Swansea University
Prifysgol Abertawe

FACULTY OF SCIENCE AND ENGINEERING

UNDERGRADUATE STUDENT HANDBOOK

Year 0 (FHEQ LEVEL 4)

MARINE BIOLOGY

FOUNDATION PROGRAMMES

SUBJECT SPECIFIC
PART TWO OF TWO
MODULE AND COURSE STRUCTURE
2022-23

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 22-23 academic year begins on 19 September 2022

Full term dates can be found here

DATES OF 22-23 TERMS

19 September 2022 – 16 December 2022

9 January 2023 – 31 March 2023

24 April 2023 – 09 June 2023

SEMESTER 1

19 September 2022 – 27 January 2023

SEMESTER 2

30 January 2023 – 09 June 2023

SUMMER

12 June 2023 – 22 September 2023

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. You should also refer to the Faculty of Science and Engineering proof-reading policy and this can be found on the Community HUB on Canvas, under Course Documents.

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.

This has been a challenging period for everyone. The COVID-19 pandemic has prompted a huge change in society as well as how we deliver our programmes at Swansea University and the way in which you study, research, learn and collaborate. We have been working hard to make sure you will have or continue to having an excellent experience with us.

We have further developed some exciting new approaches that I know you will enjoy, both on campus and online, and we cannot wait to share these with you.

At Swansea University and in the Faculty of Science & 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 staff, administrators, and your fellow students - I'm sure you will find many friendly helping hands ready to assist you.

We all know this period of change will continue and we will need to adapt and innovate to continue to be supportive and successful. At Swansea we are committed to making sure our students are fully involved in and informed about our response to challenges.

In the meantime, learn, create, collaborate, and most of all – enjoy yourself!

Professor Johann (Hans) Sienz
Interim Pro-Vice Chancellor/Interim Executive Dean
Faculty of Science and Engineering

Faculty of Science and Engineering	
Interim Pro-Vice Chancellor/Interim Executive Dean	Professor Johann Sienz
Head of Operations	Mrs Ruth Bunting
Associate Dean – Student Learning and Experience (SLE)	Professor Paul Holland
School of Biosciences, Geography and Physics **Head of School: Siwan Davies**	
School Education Lead	Dr Laura Roberts
Head of Biosciences	Professor Geoff Profitt
Biosciences Programme Director	Dr Wendy Harris
Year Coordinators	Year 1 – Dr Chris Lowe Year 2 – Dr Kevin Arbuckle Year 3 – Dr Ed Pope MSc – Dr Aisling Devine

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 9am-5pm.

The **Student Support Team** provides dedicated and professional support to all studentsin 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 and 01792 6062522 (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 otherresources:

https://myuni.swansea.ac.uk/fse/coe-student-info/

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 22-23 handbooks to ensure that you have access to the most up-to-date versions. Access to print material in the library may be limited due to CV-19; your reading lists will link to on-line material whenever possible. 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/

FIELDCOURSES AND PRACTICALS

Year 2 Local Residential Field courses

After successful completion of Year 1, you will take a compulsory Year 2 local residential field course in your subject area usually in early September, before induction week. Information regarding finals dates is sent early in the second semester.

Practical Attendance

Modules have up to 3 weeks of practical work and, when a module is running, students taking that module will work in a laboratory for approximately 3 hour slots on **one** day (time of practical may vary between modules). The practicals for BIO – prefixed modules will take place in **Laboratory 115 or 118** in the Wallace Building or **Laboratory M100** in the Margam Building. There are also some computer-based practical classes, please refer to your timetable for the date and location of these. You lecturer will inform you of the correct session to attend. **You can only attend the session that you have been allocated.**

It is particularly important that students should attend at the start of each practical class as it is then that the work for the session is explained and late arrival may well jeopardise your chance of understanding the content of that class.

The lecturers delivering the practicals will inform students how practical work should be submitted for assessment. Sometimes you will be told that practical work for marking will be collected from you at the end of the laboratory class. For other practicals you will submit onto Turnitin through Canvas.

Attendance at practical classes is compulsory, and absence must be covered by Extenuating Circumstances or will result in a Zero for associated assessment.

For practical classes each student will require the following:-

(a) A **laboratory overall**; students are expected to wear an overall during practical classes and will **not** be admitted to a class unless they do so.

(b) **Safety glasses/goggles**; these must be brought to all practical classes and must be worn unless the lecturer in charge allows dispensation.

(c) **Your own paper** and **pencils** etc.

(d) **Dissection kit**: standard dissection kit containing forceps, seekers, scalpels, scissors and a hand lens.

If you do not already have them, laboratory coats, safety glasses and dissection kits should be purchased before the start of your practical.

USE OF ANIMALS IN TEACHING - POLICY STATEMENT

We ensure a responsible and ethical policy in the use of living or dead animals in teaching. We ensure a minimum number of animals will be used in any class that requires them and always seek alternatives to the use of animals where possible. The use of live animals for teaching is reconsidered at regular intervals and subject to strict ethical reviews. In addition to conformity to Home Office regulations, we endorse an approach which emphasises the importance of avoiding trivial exercises, minimising stress, choosing the right species, ensuring correct sample size and minimising durations of experiments.

There are clear moral and technical distinctions between vivisection (surgery on live animals) and dissection and these should be appreciated. In Swansea, **no** student practicals involve vivisection as the term is generally understood, however a small of practicals may involve the use of dead animals. Students and staff are expected to handle animal material respectfully and sparingly.

The use of animal material **is not** a necessary component in the training of Bioscientisits and we **do** use alternatives (videos, models and museum material) wherever possible. **Alternative assessments will be made available if you choose not to participate.**

Year 0 (FHEQ Level 3) 2022/23
Marine Biology
BSc Marine Biology[C160]

Compulsory Modules

Semester 1 Modules	Semester 2 Modules
BIO012 **Foundation Biology** **20 Credits** **Dr KAR Rose**	**BIO016** **Molecular Biology and Biochemistry** **20 Credits** **Dr MPS Gwilliam**
Total 120 Credits	

Optional Modules
Choose exactly 40 credits

GE-006	An Introduction to Data Visualisation.	Dr P Alton	TB2	20
GE-007	Foundation Physical and Environmental Geography	Prof NJ Loader/Dr NJ Felstead	TB1	20

Or
Choose exactly 40 credits

CH-005	Elementary Chemistry	Prof SG Bott	TB1	20
CH-010	Reactions and Products	Prof SG Bott	TB2	20

BIO012 Foundation Biology

Credits: 20 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr KAR Rose

Format: lecture (87%)
practical (13%)
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)

Module Aims: This module will provide the learner with a detailed and holistic overview of life on earth and includes a range of subject matter including evolution, cell biology, anatomy and physiology, as well as behaviour, ecology and conservation. The module is supported by one practical session that aims to build upon core skills required within the field of biology including scientific drawing, species identification, data handling and report writing.

Module Content: The module will comprise of the following lecture material:
- Introduction & Philosophy of science
- Evolution
- Taxonomy
- Plant cells
- Animal cells
- Basic plant structure
- Basic plant physiology
- Basic animal anatomy
- Basic animal physiology
- Animal behaviour
- Population Ecology
- Community Ecology
- Conservation

The module also includes one practical session on barn owl dietary analysis

Intended Learning Outcomes: At the end of this module students will be able to demonstrate a knowledge of:
1. The processes involved in evolution
2. The structure and function of animal and plant cells
3. The structure and function in plant and animal anatomy and physiology
4. The different levels of organisation in biology (cellular to whole organism)
5. The mechanisms involved in animal behaviour and adaptation
6. Ecological systems and how to conserve them

Assessment: Examination (50%)
Coursework 1 (20%)
Coursework 2 (15%)
Coursework 3 (15%)

Assessment Description: Assignment 1. Basic plant identification
Assignment 2. Freshwater invertebrate identification and ecology
Assignment 3

Moderation approach to main assessment: Second marking as sampling or moderation

Assessment Feedback: Assignments - written feedback provided for each student, general overview provided during the feedback lecture, written generic overview provided on BlackBoard

Formal examination - written generic overview of exam performance provided on Canvas

Failure Redemption: Re-submission of continual assessment, re-examination (MCQ examination),

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

Not available to visiting or exchange students with exception of those within the College's existing exchange programmes

BIO016 Molecular Biology and Biochemistry

Credits: 20 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr MPS Gwilliam

Format: 15 hours lectures,
9 hours practical sessions (3 x 3 hours), Formative practical sessions (5 hrs),
1 hour revision session
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 and e-learning)

Module Aims: This module introduces the identification and role of essential macromolecules within a cell and their basic biochemical processes. Lectures and laboratory-based practicals will explore the core concepts of molecular biology and the practical application of molecular techniques. Lectures will cover the fundamental cellular chemistry that is necessary to understand the molecular nature of cells and the processes involved in maintaining life. Practicals will develop this learning to investigate specific molecular applications utilised in real-life situations, and also provide context to how and why gene regulation occurs.

Module Content: This module will use a combination of lectures (20 x 1 hour) and practicals (3 x 3 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 how molecular tools can be used to in crime investigations, identification of disease causing agents, assessing human/animal relatedness, sources of contamination and more, and how genes are regulated and why.

The syllabus is split into four major themes:
1. Molecules: the stuff of life – Chemistry, carbohydrates, proteins, lipids, DNA and RNA
2. The working cell – Metabolism, cellular respiration and photosynthesis
3. Molecular Genetics – DNA synthesis, transcription, translation and gene regulation
4. Tools of Molecular Biology – Recombinant DNA technology, molecular techniques and genomics.

Practical classes:
1. Will investigate different methods to identify macromolecules
2. Will apply concepts of gene regulation and biochemistry. You will perform a Dinitro Salicylic Acid (DNS) method and a calibration curve for carbohydrates which will allow you to estimate the amount of sugar in different solutions; you will also relate these results with the type/amount of enzymes produced under specific substrates
3. Will apply the principles of restriction analysis and electrophoresis to cleave, separate and visualize DNA fragments. We will see how these techniques can be combined to obtain a DNA fingerprint and undertake our own crime scene investigation.

Specific skills employed include: Aseptic technique, molecular techniques, micropipette handling, identification of substances via basic chemistry techniques, generating and devising how to present data to allow critical analysis.

E-learning
Additional resources provided on Blackboard.

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

LO1) Identify essential macromolecules within a cell environment
LO2) Show an understanding of the role of the macromolecules and their regulating mechanisms
LO3) Show an understanding of cell structure and metabolism
LO4) Show an understanding of the most common techniques used in molecular biology

Assessment: Examination (50%)
Coursework 1 (16%)
Coursework 2 (16%)
Coursework 3 (18%)

Assessment Description: Exam - 50% MCQ (75 questions in 2 hours) CW1- 16% Macromolecules lab report CW2- 16% Gene regulation lab report CW3- 18% CSI Swansea lab report
Moderation approach to main assessment: Not applicable
Assessment Feedback: Formative feedback on coursework and examinations. Contact lecturer as required.
Failure Redemption: Re-submission of coursework, re-sit of examination
Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus. Not available to visiting or exchange students with exception of those within the school's existing exchange programmes.

CH-005 Elementary Chemistry

Credits: 20 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof SG Bott

Format: 44 hours of workshops and lectures
156 hours of independent study and assessment preparation

Delivery Method: Flipped content, active classrooms, workshops, peer-led learning.

Module Aims: This module will introduce students to the concept of atomic structure and electron configuration, inter- and intra- molecular forces, bonding and molecular structures. Through a series of interactive workshops, students will apply this knowledge in order to be able to describe and explain periodicity, the properties of groups and the observed trends, and to predict the shape and simple structures of molecules and ions. Students will also be introduced to acids, bases and pH, Avogadro's constant, simple molecular calculations and the concept of an ideal gas. Students will also become familiar with organic molecules, their functional structures and their uses. This module will form the bridge to help students to transition from GCSE and A-level Chemistry, building a strong foundation for Chemistry at Level 4.

Module Content: - electromagnetic spectrum and atomic spectra
- atomic structure and electron configuration;
- molecular formulas;
- the mole and molar mass
- organic molecules and functional groups;
- trends across and down the periodic table;
- predicting structure and shapes of simple molecules and ions;
- inter- and intra-molecular forces and bonding;
- states of matter and phase diagrams;
- gas laws and the Ideal Gas equation.
- acids, bases
- molar calculations of concentration

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

- describe atomic structure and electron configuration and use this to explain periodicity, inter and intro-molecular interactions and bonding, as well as simple molecular and atomic structures;

- perform basic molar calculations;

- draw simple organic molecules and recall functional groups

- critically evaluate and solve problems on chemical concepts

Assessment: Online Class Test (50%)
Assignment 1 (50%)

Assessment Description: Examination
Workshop and online quizzes portfolio

Moderation approach to main assessment: Second marking as sampling or moderation

Assessment Feedback: Students will receive verbal, written and online feedback, both formative and summative and at regular intervals.

Failure Redemption: A suitable alternative supplementary assessment will be provided, in line with University policy.

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

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CH-010 Reactions and Products

Credits: 20 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof SG Bott

Format: 44 hours of workshops and classes
156 hours of independent study and assessment preparation
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

Flipped content, active classrooms, workshops, peer-led learning.

Module Aims: This module will introduce students to theories and laws that underpin our knowledge of atomic and molecular interactions/reactions. It will start with discussions and calculations for chemical equations. Thermodynamics will be include equilibrium, enthalpy, entropy, Gibbs Free Energy, calorimetry and Hess' Law (including,Born-Haber cycles and Le Chatelier's Principle). Simple kinetics and rate laws including catalysis will be introduced. A variety of simple and fundamental organic reactions will be introduced including but not limited to electrophilic and nuleophilic addition and substitution. This module will form the bridge to help students to transition from GCSE and A-level Chemistry, building a strong foundation for Chemistry at Level 4.

Module Content: Chemical Equations and Stoichiometry

Calorimetry, Enthalpy, Hess’ Law, Born-Haber cycles

Rate of reaction and rate laws, the Arrhenius equation, simple Collision theory

Equilibrium including Le Chatelier's Principle (including workshop on the quadratic equations)

Acid-base reactions including titrations and buffer calculations

Entropy;

Gibbs free energy

Oxidation, reduction and redox reactions

Electrochemical potential and Galvanic cells

Electrolysis

Nucleophilic addition and substitution reactions

Electrophilic addition and substitution reactions

Elimination reactions

Organic redox reactions

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

- Perform standard stoichiometric calculations

- Define and use the standard enthalpy of combustion and formation, molar enthalpy changes (calorimetry) and Hess's Law.

- Construct lattice enthalpies and enthalpies of hydration.

- Apply the concept of entropy to explaining various reaction properties

- Combine enthalpic and entropic considerations to predicting the spontaneity of reactions

- Calculate the Gibbs free energy of a reaction using multiple procedures

- Use collision theory to explain why small increases in T can increase a rate of reaction and to understand why pressure and concentration can effect the rate of reaction.

- Apply simple mechanistic considerations (reaction coordinate, intermediate, slow step, catalysis)

- Perform calculations using the rate equation and explain qualitatively how changes in T affect the rate constant.

- Use Le Chatelier's Principle to qualitatively predict the position of equilibrium, when T, P or C is changed.

- Perform calculations with Kc and Kp and derive partial pressures from the mole fraction and total pressure.

- Perform multiple types of calculations associated with acids and bases

- Construct, balance and apply redox reactions

- Determine the potential of electrochemical reactions

- Predict the products of electrolytic processes

- Predict the products and explain mechanisms of simple organic reactions

- Critically evaluate and solve problems on chemical concepts

Assessment: Assignment 1 (50%)
In class test (Invigilated on campus) (50%)

Assessment Description: Examination (in-class)
Workshop and online quizzes portfolio

Moderation approach to main assessment: Second marking as sampling or moderation

Assessment Feedback: Students will receive verbal, written and online feedback, both formative and summative and at regular intervals.

Failure Redemption: A suitable alternative supplementary assessment will be provided, in line with University policy.

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

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GE-007 Foundation Physical and Environmental Geography

Credits: 20 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof NJ Loader, Dr NJ Felstead

Format: 20 hours (online delivery lecture and practical classes) covid-19 restrictions permitting.
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

Delivery of course through on-line and on campus dependent upon covid-19 restrictions (synchronous and asynchronous material).

Delivery of course through outdoor face-to-face practical classes – these activities will be formative in nature and are dependent upon UKGOV, WG and University Health and safety guidance – and appropriate timetabling.

Module Aims: This module complements topics taught in the Foundation Human Geography module (GE-008), to give an understanding of physical geography and the environment.

The module considers the impacts of physical geography processes on human habitation, and how humans might mitigate against the effects of nature's extreme events. It also examines the complex issues surrounding human impacts on the landscape.

Foundation Physical & Environmental Geography will pave the way for students to study Geography at Level 4 (Year 1).

Module Content: GE-007 uses the following broad themes/issues to explore physical geography systems and processes, and human impacts on - and relationships with - the natural environment:

- Coastal processes
- Weather and climate
- Quaternary Research / the Anthropocene
- Rivers
- Geomorphology
- Desertification
- Earth science
- Renewable energy
- Erosion and weathering

Intended Learning Outcomes: By the end of this module, the student should be able to:

- Understand and describe key physical geography systems and processes;
- Identify and give examples of features and landforms associated with key physical geography systems and processes;
- Demonstrate an awareness of the complex issues that surround human interactions with environments; and
- Show an appreciation of issues involved in hazard mitigation and landscape management.

Assessment: Assignment 1 (34%)
Assignment 2 (33%)
Assignment 3 (33%)

Assessment Description: Assessment revised to comprise: 4 x Short answer written questions (comprising c. 4-5 questions) set throughout the course Best three marks to comprise the module mark

Moderation approach to main assessment: Second marking as sampling or moderation

Assessment Feedback: Generic feedback on coursework via lectures synchronous and possibly Canvas.
Individual feedback on exam performance via tutorial system.

Failure Redemption: Resit examination in August (essay)

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

Only available to students enrolled on Science Foundation Year in Geography.