FACULTY OF SCIENCE AND ENGINEERING

POSTGRADUATE
STUDENT HANDBOOK

YEAR 4 (FHEQ LEVEL 7)

ENVIRONMENTAL BIOLOGY CONSERVATION AND RESOURCE MANAGEMENT

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

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/

MSc (FHEQ Level 7) 2023/24
Environmental Biology: Conservation and Resource Management
MSc Environmental Biology: Conservation and Resource Management

Compulsory Modules

Semester 1 Modules	Semester 2 Modules
BIOM25B Science Skills and Research Methods 20 Credits Prof MS Fowler/Dr AP Devine/Dr JN Griffin/Dr C Pimiento	BIOM22 Advanced Techniques in Biodiversity Assessment 20 Credits Prof LJ Roberts/Dr PJ Neyland
	BIOM32 Ecosystems: Ecology, Conservation & Resource Management 20 Credits Prof CA Froyd/Dr WE Harris
Dissertation	
BIOM34 Research Project in Environmental Biology 60 Credits Dr AP Devine	
Total 180 Credits	

Optional Modules
Choose exactly 40 credits

BIOM12	Biodiversity and Health Ecology	Dr KL Wells	TB1	20
GEGM04	Environmental Modelling	Prof PRJ North/Prof B Kulessa	TB1	20
GEGM10	Satellite Remote Sensing	Dr JAB Rosette	TB1	20
GEGM22	Geographical Information Systems	Prof AJ Luckman/Dr RJ Fry/Dr Y Sun/..	TB1	20

And
Choose exactly 20 credits

BIOM37B	Conservation of Aquatic Resources	Prof C Garcia De Leaniz/Prof S Consuegra Del Olmo/Dr PE Jones/..	TB2	20
GEGM21	Climate Change - Past, Present and Future	Dr J Hiemstra/Dr PG Albert	TB2	20
GEGM26	Climate Science and Policy	Prof T Murray	TB2	20

BIOM12 Biodiversity and Health Ecology

Credits: 20 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr KL Wells

Format: Lectures (15 hrs)
Practical (PC and Lab)
Tutorials/Workshops
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

Blended learning, lectures, practicals, workshops

Module Aims: Biodiversity & Health Ecology emerges as a new interdisciplinary research field at the intersection of humans, animals and ecosystems. It acknowledges that the spread of infectious diseases and pollutants in time of global changes strongly links health issues across organisms and ecosystems. Understanding and controlling Emerging Infectious Diseases (e.g. SARS, Ebola and Nipah virus) requires interdisciplinary and holistic concepts and approaches that account for human and animal interactions in all kind of natural and anthropogenic environments. This module addresses contemporary topics in the field of One Health from an ecological perspective and in context of changing biodiversity. It introduces background information and essential tools for environmental biologists, disease ecologists and resource managers to take part in tackling this global challenge. Through participation in this module you will develop the foundations to engage in research in this field.

Module Content: The growing awareness that health of humans, animals and ecosystems are tightly interwoven in times of global change requires interdisciplinary approaches in conservation and resource management. This module addresses contemporary topics in the field of One Health from an ecological perspective and in context of changing biodiversity due to human impacts. We will explore health at the human – domestic animal – wildlife interface with emphasis on interdisciplinary concepts and tools necessary to tackle global challenges in context of changing environments, agriculture, biodiversity and socioeconomic trends.
We will look at relevant tools and methods to explore interdisciplinary OneHealth as a topic of interest in basic and applied science and for informed decision making for governmental and non-governmental stakeholders.

This module will help you to develop the necessary ways of thinking and skills to link the manifold changes in our urban and natural environments to issues of human and wildlife health. We will highlight important ecological principles and topics that are at the backbone to understand the epidemiology and spread of infectious diseases, including human demography and habitat exploitation, biological invasions, population and community ecology, biotic interactions, functional biodiversity and, more generally, global change and climate change.
The course instructors look forward to sharing different skills and perspectives as we journey together through this interdisciplinary module!

Intended Learning Outcomes: On completion of this course, students will be able to:
L01 Develop and describe key concepts of EcoHealth and One Health and interdisciplinary approaches to tackle global challenges for conservation and resource management
L02 Understand system dynamics such as the spread of infectious diseases at the interface of humans, domestic and wild animals and ecosystems in context of changing environments, agriculture, biodiversity and socioeconomic trends
L03 Work independently and as a team to gather, synthesize and critically evaluate information pertaining to One Heath scenarios.
L04 Apply ecological key principles into ecosystem and animal health issues
L05 Be familiar with surveillance, risk assessment, and control measures to combat infectious disease spread at the human-wildlife interface

Assessment:	Examination 1 (40%) Coursework 1 (20%) Coursework 2 (20%) Coursework 3 (20%)
Resit Assessment:	Examination (Resit instrument) (100%)

Assessment Description: 3 hours exam
CW1 Poster
CW2 Essay
CW3 Report

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

Assessment Feedback: Annotated feedback on coursework and exams

Failure Redemption: Repeat/resit failed module components

Reading List: Sharon L. Deem 1963- author., Kelly E. Lane-deGraaf 1977- author.; Elizabeth A. Rayhel 1957- author., Introduction to one health : an interdisciplinary approach to planetary health / Sharon L. Deem, Kelly E. Lane-deGraaf, Elizabeth A. Rayhel., Hoboken, NJ : John Wiley & Sons, Inc., 2019.ISBN: 9781119382836

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Daszak, P ; Cunningham, A ; Hyatt, AD, Daszak, P (correspondence author), Emerging infectious diseases of wildlife--threats to biodiversity and human health, 2000-01-21.ISBN: 00368075

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Fresco, Louise O, Challenges for food system adaptation today and tomorrow, Elsevier Ltd, 2009.ISBN: 14629011

Hoberg, Eric P. ; Brooks, Daniel R., A macroevolutionary mosaic: episodic hostswitching, geographical colonization and diversification in complex host–parasite systems, Blackwell Publishing Ltd, 2008-09.ISBN: 03050270

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Deem, Sharon L., Lane-Degraaf, Kelly E. ; Rayhel, Elizabeth A., Introduction to one health: an interdisciplinary approach to planetary health, 2019.ISBN: 9781119382867

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Kris A. Murray ; Nicholas Preston ; Toph Allen ; Carlos Zambrana-Torrelio ; Parviez R. Hosseini ; Peter Daszak, Global biogeography of human infectious diseases, National Acad Sciences, 2015-10-13.ISBN: 1507442112

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Abrams, Peter A., When does greater mortality increase population size? The long history and diverse mechanisms underlying the hydra effect, Blackwell Publishing Ltd, 2009-05.ISBN: 1461023X

Hethcote, Herbert W., The Mathematics of Infectious Diseases, Society for Industrial and Applied Mathematics, 2000.ISBN: 00361445

Earn, D J ; Rohani, P ; Bolker, B M ; Grenfell, B T, Earn, D J (correspondence author) ; Earn, D J (record owner), A simple model for complex dynamical transitions in epidemics., 2000-01-28.ISBN: 00368075

Fine, P ; Eames, K ; Heymann, DL, "Herd Immunity": A Rough Guide, OXFORD UNIV PRESS INC, 2011-04-01.ISBN: 10584838

Matthew James Keeling author., Pejman Rohani author., Modeling infectious diseases in humans and animals / Matt J. Keeling and Pejman Rohani., Princeton : Princeton University Press, 2008.ISBN: 1400841038

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

The growing awareness that health of humans, animals and ecosystems are tightly interwoven in times of global change requires interdisciplinary approaches in conservation and resource management. This module addresses contemporary topics in the field of One Health from an ecological perspective and in context of changing biodiversity due to human impacts. We will explore health at the human – domestic animal – wildlife interface with emphasis on interdisciplinary concepts and tools necessary to tackle global challenges in context of changing environments, agriculture, biodiversity and socioeconomic trends.
We will look at relevant tools and methods to explore interdisciplinary OneHealth as a topic of interest in basic and applied science and for informed decision making for governmental and non-governmental stakeholders.

This module will help you to develop the necessary ways of thinking and skills to link the manifold changes in our urban and natural environments to issues of human and wildlife health. We will highlight important ecological principles and topics that are at the backbone to understand the epidemiology and spread of infectious diseases, including human demography and habitat exploitation, biological invasions, population and community ecology, biotic interactions, functional biodiversity and, more generally, global change and climate change.
The course instructors look forward to sharing different skills and perspectives as we journey together through this interdisciplinary module!

BIOM22 Advanced Techniques in Biodiversity Assessment

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof LJ Roberts, Dr PJ Neyland

Format: 24 hours workshops
15 hours fieldwork

Delivery Method: Delivery will be blended and include lectures, workshops, online learning, briefing sessions and regular field work.

Module Aims: This module aims to introduce advanced professional techniques in biodiversity assessment and management.

Students will learn how to use, interpret and evaluate appropriate metrics and methodologies to assess the impacts of new developments on biodiversity such as Ecological Impact Assessment (EcIA), UK Habitat Classification, Biodiversity Net Gain (BNG) and Environment Net Gain (ENG). Student will also learn the evaluation of ecological and broader environmental features as part of an economic valuation of the environment e.g. for ecosystem services assessment, natural capital valuation and/or environmental net gain.

This module provides students with highly employable skills within the environmental and conservation sector, aligning with the CIEEM's Competency Framework. While undertaking the module student will gain the experiences and develop a portfolio to allow them to apply for Qualifying Membership with the CIEEM.

Module Content: The syllabus and locations are indicative and subject to change based on weather and staff availability

Week 1
Workshop 1: Module Overview, Biodiversity Legislation, Assessment 1
Workshop 2: Theory of Biodiversity Assessment, Ecological Impact Assessment, Assessment 2

Week 2
Workshop 3: EcIA Scoping, Introduction to UK Habitat Classification
Fieldwork: Margam Park EcIA UK Habs survey

Week 3
Workshop 4: Habitat Mapping and Introduction to Biodiversity Net Gain
Fieldwork: Margam Park EcIA for Biodiversity Net Gain Survey

Week 4
Workshop 5: Introduction to Environment Net Gain
Fieldwork: Margam Park EcIA for Environment Net Gain Survey

Week 5
Assessment workshop

Intended Learning Outcomes: Students will be able to:
1. Undertake, interpret and critically evaluate methods of biological assessment including Preliminary Ecological Appraisals, Biodiversity Net Gain and Environment Net Gain using UK Habitat Classification;
2. Critically appraise techniques for assessing ecological and broader environmental features as part of an economic valuation of the environment e.g. for ecosystem services assessment, natural capital valuation and/or environmental net gain.
3. Synthesise ecological information and analyse biological data to create professional reports and work effectivity as an individual or as part of a team to collect data
4. Demonstrate and evidence professional competencies in environmental conservation and management

Assessment:	Coursework 1 (37%)
	Coursework 2 (38%)
	Coursework 3 (25%)

Assessment Description: Coursework 1: EcIA Part 1: UKHabs and Impact Assessment
Coursework 2: EcIA Part 3: Biodiversity Net Gain, Environmental Net Gain and Evaluation
Coursework 3: Application for Qualifying Membership of the CIEEM

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

Assessment Feedback: Written feedback directly on coursework. Discussion and questions will additionally be used. Feedback sessions and workshops.

Failure Redemption: August resit of failed continuous assessment components

Reading List: JNCC, Handbook for Phase 1 habitat survey - a technique for environmental audit.
Sunderland, What works in conservation.
Chouinard, Omer, editor.; Jorgensen, Bethany, 1986- editor.; Tett, Paul, editor.; Vanderlinden, Jean-Paul, editor.; Vasseur, Liette, 1963- editor.; Baztan, Juan, editor.; Wright, Wendy Watson, writer of foreword., Coastal zones : solutions for the 21st century, Elsevier, 2015.ISBN: 9780128027486
Glasson, John, 1946-, Introduction to environmental impact assessment, ROUTLEDGE, 2019.ISBN: 0429894619

Additional Notes: This module provides students with highly employable skills within the environmental and conservation sector, aligning with the CIEEM's Competency Framework. While undertaking the module student will gain the experiences and develop a portfolio to allow them to apply for Qualifying Membership with the CIEEM.

The module is available to exchange or visiting students.

BIOM25B Science Skills and Research Methods

Credits: 20 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof MS Fowler, Dr AP Devine, Dr JN Griffin, Dr C Pimiento

Format: Contact hours are divided into 20 hrs of lectures and 23 hrs of practicals/seminars/self-directed learning.

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 on campus
ICT Practicals on campus (PC Labs)
Group Symposium on Campus

Module Aims: This intensive lecture and practical based module covers science skills for students wishing to pursue postgraduate studies, including MSc, MRes, MPhil and PhD degrees. It will teach students how to make good use of library and internet resources (including Web of Science, Canvas and Dryad), to design and analyse their experiments, and to make presentations of their data during conferences and symposia.

It will provide PG students in the Department of Biosciences (and other Departments in the Faculty of Science and Engineering) with the research and analytical skills necessary to carry out their research projects. It will teach them how to formulate and test scientific hypotheses, and how to generate and analyse scientific results using a variety of research methods. Lecture topics include Reporting and Presentation skills, Numerical skills and Data Analysis and Scientific Writing. The lectures are taught during the first part of the Semester. The module is examined through a combination of Continuous Assessment (90%) and an online examination in the form of a MCQ test (10%).

Basic reading:

Whitlock, M. and Schluter, D. (2014) The Analysis of Biological Data (Roberts & Co.).
Crawley, M.J. (2005) Statistics: An Introduction Using R (Wiley).
Original research papers given in reading list and found through self-directed learning.

Module Content: Library and internet resources
Experimental design
Plagiarism and how to avoid it
Presentation skills (PowerPoint and graphics packages)
Scientific writing and literature reviews
Environmental data analysis and presentation using R

Intended Learning Outcomes: On completion of this course, students will be expected to:

Critically assess the merits of different experimental designs and the key concepts in methodology and philosophy of science
Understand safety requirements of their work
Make lucid and timely presentations of their data
Understand the problems and consequences of plagiarism in scientific research
Make efficient use of databases, library and internet resources for their postgraduate studies
Demonstrate knowledge of which statistical tests are appropriate for different data types
Write appropriate code to plot, explore and analyse data in the R programme environment
Interpret and evaluate the output of statistical models applied to data
Critically read, summarise and synthesise published scientific literature

Assessment:	Online Multiple Choice Questions (10%) Coursework 1 (30%) Coursework 2 (40%) Group Work - Presentation (20%)

Assessment Description: Class Test: 1 hour online MCQ assessing Data Analysis
Group Oral Presentation
CW1 - Literature Review
CW2 - Environmental Data Analysis using R (Report: Analysis of Provided (x2) and Own Data sets)

Moderation approach to main assessment: Not applicable

Assessment Feedback: Annotated scripts (using Turnitin/Grademark)
Feedback posted on Canvas
In-class questions, using clickers for instant feedback
Mock MCQ practice examination questions, using clickers for instant feedback
Model answers

Failure Redemption: Redemption of failed components

Reading List: Whitlock, Michael C., Schluter, Dolph., The Analysis of Biological Data, Macmillan Learning, 2020.ISBN: 9781319325350
Michael Whitlock author., Dolph Schluter author., The analysis of biological data / Michael C. Whitlock and Dolph Schluter., Greenwood Village, Colorado : Roberts and Company Publishers, 2015.ISBN: 9781936221486
Michael J. Crawley, The R book / Michael J. Crawley, Imperial college London at Silwood Park, UK., Chichester, West Sussex, United Kingdom : Wiley, 2013.ISBN: 9780470973929
Danny McCarroll author., Simple statistical tests for geography / Danny McCarroll., Boca Raton, FL : CRC Press is an imprint of the Taylor & Francis Group, an Informa business, 2017.ISBN: 9781315380438
Jim Fowler 1943-, Louis Cohen; Phil Jarvis, Practical statistics for field biology / Jim Fowler, Louis Cohen and Phil Jarvis., John Wiley, 1998.ISBN: 9780471982968
Grafen, Alan., Hails, Rosemary., Modern statistics for the life sciences / Alan Grafen, Rosie Hails., Oxford University Press,, 2002.ISBN: 0199252319
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
Crawley, Michael J. author., Statistics : an introduction using R, John Wiley & Sons, Ltd, 2015 - 2015.ISBN: 9781118941119

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

Not available to exchange or visiting students

BIOM32 Ecosystems: Ecology, Conservation & Resource Management

Credits: 20 Session: 2023/24 January-June	
Pre-requisite Modules:	
Co-requisite Modules:	
Lecturer(s): Prof CA Froyd, Dr WE Harris	
Format:	19 hours of lectures / workshops 21 hours of field visits. 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

Combination of lectures/workshops and field site visits.

Module Aims: In this module, the students will learn to identify and understand the diversity and contrasting characteristics of terrestrial ecosystems with an emphasis on the origin and effects of various human-induced environmental impacts.

Module Content: In this module the students will learn to identify and understand the diversity and contrasting characteristics of terrestrial ecosystems with an emphasis on the origin and effects of various human-induced environmental impacts.

Due to the mode of teaching the syllabus outlined below is indicative of the material provided and is subject to modification.

*Terrestrial systems;
*Ecological monitoring for conservation;
*Biodiversity and biogeography;
*Long-term ecology;
*Conservation planning and resource management

Field visits will focus on woodland communities and include lowland and upland deciduous woodlands and upland coniferous woodlands in the locality

Intended Learning Outcomes: Upon completion of this module students will be able to acquire advanced, specialised knowledge on:

*Applied Conservation biology and Management;
*Implications of anthropogenically driven habitat changes and its possible relation to climate change.

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

Assessment Description: A 2 hour written examination and 3 assignments consisting of a 3000 word field course report, a 1,500 word briefing paper, and a group workshop discussion presentation.

EX1: 50%
CW1: 10%
CW2: 20%
CW3: 20%

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

Assessment Feedback: Written feedback given on submitted work and annotated examination scripts

Failure Redemption: Resit examination (capped at 50%).

Reading List: Hartel, Tibor, Kirby, K. J., editor.; Watkins, C., editor., Europe's changing woods and forests : from wildwood to managed landscapes, CABI, 2015.ISBN: 1789243971

Kirby, K. J, Watkins, C, Europe's changing woods and forests : from wildwood to managed landscapes / edited by Keith J. Kirby and Charles Watkins., CABI, 2015.ISBN: 1780643373

J. S. Rodwell editor.; C. D. Pigott contributor., British plant communities. Volume 1, Woodlands and scrub / J. S. Rodwell, editor ; C. D. Pigott [and nine others], contributor ; for the Nature Conservancy Council., Cambridge : Cambridge University Press, 1991.ISBN: 1107099560

Rodwell, J. S, Pigott, C.D, British plant communities. Vol.1, Woodlands and scrub ; J. S. Rodwell (editor) ; C.D.Pigott ... [et al.] for the Nature Conservancy Council., Cambridge University Press, 1991.

Whittaker, Robert JFernandez-Palacios, Jose Maria, Island biogeography ecology, evolution, and conservation / Robert J. Whittaker, and Jose Maria Fernandez-Palacios., Oxford University Press, 2007.ISBN: 0198566123

Richard J. Hobbs, R. J Hobbs (Richard J.); Eric Higgs 1958-; Carol M Hall, Novel ecosystems intervening in the new ecological world order / edited by Richard J Hobbs, Eric S. Higgs, and Carol M. Hall., Wiley-Blackwell, 2013.ISBN: 1118354184

David A. Perry 1938-, Ram Oren 1952-; Stephen C. Hart 1961-, Forest ecosystems / David A. Perry, Ram Oren, Stephen C. Hart., Johns Hopkins University Press, 2008.ISBN: 9780801888403

Roberts, Neil, Holocene : an environmental history / Neil Roberts., Wiley Blackwell, 2014.ISBN: 1405155213

Oliver Rackham author, Woodlands / Oliver Rackham., London : William Collins, 2015.ISBN: 9780008156916

Richard H. W. Bradshaw, Martin T Sykes, Ecosystem dynamics : from the past to the future / Richard H.W. Bradshaw, University of Liverpool, Martin T. Sykes, Lund University., Chichester, West Sussex, UK ; Hoboken, NJ, USA : Wiley Blackwell, 2014.ISBN: 9781119970774

Stace, Clive A., author., Thompson, Hilli, illustrator.; Stace, Margaret A., illustrator., New flora of the British Isles., C&M Floristics, 2019.ISBN: 9781527226302

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

Not available to exchange or visiting students.

BIOM34 Research Project in Environmental Biology

Credits: 60 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr AP Devine

Format: Project supervision meetings. Initially more frequent to get project started, reducing during project phase, increasing as required.

Delivery Method: Project work. Varies according to topic of study. May be desk-based, lab-based, field-based.

Module Aims: In this module the students will learn how to:
* perform a literature search in order to establish what has already been published in the selected subject area
* appreciate the safety considerations of scientific research by completing appropriate audits of the materials and methods involved
* investigate a problem in environmental biology in which hypotheses can be generated and tested with the application of appropriate statistical analysis
* acquire a range of skills in the conduct of scientific research
* integrate material from the literature with the results obtained from the research carried out into an effective dissertation
* present their proposed methods and main results to peers

Module Content: In this module the students will learn how to:
* Perform a literature search in order to establish what has already been published in the selected subject area;
* Appreciate the safety considerations of scientific research by completing appropriate audits of the materials and methods involved;
* Investigate a problem in environmental biology in which hypotheses can be generated and tested with the application of appropriate statistical analysis;
* Acquire a range of skills in the conduct of scientific research;
* Integrate material from the literature with the results obtained from the research carried out into an effective dissertation.
* present their proposed methods and main results to peers

The investigation will typically last for 12 to 15 weeks. The first two weeks will be spent undertaking a literature survey, a safety audit and in planning the research. Students will be expected to spend an average of at least 30 h per week in the laboratory and/or field during the following 10 weeks. The last three weeks will be spent completing the dissertation (of not more than 20,000 words). The oral presentations on the project (worth 10% of the mark) will be given approx. 1 month after commencing the project, giving an outline of the proposed question and methods.

Intended Learning Outcomes: Upon completion of this module students will be able to undertake the following at a level commensurate with MSc expectations:
*Survey the scientific literature, making appropriate use of electronic data base searcges where appropriate;
*Design meaningful experiments and/or surveys with adequate controls incorporating appropriate statistical procedures;
*Research and understand the implications of current health and safety regulations;
*Execute a careful and accurate research programme;
*Record data in a careful and accurate manner;
*Interpret data and plan appropriate subsequent research as indicated by earlier results;
*Perform statistical tests and present data using appropriate graphical, pictorial and tabular methods, making appropriate use of IT skills;
*Write a coherent scientific report.
*Present proposed methods and main results to an audience of peers

Assessment: Project (90%)
                         Presentation (10%)

Assessment Description: Coursework assessments:
(1) Project dissertation (90%).
(2) 7 min presentation of project background, aims & methods in class seminar (10%)

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

Assessment Feedback: Written feedback given directly on submitted drafts and coursework.
Verbal & written feedback from presentations.

Failure Redemption: Resubmission of research dissertation within 3 months of relevant Exam Board meeting. One feedback session permitted with project supervisor prior to resubmission. Grade capped at 50%.

Additional Notes:

Not available to exchange or visiting students.

BIOM37B Conservation of Aquatic Resources

Credits: 20 Session: 2023/24 January-June	
Pre-requisite Modules:	
Co-requisite Modules:	
Lecturer(s): Prof C Garcia De Leaniz, Prof S Consuegra Del Olmo, Dr PE Jones, Dr GR Thomas, Dr RKF Unsworth	
Format: Combination of lectures (16) and seminars (4)	
Delivery Method: Combination of lectures and seminars.	
Module Aims: The module will identify major issues in the conservation of aquatic organisms and develop the knowledge base of students in aquatic conservation, including those related to captive breeding programmes and the potential effects of climate change and other stressors. Some of the lectures/seminars are given by invited experts in the field. The module is assessed by a combination of continuous assessment (50%) and written examination (50%).	
Module Content: Conservation practice globally Specific issues of conservation to various taxa particularly those of key importance to aquatic resources Role of captive breeding programmes in conservation of aquatic species Climate change and its potential impact on the conservation of aquatic species	
Intended Learning Outcomes: Students will acquire advanced, specialised knowledge on: Conservation practice globally Specific issues of conservation to various taxa particularly those of key importance to aquatic resources Assessment of extinction risks Role of captive breeding programmes in conservation of aquatic species Climate change and its potential impact on the conservation of aquatic species	

Assessment:	Examination (50%)
	Coursework 1 (15%)
	Coursework 2 (30%)
	Coursework 3 (5%)
Resit Assessment:	Examination (100%)

Assessment Description: Written examination (50%) Coursework 1 - Fisheries Management Solutions (15) Coursework 2 - Darwin Grant Application (30%) Coursework 3 - Poster for dissemination and advocacy of Darwin Grant Application (5%).	
Moderation approach to main assessment: Moderation by sampling of the cohort	
Assessment Feedback: Written feedback on coursework. Graded examination.	
Failure Redemption: Resit exam capped at 50%.	
Reading List: Pullin, Andrew S., Conservation biology / Andrew S. Pullin., Cambridge University Press,, 2002.ISBN: 0521644828 Hunter, Malcolm L., author., Gibbs, James P., author.; Popescu, Viorel D., author.; Hunter, Malcolm L., Fundamentals of conservation biology., Wiley Blackwell, 2021.ISBN: 9781119144168 Malcolm L. Hunter author., James P. Gibbs author., Fundamentals of conservation biology / Malcolm L. Hunter, Jr., James P. Gibbs., Blackwell Publishing, 2007.ISBN: 9781405135450 T. M Caro (Timothy M.), editor., Behavioral ecology and conservation biology / edited by Tim Caro., New York : Oxford University Press, 1998.ISBN: 9780195104905	
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Not available to exchange or visiting students.	

GEGM04 Environmental Modelling

Credits: 20 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof PRJ North, Prof B Kulessa

Format: 36 Contact Hours will be delivered through live activities on-campus, and will include, lectures, seminars, and computer practical 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

On Campus

Module Aims: An understanding of the environment is increasingly important in many areas, e.g. industry, agriculture, conservation, health, science, and planning. This module introduces computational modelling in a geographical context. It aims to develop thinking about environmental issues within a modelling framework, and to develop practical skills in developing and using computational models, and in computer data analysis and visualisation. Examples are focused on solving practical scientific problems in environmental dynamics and climate change, focussing on modelling the terrestrial carbon and hydrological cycles.

Module Content: This module introduces computational modelling in the context of environmental dynamics and climatic Change. It aims to develop thinking about environmental issues within a modelling framework, and to develop practical skills in developing and using computational models, and in computer data analysis and visualisation. Examples are focussed on solving practical scientific problems which involve modelling the terrestrial carbon and hydrological cycles.

Outline of lecture topics:

-Role of modelling in environmental dynamics and climate change.
-Land surface carbon and hydrological cycles
-Models of plant photosynthesis and respiration
-Climate modelling and GCMs
-Modelling vegetation dynamics and succession
-Hydrological modelling - ground water and evapotranspiration
-Modelling surface water flow
-Example applications in climate change science and environmental planning

Example practical sessions

-Computer data analysis and visualisation
-Modelling the terrestrial carbon cycle using Biome BGC
-Introduction to modelling groundwater flow

Intended Learning Outcomes: -A broad understanding of the purpose and scope of computational modelling in environmental dynamics and climate change
-A critical awareness of the range of modern applications to which environmental modelling contributes
-An understanding of the environmental processes related to the water cycle and to biogeochemical cycles
-An ability to independently develop and execute simple computational models
-The ability to solve problems and write reports based on application of existing environmental models

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

Assessment Description: Examination
Coursework 1 - Hydrological Modelling
Coursework 2 - Carbon Cycle

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

Assessment Feedback: Continual assessment feedback in writing on standard department feedback forms

Failure Redemption: resit examination or resubmit continual assessment whichever if applicable
Reading List: Schlesinger, William H., author., Bernhardt, Emily S., author., Biogeochemistry : an analysis of global change., Academic Press, 2020.ISBN: 9780128146095 Hornberger, George M., Elements of physical hydrology / George M. Hornberger ... [et al.]., Johns Hopkins University Press,, c1998..ISBN: 9780801858574 George M Hornberger, Elements of physical hydrology / George M. Hornberger [and others]., Johns Hopkins University Press, 2014.ISBN: 9781421413730 Fitts, Charles R. (Charles Richard), 1953-, Groundwater science, Academic Press, 2013.ISBN: 9780123847058
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Available for visiting students.

GEGM10 Satellite Remote Sensing

Credits: 20 Session: 2023/24 September-January	

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr JAB Rosette

Format: 20
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

Primarily on campus

Module Aims: This module explains the use of remote sensing as a tool for gathering and analyzing information about human resources and the natural environment. It is appropriate for students who would find it valuable to understand how information about human activity and environmental change is retrieved from images of the Earth acquired by satelite or aircraft instruments. Emphasis is placed on the role of ongoing missions in providing operational information for science and society. Lecture material is supported by hands-on experience exploring satellite images in a computer environment.

Module Content: This module explains the use of remote sensing as a tool for gathering and analysing information about human resources and the natural environment. It is appropriate for students who would it valuable to understand how information about human activity and environmental change is retrieved from images of the Earth acquired by satellite or aircraft instruments. Emphasis is placed on the role of ongoing missions in providing operational information for science and society.
Elements of Geographic Information Systems (GIS) appropriate for dealing with spatially-explicit image data are examined. Lecture material is supported by hands on experience exploring satellite images in a computer environment.
Outline of lecture topics:
The role of remote sensing in providing information about human acitivity and environmental processes.
Principles behind the technology of satellites, imaging intruments and data analysis.
Applications of remote sensing: The following topics will be examined in terms of their requirement for infomation, the development of specific tools and techniques, and the results achieved:
a. Human resources: Forestry and agriculture
b. The human environment: The urban landscape
c. The natural environment: The atmosphere and oceans
d. Environmental change: The land surface and global vegetation
Environmental monitoring: Snow and ice
Example practical sessions:
Practical sessions will be carried out in a computer laboratory and written reoprts of the findings will form the continuous assessment assignments. These sessions will include:
Exploring spatial and spectral features in optical satellite images
Comparing data image data from different parts of the spectrum
Global satellite data and time-series analysis
Topographic analysis and visualisation of remotely-sensed data
Finding and acquiring remote-sesing sata using catalogues and archives.

Intended Learning Outcomes: Conceptual understanding of the purpose and scope of remote sensing.
Comprehensive understanding of how remote sensing techniques provide information about human resources and environmental processes.
Critical awareness of current remote sensing systems and ongoing research for monitoring human and natural environments.
Ability to explore, interpret and analyze satellite images in a computer environment.

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

Assessment Description: Exam (50%) - 2 hour exam
Coursework (50%) - 2500 word practical report

Moderation approach to main assessment: Universal Non-Blind Double Marking of the whole cohort
Assessment Feedback: Students will receive examination feedback after exams if taken in January. Continual assessment feedback is given in writing on standard departmental feedback forms.
Failure Redemption: resit examination or resubmit continual assessment whichever if applicable
Reading List: James B. Campbell 1944-, Randolph H Wynne, Introduction to remote sensing / James B. Campbell, Randolph H. Wynne., Guilford Press, 2011.ISBN: 9781609181765 Campbell, James B.,, Introduction to remote sensing / James B. Campbell., Taylor & Francis,, c2007..ISBN: 9780415416887 Robert A. Schowengerdt author., Remote sensing : models and methods for image processing / Robert A. Schowengerdt., Burlington, MA : Academic Press is an imprint of Elsevier, 2007.ISBN: 9780123694072 Paul M. Mather, Magaly Koch, Computer processing of remotely-sensed images : an introduction / Paul M. Mather and Magaly Koch., Wiley-Blackwell, 2011.ISBN: 9780470742389 Liang, Shunlin., Quantitative remote sensing of land surfaces / Shunlin Liang., Wiley-Interscience,, c2004..ISBN: 0471281662 Lillesand, Thomas M., author., Kiefer, Ralph W., author.; Chipman, Jonathan W., author., Remote sensing and image interpretation, Wiley, 2015.ISBN: 111834328X
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Available to visiting or exchange students with permission from scheme coordinator.

GEGM21 Climate Change - Past, Present and Future

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr J Hiemstra, Dr PG Albert

Format:　　LECTURES (18 hours)

Delivery Method: LECTURES (video materials and face-to-face sessions)

Module Aims: This module will examine the Earth's climate system, and the principal natural and anthropogenic forcing mechanisms controlling it. The detection and nature of recent environmental changes will be discussed within the context of the Earth's climate history . The tools and methods used to measure, predict and study climate changes will be introduced. This will include the fundamental structure of General Circulation Models and how these techniques may be employed in conjunction with instrumental and proxy data to study the climate of the past and to reduce uncertainty in future climate change projections.

Module Content: Outline of lecture topics:

Fundamentals of climatology:

The development of the global climate system - an introduction.
Internal climate forcings (thermohaline circulation, greenhouse gases and ice cores)
External climate forcings (solar variability, volcanic eruptions, asteroid impacts)
Large-scale climate phenomena e.g., SE Asian Monsoon, El Niño/Southern Oscillation, Arctic Oscillation, ITCZ.
Recent climatic change - magnitude, detection, evidence and attribution.
The international response - IPCC, Kyoto, wider climate change debate.

Reducing uncertainty in future climate change projections:

Past Climatic Change the key to understanding the future? - Glacial/Interglacial, evidence for the "Little Ice Age" and "Medieval Warm Period".
Methods in quantitative palaeoclimatology - the last 1000 years.
Modelling Climate - an introduction.
Combining climate model and proxy data to refine estimates of future environmental change.

Intended Learning Outcomes: See Module Aims

Assessment:　　　　　Examination 1 (80%)
　　　　　　　　　　　Coursework 1 (20%)

Assessment Description: Exam (80%) - 2 hour exam
Coursework (20%) - 7 Canvas quizzes

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

Assessment Feedback: Students will receive examination feedback after exams. Continual assessment feedback is given in sessions.

Failure Redemption: Re-sit examination.

Reading List: Ruddiman, W. F. (William F.), Earth's climate : past and future / William F. Ruddiman., W.H. Freeman and Company, 2013.ISBN: 9781429255257
Stocker, Thomas, Climate change 2013 : the physical science basis : Working Group I contribution to the Fifth assessment report of the Intergovernmental Panel on Climate Change / edited by Thomas F. Stocker, Working Group I co-chair, University of Bern [and nine others]., 2014.ISBN: 9781107661820
Raymond S. Bradley 1948- author., Paleoclimatology : reconstructing climates of the quaternary / Raymond S. Bradley., Oxford : Academic Press is an imprint of Elsevier, 2015.ISBN: 9780123869135
Lowe, J. J. (Joseph John); Walker, M. J. C. (Michael James Cawthorne), Reconstructing quaternary environments / John Lowe and Mike Walker., 2014.ISBN: 9780131274686
Kump, Lee R., Crane, Robert G., Kasting, James F., The earth system / Lee R. Kump ; James F. Kasting ; Robert G. Crane., Pearson Education,, 2011.ISBN: 9780321733283
Barry, Roger Graham., Chorley, Richard J., Atmosphere, weather, and climate / Roger G. Barry and Richard J. Chorley., Routledge,, 2010.ISBN: 9780415465700

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

N/A

GEGM22 Geographical Information Systems

Credits: 20 Session: 2023/24 September-January	
Pre-requisite Modules:	
Co-requisite Modules:	
Lecturer(s): Prof AJ Luckman, Dr RJ Fry, Dr Y Sun	

Format: 32

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: Online asynchronous mini-lectures and demonstrations, remote or in-person computer lab access for working through exercises at a time to suit the student, one hour per week timetabled in-person contact for help and advice, and 3 hours per week synchronous timetabled help session via zoom

Module Aims: This module will provide students from a range of disciplines including Geography and Bioscience with a comprehensive understanding of Geographic Information Systems, and key practical skills in the market-leading open-source GIS software tool Quantum GIS (QGIS). At the end of the module students will know how and where to acquire geospatial data, how to combine and analyse these data for specific objectives, and how to visualise primary and derived data in the form of maps.

Module Content: INTRODUCTION

This module will provide students from a range of disciplines including geography and bioscience, with a comprehensive understanding of Geographical Information Systems and key skills in using GIS within their research work and future careers. It will take a hands-on approach in a computer lab, combined with a series of lectures, to address the learning outcomes. Emphasis will be placed on equipping students with practical skills in the Quantum GIS (QGIS) software, and giving them the ability to import, combine, spatially analyse, and map a range of data from field survey, government agencies and census statistics.

INDICATIVE LECTURE TOPICS
- Introduction to GIS in Geography and Bioscience
- Sources and types of geospatial data relevant to Geography and Bioscience
- Aspects of visualizing and manipulating data from understanding the geographic reference frame through to spatial filters, spatial interpolation and map projections
- Approaches to querying data including combining attributes, selection of elements using spatial and attribute data, containment within regions and selection through proximity
- Elements of data analysis including spatial statistics, analysis of road and other communication networks, and surface elevation studies including line-of-sight visibility
- Basics of mapping and map design from cartographic principles, through symbolism and generalization, to human perception of space and essential reference data.

INDICATIVE COMPUTER PRACTICAL EXERCISES
- Importing and manipulating GIS layers
- Digitising and geocoding new data
- Querying, measurement and retrieval
- Raster and vector analysis
- Combining layers using containment and buffering
- Analysis of pathways within a transport network
- Topographic analysis, visualisation and viewsheds

Intended Learning Outcomes: At the end of this module, the student will:

1) Have a critical awareness of the purpose, scope and potential applications of Geographical Information Systems (GIS).

2) Understand the nature of geospatial data and be able to critically evaluate a range of geospatial data types.

3) Be able to synthesize a range of primary (e.g. GPS, remote sensing) and secondary (e.g. Ordnance Survey, UK census) sources of geospatial data.

4) Be familiar with the QGIS software package whilst having a critical awareness of the strengths and weaknesses of alternative commercial and freeware GIS software tools.

5) Have the skills to import, combine and synthesize geographic data from multiple map sources in QGIS.

6) Understand data standards and formats such as GeoTiff, Shape Files and KML, and be able to exchange geospatial data between software packages.

7) Be skilled in applying a range of GIS analysis tools from basic data editing to view-shed and network analysis.

8) Be able to critically evaluate evaluate maps using cartographic principles and results from advanced applications of GIS, based on case studies from epidemiology, demography, biological habitat mapping and geography.

9) Have the skills to develop a GIS project from basic data sourcing to spatial analysis and map visualization.

Assessment:	Coursework 1 (10%)
	Coursework 2 (20%)
	Coursework 3 (10%)
	Coursework 4 (60%)

Assessment Description: Coursework 1: Specimen Map. Individual formative assignment submitted through Turnitin and marked online

Coursework 2: Project proposal with map of indicative dataset. Individual Turnitin assignment submitted through Turnitin and marked online

Coursework 3: Multiple Choice Quiz. Individual randomized MCQ based on the course content and marked automatically online

Coursework 4: Project report. Individual summative assignment submitted through Turnitin and marked online

Moderation approach to main assessment: Moderation of the entire cohort as Check or Audit

Assessment Feedback: Student will receive feedback within 3 weeks of submission on all assignments. Feedback will include both individual formative comments and general group comments.

Failure Redemption: Resubmit failed component(s)

Reading List: QGIS, QGIS Tutorial.

D. Ian Heywood author., Sarah Cornelius author.; Steve Carver author., An introduction to geographical information systems / Ian Heywood, Sarah Cornelius, Steve Carver., Harlow : Pearson Education Limited, 2011.ISBN: 9780273722595

Paul. Longley, Geographic information science & systems / Paul A. Longley, University College London, UK, Michael F. Goodchild, University Of California, Santa Barbara, USA, David J. Maguire, Birmingham City University, UK, and David W. Rhind, City University, London, UK., Hoboken, NJ : Wiley, 2015.ISBN: 9781118676950

Burrough, P. A., author., McDonnell, Rachael, author.; Lloyd, Christopher D., author., Principles of geographical information systems, Oxford University Press, 2015.ISBN: 9780198742845

Christopher B. Jones, Geographical information systems and computer cartography / by Christopher B. Jones., Longman, 1997.ISBN: 9780582044395

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

This module is available to all postgraduate students within the Faculty of science and engineering, Medicine and Human and Health Sciences. Student should be familiar with basic computing and will benefit from numeracy skills.

GEGM26 Climate Science and Policy

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof T Murray

Format:
> 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

Campus

Module Aims: This module will develop critical thinking about the role of science, especially climate science, in society. This role will be discussed in terms of what is desirable, what is practical and what is the present reality. We will focus on a few specific areas; what climate science tells us about what we should do as a society; what current policy is and what is needed; how science provides advice to policy-makers (especially through the activities of bodies such as the Intergovernmental Panel on Climate Change); and the symbotic/antagonistic relationship between science and the media. During the module you will be challenged to think about familiar topics in new ways - from the ownership of the information you consume to the role of housing, agriculture and business in a post-carbon society. We will also consider the communication of climate science topics to scientists, the general public and to policy makers.

Assuming there are no covid restrictions this module will be taught in a mixed format - there will be one or two face-to-face field trips, meetings and role playing sessions - but in order to allow visiting speakers from the widest range of sources - most sessions will be delivered online.

Module Content: Sample syllabus (details will change from year-to-year)

Climate Science and Policy, lectures, seminars and discussions

WEEK 1: Introduction / format of the module; The scientific method; Peer Review; Intro to the EN-ROADS simulator. Distribution of talk symposium topics.

WEEK 2: Visiting speaker; Science and the media; Assignment: critique of article.

WEEK 3: Visiting speaker; Science, risk and policy.

WEEK 4: NO SESSION

 WEEK 5: Visiting speaker; Student talk symposium: [Topics: Extinction Rebellion; IPCC; Climate Change Committee; NRW; SPECIFIC, Institute for Government, IPCC topics].

 WEEK 6: Citizen's assembly report https://www.climateassembly.uk/recommendations/index.html (Links to an external site.) Two visiting speakers.

WEEK 7: Visiting speaker; Feedback on critique. Science into stories… Getting science into the media, press releases; Assignment: writing a press release

 WEEK 8: 2nd part of student talk symposium.

WEEK 9: Two visiting speakers.

 WEEK 10: 23rd April World Climate Summit simulation https://www.climateinteractive.org/programs/world-climate/ 6 bloc simulation plus possibly Extinction Rebellion => teams of 3 or 4 people, 3 rounds negotiations, ~20 minutes ea

Typical visiting speaker topics:
Purpose, People, Play - we are the leaders we are waiting for
Calculating and reducing the carbon footprint of Swansea University
Solutions to fuel poverty and climate change in the built environment
What is farming for? Agriculture and Climate Change in the UK
Why net zero is not enough
Well-being of future generations (Wales) act, 2015, The Environment Act and the Climate Emergency
IPCC, how it works and is it fit for purpose?
Natural Resources Wales, Welsh environmental legislation and the climate emergency
Use of activism to provoke behaviour change - Extinction Rebellion

Intended Learning Outcomes: At the end of this module you will have developed understanding of:
- the role of an individual in the climate system and your own carbon footprint
- inputs into climate models and the changes that are needed in society to limit climate warming to below 1.5/2.0 degrees C as per the Paris agreement
- current UK policy on climate change, including net zero - and whether this is sufficiently ambitious
- the role of different aspects of the UK economy in climate change (business, agriculture etc)
- the international basis for tackling climate change and the role of and challenges for different countries
- the workings and findings of the IPCC and other climate related policy bodies
- the way that science and the media interact and the ownership and influences on the media we consume

Assessment: Participation Exercise (5%)
                         Coursework 1 (25%)
                         Coursework 2 (30%)
                         Coursework 3 (40%)

Assessment Description: Participation Exercise- Contribution and engagement (Throughout course, 5%)
Coursework 1- Press release & critique of media article (31/10/2022, 25%) individual mark
Coursework 2- INDC document (29/11/2022, 30%) group mark
Coursework 3- Reflective essay (15/12/2022, 40%) individual mark

Moderation approach to main assessment: Moderation by sampling of the cohort
Assessment Feedback: Via online marking and feedback in class sessions
Failure Redemption: Resit coursework / alternative essay if coursework cannot be resat
Reading List: Nelkin, Dorothy., Selling science : how the press covers science and technology / Dorothy Nelkin., W.H. Freeman,, c1995..ISBN: 9780716725954 Gregory, Jane,, Miller, Steve,, Science in public : communication, culture, and credibility / Jane Gregory and Steve Miller., Perseus Pub.,, 2000.ISBN: 9780738203577 Mark C. Serreze author., Roger G Barry (Roger Graham), 1935- author., The Arctic climate system / Mark C. Serreze, University of Colorado at Boulder, Roger G. Barry, University of Colorado at Boulder., New York, NY, USA : Cambridge University Press, 2014.ISBN: 9781107037175
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Available to visiting postgraduate students with permission of scheme coordinator.