued. Always feel free to talk to academic, technical and administrative staff, administrators - I'm sure you will find many friendly helping hands ready to assist you. And make the most of living and working alongside your fellow students.

During your time with us, please learn, create, collaborate, and most of all – enjoy yourself!

Professor David Smith
Pro-Vice-Chancellor and Executive Dean
Faculty of Science and Engineering

Faculty of Science and Engineering	
Pro-Vice-Chancellor and Executive Dean	Professor David Smith
Director of Faculty Operations	Mrs Ruth Bunting
Associate Dean – Student Learning and Experience (SLE)	Dr Laura Roberts
School of Biosciences, Geography and Physics	
Head of School	TBC
School Education Lead	Dr Wendy Harris and Dr Sarah Roberts
Head of Biosciences	Professor Luca Borger
Biosciences Programme Director	Dr Ed Pope
Year Coordinators	Head of Foundation Year: Dr Kayleigh Rose Head of Level 1: Dr Chris Lowe Head of Level 2: Dr Kevin Arbuckle Head of Level 3: Dr Penny Neyland Head of MSc: Dr Aisling Devine Head of MRes: Dr Nicole Esteban

STUDENT SUPPORT

The Faculty of Science and Engineering has two **Reception** areas - Engineering Central (Bay Campus) and Wallace 223c (Singleton Park Campus).

Standard Reception opening hours are Monday-Friday 8.30am-4pm.

The **Student Support Team** provides dedicated and professional support to all students in the Faculty of Science and Engineering. Should you require assistance, have any questions, be unsure what to do or are experiencing difficulties with your studies or in your personal life, our team can offer direct help and advice, plus signpost you to further sources of support within the University. There are lots of ways to get information and contact the team:

Email: studentsupport-scienceengineering@swansea.ac.uk (Monday–Friday, 9am–5pm)

Call: +44 (0) 1792 295514 (Monday-Friday, 10am–12pm, 2–4pm).

Zoom: By appointment. Students can email, and if appropriate we will share a link to our Zoom calendar for students to select a date/time to meet.

The current student **webpages** also contain useful information and links to other resources:

https://myuni.swansea.ac.uk/fse/

READING LISTS

Reading lists for each module are available on the course Canvas page and are also accessible via http://ifindreading.swan.ac.uk/. We've removed reading lists from the 23-24 handbooks to ensure that you have access to the most up-to-date versions.
We do not expect you to purchase textbooks, unless it is a specified key text for the course.

THE DIFFERENCE BETWEEN COMPULSORY AND CORE MODULES

Compulsory modules must be **pursued** by a student.

Core modules must not only be **pursued**, but also **passed** before a student can proceed to the next level of study or qualify for an award. Failures in core modules must be redeemed.

Further information can be found under "Modular Terminology" on the following link - https://myuni.swansea.ac.uk/academic-life/academic-regulations/taught-guidance/essential-

info-taught-students/your-programme-explained/

Year 2 (FHEQ Level 5) 2023/24
Marine Biology
BSc Marine Biology[C160,C160]
BSc Marine Biology with a Year Abroad[C107]

Compulsory Modules

Semester 1 Modules	Semester 2 Modules
BIO237 **Marine Invertebrates** **15 Credits** **Dr EC Pope**	**BIO224** **Ichthyology** **15 Credits** **Dr EC Pope**
BIO245 **Boat Based Marine Biology** **15 Credits** **Dr CD Lowe**	**BIO262** **Oceanography** **15 Credits** **Dr CD Lowe**
BIO252 **Ecological Data Analysis** **15 Credits** **Prof L Borger/Dr N Franconi**	
BIO260 **Marine Biology Field Course** **15 Credits** **Dr EC Pope/Dr CM Bertelli/Dr CE Davies/Dr CD Lowe**	
Total 120 Credits	

Optional Modules

Choose exactly 15 credits
75 credits possible in TB1

BI-200	Professional Development and Careers Planning	Miss VV Wislocka	TB1	0
BIO235	Molecular Ecology	Dr Micheal Gwilliam	TB1	15
BIO239	Ecological Microbiology and the Cycles of Life	Prof DC Eastwood	TB2	15
BIO261	Population and Community Ecology	Dr M Lurgi Rivera	TB2	15

And

Choose exactly 15 credits

BIO231	Year 2 Biological Sciences Literature Review	Dr GR Thomas	TB2	15
BIO231C	Adolygiad Llenyddiaeth Bl 2	Dr GR Thomas	TB2	15

Year 2 (FHEQ Level 5) 2023/24
Marine Biology
BSc Marine Biology with a Year in Industry[C424]

Compulsory Modules

Semester 1 Modules	Semester 2 Modules
BI-200 **Professional Development and Careers Planning** **0 Credits** **Miss VV Wislocka**	**BIO224** **Ichthyology** **15 Credits** **Dr EC Pope**
BIO237 **Marine Invertebrates** **15 Credits** **Dr EC Pope**	**BIO262** **Oceanography** **15 Credits** **Dr CD Lowe**
BIO245 **Boat Based Marine Biology** **15 Credits** **Dr CD Lowe**	
BIO252 **Ecological Data Analysis** **15 Credits** **Prof L Borger/Dr N Franconi**	
BIO260 **Marine Biology Field Course** **15 Credits** **Dr EC Pope/Dr CM Bertelli/Dr CE Davies/Dr CD Lowe**	
Total 120 Credits	

Optional Modules

Choose exactly 15 credits
75 credits possible in TB1

BIO235	Molecular Ecology	Dr Micheal Gwilliam	TB1	15
BIO239	Ecological Microbiology and the Cycles of Life	Prof DC Eastwood	TB2	15
BIO261	Population and Community Ecology	Dr M Lurgi Rivera	TB2	15

And

Choose exactly 15 credits

BIO231	Year 2 Biological Sciences Literature Review	Dr GR Thomas	TB2	15
BIO231C	Adolygiad Llenyddiaeth Bl 2	Dr GR Thomas	TB2	15

BI-200 Professional Development and Careers Planning

Credits: 0 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Miss VV Wislocka

Format: 6 hours consisting of live lectures which will include guest lectures with employers, previous students. Face to face delivery.

Delivery Method: All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed activities each week.

These modules are delivered through online resources, scheduled Zoom sessions and 1-2-1 meetings. There is self-directed learning required using online resources provided.

Module Aims: This module is a mandatory module for all students who have enrolled (or transferred) onto the Science Industrial Placement Year but is also available to all other Bioscience students.
The module focuses on the underpinning and fundamental requisites required to gain, enter and progress through a successful career.
Learners will be introduced to
(a) sourcing placements, CV writing, and application techniques;
(b) Interview techniques, how to pitch yourself and be successful;
(c) workplace fundamentals and IP awareness, behaviors and expectations; and,
(d) Key employability skills; getting the most from your job or Industrial Placement.

Module Content: How to find placements and the main sites to use,
Cv writing, CV do's and dont's
Writing a cover letter
Assessments centres, interview techniques and mock interviews
How to utilise LinkedIn for your placement search

Intended Learning Outcomes: By the end of this module, students will be able to:

1) Be aware of and possess the essential skills needed to secure placement opportunities; alongside having the skills to apply for relevant placements.

2) Have a general understanding of an interview process and what tools and attributes make a good interview.

3) Discuss and share what is expected within the workplace including behavioral and professional conduct.

4) Identify personal employability skills and how these will be used in a workplace setting.

5) Understand the need to reflect and maximise the placement experience in future career decisions.

Assessment: Assignment 1 (100%)

Assessment Description: Students are required to attend all taught sessions and the one to one meeting (if required). The module has no credit attached. However to ensure engagement with the content a compulsory quiz will be added in session 5.Students who do not attend and have no valid reason will not be permitted to continue on a Science Industrial Placement Year programme of study.

Moderation approach to main assessment: Not applicable

Assessment Feedback: Feedback will be given once assessments are marked.

For the H&S quiz, there is an automatic pass/fail.

Failure Redemption: Successful completion of this module depends upon satisfactory attendance at, and engagement with, all sessions. Therefore there will normally be no opportunity to redeem failure. However, special provision will be made for students with extenuating or special circumstances.

Additional Notes: Delivery of teaching will be live, whilst assessments will be self-directed activities online.

BIO224 Ichthyology

Credits: 15 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr EC Pope

Format: 15 lectures
3 h mackerel dissection
3 h computer-based practical
4 h aquarium visit
4 h mini-symposium

Delivery Method: In-person lectures and practicals.

Module Aims: This module follows on from BIO105 Animal Diversity to discuss the evolution, ecology, structure, functional physiology and exploitation by humans of the paraphyletic group of animals referred to as fish. A dissection will further investigate fish anatomy, emphasising the relationship between form and function, and a report using online data sources will demonstrate the wealth of data available to ichthyologists in the 21st century. Students will also give short group presentations at a virtual symposium.

Module Content: ectures:

The following distribution of lecture material is indicative; due to the interactive mode of teaching it is subject to modification.

Origins and evolution of fish
Body form and function
Colour, camouflage and bioluminescence
Sensory systems
Buoyancy
Trophic strategies
Respiration (gas exchange)
Osmoregulation
Reproduction and life history strategies
Intertidal fish as a case study
Fisheries

Practicals:

(These are shown as examples and are subject to change from one year to another)

Fish dissection
Use of online repository FishBase
Aquarium visit
Presentation at mini-symposium

Intended Learning Outcomes: At the end of the module the student will be able to:

LO1) Demonstrate a detailed knowledge of the evolution and taxonomic diversity of fish;
LO2) Explain the challenges of living in an aqueous environment;
LO3) Describe fish anatomy and physiology in detail, subtended by laboratory dissections;
LO4) Differentiate the reproductive strategies employed by fish;
LO5) Recognise the constraints placed upon fish by gills;
LO6) Compare teleost and elasmobranch anatomy, physiology, ecology and reproductive biology;
LO7) Access online data repositories, analyse and present downloaded data;
LO8) Discuss the basic concepts of fisheries and fishery science;
LO9) Present on an aspect of fish biology at a symposium;
L10) Conduct behavioural inventories of captive fish.

Assessment: Examination (50%)
Coursework 1 (20%)
Coursework 2 (20%)
Coursework 3 (10%)

Assessment Description: Exam (50% of grade): 30 online MCQ (33%); choice of one out of three essays (online; 67%).
Continuous assessment (50% of grade); 2 practical assignments encompassing use of FishBase (20%) and fish anatomy (20%); 1 group presentation at a symposium (10%).

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Practical reports and exam scripts will receive individual written feedback. Practical classes will also receive group level feedback.

Failure Redemption: Re-submission of continuous assessment and examination

Reading List: Q. Bone author., Richard H. Moore 1945- author., Biology of fishes / Quentin Bone, Richard H. Moore., New York : Taylor & Francis Group, 2008.ISBN: 9780415375627
Carl E. Bond, Biology of fishes / Carl E. Bond., Saunders College Pub, 1996.ISBN: 0030703425
D. H. Cushing, Population production and regulation in the sea : a fisheries perspective / David Cushing., Cambridge University Press, 1995.ISBN: 0521384575

Additional Notes: Delivery will be via in-person lectures and practicals, supported with the Canvas virtual learning environment.

Syllabus as stated is subject to modification due to staff availability.
Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.

BIO231 Year 2 Biological Sciences Literature Review

Credits: 15 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr GR Thomas

Format: 2 Lectures
1 library workshop
1 workshop tutorial
Correspondence with marker
1 Feedback tutorial

Delivery Method: Composite of asynchronous lectures, synchronus sessions, and tutorial workshops. Independent study

Module Aims: This module is designed to develop the core literacy skills of undergraduate students at Level 2 in Biosciences. It
consists of the production of a detailed, 3000 word critical review of a recent topic of scientific interest that is
relevant to the students degree scheme (biological, zoological or marine) and an accompanying scientific poster. Students are required to independently undertake a thorough literature search utilising an appropriate scientific search engine. They must then collate all of the relevant information into a comprehensive review summarising the key aspects of the topic whilst also validating the reliability of the sources of information. Furthermore, students will be required to prepare a poster summarising the key background information and findings of their review. All reviews and posters will be submitted electronically via TURNITIN to ensure compliance with the Universities policies on plagiarism.

Module Content: Lectures and tutorials will encompass:

Lecture 1 - Writing a scientific review and utilising search engines
Lecture 2 - Poster preparation and presentation
Workshop – Database searches and referencing
Tutorial 1 - Group discussion of chosen topics and further guidance
Tutorial 2 - Feedback on first draft from allocated marker
Tutorial 3 - Feedback review and poster

Intended Learning Outcomes: Students will be able to:

LO1) Acquire and recall knowledge of species and biological diversity
LO2) Principles of biology and their applications encompassing the interactions and relationships of organisms with their environment, from single celled organisms to ecosystems and the methods used for their investigation.
LO3) Apply knowledge of the principles and concepts of biological sciences to problem solving in the real world and in artificial systems.
LO4) Design, plan and create an independent literature-based research project and analyse its results critically, interpreting them in the context of current biological knowledge
LO5) To critically assess, evaluate and synthesise information from published scientific sources and use it to construct reasoned arguments and testable hypotheses.
LO6) Draw links and identify themes between the range of scientific subject investigated within constructing meaning from oral, written, and numerical information through interpretation and summarising key component
LO7) Conduct an effective literature search by describing, summarising, evaluating and clarifying scientific information and identify and articulate the relationships between the literature
LO8) Format, reference and structure a scientific review
LO9) Summarise information through the production of a scientific poster
LO10) Design and manage a programme of work to investigate a given problem
LO11) Accept responsibility for and manage their own learning, making use of appropriate texts, journals, electronic resources and other learning resources.

Assessment: Report (75%)
Presentation (25%)

Assessment Description: 3000 word literature review
Poster presentation

Moderation approach to main assessment: Universal Double Blind Marking of the whole cohort
Assessment Feedback: Individual written formative feedback on a draft Written comments and oral feedback on final submission Individual written feedback on poster from tutor and peer review
Failure Redemption: Re-submission of coursework
Reading List: Johnson, Stuart, 1973- author., Scott, Jon, author., Study and communication skills for the biosciences, Oxford University Press, 2019.ISBN: 9780198791461 Boyle, J. and Ramsay, S., Ramsay, Scott,, Palgrave Study Skills: Writing for Science Students, Palgrave, 2017.ISBN: 9781137571519 Jennifer Boyle author., Scott Ramsay author., Writing for science students / Jennifer Boyle and Scott Ramsay., London : Palgrave in the UK is an imprint of Macmillan Publishers Limited, 2017.ISBN: 9781137571519
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.

BIO231C Adolygiad Llenyddiaeth Bl 2

Credits: 15 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr GR Thomas

Format:
2 darlith
1 gweithdy llyfrgell
1 gweithdy yn ystod tiwtorialau
Trafodaeth gyda'r marciwr
1 tiwtorial adborth

2 Lectures
1 library workshop
1 workshop tutorials
Correspondence with marker
1 Feedback tutorial

Delivery Method: Cyfansawdd o ddarlithoedd asyncronig, sesiynau cydamserol, a gweithdai yn ystod tiwtorialau.
Astudiaeth annibynnol.

Composite of asynchronous lectures, synchronus sessions, and tutorial workshops.
Independent study

Module Aims: Mae'r modiwl hwn wedi'i gynllunio i ddatblygu sgiliau llythrennedd craidd myfyrwyr israddedig Lefel 2 y
Biowyddorau. Mae'n cynnwys cynhyrchu poster ac adolygiad manwl a beirniadol o'r llenyddiaeth ddiweddar ar bwnc
sy'n berthnasol i bwnc gradd y myfyriwr (swoleg, bioleg, bioleg y mor). Rhaid i'r adolygiad fod yn 3000 o eiriau o
hyd. Mae'n ofynnol i fyfyrwyr gynnal chwiliad llenyddiaeth drylwyr annibynnol gan ddefnyddio cronfa gwyddonol
priodol neu peiriant chwilio. Rhaid i'r myfyriwr gasglu'r holl wybodaeth berthnasol mewn adolygiad cynhwysfawr sy'n
crynhoi'r agweddau allweddol o'r pwnc tra hefyd yn dilysu dibynadwyedd y ffynonellau gwybodaeth. Ar ben hynny,
bydd myfyrwyr yn paratoi poster yn crynhoi'r wybodaeth hyn yn gryno, ynghyd a chefndir allweddol a chanfyddiadau
eu hadolygiad. Bydd adolygiadau a phosteri yn cael eu cyflwyno yn electronig trwy Turnitin i sicrhau cydymffurfiaeth â
pholisïau y Brifysgol ar llên-ladrad.

This module is designed to develop the core literacy skills of undergraduate students at Level 2 in Biosciences.
It consists of the production of a detailed, 3000 word critical review of a recent topic of scientific interest that is relevant to the students degree scheme (biological, zoological or marine) and an accompanying scientific poster.
Students are required to independently undertake a thorough literature search utilising an appropriate scientific
search engine. They must then collate all of the relevant information into a comprehensive review summarising the
key aspects of the topic whilst also validating the reliability of the sources of information. Furthermore, students will
be required to prepare a poster summarising the key background information and findings of their review. All
reviews and posters will be submitted electronically via TURNITIN to ensure compliance with the Universities policies on
plagiarism.

Module Content: Bydd darlithoedd a tiwtorialau yn cwmpasu:
Darlith 1 - Ysgrifennu adolygiad gwyddonol a defnyddio peiriannau chwilio
Darlith 2 - Paratoi a cyflwyno posteri
Gweithdy 1 - archwilio cronfeydd data a ffynhonellu effeithiol
Tiwtorial 1 - Trafodaeth grp o bynciau a ddewiswyd ac arweiniad pellach
Tiwtorial 2 - Adborth ar y drafft cyntaf gan eich marciwr
Tiwtorial 3 - Adolygiad o'r adborth a phoster

Lectures and tutorials will encompass:
Lecture 1 - Writing a scientific review and utilising search engines
Lecture 2 - Poster preparation and presentation
Workshop – Database searches and referencing
Tutorial 1 - Group discussion of chosen topics and further guidance
Tutorial 2 - Feedback on first draft from allocated marker
Tutorial 3 - Feedback review and poster

Intended Learning Outcomes: Mi fydd myfyrwyr yn medru:

LO1) Gaffael a dwyn i gof gwybodaeth o rywogaethau ac amrywiaeth biolegol
LO2) Egwyddorion bioleg a sut maent yn cwmpasu'r rhyngweithio a pherthnasoedd o organebau â'u hamgylchedd, o organebau un gellog i ecosystemau, a'r dulliau a ddefnyddir ar gyfer eu hymchwilio.
LO3) Defnyddio deallusrwydd o egwyddorion a chysyniadau y gwyddorau biolegol er datrys problemau yn y byd go iawn ac
mewn systemau artiffisial.
LO4) Dylunio, cynllunio a chreu prosiect ymchwil annibynnol ar sail llenyddiaeth, gan ddadansoddi y canlyniadau yn feirniadol,
a dehongli hyn yng nghyd-destun gwybodaeth fiolegol.
LO5) Asesu yn feirniadol, gwerthuso a chyfuno gwybodaeth o ffynonellau gwyddonol cyhoeddedig ac yn ei ddefnyddio i
llunio dadleuon rhesymegol a damcaniaethau sy'n cael eu profi.
LO6) Adnabod cysylltiadau ac adnabod themâu rhwng yr ystod o bynciau gwyddonol, cyn greu ystyr o'r wybodaeth ar lafar, yn ysgrifenedig, a rhifiadol trwy ddehongli a chrynhoi.
LO7) Cynnal chwiliad llenyddiaeth effeithiol drwy ddisgrifio, crynhoi, gwerthuso ac egluro gwybodaeth a nodi a mynegi perthynasau.
LO8) Fformatio, cyfeirio a strwythuro adolygiad gwyddonol
LO9) Crynhoi gwybodaeth drwy gynhyrchu poster gwyddonol
LO10) Dylunio a rheoli rhaglen o waith i ymchwilio i broblem benodol
LO11) Derbyn cyfrifoldeb am, a rheoli eu dysgu eu hunain, gan wneud defnydd o destunau priodol, cyfnodolion, adnoddau electronig ac adnoddau dysgu eraill

Students will be able to:

LO1) Acquire and recall knowledge of species and biological diversity
LO2) Principles of biology and their applications encompassing the interactions and relationships of organisms with
their environment, from single celled organisms to ecosystems and the methods used for their investigation.
LO3) Apply knowledge of the principles and concepts of biological sciences to problem solving in the real world and
in artificial systems.
LO4) Design, plan and create an independent literature-based research project and analyse its results critically,
interpreting them in the context of current biological knowledge
LO5) To critically assess, evaluate and synthesise information from published scientific sources and use it to
construct reasoned arguments and testable hypotheses.
LO6) Draw links and identify themes between the range of scientific subject investigated within constructing meaning from oral, written, and numerical information through interpretation and summarising key component
LO7) Conduct an effective literature search by describing, summarising, evaluating and clarifying scientific information and identify and articulate the relationships between the literature
LO8) Format, reference and structure a scientific review
LO9) Summarise information through the production of a scientific poster
LO10) Design and manage a programme of work to investigate a given problem
LO11) Accept responsibility for and manage their own learning, making use of appropriate texts, journals, electronic
resources and other learning resources.

Assessment: Report (75%)
Presentation (25%)

Assessment Description: Adolygiad llenyddiaeth 3000 o eiriau
Cyflwyniad poster

3000 word literature review
Poster presentation

Moderation approach to main assessment: Universal Double Blind Marking of the whole cohort

Assessment Feedback: Adborth unigol wedi'i ysgrifennu ar ddrafft
Adborth ysgrifenedig ac ar lafar ar y drafft terfynnol
Adborth unigol ar y poster wrth eich tiwtor

Individual written formative feedback on a draft
Written comments and oral feedback on final submission
Individual written feedback on poster from tutor

Failure Redemption: Ail-gyflwyno gwaith cwrs

Re submission of coursework

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Modiwl cyfrwng Cymraeg yw hon. Nid yw ar gael i fyfyrwyr sy'n ymweld a'r adran, ag eithrio'r rhai sydd yn rhan o
raglen cyfnewid yr adran.

This is a Welsh language module. Not available to visiting or exchange students with exception of those within the
School’s existing exchange programmes

BIO235 Molecular Ecology

Credits: 15 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr Micheal Gwilliam

Format: 17 - Lectures (including 1 revision and 1 feedback)
3 -1 x 3 hour lab practical
3 - 1 x 3 PC pracs
6- 2 x 3 hour workshop
6 -2 x 3 hour drop-in sessions

Delivery Method: Composite lectures, practicals, workshops and seminars

Module Aims: Molecular ecology is an emerging field that takes advantage of the latest advances in molecular genetics to answer
a varied range of theoretical and practical questions in ecology including conservation genetics, behavioural
ecology, phylogeography, adaptation, hybridization and speciation. Through a combination of theoretical lectures,
laboratory practicals and class discussions we will consider the application of a range of molecular and statistical
tools to problems such as species conservation, biological invasions, wildlife forensics or fisheries. Lectures include a basic introduction to the field of Molecular Ecology and its connections to Conservation Biology and Population Genetics. This will be followed by lectures on population diversity focused on: molecular markers and genetic variation in natural populations, phylogeography and barcoding, population structuring and differentiation, mating systems, behavioural ecology and inbreeding. A more applied part of the programme will include lectures on microbial ecology, forensic science and conservation applications. Two practical lectures will cover the use of barcoding for species identification, including DNA extraction, amplification and sequencing (laboratory based) and the identification of there sequences using databases such as Genbank (computer based).

Module Content: Lectures will cover the following general topics:
•Overview of Molecular ecology: history and molecular applications for ecologists
•Basic molecular markers and techniques applied for ecological studies
•Basic population genetics
•Applications:
Behavioural ecology
Conservation genetics
Population ecology
Phylogeography and landscape genetics
Identification of species, individuals and sex

•MCQ quiz and review of past exam questions

Assignments
-Problem-solving exercise and/or MCQ quiz at final lecture and practical

Practicals
-Combined laboratory and computer based practical: use of molecular methods for species identification
Workshop
-Analysis of current literature on Mol Ecol to discuss methods, interpretation of results and writing up

Intended Learning Outcomes: At the end of the module students will have been introduced to molecular techniques used in ecological research.
The principles of population genetics will be introduced, and published case studies will be explored.

By the end of the module, the student is expected to be able to:

LO1) Appreciate the application of molecular tools in ecological and conservation studies
LO2) Recognise basic molecular techniques commonly used in such studies and their particular application
LO3) Demonstrate a knowledge of the basic principles of population genetics and how it is applied to ecological and conservation research
LO4) Locate ecological/conservation research papers (journal articles) reporting the use of molecular methods in inter- and intraspecific studies
LO5) Recognise the structure and language of a scientific paper and produce a basic paper with the results of their laboratory practical work
LO6) Calculate population genetic diversity and recognise the context for its application
LO7) Interpret the results from basic analyses of diversity and relate them to managing problems
LO8) Carry out basic molecular lab analyses for species identification using DNA barcoding

Assessment: Examination (50%)
Coursework 1 (25%)
Coursework 2 (25%)

Assessment Description: Examination: 30 MCQ, short essay and analytical question

Coursework 1: MCQ based on course topics and lab practical

Coursework 2: Analysis and writing of results of lab and computer practical in the form of a scientific report/paper

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Written feedback for coursework and exams
Verbal feedback for coursework and for exams if needed

Failure Redemption: Re-submission of practical reports or exam

Reading List: Freeland, Joanna, author., Molecular ecology, Wiley Blackwell, 2020.ISBN: 9781119426158
Freeland, Joanna, author., Kirk, Heather, 1980- author.; Petersen, Stephen, author., Molecular ecology / Joanna R. Freeland and Heather Kirk ; Stephen Petersen., John Wiley & Sons Ltd, 2011 - 2011.ISBN: 9780470748336
Rowe, Graham, author., Sweet, Michael (Michael John), author.; Beebee, Trevor J. C. (Trevor John Clark), author., An introduction to molecular ecology, Oxford University Press, 2017.ISBN: 9780198716990
Frankham, Richard,, Ballou, J. D., Briscoe, David A., Introduction to conservation genetics / Richard Frankham, Jonathan D. Ballou, David A. Briscoe ; line drawings by Karina H. McInnes., Cambridge University Press,, 2010.ISBN: 9780521702713

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.

BIO237 Marine Invertebrates

Credits: 15 Session: 2023/24 September-January

Pre-requisite Modules: BIO114

Co-requisite Modules:

Lecturer(s): Dr EC Pope

Format: 15 lectures; 2 practicals; 1 fieldtrip. Contact Hours will be delivered through in-person activities on-campus.

Delivery Method: Delivery of both teaching and assessment will be via in-person lectures and laboratory practicals, supported using the Canvas virtual learning environment.

Module Aims: This module introduces students to the vast diversity of marine invertebrate and the fundamental roles they play in marine ecology. Students will receive 15 lectures and two laboratory practicals covering the general themes of: marine invertebrate taxonomy and developmental biology; form, function and behaviour; comparative physiology; reproductive strategies and biogeography; and ecological roles. Students will also visit an outstanding intertidal environment to see the fundamental importance of marine invertebrates in this ecosystem. Students will be examined on their understanding of the lecture material, recommended reading and practical techniques.

Module Content: Lectures:

The following distribution of lecture material is indicative; due to the interactive mode of teaching it is subject to modification.

The challenges of living in a marine environment
The intertidal zone
Gelatinous marine animals
Polychaetes
Crustaceans
Molluscs
Echinoderms
Reproductive strategies
Larval dispersal and biogeography
Developmental biology
Nervous systems
Locomotory strategies
Benthic and pelagic ecology
Biofouling
Sentience

Practicals:

(These are shown as examples and are subject to change from one year to another)

Larval generation
Comparative dissection
Field trip to demonstrate the abundance of marine invertebrates intertidally.

Intended Learning Outcomes: At the end of the module the student will be able to:

LO1) Demonstrate an understanding of the evolution and taxonomic diversity of marine invertebrates (assessed during examination)
LO2) Show a thorough knowledge of the biology and ecology of key groups of marine invertebrates (assessed during examination)
LO3) Appreciate the comparative anatomy and physiology of key marine invertebrate phyla (assessed during examination and practicals)
LO4) Discuss marine reproductive strategies and their importance for the biogeography of species (assessed during examination and practicals)
LO5) Perform standard aquaculture procedures involved in the production of invertebrate larvae (from practicals)
LO6) Discuss comparative mollusc anatomy, subtended by laboratory dissections (assessed during examination and practicals)
LO7) Produce detailed laboratory reports, including data analysis and use of other research to strengthen arguments (from practical report)

Assessment: Examination 1 (50%)
Coursework 1 (25%)
Coursework 2 (25%)

Assessment Description: Theory exam (30 multiple-choice questions: 33%; one essay choice from three: 67%).
Continuous assessment; 2 practical assignments encompassing comparative anatomy and reproduction and feeding.

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Individual written formal feedback on assignments
Lecture giving overall class feedback on assignment

Failure Redemption: Re-submission of continuous assessment and examination

Reading List: Levinton, Jeffrey S., author., Marine biology : function, biodiversity, ecology, Oxford University Press, 2022.ISBN: 9780197543504
J. Moore (Janet) author., Raith Overhill illustrator., An introduction to the invertebrates / Janet Moore ; illustrated by Raith Overhill., Cambridge : Cambridge University Press, 2006.ISBN: 9780521857369

Additional Notes: Delivery of both teaching and assessment will be via in-person lectures and practicals, supported using the Canvas virtual learning environment.

Syllabus as stated is subject to modification due to staff availability. Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.

BIO239 Ecological Microbiology and the Cycles of Life

Credits: 15 Session: 2023/24 January-June

Pre-requisite Modules: BIO104

Co-requisite Modules:

Lecturer(s): Prof DC Eastwood

Format: Lectures and laboratory-based practicals

Delivery Method: Composite, lectures and practicals

Module Aims: This module provides an introduction into how microbes impact the world we see around us. Lectures and laboratory-based practicals will explore how microbes occupy almost every environment on the planet and drive the elemental cycles (carbon, nitrogen, phosphorous) on which all life relies. Lectures will cover microbial diversity and adaptations to extreme environments, elemental cycling in terrestrial and aquatic systems, and interactions with plants and animals. Practicals will develop this learning to investigate specific ecological examples of dynamic microbial communities.

Module Content: This module will use a combination of lectures (18 x 1 hour) and practicals (3 x 4 hours). Practicals will use specific examples highlighted in the lectures to put the theory-based learning into a real world context. The topics covered will explore diverse habitats and show how microbes have adapted to thrive and ultimately drive the existence of all organisms in the ecosystem.

The syllabus is split into four major themes:
1. Microbial diversity
- bacteria, Archaea and fungi; extremophiles,
2. Microbial nutrition and respiration
- heterotrophs and autotrophs; mechanisms of carbon assimilation; alternatives to oxygen respiration
3. Major biogeochemical cycles & how microbes influence them
- carbon, nitrogen, phosphorous, iron, sulphur and trace metals
4. Interactions with plants and animals
- symbionts and pathogens; endophytes, nitrogen fixation and mychorrhizal fungi, gut flora, common diseases of plants and animals.

Interdisciplinary skills in physics, chemistry and mathematics will be developed through:
i) Considering the energetics of chemical reactions which provide energy for growth and selection of nutritional modes based on underlying environmental conditions.
ii) How different elements are processed by cells and how microbes utilise the chemical properties of elements to generate energy.
iii) Quantify and critically assess microbial presence and diversity in habitats to determine their potential impact on habitats and interactions between different species.

Practical classes will investigate:
Microbial biodiversity in water column and in soil. How microbes alter the local chemistry to change the environment around the cell. Students will identify specialist nutritional modes and discuss how different microbes adapt to particular niches and interact with one another.

Specific skills employed include: aseptic technique and microbial culturing on selective media, light microscopy, isolation of crystals via basic chemistry techniques, generating and devising how to present data to allow critical analysis.

Intended Learning Outcomes: At the end of this module the students will be able to:

LO1) Describe and distinguish the major groups of microbes (bacteria, archaea, eukaryotic) and example habitats in which they are found,
LO2) Describe and form links between the broad morphological and biochemical variation within the microbial world,
LO3) Contrast and compare how the microbial communities in a particular environment affect the major biogeochemical cycles of life (carbon, nitrogen, phosphorous, iron, sulphur, and trace metals),
LO4) Demonstrate how microbe interactions are essential for the lifestyles of plants and animals, using specific examples.
LO5) Undertake practical skills needed to isolate and innumerate microbes from the environment, and be able to critically analyse and present such data sets to demonstrate diversity in the environment and discuss how small-scale microbial processes can have large scale ecological impacts.

Assessment:	Examination (50%) Coursework 1 (15%) Coursework 2 (35%)
Assessment Description: Examination (50% of total module mark: 2 hours examination; 30 MCQ (33% of examination mark) and one essay question (67% of examination mark) Coursework consisting of practical write up and data interpretation (50% of total module mark) Coursework 1: Experiments 1&2: Biogeochemistry & Plant fungal interaction method testing (15%) Coursework 2: Experiment 3: Winogradsky column, Nutritional mode selection and microbial diversity (35%)	
Moderation approach to main assessment: Moderation by sampling of the cohort	
Assessment Feedback: Formative and summative feedback on coursework and examinations. Individual and group feedback sessions with lecturer as appropriate.	
Failure Redemption: Re-submission of coursework, re-sit of examination	
Reading List: Slonczewski, Joan, author., Foster, John Watkins, author.; Zinser, Erik R., author., Microbiology : An evolving science, W. W. Norton & Company, 2020.ISBN: 0393420043	
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.	

BIO245 Boat Based Marine Biology

Credits: 15 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules: BIO260

Lecturer(s): Dr CD Lowe

Format: 10 x lectures
6 x 4 hr boatwork
1 x 3 hr practical

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: The lectures in this module are a combination of a safety briefing as well as learning content. Since these briefings are mandatory to attend before the weekly fieldwork on the boat it is important to maximise attendance, I therefore propose that the first two lectures are timetabled as face to face, so that I can discuss general topics, determine boat groups and talk about the general structure of the field work, before moving to an online Zoom lecture for the remaining lectures. This will not drastically change the amount of face to face time that the students will receive as they will have half a day of face to face time with me on the boat each week.

Module Aims: In this boat-based, hands on module students will spend several sessions at sea using the University's Research Vessel, the Mary Anning. Although subject to weather conditions, students should expect to spend six, four hour sessions at sea. The Mary Anning is an 18m purpose built catamaran that was designed from the keel up as a survey and teaching vessel and as such is an ideal resource to give students hands on experience of working at sea with a variety of pieces of equipment. Students will assist with deployment of equipment, learn how to handle and identify organisms encountered, and return them to the sea so as to minimise harm to these organisms.

Students will be introduced to sampling techniques used in marine biological research and commercial surveys. They will be given theoretical information on different sampling gears and gear selection followed by practical use of these gears on the Mary Anning.

Assessment is 100% coursework based around survey operations and reporting common in both academic and commercial settings.

Module Content: Lectures and Practicals
Field demonstration practicals -

1) Marine biological sampling using grab sampler and beam trawl conducted in Swansea Bay
2) Marine biological sampling using pelagic and otter trawls conducted in Swansea Bay;
3) Oceanographic boatwork using a CTD, echosounder and side scan sonar equipment conducted in Swansea Bay;
4) Boat based marine mammal and bird surveys conducted in Swansea Bay or the Gower.
5) Plankton boat work (including phytoplankton and zooplankton sampling);
6) In depth beam trawl sample taxonomic identification

Note; due to the vagaries of the weather it may be necessary to alter the contents of this module The practicals and field work are simply shown as examples.

Intended Learning Outcomes: At the end of the module the student will be able to:

LO1) Discuss and apply the different forms of marine biological sampling, with particular emphasis on boat based sampling techniques;
LO2) Critically apply this knowledge in order to design their own sampling and experimental protocols.
LO3) Have in depth and transferable boat based skills commonly used by academics, environmental consultancies and government agencies.
LO4) Taxonomically identify local marine fauna.
LO5) Statistically analyse both ecological and experimental data

Assessment: Coursework 1 (30%)
Coursework 2 (30%)
Coursework 3 (40%)

Assessment Description: Coursework 1 - Grab sample sediment analysis
Coursework 2 - Sample method comparisons
Coursework 3 - Habitat assessment

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Individual and group feedback on assignments.
Feedback lecture and question and answer session.
Kahoot online practice quiz.

Failure Redemption: Resubmission of coursework.

Reading List: Anne Gro Vea Salvanes editor., Marine ecological field methods : a guide for marine biologists and fisheries scientists / edited by Anne Gro Vea Salvanes [and five others]., Hoboken, New Jersey : Wiley Blackwell, 2018.ISBN: 1119184347
Anastasios Eleftheriou 1935-, Methods for the study of marine benthos edited by Anastasios Eleftheriou., Wiley-Blackwell, 2013.ISBN: 1118542371
A. D McIntyre (Alasdair Duncan); A Eleutheriou, Methods for study of marine benthos / edited by A.D. McIntyre and A. Eleftheriou., Blackwell Science, 2002.ISBN: 9780632054886

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Students wishing to take this module must have passed the RYA Sea Survival Course in year 1. Available to single honours Marine Biology students only. Not available to any visiting and exchange students. Practical sessions may change due to staff availability and the weather.

BIO252 Ecological Data Analysis

Credits: 15 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof L Borger, Dr N Franconi

Format: 16 hours practical IT workshops.
10 hours taught lectures.
11 hours Stats Help sessions.
3 hours computer-based continuous assessments.

Delivery Method: 16 hours practical IT workshops
10 hours taught lectures & feedback sessions.
11 hours Stats exercise and feedback sessions.
3 computer-based continuous assessments.
Weekly assigned readings and computer-based exercises.
Final data analysis project.

Module Aims: This module introduces students to the basics of analyzing ecological data, using the R Software Environment for Statistical Computing. The topics covered will be also broad enough to be equally applicable to basic data analysis across biology and the skills acquired are widely transferrable for non-academic jobs. Students will receive 8 computer-based workshops/practicals of 2 hours each, complemented by 10 lectures and 11 Stats exercise and Feedback sessions before each workshop. The module will cover 5 broad key themes: 1). Data analysis and statistics, reproducibility and the R Software Environment; 2). Data management; 3). Data visualization; 4). Data analysis - The linear model; 5). Data analysis - Presentation of results and outline of more advanced methods. The module will be subject to continuous assessment consisting of 3 pieces of computer-based work (60% of final mark), which will require the students to carefully complete all course work assigned on a weekly basis ('independent learning'), in order to be able to complete the assignments. A further 40% of the final mark will consist in a data analysis report, to be completed after the end of the course. Weekly readings and non-assessed computer-based exercises will be assigned, too.

Module Content: Computer-based workshops & taught lectures:

1). Statistical methods, reproducibility and the R Software Environment;
2). Data management;
3). Data visualisation;
4). The Linear Model - linear regression;
5). Model criticism (model diagnostics);
6). The Linear Model - analysis of variance (ANOVA);
7) The Linear Model - analysis of co-variance (ANCOVA);
8). Presentation of statistical results & report writing and data management.

Intended Learning Outcomes: At the end of this module students will have been exposed to the basics of how to handle and analyze scientific data using R, for exploratory and confirmatory purposes, communicate the findings, and store both the data and the codes used, to allow full replicability. The student is expected to be able to:

1. Accurately input data for statistical analysis into R, visualize the data and, taking into account the specific question asked, choose and conduct basic statistical analysis using the linear model and hypothesis tests, or be able to identify if it is not applicable.
2. Critically interpret the data and analyses and produce basic informative tables and graphs to report the results of different types of basic statistical models.
3. Be able to provide all the data and computer codes for a full replicability of all analyses.
4. Format the results for a scientific publication.
5. Be able to learn new methods and packages in R independently.

These outcomes will crucially rely on essential independent learning by the students between each of the weekly workshops. As each workshop will build upon the material learned in the previous sessions, which will need to be assimilated and practiced independently, regular work by the students each week after each lecture and each workshop will be essential. Also, without essential independent learning, following the instructions provided during each workshop, student will not be able to satisfactorily complete the continuous assessments and obtain the grade. To aid this, weekly readings and non-assessed (computer-based and non) exercises will be provided.

Assessment: In class test (Invigilated on campus) (20%)
Class Test 2 - Held under exam conditions (20%)
Class Test 3 - Held under exam conditions (20%)
Coursework 1 (40%)

Assessment Description: CW1: Visualizing data and models in R for exploratory and confirmatory analyses.
CW2: The linear model: simple linear regression and ANOVA
CW3: The linear model: linear model with interactions up to ANCOVA
Coursework 1: Statistical Analysis Report

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: One-to-one feedback during the workshops by both lecturers and teaching assistants to students.
Taught lectures and exercise and feedback sessions.
Additional Stats Exercise and Help sessions to provide feedback and repetitions during the course.
Online help through Canvas.

Failure Redemption: Re submission of continuous assessment and/or final report.

Reading List: Michael J. Crawley author., Statistics : an introduction using R / Michael J. Crawley., Chichester : John Wiley & Sons, Ltd, 2015.ISBN: 9781118941096
Andrew P. Beckerman author., Owen L. Petchey author., Getting started with R : an introduction for biologists / Andrew P. Beckerman & Owen L. Petchey., Oxford : Oxford University Press, 2012.ISBN: 9780199601622
Whitlock, Michael C., Schluter, Dolph., The Analysis of Biological Data, Macmillan Learning, 2020.ISBN: 9781319325350
Grafen, Alan; Hails, Rosemary, Modern statistics for the life sciences / Alan Grafen, Rosie Hails., Oxford University Press, 2002.ISBN: 0199252319
Faraway, Julian James, Linear models with R / Julian J. Faraway., 2015.ISBN: 9781439887332
Ekstrøm, Claus Thorn; Sørensen, Helle, Introduction to statistical data analysis for the life sciences / Claus Thorn Ekstrøm, Biostatistics, Department of Public Health, University of Copenhagen, Helle Sørensen, Department of Mathematical Sciences, University of Copenhagen., 2015.ISBN: 9781482238938

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Syllabus as stated is subject to modification due to staff availability. Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.

BIO260 Marine Biology Field Course

Credits: 15 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr EC Pope, Dr CM Bertelli, Dr CE Davies, Dr CD Lowe

Format: This is a residential field with five and a half days on site.

Delivery Method: This is a residential field with five and a half days on site.

Module Aims: This residential field course comprises practical work employing shore-based techniques to sample littoral and benthic marine habitats. Students will learn techniques for the identification of marine organisms and gain experience in the analysis and presentation of ecological data.

Module Content: This field based module comprises practical work employing shore-based techniques to sample littoral and benthic marine habitats. Students learn techniques for the identification of marine organisms and gain experience in the analysis and presentation of ecological data.

Taxonomic orientation: trawled species
Seine netting
Beach transect: infauna identification and distribution
Rocky shore (sheltered and exposed) transects
Final data collation
ID test
Group presentations on rocky shore projects

Practical work is subject to change depending on weather and staff availability.

Intended Learning Outcomes: At the end of the module the student will be able to:

LO1) Compare different marine sampling techniques and know their respective advantages and disadvantages (assessed during field course and via reports)
LO2) Correctly record ecological data and explain the importance of accurate record keeping
LO3) Analyse, display, interpret and present marine ecological data (assessed via reports and group presentation)
LO4) Identify common marine species, particularly invertebrates (assessed by an ID test)
LO5) Use dichotomous keys to identify any marine species (assessed via portfolio).
LO6) Produce detailed laboratory and field reports, including data analysis and use of other research to strengthen arguments (assessed via reports).
LO7) Present ecological data orally as a part of a group

Assessment:
Coursework 1 (10%)
Coursework 2 (20%)
Coursework 3 (20%)
Coursework 4 (25%)
Coursework 5 (25%)

Assessment Description: 1. GW Individual: professional behaviour (during entire course)
2. In class test: Identification test (of samples collected during the fieldcourse)
3. Group Work Presentation
4. Taxonomy portfolio (CW1)
5. Sandy shore report (CW2)

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Student feedback will be provided on reports and during a formal feedback lecture

Failure Redemption: Submission of alternative assessments

Reading List: Levinton, Jeffrey S., author., Marine biology : function, biodiversity, ecology, Oxford University Press, 2022.ISBN: 9780197543504
Little, Colin; Williams, Gray A; Trowbridge, Cynthia D, The biology of rocky shores / Colin Little, Gray A. Williams and Cynthia D. Trowbridge., Oxford University Press, 2009.ISBN: 0198564910
Anton. McLachlan, A. C Brown, The ecology of sandy shores A. McLachlan, A.C. Brown., Elsevier, 2006.ISBN: 1280636580
P. J. Hayward (Peter J.), Animals of sandy shores / by Peter J. Hayward., Company of Biologists Ltd., 1994.ISBN: 0855462930

Additional Notes: This is a level 5 Biosciences module which is compulsory for marine biology students. The module is not available to visiting and exchange students.

BIO261 Population and Community Ecology

Credits: 15 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr M Lurgi Rivera

Format: 10 hours lectures
18 hours PC lab
2 hours workshop
Group Presentation session

Delivery Method: Lectures, ICT workshops, group presentation workshop and e-learning

Module Aims: This module will introduce students to concepts and basic analytical tools to understand and predict the growth or decline of animal, plant and other populations for: individual species; interacting, multispecies (e.g., predator-prey) communities; and spatial networks connected by dispersal.

Students will become familiar with 5 major themes related to ecological dynamics: population growth and density dependence, competition, consumer-resource interactions and spatial processes. Students will develop skills in conceptual thinking and data analysis, using and developing ecological models to predict how populations change over time and space, as well as report writing and presentation skills. Students will learn about how these tools are used in practical situations like conservation and invasive species management.

The course will be structured with lectures introducing background information and core concepts being followed by corresponding PC lab sessions where students will gain experience of putting those concepts into practice. An additional workshop session will prepare students for group presentations dealing with classical concepts in population ecology.

Module Content: The module aims to build on the basics of population ecology taught at level 1. A holistic approach will be adopted, teaching students both classical ecological theory and practical, transferable skills. It aims to:
1) introduce students to some fundamental concepts, by comparing and contrasting various hypotheses in population, community and spatial ecology
- Exponential population growth, density dependence, antagonistic (consumer-resource) species interactions, dispersal and metapopulations, age/stage structure, basic types of population dynamics (stable, cyclic, chaotic).
2) consider modern themes in population ecology
- stability of ecological communities, functional responses, network theory, environmental change
3) teach students how to develop and simulate simple ecological models appropriately
- Single-species (Logistic), multi-species (e.g., Lotka-Volterra), Metapopulation and structured population models
4) link these models to existing data sets from natural and lab populations
- Linking population time series to ecological models via statistical estimation
5) prepare reports and group presentations to a professional standard

Practicals:
• Ecological modelling PC workshops
• Network analysis PC workshop
• PC data analysis workshop
• Classical Concepts in Population Ecology workshop

Intended Learning Outcomes: At the end of the module students will be able to:

LO1) Recognise fundamental concepts and hypotheses in population, community and spatial ecology
LO2) Classify important features of basic population models
LO3) Recognise different stability states in population and community dynamics
LO4) Understand and analyse how functional responses arise and affect dynamics
LO5) Develop and use computer code to simulate simple single and multispecies ecological models
LO6) Apply simple statistical methods to estimate key demographic parameters from natural and lab populations
LO7) Recognise simple network metrics and applications
LO8) Understand how ecological models are applied to modern environmental and conservation challenges
LO9) Combine basic concepts covered in the course in a novel way to develop a new modelling framework that addresses a question of interest to the student

Assessment: Examination (50%)
Coursework 1 (40%)
Group Work - Presentation (10%)

Assessment Description: Final Exam: MCQ, Analytical & Short Answer Questions

Coursework 1: Personal Population Model

Group Presentation: Classical concepts in population ecology

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Feedback is given directly on submitted continuous assessment assignments through annotated scripts, feedback forms and via a feedback lecture session as appropriate.

Failure Redemption: Resit examination, resubmission of coursework of failed element

Reading List: Turchin, Peter, 1957-, Complex population dynamics a theoretical/empirical synthesis, Princeton University Press, 2003.ISBN: 1400847281
Lehman, Lobert & Clark, Quantitative Ecology: A New Unified Approach, University of Minnesota Libraries Publishing, 2019.ISBN: 9781946135537
Gotelli, Nicholas J., 1959- author., A primer of ecology, Sinauer Associates, 2008 - 2008.ISBN: 9780878933181
Gotelli, Nicholas J., 1959-, A primer of ecology, Sinauer Associates, 1995.ISBN: 0878932704

Additional Notes: Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.

BIO262 Oceanography

Credits: 15 Session: 2023/24 January-June

Pre-requisite Modules: BIO112

Co-requisite Modules:

Lecturer(s): Dr CD Lowe

Format: 18 x 1 hour Lectures
4 x 3 hour practical

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

Lectures and practical

Module Aims: To understand the life that lives in our oceans, we need to understand those oceans and the processes which take place in them.
This module will introduce students to the world's oceans, covering the physical, chemical and biological makeup of the open seas. Topics will consider the formation of the ocean basins, how water moves around these basins and the variations in the ocean's environment which dictate what life can live where. We will also consider long term changes in our environment and the impact that humans are having on this.
Through four practical exercises, students will gain hands on experience with oceanographic instrumentation in the laboratory and at sea.

Module Content: Lectures:

The following distribution of lecture material is indicative; due to the interactive mode of teaching it is subject to modification.
A history of ocean science
The global ocean
Tides and currents
Oceanic water movement
Charts, navigation and shipping
Physical properties of seawater
Chemical properties of seawater
Measuring physical and chemical properties
Nutrients and biogeochemical cycling
Phytoplankton
The microbial loop
Zooplankton and nekton
Sampling and measuring plankton
Primary production in the oceans and seasonality
Remote sensing - Optical
Remote sensing - Acoustic
Natural climactic cycles
Anthropogenic impacts on the ocean

Practicals:
(These are shown as examples and are subject to change from one year to another)

* Identification of water samples based on physical and chemical parameters.
* Design and construction and calibration of simple electronic instruments for measurements of basic oceanographic parameters
* Deployment of above instruments to sea, data collection and analysis.
* Use of navigation charts and the oceanographic features displayed on them.

Intended Learning Outcomes: At the end of the module the student will be able to:

LO1) Describe the variety of chemical and physical features that exists in the oceans and coastal seas (assessed during examination)
LO2) Describe the formation of ocean basins, tides and oceanic currents (assessed during examination)
LO3) Describe environmental factors which underpin the ecology of organisms living in open water (assessed during examination and practical)
LO4) Identify appropriate sample methods for different marine systems, physical and chemicals parameters and the requirements of study type (assessed during examination)
LO5) Understand the key concepts of how common oceanographic instrumentation measure in water parameters (assessed during examination and practical)
LO6) Describe how data created through in situ marine surveys can be used to make inferences over larger temporal and spatial scales. (from practical write-ups)
LO7) Describe the communities which live in the planktonic environment, including energy and nutrient flows, seasonality and community structures.

Assessment: Coursework 1 (20%)
Coursework 2 (30%)
Examination (50%)

Assessment Description: Coursework 1 - March - Zooplankton structure and function.
Coursework 2 - April - Identification of season changes in physical, chemical and biological seawater parameters.

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Individual written formal feedback on assignments.

Failure Redemption: Re-submission of continuous assessment and examination

Reading List: Trujillo, Alan P., author., Thurman, Harold V., author., Essentials of oceanography, Pearson, 2019.ISBN: 9780134891521
Lalli, Carol M., Parsons, Timothy Richard, 1932-, Biological oceanography an introduction, Pergamon Press, 1993.ISBN: 1281795895

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Syllabus as stated is subject to modification due to staff availability. Normally available to elective, visiting or exchange students. Please note that any failures are redeemed during the August resit period, so you must ensure your availability.