The following module specifications reflect the most current planning for module delivery in the 2021/22 academic year. In planning for module delivery in 2021/22 the University will continue to respond to the UK government's projected road map, and also to any further relevant national developments and public health requirements relating to the coronavirus pandemic. The University will continue to develop our approach to delivery and assessment in 2021/22 and these specifications may be subject to change in the event of updating national guidance or public health requirements. The specifications will be updated as soon as practically possible to reflect changes as they arise.

Module Specification

BS1030 The Molecules of Life - An Introduction to Biochemistry and Molecular Biology

Academic Year: 2021/2
Module Level: Year 1
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	22
Synchronous Small Group Teaching	6
Synchronous Practical Classes/ Workshops/Professional Placements	15
Synchronous Other	16
Asynchronous Lectures/Presentations	15
Asynchronous Other	
Guided Independent Study	226
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Mark Leyland
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical report 1	10				
002	Practical report 2	10				
003	Essay	20				
004	End of Module Assessment (open book)	50				
005	Engagement	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain the basic chemical principles that underpin biochemistry
- Describe the structures of biological macromolecules and their components
- Explain the basic mechanisms of DNA replication, transcription and translation
- Discuss concepts of gene expression and control in prokaryotes and eukaryotes
- Discuss the relationship between protein structure and function
- Outline the key metabolic processes in cells and identify important mechanisms of metabolic regulation
- Demonstrate an ability to analyse experimental data
- Use and assess literature to produce written reports
- Reflect on and articulate motivations, strengths and experience of developing one or more transferable skills

Teaching and Learning Methods

Lectures, laboratory practical sessions, review sessions and group work, small group tutorials, revision sessions

Assessment Methods

Practical report, essay, final assessment, engagement

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparation of laboratory reports, completion of pre-lab tests, reading practical books in preparation for laboratory classes, researching and evaluating scientific literature, preparation of formative talks/presentations for small-group tutorials, problem-solving in support of small group tutorials, guided reading to support module material.

Last Published: 19 September 2021

Module Specification

BS1040 The Cell - An Introduction to Cell Biology and Microbiology

Academic Year: 2021/2
Module Level: Year 1
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	22
Synchronous Small Group Teaching	6
Synchronous Practical Classes/ Workshops/Professional Placements	15
Synchronous Other	
Asynchronous Lectures/Presentations	23
Asynchronous Other	15
Guided Independent Study	219
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Catherine Pashley
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Essay	20				
002	Lab Practical Report	10				
003	Engagement	10				
004	Statistics	10				
005	End of Module Assessment	50		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Discuss and explain the basic structure and function of cells and cellular organelles, membrane transport and cellular homeostasis.
- Discuss and explain some of the diversity of life on earth including some of the similarities and differences in structures and replication between viruses and other subcellular infectious agents, archaea, bacteria, unicellular and multicellular microbial eukaryotes.
- Describe how micro-organisms cause disease, are used in biotechnology and influence geochemical cycles.
- Discuss and explain the principles of systematics and classification, especially as they apply to micro-organisms.
- Demonstrate the use of techniques to study and handle cells and micro-organisms appropriately.
- Demonstrate competency in oral and written communication, numeracy, basic statistical skills, IT skills, problem solving, and group working.
- Demonstrate awareness of the importance of microbiology within economic, ecosystem and health sustainability issues.
- Use relevant sources to inform academic writing and demonstrate academic integrity in their submitted work through appropriate use of academic citation and referencing conventions.

Teaching and Learning Methods

Lectures, tutorials, practical classes, workshops, problem solving classes.

Assessment Methods

Practical coursework book, essay and end of module assessment.

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Reading recommended literature and text books, reviewing lectures, preparing the essay and other written work, revising for the exam. Online tutorials on avoiding plagiarism provided by the School of Biological Sciences and by the University.

Last Published: 19 September 2021

Module Specification

BS1050 From Individuals to Populations - An Introduction to Genetics

Academic Year: 2021/2
Module Level: Year 1
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	1
Synchronous Small Group Teaching	6
Synchronous Practical Classes/ Workshops/Professional Placements	12
Synchronous Other	22
Asynchronous Lectures/Presentations	22
Asynchronous Other	
Guided Independent Study	79
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Ezio Rosato
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Blackboard test	30				
002	End of Module Assessment (open book)	60		2		
003	Engagement mark	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain how chromosomes are inherited through mitosis and meiosis and how genetic variation is generated.
- Perform elementary genetic analyses.
- Perform elementary statistical analyses.
- Recognise genetic diseases and genetically influenced disorders and appropriate methods of screening.
- Explain genetic variation and methods to measure it.
- Explain what factors influence global patterns of genetic diversity.
- Describe basic elements of molecular evolution of genes and genomes
- Define DNA sequencing technologies and their use in modern genetics
- Demonstrate competence in data analysis

Teaching and Learning Methods

A combination of synchronous and asynchronous delivery methods including slides presentations, exploration of specific topics, general summaries, tutor-led review sessions, problem solving and experimental analyses.

Assessment Methods

Coursework assessment and examination. Students earn engagement marks (10%) by submitting 5 out of 6 formative assessments (or 80% of the due number if they have mitigating circumstances).

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparing for and revising all synchronous and asynchronous material delivered through the module. Consulting textbooks to improve and widen understanding. Preparing for and producing coursework. Preparing for the final examination.

Module Specification

BS1060 Multicellular Organisation - An Introduction to Physiology, Pharmacology and Neuroscience

Academic Year: 2021/2
Module Level: Year 1
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	0
Synchronous Small Group Teaching	5
Synchronous Practical Classes/ Workshops/Professional Placements	2
Synchronous Other	12
Asynchronous Lectures/Presentations	30
Asynchronous Other	100
Guided Independent Study	151
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Volko Straub
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Test 1	30				
002	Test 2	30				
003	Lab Practical Report	30				
005	Engagement	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe general aspects of the organisation, function and operating principles of the main physiological systems in the human body.
- Apply basic concepts of pharmacology to classes of cell surface receptors for neurotransmitter, hormones and local mediators.
- Describe the properties of cell surface receptors, their functions and relevant signalling pathways.
- Explain how individual physiological systems work together to achieve whole body homeostasis.
- Demonstrate understanding of human physiological measurements
- Handle, manipulate, display and statistically analyse physiological data.

Teaching and Learning Methods

Lectures, practical classes, tutorials

Assessment Methods

Tests x2, report and engagement

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

• Read a variety of relevant source material including textbooks and scientific articles. Specific reading tasks will be posted during the lectures and on Blackboard.
• Prepare report including data handling.
• Revise module content guided by lecture material and module workbook as well as external sources.
• Prepare and revise material covered in group work sessions (listed as tutorials).
• Prepare for practical sessions assisted by practical handbooks.
• Complete formative online tests to check understanding of material and prepare for summative online tests and exams.

Module Specification

BS1070 Biodiversity and Behaviour - An Introduction to Zoology

Academic Year: 2021/2
Module Level: Year 1
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	12
Synchronous Other	12
Asynchronous Lectures/Presentations	22
Asynchronous Other	6
Guided Independent Study	98
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Sinead Drea
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Statistics	15				
002	End of module assessment	60		1		
003	Presentation	20				
004	Engagement	5				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe and discuss:
• Phylogeny and the tree of life
• Basic animal and plant development
• Animal and plant origins and diversity
• Biodiversity/ecology and its importance
• Animal behavioral/physiological adaptations
• Use appropriate statistical analysis software to analyse data

Teaching and Learning Methods

A combination of synchronous and asynchronous delivery methods including slides presentations, exploration of specific topics, general summaries, tutor-led sessions, statistical/data analyses.

Assessment Methods

Coursework assessment, engagement and end of module assessment.

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparing for and revising all synchronous and asynchronous material delivered through the module. Consulting textbooks/ papers. Preparing for and producing coursework. Preparing for the final end of module assessment.

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Module Specification

BS2004 Contemporary Techniques in Biological Data Analysis

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	11
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	11
Synchronous Other	
Asynchronous Lectures/Presentations	11
Asynchronous Other	22
Guided Independent Study	95
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Eamonn Mallon
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Per session MCQs	50				
002	Final Guided Analysis	50		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Understand various classical tests as examples of linear modules - assessed by exam
Understand the basic logic and set up of GLMs - assessed by exam
Design a statistically robust experiment - assessed by exam and MCQs
Explain how various complications (eg interactions) are implemented in GLMS - assessed by exam
Choose the correct statistical mode, ie model selection - assessed by exam
Implement practical aspects of the above in the statistical programming language R - assessed by MCQs

Teaching and Learning Methods

Lectures and workshops

Assessment Methods

Per sessions MCQ's and open book analyses

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Background reading, practice datasets, answering MCQs

Last Published: 19 September 2021

Module Specification

BS2009 Genomes

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	0
Synchronous Small Group Teaching	7
Synchronous Practical Classes/ Workshops/Professional Placements	6
Synchronous Other	19
Asynchronous Lectures/Presentations	21
Asynchronous Other	0
Guided Independent Study	97
Total Module Hours	156

Period: Semester 1
Occurence: E
Coordinator: Celia May
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lab Practical Report	35				
003	End of Module Assessment	55				
004	Engagement Marks	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- describe how prokaryotic and eukaryotic genomes are organised
- discuss mechanisms operating to influence this organisation
- explain basic processes of genome maintenance
- analyse experimental data
- perform simple bioinformatic analyses
- propose experimental strategies to study and manipulate genomes

Teaching and Learning Methods

Asynchronous lectures; synchronous discussion groups, tutorials and clinics; laboratory and computer practical classes.

Assessment Methods

Practical analysis, end-of-module assessment (open book), engagement marks associated with practical, tutorial and lecture programme components (e.g. submission of answers to a variety of tasks to Blackboard, Top Hat, etc).

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparation for lectures and reviewing lecture presentations. Reading based on lecture topics. Preparation for tutorials and review of tutorials. Analysing experimental and bioinformatic data and considering experimental design. Preparing Practical Analysis (including experimental and bioinformatic components) for submission. End-of-Module Assessment preparation.

Last Published: 19 September 2021

Module Specification

BS2013 Physiology and Pharmacology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	5
Synchronous Practical Classes/ Workshops/Professional Placements	2
Synchronous Other	8
Asynchronous Lectures/Presentations	20
Asynchronous Other	2
Guided Independent Study	113
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Martyn Mahaut-Smith
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lab practical reports	40				
002	End of Module Assessment	60		3		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe the basic structure of the various classes of cell surface receptors, explain the intracellular signalling pathways regulated by such receptors, provide examples of receptors that possess multiple subtypes for a given hormone or neurotransmitter (agonist).
- Undertake a quantitative analysis of drug-receptor interactions and interpret the Information; describe how drugs can modify agonist-receptor interactions and be able to quantify these effects.
- Discuss the mechanisms by which drugs can modify the function of the cardiovascular system to treat disease states such as hypertension.
- Plan experiemnts and generate data via a computer-based simulation package in orer to address the sites and mechanisms of drug addition
- Handle, graph, manipulate, tabulate and analyse pharmacological data derived from experiments.
- Demonstrate a range of transferable skills including written communication, information technology, numeracy, team working, problem solving, examination technique, information handling.

Teaching and Learning Methods

Asynchronous: understanding concepts and analytical/presentation skills
Synchronous: theory and concepts, analysis and presentation of data
Directed reading

Assessment Methods

Practical assignments
End of module assessment

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Reviewing material reviewed in asychronous sessions, undertaking guided activites in preparation for synchronous sessions. Preparation and generation of material for practical assignments. Reading literature relevant to these topics to gain further insight into the module content.

Module Specification

BS2014 Exercise Physiology and Pharmacology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	5
Synchronous Practical Classes/ Workshops/Professional Placements	6
Synchronous Other	7
Asynchronous Lectures/Presentations	20
Asynchronous Other	
Guided Independent Study	110
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: John Mitcheson
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lab practical report	30				
002	End of module assessment	60		2		
003	Engagement	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain the structure and function of the neuromuscular junction.
- Explain the different elements of the musculoskeletal system and skeletal muscle contraction.
- Integrate and explain the control mechanisms responsible for regulating the musculoskeletal, cardiovascular and respiratory systems through a consideration of the acute and chronic effects of, for example, aerobic exercise at the metabolic, cellular and systems levels.
- Describe the limitations to exercise and selected relationships between exercise, health and disease.
- Explain the use and abuse of drugs in performance sport, including cellular and systems effects.
- Demonstrate the ability to handle, manipulate, display and statistically analyze physiological data.
- Use a range of transferable skills including written communication, information technology, numeracy, team working, problem solving, examination technique, information handling.

Teaching and Learning Methods

Asynchronous presentations with associated work activities. Synchronous summary and/or Q&A sessions at the end of each lecture topic. Tutorials with problem solving worksheets. Circumstances permitting - a laboratory based practical class. Data handling worksessions. Directed reading

Assessment Methods

Practical report and supporting work, aend of module assessment, and engagement. Engagement will be assessed by attendance (and participation) at tutorials and completion of tutorial worksheets. Marks will be recorded by tutors.

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparation for practical class. Completion of worksheets for tutorials. Practical report preparatory work and report generation. Reviewing asychronous presentations and completion of associated learning activities. Additional reading around subject areas and revision for examination.

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Module Specification

BS2015 Physiology of Excitable Cells

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	10
Synchronous Other	5
Asynchronous Lectures/Presentations	20
Asynchronous Other	5
Guided Independent Study	110
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Paul Glynn
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	MCQ/SAQ Coursework 1	20				
002	MCQ/SAQ Test 1	20				
003	MCQ/SAQ Coursework 2	20				
004	MCQ/SAQ Test 2	20				
005	MCQ/SAQ Test 3	20				

Intended Learning Outcomes

BS2015 extends material from BS1060 (which is a pre-requisite for BS2015). The module aims to develop the student's understanding of:
1. structure, organization, and function of the nervous system and its components.
2. qualitative and quantitative aspects of membrane excitability, ion channel function, and axonal conduction.
3. Transmission at, and pharmacology of, chemical synapses.
4. qualitative and quantitative aspects of integration at synapses; synaptic plasticity.
5. the physiology of vision to demonstrate how the nervous system adapts or mal-adjusts in response to external factors.

In addition, BS2015 entails use of, and so aims to enhance the student's facility with, transferable skills: numeracy; data-handling/analysis; concise written communication.

Teaching and Learning Methods

All taught material will be delivered online.

Assessment Methods

All assessment will be open-book. Memorisation is not required.
There is NO final exam.

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Completion of worksheets. Data handling questions, Looking through lecture material before and after lectures, reviewing lecture recordings. Additional reading around subject areas and revision for examination.

Module Specification

BS2026 Genes, Development and Inheritance

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	1
Synchronous Small Group Teaching	15
Synchronous Practical Classes/ Workshops/Professional Placements	4
Synchronous Other	19
Asynchronous Lectures/Presentations	22
Asynchronous Other	
Guided Independent Study	89
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Celia May
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
005	Experimental analysis	20				
006	Essay (1500 words)	20				
007	End of Module Assessment (open book)	60		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain the use of genetics to dissect gene regulation and function during development.
- Describe how genetics is used to study human disease.
- Analyse human pedigrees to determine inheritance patterns of genes.
- Relate disruptions in the genome to expression of diseases and mutant phenotypes.
- Explain the use of population genetic analysis.
- Critically analyse experimental data.
- Demonstrate competency in accessing information, organising references and writing and producing an essay.

Teaching and Learning Methods

Asychronous lectures; synchronous discussion groups, problem-solving tutorials and clinics; laboratory class, synchronous experimental analysis and design sessions.

Assessment Methods

Experimental analysis, Essay (1500 words), End of Module Assessment (open book)

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparation for lectures and reviewing lecture presentations. Reading based on lecture topics. Preparation for problem-solving tutorials and follow-up of provided solutions. Preparing for experimental classes and preparing Experimental Analysis for submission. Researching and writing essay for submission. End-of-Module Assessment preparation.

Module Specification

BS2030 Principles of Microbiology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	11
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	23
Asynchronous Other	6
Guided Independent Study	108
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Hasan Yesilkaya
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
002	Lab practical report	35				
003	End of module assessment	65		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain basic techniques for isolation, handling and identification of microbes, and demonstrate an ability to apply microbiology techniques in the laboratory.
- Demonstrate an awareness of microbial diversity and microbial cell structure.
- Evaluate ways in which genetic techniques can be applied to the study of bacteria and applications of these techniques in biotechnology.
- Describe the features of specific microorganisms that are important in infections disease and bioindustry.
- Communicate in writing an awareness of the concepts of microbiology, including the microbiology in health and environmental sustainability.

Teaching and Learning Methods

Lectures, laboratory practicals.

Assessment Methods

Practical report and end of module assessment.

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Guided reading (text books and research journal articles), reviewing lectures, preparing written work.

Module Specification

BS2032 Immunology and Eukaryotic Microbiology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	3
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	8
Synchronous Other	10
Asynchronous Lectures/Presentations	10
Asynchronous Other	10
Guided Independent Study	109
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Andrea Cooper
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
002	Workbook	50				
004	End of module assessment	50		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe the major features of eukaryotic microbiology and immunology.
- Perform microbiological and immunological procedures.
- Present and interpret laboratory results.
- Demonstrate competence in acquiring information from the scientific literature and use of basic bioinformatics tools.
- Be able to work effectively in small groups.
- Demonstrate effective time management.
- Demonstrate awareness of health sustainability.

Teaching and Learning Methods

Lectures
Laboratory practical classes
Optional field trip

Assessment Methods

- workbook: 40%
- Exam (1.5 hours): 60%

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Reading a wide range of literature relevant to the content of the module, including current news, textbooks and scientific articles. Reviewing lectures, revising for assessment.

Last Published: 19 September 2021

Module Specification

BS2033 Immunology and Eukaryotic Microbiology (with Science Enterprise Trip)

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	3
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	8
Synchronous Other	10
Asynchronous Lectures/Presentations	10
Asynchronous Other	10
Guided Independent Study	109
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Andrea Cooper
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Workbook with assignment on visit (reassessment by workbook with assignment on practical class for any student who misse	50				
002	End of module assessment	50		1.5		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe the major features of eukaryotic microbiology and immunology.
- Perform microbiological and immunological procedures.
- Present and interpret laboratory results.
- Demonstrate competence in acquiring information from the scientific literature and using basic bioinformatics tools.
- Be able to work effectively in small groups.
- Demonstrate effective time management.
- Demonstrate awareness of health sustainability.
- Demonstrate detailed knowledge of the mission and governance of selected public and private enterprise life science establishments, and awareness of current and future trends in selected sectors of life science industry.

Teaching and Learning Methods

Lectures
Laboratory practical classes
Compulsory science and enterprise trip

Assessment Methods

Workbook: 50%
End of module assessment: 50%

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Reading a wide range of literature relevant to the content of the module, including current news, textbooks and scientific articles. Reviewing lectures, completing workbook, revising for assessment.

Module Specification

BS2040 Bioinformatics

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	10
Synchronous Practical Classes/ Workshops/Professional Placements	4
Synchronous Other	5
Asynchronous Lectures/Presentations	22
Asynchronous Other	10
Guided Independent Study	99
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Richard Badge
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Computer practical report	20				
002	Bioinformatics anaysis report	20				
003	Engagement	5				
004	End of module assessment	55				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Use computer systems to access bioinformatic databases.
Explain the use of computers in analysing genomic data.
Describe how protein structures are determined and modelled.
Compare DNA and protein sequences to analyse gene structure and function.
Demonstrate competency in accessing information, organising references and writing and producing practical reports

Teaching and Learning Methods

Video Presentations; Computer Practical Classes; Tutorials with group-work tasks and discussion; Engagement activities; Directed Study; Guided Independent Study.

Assessment Methods

Practical Reports; Open-Book End-of-Module Assessment; Engagement activities (satisfactory completion of online tests)

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Students will be directed to essential reading (textbooks; selected journal articles) and recommended reading (journal articles, books, webpages) to complement the video presentations and assist preparation for End-of-Module Assessment and Computer Practical reports. Preparation for computer practical, execution of practice computational analyses. Planning, drafting and preparation of Computer Practical reports. Problem solving in support of small-group tutorials. Engagement activities (online tests contribution). Revising for End-of-Module Assessment.

Details of indicative activities subject to modification as required.

Last Published: 19 September 2021

Module Specification

BS2066 Behavioural Neurobiology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	11
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	7
Asynchronous Lectures/Presentations	24
Asynchronous Other	7
Guided Independent Study	101
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Tom Matheson
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical Report 1	30				
002	End of Module Assessment	65		2		
004	Engagement (tutorial participation):	5				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain and critically discuss the main topics with reference to appropriate source material, including primary research papers.
- Plan and carry out quantitative analyses of behaviour on existing video recordings, analyse and interpret the quantitative data, critically review the experimental paradigm, and write up as a formal report .
- Discuss the results of experiments in the context of the related research literature.
- Use a computer modelling environment to design and carry out tests of neural network function.
- Analyse the patterns of connectivity in a model neural network to explain its functional organisation.

Teaching and Learning Methods

• Asynchronous mini-lectures supported by asynchronous pre-lecture and post-lecture material.
• Asynchronous practical exercise supported by asynchronous pre-practical and post-practical material. The practical integrates critique of experimental design with training in quantification of behaviour and generic data analysis skills using existing research data as an example.
• Asynchronous interactive quizzes and self-learning exercises.
• Synchronous online interactive review sessions (face-to-face if possible)
• Synchronous online whole-class tutorials (face-to-face if possible)
• Online group work.
• Synchronous and asynchronous online Instructor feedback.
• Guided independent study.

Assessment Methods

- Practical Report: 40%
- End of Moudule Assessment: 60%

Pre-Requisites

Co-Requisites

Excluded Combinations

BS2077

Guided Independent Study: Indicative Activities

• Reading textbooks and primary research papers from the reading list and found independently to support the framework set out in the course material.
• Preparing for the practical by engaging with the supporting material and reading related research papers.
• Analysing provided video recordings to generate quantitative behavioural data. Interpreting the data in light of the experimental design, and relating them to the relevant literature.
• Preparing for tutorials by engaging with relevant online material in advance, reading relevant literature, and preparing for group work.
• Developing knowledge and preparing for the final online assessment exam by: revising lecture notes, online learning resources, feedback materials (from tutorials and the practical reports), and material from the reading list as well as independently found sources.

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Module Specification

BS2077 Neurobiology and Animal Behaviour

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	11
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	7
Asynchronous Lectures/Presentations	25
Asynchronous Other	7.5
Guided Independent Study	99.5
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Swidbert Ott
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical Report	30				
003	End of Module Assessment	65		2		
004	- Engagement (tutorial participation)	5				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain and critically discuss with reference to appropriate source material, including primary research papers.
- Plan and carry out quantitative analyses of behaviour on existing video recordings, analyse and interpret the quantitative data, critically review the experimental paradigm, and write up as a formal report .
- Formulate hypotheses and test them using appropriately chosen and interpreted statistical techniques.

Teaching and Learning Methods

• Asynchronous mini-lectures supported by asynchronous pre-lecture and post-lecture material.
• Asynchronous practical exercise supported by asynchronous pre-practical and post-practical material. The practical integrates critique of experimental design with training in quantification of behaviour and generic data analysis skills using existing research data as an example.
• Asynchronous interactive quizzes and self-learning exercises.
• Synchronous online interactive review sessions (face-to-face if possible)
• Synchronous online whole-class tutorials (face-to-face if possible)
• Online group work.
• Synchronous and asynchronous online Instructor feedback.
• Guided independent study.

Assessment Methods

- Practical Report: 40%
- End of Module Assessment: 60%

Pre-Requisites

Co-Requisites

Excluded Combinations

BS2066

Guided Independent Study: Indicative Activities

• Reading textbooks and primary research papers from the reading list and beyond to support the framework set out in the course material.
• Preparing for practicals and tutorials by engaging with the supporting material, reading relevant research papers and preparing for group work.
• Analysing provided video recordings to generate quantitative behavioural data. Interpreting the data in light of the experimental design, and relating them to the relevant literature.
• Developing knowledge and preparing for the final online assessment by: revising lecture notes, online learning resources, feedback materials (from tutorials and the practical report), and material from the reading list as well as independently found sources.

Last Published: 19 September 2021

Module Specification

BS2091 Biochemistry of Nucleic Acids

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	12
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	8
Synchronous Other	10
Asynchronous Lectures/Presentations	23
Asynchronous Other	10
Guided Independent Study	85
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Olga Makarova
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lab Practical Report	30				
002	Computer Practical	10				
003	End of Module Assessment (open book)	60		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe how information encoded in DNA is transcribed into RNA and how primary transcripts are processed to achieve their final, functional form.
- Demonstrate the principles of the genetic code and translation of genetic information from messenger RNA into protein.
- Cary out and interpret simple experiments illustrating aspects of the above.
- Explain the principles underpinning the regulation of gene expression in prokaryotes and eukaryotes.
- Describe molecular mechanisms of DNA manipulation by specified enzyme(s).
- Develop transferable skills in writing and data analysis.

Teaching and Learning Methods

Lectures, interactive tutorials, practicals, computer-based sessions, revision sessions

Assessment Methods

- End of Module assessment: 60% (2 hours)
- Computer practical: 10%
- Lab Practical Report: 30%

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Guided reading, recommended audiovisual materials.
Lectures made available for review using Reflect.
Preparation for tutorials.
Research for long-format writing task.

Last Published: 19 September 2021

Module Specification

BS2092 Molecular Cell Biology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	3
Synchronous Practical Classes/ Workshops/Professional Placements	6
Synchronous Other	11
Asynchronous Lectures/Presentations	20
Asynchronous Other	6
Guided Independent Study	104
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Sue Shackleton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Tutorial Test 1	4				
002	Tutorial Test 2	4				
003	Tutorial Test 3	4				
004	Lab practical report	28				
005	End of Module Assessment (open book)	60		3		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe the principles and outline the steps involved in common cell biology techniques.
- Explain how membrane and secreted proteins are post-translationally processed and targeted to different subcellular and extracellular locations.
- Explain how signalling pathways integrate extracellular signals to allow the regulation of complex cellular processes such as metabolism and cell proliferation.
- Explain the respective roles of microtubules, actin and intermediate filaments in the maintenance of cell architecture and function.
- Describe the processes involved in mitotic cell division and eukaryotic cell cycle control.
- Develop a strategy to address a specific scientific hypothesis and be able to critically analyse the results of such experiments.

Teaching and Learning Methods

Recorded lectures, with associated activity sheets
Weekly review sessions
Practical
Tutorials

Assessment Methods

Tutorial Multiple Choice Question tests (12%)
Practical Report (28%)
End of module assessment (60%)

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Weekly tasks involving guided further reading from course text book and other materials, watching videos, answering associated questions and carrying out online laboratory simulation exercises.
Preparation of answers to tutorial questions and MCQ tests.
Analysis of data and preparation of practical report.
Formative exam-practice question.
Consolidation of information and revision for end of module assessment.

Module Specification

BS2093 Protein Control in Cellular Regulation

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	12
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	5
Synchronous Other	10
Asynchronous Lectures/Presentations	10
Asynchronous Other	10
Guided Independent Study	101
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Mark Leyland
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	cComputer Modelling Practical	10				
002	Presentation	20				
003	End of Module Assessment	70		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Discuss the properties of enzymes and describe the different ways protein activity is regulated.
- Discuss the molecular properties of proteins involved in energy transduction.
- Explain the integration and regulation of metabolism.
- Demonstrate the ability to analyse the molecular features of proteins.
- Analyse experimental data to solve problems.

Teaching and Learning Methods

Lectures, interactive tutorials, practicals, computer-based sessions, revision sessions.

Assessment Methods

- Computer modelling practical: 10%
- Presentation: 20%
- Exam: 70% - 2 hours

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Guided reading on key aspects of the module, preparation for laboratory practicals, analysis of data generated from laboratory practical, problem-solving in interactive tutorials, completion of online tests for formative assessment, reading of scientific literature to develop presentations, prearation of slides for presentations.

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Module Specification

BS3000 Evolutionary Genetics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	4
Synchronous Other	11
Asynchronous Lectures/Presentations	22
Asynchronous Other	
Guided Independent Study	113
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Ed Hollox
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
002	Research Poster	20				
003	Research Essay	30				
004	End of Module Assessment	50		2		

Period: Semester 1
Occurence: E1
Coordinator: Ed Hollox
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
002	Research Poster	20				
003	Research Essay	30				
004	End of Module Assessment	50		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Demonstrate an understanding of the process of mutation, drift and the molecular clock in phylogenetics and evolutionary genetic analysis.
- Discuss the methods used for inferring natural selection from molecular and experimental data.
- Discuss the role of gene duplication in evolution.
- Critically evaluate the various evolutionary pressures that gave rise to modern humans.
- Explain the in the genetic basis of body plan evolution.
- Critically evaluate research publications.
- Relate experimental evidence to its interpretation.

Teaching and Learning Methods

These topics will be covered in approximately 22 hours of asynchronous teaching material, combined with two 2 hour synchronous computer workshops and 11 hours of timetabled synchronous question and answer sessions.

Assessment Methods

A research poster and recorded oral summary based on a recent research paper will contribute 20% of the module mark.
A 2500 word essay based on the same research paper will contribute 30% of the module mark.
A two hour open-book assessment conducted within a 24 hour window will contribute 50% of the module mark.

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Module Specification

BS3003 Cancer Cell and Molecular Biology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	4
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	8
Asynchronous Lectures/Presentations	13
Asynchronous Other	
Guided Independent Study	125
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Salvador Macip
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	MCQ 1	2				
002	MCQ 2	2				
003	MCQ 3	2				
004	Infographic	38				
005	Essay	56				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe the main features which distinguish malignant cells from normal cells, the mechanisms which regulate their proliferation and survival, and how this information can be used to design new therapies
- Integrate information from diverse sources to understand the origins of cancer and the processes involved on the progression into a full malignancy.
- Conduct a literature research project and write a critical appraisal of the subject, summarising the most important facts.

Teaching and Learning Methods

There will be 4 small group synchronous sessions (60-minute tutorials) spread over the length of the course. A work sheet outlining the aims and objectives of each session will be available on Blackboard prior to the tutorials and some preparation work will be needed. Tutorials are not marked, but attendance and participation are compulsory and will be monitored. The tutorials will be related to the contents of the lectures and the module assessments.

Assessment Methods

BS3003 has no exam. There will be three forms of assessment: an infographic (38%), a 5000-word essay (56%) and three multiple choice question computer tests (MCQ). These MCQs tests will help guide the students through the curriculum. They will be spread over the weeks of the module and related to the topics delivered in the previous weeks.

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Each topic has a list of essential papers which guides the students to extra reading. Preparation for tutorials is based on a list of questions that the students have to research and answer ahead of the session, thus guiding them through the acquisition of basic knowledge to reinforce what is taught in lectures. Information on how to write an essay is given to students in documents and in tutorial discussions, in order to guide them through the acquisition of the skills needed to complete the appropriate ILOs.

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Module Specification

BS3010 Gene Expression: Molecular Basis and Medical Relevance

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	3
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	12
Asynchronous Lectures/Presentations	20
Asynchronous Other	
Guided Independent Study	115
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Shaun Cowley
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Engagement (MCQ test 1)	4		0.08		
002	Engagement (MCQ test 2)	4		0.08		
003	Engagement (MCQ test 3)	4		0.08		
005	Debate content and performance (presentation)	30				
006	End of Module Assessment (open book)	58		2.42		

Period: Semester 1
Occurence: E1
Coordinator: Shaun Cowley
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Engagement (MCQ test 1)	4		0.08		
002	Engagement (MCQ test 2)	4		0.08		
003	Engagement (MCQ test 3)	4		0.08		
005	Debate content and performance (presentation)	30				
006	End of Module Assessment (open book)	58		2.42		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Acquire a thorough knowledge of the molecular mechanisms of gene expression and its control, in mammals, to enable them to pursue independent study in this area.
- Describe how gene expression can be perturbed and cause disease.
- Explain the role of creative thought and rigorous tests of hypotheses in science.
- Appraise published work and become independent thinkers in the planning and interpretation of experimental approaches to discovering how gene activity is controlled.
- Develop skills in assimilation and appraisal of data, reasoning and communication that will prepare them for more general employment.

Teaching and Learning Methods

Lectures, discussing prepared answers, computer class, extensive guided reading

Assessment Methods

Examination (final)
Debate content and performance

Pre-Requisites

BS2091

Co-Requisites

Excluded Combinations

-

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BS3010 Gene Expression: Molecular Basis and Medical Relevance

Guided Independent Study: Indicative Activities

Preparation for debates will require group organisation and planning, independent reading of research papers, and preparation of Powerpoint presentations illustrating published data and other key points in support of the case they are making in the debate (and illustrations of weaknesses in the data being presented by their opponents).

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Module Specification

BS3011 Microbial Pathogenesis and Genomics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	1
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	6
Synchronous Other	7
Asynchronous Lectures/Presentations	7
Asynchronous Other	17
Guided Independent Study	112
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Christopher Bayliss
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Bioinformatic analysis	5				
002	Data Analysis Test	25				
003	Experimental strategy report	70				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Present in detail and explain the genetic mechanisms underlying selected processes in bacteria.
- Demonstrate knowledge of the molecular and genetic basis of strategies employed by microorganisms to invade host tissue, avoid host defence mechanisms and proliferate at sites of infection.
- analyse and interpret data and information from primary literature sources, and organise and communicate it in writing. demonstrate, in writing, a capacity for critical analysis of a specialised or topical issue in microbiology.
- Design a research activity to determine the contributions of a virulence factor or other mechanism to an infectious disease. Demonstrate use of bioinformatics tools to analyse and understand microbial virulence traits.

Teaching and Learning Methods

Lectures, tutorials, problem solving classes, formative assessment, attending Departmental and College external seminars to enhance understanding of the impact of scientific research and to increase scientific knowledge related to the module.

Assessment Methods

Onine data analysis and bioinformatics test.
Written reports on experimental design and analysis.

Pre-Requisites

BS2009

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Reading research literature, reviewing lectures, reviewing and understanding lecture material, analysing data and information for tutorials and seminars, preparing coursework.

Module Specification

BS3013 Human and Environmental Microbiomics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	8
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	10
Asynchronous Lectures/Presentations	18
Asynchronous Other	
Guided Independent Study	112
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Martha Clokie
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
002	Presentation	30				
003	End of module assessment	70		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Discuss how microbes play essential roles in planetary and human health and sustainability.
- Discuss how our understanding of microbiology has been transformed over the last decade by advances in sequencing technology, which has facilitated a deep understanding in microbial diversity and evolution and physiology both from whole genome and metagenome approaches.
- Identify the key roles played by microbes in human health and in the wider environment including aquatic and terrestrial environments.
- Demonstrate in the context of the above areas of environmental microbiology, experience of accessing information from the scientific literature in electronic and written form, and its organisation through oral presentation.
-Understand the roles viruses have in shaping microbial communities in both human and environmental microbiomes.

Teaching and Learning Methods

Lectures, seminars

Assessment Methods

Seminar
Exam (final)

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Guided reading (research journal articles), reviewing lectures, preparing written work, revising for exam.

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Module Specification

BS3015 Molecular and Cellular Immunology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	5
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	30
Asynchronous Lectures/Presentations	22
Asynchronous Other	
Guided Independent Study	93
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Cordula Stover
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of module assessment	50		2		
002	Scientific Interview Discussion	50				

Period: Semester 1
Occurence: E1
Coordinator: Cordula Stover
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of module assessment	50		2		
002	Essay	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Demonstrate a detailed knowledge of the mammalian immune system, including specific and non-specific immune responses.
- Explain the molecular and cellular approaches used to investigate mechanisms of immunity.
- Demonstrate a capacity for critical analysis of a specialised or topical issue in immunology

Teaching and Learning Methods

For blocks of lectures, rotating groups of students will be chosen to answer questions at the beginning of the next session pertaining to the previous session.
Frontloading of lectures with OER available on blackboard with signposting in the lectures.
Peer review and feedback in tutorials.

Assessment Methods

Data handling paper (final). Research papers will be provided by contributors and related to a module ILO topic. Task: present selected experiment in the context of the area (attendance of lectures necessary) and analyse results (individually).

Scientific panel discussion
This will take the format of a news panel interview. Students in groups of three will present a group project on an immunological topic. Students will be introduced to the assessment format using tutorial sessions.
Task: students will take on 1 of 3 roles: 1. The Scientist (presents immunology proposal), 2. The Public member (questions relevance to health), 3. The Research Council Funder (evaluates relevance of case presented to the public by the scientist).
All 3 immunology project sessions will be double marked. Also, the Scientific interview will be peer assessed (worth 10% of the interview mark). With permission from participant groups, sessions will be Panopto recorded.

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Reading a wide range of literature relevant to the overall content of the module. Practice for assessment: data handling (reading and analysing example papers) and practice for the scientific interview.

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UNIVERSITY OF LEICESTER

Module Specification

BS3016 Neuroscience Futures

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	5
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	10
Asynchronous Other	
Guided Independent Study	135
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Jian Liu
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Essay (1500 words)	30				
002	Journal Club Presentation	10				
003	Journal Club Evaluation tests	20				
004	Examination (Final)	40		1.5		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Interrogate the primary neuroscience literature in current research areas, led by relevant academic staff and to develop critical faculties.
Using specific examples, describe and explain recent advances in neuroscience with special reference to new and developing methodologies.
Read, analyse, and interpret data from the neuroscience literature.

Communicate complex ideas and research findings using a variety of appropriate media.

Integrate relevant information and critique research in the context of an appropriate neuroscience field.

Teaching and Learning Methods

Lectures and Research Seminars with Journal Clubs in which there will be oral discussion with questions and answers (as in tutorials) alongside online evaluation; students will have directed reading and study support sessions.

Assessment Methods

Essay (1500 words)
Journal Club Presentation
Journal Club Evaluation tests
Examination (final)

Pre-Requisites

BS2015: Neuroscience
BS2066: Behavioural Neurobiology

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

For each conference the students will read one research paper which will be discussed in the Journal Club. They will participate in online tests for each conference. Their first assessment (JCI) will take the form of an introduction in the research area of one Conference: the students will each collate a Virtual Journal of 5 research articles (one article provided as a starting point) and write a 1000 word introduction, explaining the contribution of these articles to research in that Conference topic.
Look through lecture and seminar materials before and after each session and answer formative quizzes. Conduct additional reading around subject areas, read each research article in preparation for the Journal Club and do the quizzes in each conference; these will be preparation for their written journal critique (TE) and the DAQ assessments. Review lecture recordings, and additional materials online.

Module Specification

BS3031 Human Genetics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	11
Synchronous Small Group Teaching	8
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	22
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	109
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Nicola Royle
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Essay (3000 words)	30				
002	Problem based assessment	20				
003	End of module assessment	50		2		

Period: Semester 1
Occurence: E1
Coordinator: Nicola Royle
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Essay (3000 words)	30				
002	Problem based assessment	10				
003	Examination (final)	60		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Discuss the variety and complexity of the relationships between mutations in or near genes and the manifestation of disease phenotypes.
- Discuss the many ways that research in human genetics can be used.
- Solve problems in genetics and interpret the outcome.
- Critically assess a range of research papers in the field of human genetics to extract essential information.
- Conduct an independent literature search on a topic in human genetics and construct a coherent written overview.

Teaching and Learning Methods

Lectures and seminar. Problem-solving tutorials. Help clinics. Directed learning and self-directed learning

Assessment Methods

Essay (3000 words)
Problem based assessment
Examination (Final)

Pre-Requisites

BS2026 Genes, Development and Inheritanc

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Preparation for lectures and follow-up.
Preparation for problem solving tutorial and follow-up.
Research topic for assessed essay and essay preparation.
Exam preparation

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Module Specification

BS3033 Physiology, Pharmacology and Behaviour

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	23
Synchronous Small Group Teaching	3
Synchronous Practical Classes/ Workshops/Professional Placements	10
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	114
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Frank Proudlock
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Essay (2000 words)	30				
002	Group Presentation	15				
003	End of Module Assessment	50		3		
004	Engagement	5				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Interpret the hierarchical and parallel processing of visual information by the brain and be able to relate this to the process of image extraction.
- Correlate the roles of the different brain structures involved in voluntary movement and be able to reconstruct, in overview, their interactions during movement generation.
- Evaluate the role of a variety of brain mechanisms in generating feeding behaviour and pursuit of other rewards.
- Describe some of the different approaches to investigating CNS function and compare their relative advantages and disadvantages.
-Relate the role of integration within the CNS with particular reference to sensori-motor integration, higher functions such as learning, memory and attention and to higher disorders of the CNS such as schizophrenia.
- Work individually and in groups, be able to discuss orally, or present in writing a critical analysis of a theory of some aspects of brain function based on the use of recent research reports.

Teaching and Learning Methods

Lectures; critical analysis with peers of mainstream science documentary; practical classes, discussion, and preparation; directed reading

Assessment Methods

Group presentation
Essay (2000 words)
End of module assessment (final)
Engagement

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

- Read a variety of relevant source material including textbooks and scientific articles. Specific reading tasks will be posted as part of the course material and on Blackboard.
- Research scientific literature to answer coursework essay.
- Research scientific literature relevant to group presentation.
- Revise module content guided by module activities as well as external sources.
- Prepare for practical sessions assisted by module activites.
- Complete formative online engagement activites.

UNIVERSITY OF LEICESTER

Module Specification

BS3054 Molecular & Cellular Pharmacology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	4
Synchronous Other	10
Asynchronous Lectures/Presentations	18
Asynchronous Other	
Guided Independent Study	114
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: John Challiss
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Quantiative pharmacology workbook	30				
002	End of module assessment	70		3		

Period: Semester 1
Occurence: E1
Coordinator: John Challiss
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Quantiative pharmacology workbook	30				
002	Examination (Final)	70		3		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Explain how receptors can be regulated by diverse ligands (agonists, antagonists, inverse agonists, allosteric modulators).
- Describe the structures and functions of the major classes of receptor and the key components of their signal transduction and regulatory cascades.
- Describe the different mechanisms of receptor signal transduction and desensitization and their physiological and pharmacological significance.
- Describe, both in general terms and through the use of real examples, how the pharmacological manipulation of different classes of protein (receptors, enzymes) can have specific therapeutic benefits.
- Explain how acute cell signalling events relate to longer-term changes in cell phenotype and cell fate.
- Apply pharmacological principles to analyse and identify potential ‘druggable’ targets relevant to specific diseases and to understand drug discovery strategies that might be pursued to develop new drugs.
- Utilize appropriate computer software accurately to analyse pharmacological datasets.

Teaching and Learning Methods

Lectures; tutorials; computer-based, supervised work-session; problem-solving exercises; directed reading, computer-based, on-line quizzes.

Assessment Methods

Quantitative pharmacology workbook
End of module assessment

Pre-Requisites

BS2013

Co-Requisites

Excluded Combinations

-

BS3054 Molecular & Cellular Pharmacology

Guided Independent Study: Indicative Activities

• Each taught topic will be supported by Reading Lists, which will include recommended text books that can be used to provide basic support, as well as key reviews and original research articles. For some of these materials formative quizzes will be provided on-line so that students are able to test their understanding of key aspects of the recommended reading.

• To gain problem-solving skills in pharmacology the computer-based work-session will provide students with skills necessary to utilize a data-analysis programme such as GraphPad Prism. Students will then be expected to complete a workbook (as an assessment element) in which a number of datasets will require analysis and interpretation.

Module Specification

BS3055 Molecular & Cellular Neuroscience

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	22
Synchronous Small Group Teaching	1
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	44
Asynchronous Other	
Guided Independent Study	83
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Nick Hartell
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	News & Views Assessment	30				
002	End of module assessment	65		2.5		
003	Engagement	5				

Period: Semester 1
Occurence: E1
Coordinator: Nick Hartell
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	News & Views Assessment	30				
002	Examination (Final) (2.25 hours plus 15 minutes reading time)	70		2.5		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Summarise the properties of ion channels, receptors and signalling pathways involved in synaptic transmission.
- Explain the spatial and temporal sequence of events and signals that underlie the development of the nervous system.
- Explain dendritic propagation and the mechanisms underlying action potential generation.
- Explain the molecular organization of a neurone and the role of anchoring, scaffolding, receptor and signalling proteins in pre- and post-synaptic regions.
- Identify the specialized features employed to transmit information between neurons and to understand how neuronal excitability is regulated.
- Analyse data series and interpret neuroscience experimental results.

Teaching and Learning Methods

Lectures - providing introductory material and helping to guide independent study.
Tutorials - a combination of data interpretation/problem based learning and critical assessment of current literature.
Essays – an opportunity for students to research, in greater depth, a topic that is likely to be examined.

Assessment Methods

Essay (1500 words)
Examination (final)

Pre-Requisites

BS2013 or BS2014 or BS2015 or BS2066

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

• Read a variety of relevant source material including textbooks and scientific articles. Specific reading tasks will be posted as part of the course material and on Blackboard
• Research scientific literature to answer coursework News and Views Tutorial
• Revise module content guided by module activities as well as external sources.
• Complete online engagement activities provided

Last Published: 19 September 2021

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Module Specification

BS3056 Cellular Physiology of the Cardiovascular System

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	4
Synchronous Practical Classes/ Workshops/Professional Placements	3
Synchronous Other	8
Asynchronous Lectures/Presentations	20
Asynchronous Other	1
Guided Independent Study	114
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Noel Davies
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Research Essay	30				
002	End of Module Assessment	70		3		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Describe the cardiovascular system and the general control mechanisms involved in regulating the cardiovascular system including the exchange of solutes between blood and tissue.
Explain the mechanisms of ion transport at the cell membrane and understand how ion channel structure relates to function.
Discuss the molecular processes involved in regulating ion channels and contractile proteins within the cardiovascular system. Describe the cellular mechanisms leading to the generation and regulation of the cardiac action potential.
Explain the mechanisms that lead to contraction of both cardiac and smooth muscle and how these processes are controlled by the regulation of intracellular Ca^{2+}.
Discuss disorders of cardiac rhythm and appreciate the consequences of impaired blood supply (ischaemia).
Discuss the mechanisms and importance of receptor-operated Ca^{2+} increases in blood cells such as platelets and Lymphocytes.
Critique scientific information from a range of sources including the interpretation of data. Communicate biological information by writing and by means of tables, diagrams, drawings and graphs.

Teaching and Learning Methods

Asynchronous: presentations and associated material
Synchronous: presentation support, computer simulation work-sessions, tutorials with problem solving worksheets.

Assessment Methods

Combines essay with computer generated data
End of module assessment

Pre-Requisites

BS2013

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Sourcing, reading and interpreting literature relevant to the combined essay.
Analysing, interpreting and presenting data obtained from running the ionic current simulation programme.
Interpreting the literature sources and simulated data to write the combined essay.
Preparing for the tutorials using pre-circulated tutorial questions.
Reviewing pesentation topics and reading literature relevant to these topics to gain further insight into the module content.
Participate in a formative data-handling exercise aimed at improving understanding of key concepts.

Module Specification

BS3064 Comparative Neurobiology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	8.5
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	7
Synchronous Other	3.5
Asynchronous Lectures/Presentations	46.5
Asynchronous Other	7.5
Guided Independent Study	75
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Tom Matheson
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical report	30				
003	End of Module Assessment	65		2		
004	Engagement (tutorial participation)	5				

Period: Semester 1
Occurence: E1
Coordinator: Tom Matheson
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical report	30				
003	End of Module Assessment	65		2		
004	Engagement (tutorial participation)	5				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Use evidence from different animal groups to demonstrate knowledge and understanding of the principles of operation of sensory-motor integration leading to the generation of behaviour.
Synthesize raw data and published information to demonstrate understanding of energy storage mechanisms involved in insect jumping

Teaching and Learning Methods

• Asynchronous mini-lectures supported by asynchronous pre-lecture and post-lecture material.
• Asynchronous practical exercise supported by asynchronous pre-practical and post-practical material.
• Asynchronous interactive quizzes and self-learning exercises.
• Synchronous online interactive review sessions (face-to-face if possible)
• Synchronous online small group and whole-class tutorials (face-to-face if possible)
• Face-to-face laboratory practical work (if possible)
• Guided study.
• Online Group work.
• Synchronous and asynchronous online Instructor feedback.

Assessment Methods

Practical report, end of module open book assessment

Pre-Requisites

BS2014 OR BS2066 OR BS2077

Co-Requisites

Excluded Combinations

-

BS3064 Comparative Neurobiology

Guided Independent Study: Indicative Activities

• Preparing for the practical by engaging with the supporting material and reading related research papers.
• If face-to-face teaching possible, carrying out laboratory practical to measure power output of locust leg muscle.
• Carrying out in-depth analyses of two large datasets of practical results. Interpreting the data and relating them to the relevant literature.
• Reading primary research literature and textbooks to support the framework provided in the course material.
• Preparing for tutorials by searching for and reading relevant research literature, and writing essay outlines based on this.
• Following up on tutorials by working online in groups to develop material from the sessions into a structured essay outline on the allocated topics.
• Revising lecture notes, online course materials, material from the reading lists and material found independently to prepare for the online final assessment.
• Preparing for revision tutorial.

Module Specification

BS3068 Microbial Biotechnology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	8
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	11
Asynchronous Lectures/Presentations	20
Asynchronous Other	12
Guided Independent Study	97
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Primrose Freestone
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Poster plus abstract	50				
002	Enterprise assessment	50				

Period: Semester 1
Occurence: E1
Coordinator: Primrose Freestone
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Poster plus abstract	50				
002	Enterprise assessment	50				

Intended Learning Outcomes

- Understand the commercial processes involved in development of microbial products.
- Describe the central theories and concepts of selected aspects of microbial biotechnology.
- Demonstrate an awareness of the importance of microbial biochemistry to industrial microbiological processes.
- Develop a reflective appreciation of the safety, social and ethical issues surrounding uses of micro-organisms in biotechnology.
- Communicate their knowledge of microbial biotechnology via poster and group presentations.

Teaching and Learning Methods

Lectures, tutorials, mini-conference assessment.

Assessment Methods

Poster plus abstract
Enterprise assessment

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Guided reading of current research papers, reviewing lectures, preparing poster and abstract, reflecting on field trip, revising for the end of module exam.

Last Published: 19 September 2021

Module Specification

BS3070 Structural Biology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	24
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	12
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	113
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Peter Moody
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2.25		
002	Literature Comprehension Exercise	15				
003	NMR Workshop	15				

Period: Semester 1
Occurence: E1
Coordinator: Peter Moody
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		2.25		
002	Literature Comprehension Exercise	15				
003	NMR Workshop	15				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Evaluate research literature where structural biology techniques have been used
- Discuss the basis, properties and applications of important biophysical techniques.
- Explain the basis and approaches of protein crystallography.
- Explain the basis and approaches of protein nuclear magnetic resonance.
- Explain the basis and approaches of Cryo Electron Microscopy.
- Discuss the scope and contribution of protein bioinformatics as a computational method.

Teaching and Learning Methods

Lectures and computer based workshops.

Assessment Methods

Examination (final)
Data analysis workshop
NMR workshop

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Each topic has a reading list given to the students, with the expectation of viewing prior to lecture. The lectures are recorded using Reflect and made available to students for the whole year. Preparation for workshops, including analysis of data

Module Specification

BS3073 Conservation and Ecological Genetics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	10
Synchronous Small Group Teaching	10
Synchronous Practical Classes/ Workshops/Professional Placements	6
Synchronous Other	10
Asynchronous Lectures/Presentations	6
Asynchronous Other	
Guided Independent Study	108
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Robert Hammond
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical report (written as research paper)	50				
003	End of Module Assessment	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Describe the various types of molecular marker and their properties
- With a knowledge of underlying theory, describe and explain how molecular markers can be used to understand aspects of behaviour, ecology and evolution
- Apply their knowledge of molecular markers to conservation and environmental issues.

Teaching and Learning Methods

Lectures/online lectures, Tutorials/online tutorials (discussions of primary research papers), analysis workshops, drop-in help sessions, formative quizzes/tests, guided reading, independent reading.

Assessment Methods

Practical report (written as research paper)
End of module assessment (24 hour completion window)

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Directed reading, with particular emphasis on the primary literature

Last Published: 19 September 2021

Module Specification

BS3901 Research Project

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 120

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	600
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	500
Total Module Hours	1200

Period: Academic Year
Occurence: E1
Coordinator: Noel Davies
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Laboratory Performance	25				
002	Report	75				

Period: Academic Year
Occurence: E2
Coordinator: Noel Davies
Mark Scheme: UG Module Grade Only

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Laboratory Performance	100				

Intended Learning Outcomes

On completion of the project, students are expected to be able to:- test a hypothesis by appropriate experimental or computer-based techniques; conduct experimental procedures and demonstrate good laboratory or bioinformatics practice; analyse and present experimental or bioinformatics data; locate appropriate literature sources and interpret their findings in relation to other work in their subject area; discuss the project report and be aware of its wider context; produce a well written and presented dissertation that complies with the guidelines for presentation of the project.

Teaching and Learning Methods

Directed reading, Project supervision, Independent research.

Assessment Methods

Assessment of performance, individual research projects, dissertation.

PLEASE NOTE: Applicants may only apply for this project if they can submit a letter of confirmation from an academic who has agreed to supervise their project.

Your home university will be asked to confirm whether you should be assessed by Assessment Group E1 or E2. E2 is based upon the assumption that the overall grading for your period of study will be determined via your report to your home university.

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

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Module Specification

BS3902 Research Project

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 60

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	300
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	250
Total Module Hours	600

Period: Semester 1
Occurence: E1
Coordinator: Noel Davies
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Laboratory Performance	100				

Period: Semester 1
Occurence: E2
Coordinator: Noel Davies
Mark Scheme: UG Module Grade Only

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Laboratory Performance	100				

Period: Semester 2
Occurence: E1
Coordinator: Noel Davies
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Laboratory Performance	100				

Period: Semester 2
Occurence: E2
Coordinator: Noel Davies
Mark Scheme: UG Module Grade Only

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Laboratory Performance	100				

Intended Learning Outcomes

On completion of the project, students are expected to be able to:- test a hypothesis by appropriate experimental or computer-based techniques; conduct experimental procedures and demonstrate good laboratory or bioinformatics practice; analyse and present experimental or bioinformatics data; locate appropriate literature sources and interpret their findings in relation to other work in their subject area; discuss the project report and be aware of its wider context; present the key findings in the form of an oral presentation; produce a well written and presented dissertation that complies with the guidelines for presentation of the project.

Teaching and Learning Methods

Directed reading, Project supervision, Independent research

Last Published: 19 September 2021

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Module Specification

BS3902 Research Project

Assessment Methods

Oral presentation, assessment of performance, individual research projects, dissertation.

PLEASE NOTE: Applicants may only apply for this project if they can submit a letter of confirmation from an academic who has agreed to supervise their project.

Your home university will be asked to confirm whether you should be assessed by Assessment Group E1 or E2. E2 is based upon the assumption that the overall grading for your period of study will be determined via your report to your home university.

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

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Module Specification

MB1080 Introduction to Medical Bioscience

Academic Year: 2021/2
Module Level: Year 1
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	16
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	9
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	105
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Chris Willmott
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lay explanation of Scientific Issues	30				
002	Narrated PowerPoint Presentation	30				
003	Data Handling and Scientific Report 1 (R Statistics test 1)	5				
004	Data Handling and Scientific Report 2 (R Statistics test 2)	5				
005	Data Handling and Scientific Report 3 (R Statistics test 3)	5				
006	Data Handling and Scientific Report 4 (Scientific Report)	25				

Intended Learning Outcomes

On completion of the module, students should be able to:
• Describe the molecular basis of atherosclerosis
• Discuss the importance of genomics to cancer diagnosis and prognosis
• Describe the role of the microbiome in disease
• Demonstrate awareness of the key features of an accessible written explanation of a recent scientific development
• Carry out basic numerical manipulations of scientific measurements, and critically analyse experimental data
• Prepare effective visual aids (e.g. PowerPoint slides), accompanied by narration

Teaching and Learning Methods

Asynchronous lecture recordings, demonstration of calculations (online), synchronous online lectures, synchronous online tutorials

Assessment Methods

- Lay explanation of scientific issue: 30%
- Narrated PowerPoint presentation: 30%
- Data-handling and Scientific Report: 40% (3 x Online test on statistical understanding @ 5%; 1 x Written report @ 25%)

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Recommended reading (for essay).
Independent research (for oral presentation).
Practice activites (for data handling task).
Additional reading and recommended audiovisual resources (viewing list).

Module Specification

MB2020 Medical Microbiology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	10
Synchronous Small Group Teaching	5
Synchronous Practical Classes/ Workshops/Professional Placements	15
Synchronous Other	
Asynchronous Lectures/Presentations	22
Asynchronous Other	6
Guided Independent Study	92
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Galina Mukamolova
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lab practical report	40				
002	End of module assessment	60		2		

Intended Learning Outcomes

At the completion of the course students are expected to be able to:
- Describe the basic principles of microbiology and microbial diagnostics;
- Know the characteristics of major human pathogens and explain how they adapt to different environments;
- Describe major infectious diseases and name corresponding causative agents;
- Know major antimicrobials used for treatment of infectious diseases and explain how they work;
- Explain major areas of preventive treatment;
- Conduct simple experiments for identification and characterisation of medically important bacteria.
- Demonstrate competency in oral and written communications, information sourcing, handling and referencing, numeracy, data analysis, basic statistical skills, problem solving, and group working.
- Demonstrate awareness of health sustainability.

Teaching and Learning Methods

Lectures, tutorials, practical classes, workshops, problem solving classes, live weekly clinic sessions.

Assessment Methods

- Practical booklet: 40%
- Two-hour open book on-line assessment within a 24-hour window: 60%

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Reading, reviewing lectures, preparing workbook, presentation and revising for exam.

Last Published: 19 September 2021

Module Specification

MB2050 Applications of Medical Biochemistry

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	20
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	4
Synchronous Other	
Asynchronous Lectures/Presentations	20
Asynchronous Other	
Guided Independent Study	106
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Chris Willmott
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Resource Review 1	10				
002	Resource Review 2	10				
003	Resource Review 3	10				
004	Resource Review 4	10				
005	Bioethics Video	30				
006	Graphical Abstract	30				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Outline selected techniques used in diagnosis and treatment of human disease.
- Give an overview of the process involved in the generation of a pharmaceutical product.
- Discuss molecular aspects of drug design and therapeutic protein production.
- Consider the potential impact of genomics on the diagnosis and treatment of disease.
- Discuss key social and ethical issues related to current development in biomedicine.
- Work as a team to design and produce a video to discuss a specific bioethical issue.
- Critically review the information available on a specific area of biology/medicine and summarise current knowledge in a written report.

Teaching and Learning Methods

Online lecture recordings and recommended reading, synchronous online tutorials, computer-based sessions (on campus if regulations permit), team-based working, examples of previous student work provided.

Assessment Methods

- x4 Resource Reviews (10% each)
- Report to Government: 30%
- Exam (1.25 hours): 30%

Pre-Requisites

Indicative Activities
Independent research on science and ethics
Reading research articles written by Leicester staff (provided)
Recommended online resources, including recordings made locally using
Reflect lecture capture system and other tools.

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Independent research on science and ethics (for video)
Research on novel therapeutic agent (for written report), starting with initial provided source.
Recommended online resources regarding video production;
other audiovisual resources.
Recorded lectures made available for review using Reflect lecture capture system.

Last Published: 19 September 2021

Module Specification

MB2051 Current Issues in Medical Genetics

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	42
Asynchronous Lectures/Presentations	
Asynchronous Other	42
Guided Independent Study	66
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Christopher Talbot
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
005	Ethical matrix	20				
006	Website	30				
008	Dissertation (5000 words) (final)	50				

Intended Learning Outcomes

On completion of the module a typical student should be able to:
• Explain the scientific basis of current controversies in medical genetics.
• Evaluate the arguments on both sides of an ethical topic
• Outline the procedures in place for the establishment of laws and guidelines governing one of the areas listed above.
• Work as part of a team to produce a variety of presentations.

Teaching and Learning Methods

Seminars with mixture of tutor and student led discussions.
Feedback from assessment

Assessment Methods

- Ethical Matrix: 20%
- Website: 30%
- Dissertation (5,000 words): 50%

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

- Preparation for seminars
- Reading references from seminars
- Preparation for ethical matrix
- Team co-ordination and preparation of website
- Researching and writing the dissertation

Module Specification

MB2080 Pathophysiology of Disease

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	7
Synchronous Other	2
Asynchronous Lectures/Presentations	21
Asynchronous Other	2
Guided Independent Study	116
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Jonathon Willets
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Essay	40				
002	End of Modules Assessment (open book)	60		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Discuss the underlying physiological and biochemical mechanisms and disease-induced changes associated with a range of human conditions
- Outline the symptoms, prevalence, morbidity, mortality, and risk factors associated with the range of human disease states covered.
- Make effective use of electronic sources of information, including the PUBMED and OMIM databases and disease specific web sites, to find out detailed information about the physiology, aetiology and epidemiology of a particular disease.
- Critically evaluate the use of laboratory data in the identification, aetiology and pathogenesis of selected diseases processes.

Teaching and Learning Methods

Lectures, tutorials with problem-solving worksheets, laboratory practical class, work session, directed reading, study support session(s).

Assessment Methods

Coursework essay, computer-based multiple choice test and examination (final).

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Read a variety of relevant source material including teaxtbooks and scientific articles. Specific reading tasks will be posted as part of the course material and on Blackboard.
Complete the work session to become proficient in the use of online literature resources and thus effectively find backgoround material to support writing of course work early.
Revise module content guided by module activites as well as external sources
Prepare and revise material covered in tutorials
Prepare for practical sessions assisted by module activies.

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Module Specification

MB3001 Biochemical Mechanisms of Human Disease

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	21
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	126
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Russell Wallis
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination [Final]	70		2.42		
002	Coursework - literature analysis	30				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Summarise the biochemical evidence and current theories about normal and pathological ageing.
- Describe the genetic basis of laminopathies and explain how different mutations can result in different disease phenotypes by altering different properties and functions of the nuclear envelope
- Explain the molecular basis of complement activation and its role indisease
- Summarise the factors that are involved in the development of inflammation and asthma
- Critically evaluate scientific papers

Teaching and Learning Methods

Lectures, Tutorials, Guided reading, Independent research.

Assessment Methods

Examination (final)
Coursework – literature analysis

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Guided reading associated with lectures
Directed critical analysis of recent scientific paper(s) on topic associated with the lectures

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Module Specification

MB3020 Advanced Topics in Medical Microbiology

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	3
Synchronous Small Group Teaching	4
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	20
Asynchronous Other	3
Guided Independent Study	120
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Edouard Galyov
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Case Presentation	30				
002	End of module assessment (Final)	70		2		

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Critically assess current views on the molecular mechanisms underlying bacterial virulence, drawing on evidence from the studies of host-pathogen interactions, immune responses, and lessons from history.
- Describe the key virulence factors and systems of major bacterial pathogens, and mechanisms of their acquisition and exchange.
-Define host responses to bacterial infections and approaches used to diagnose bacterial infections and to create effective vaccines; to demonstrate awareness how these approaches contribute to sustainable health care.
- Have gained, in the context of the above areas of microbiology, experience of accessing information from the scientific literature in electronic and written form, to be able to perform analysis of a hypothetical clinical case and to provide an overview of microbial pathogenicity through an oral presentation.

Teaching and Learning Methods

Lectures, seminars, tutorials,directed reading

Assessment Methods

Case presentation
Examination (final)

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Reading recent research papers and review articles; assessing relevant on line education materials, self-testing, reviewing lectures, preparing clinical case presentation seminar, revising for examination.

Module Specification

MB3050 Medical Genetics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	3
Synchronous Practical Classes/ Workshops/Professional Placements	1
Synchronous Other	11
Asynchronous Lectures/Presentations	13
Asynchronous Other	
Guided Independent Study	122
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Christopher Talbot
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of Module Assessment (open book)	60		2		
002	Essay	27				
003	Oral Presentation	13				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Assess how genetics has impacted upon the practice of medicine
- Outline the problems and advances in using genetics to understand complex diseases
- Demonstrate a knowledge of the contribution of genetics to the study of various diseases, eg neurological, cardiovascular and cancer.
- Research and integrate information from a range of sources in order to give a critical appraisal of a chosen specialist area.
- Appraise a current research paper and give an oral presentation on it.

Teaching and Learning Methods

Lectures, Tutorials, Seminars, Tutor and peer-reviewed presentations, essay and feedback, pre-exam clinic, exam

Assessment Methods

End of Module Assessment (open book)
Essay (3000 words)
Presentation

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Preparation for lectures
Reviewing lecture presentations
Reading references from lectures
Researching and writing the essay
Researching, preparing and practicing the presentation

Last Published: 19 September 2021

Module Specification

MB3057 Current and Future Therapeutics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	1
Synchronous Small Group Teaching	2
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	13
Asynchronous Lectures/Presentations	10
Asynchronous Other	
Guided Independent Study	124
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Martine Hamann
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Data handling, analysis and interpretation	32				
002	News & views article	32				
003	Essay (1500 words)	32				
004		4				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Appraise the underlying pathophysiology of a range of human diseases.
- Appraise current treatment strategies for a range of human diseases, showing a knowledge of inadequacies and unmet clinical need.
- Using specific examples, appraise current research aims, models and methods designed to facilitate the understanding, diagnosis or treatment of disease.
- Use a range of transferable skills that may include written communication, information technology, numeracy, team working, problem solving, information handling.

Teaching and Learning Methods

Lectures, tutorials, directed reading

Assessment Methods

Data handling, analysis and interpretation
News and Views article
Essay (1500 words)
Engagement

Pre-Requisites

BS2013 or BS2014 or BS2015

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Working through provided material and directed tasks before and after lectures. Gathering of information to extend knowledge beyond the provided and directed reading. Revision and work towards in-course assessments.

Last Published: 19 September 2021

Module Specification

NT2001 Astrophysics, Astrochemistry and Astrobiology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	8
Synchronous Practical Classes/ Workshops/Professional Placements	12
Synchronous Other	4
Asynchronous Lectures/Presentations	10
Asynchronous Other	
Guided Independent Study	116
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework D01:Academic poster and presentation	50				
002	Coursework D02: White paper	50				

Period: Semester 1
Occurence: E1
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On completion of the module, students should be able to:
- Discuss how the observable parameters of stars are measured; relate this to their formation and evolution along the Main Sequence.
- Describe the formation of the solar system and show how newly discovered planetary systems compare in terms of: system formation; planetary composition/structure; geological processes; stellar-planetary interactions.
- Explain the range of observing techniques that are currently being used to detect planets around other stars, and recall and apply Kepler's Laws to a variety of planetary systems.
- Describe what is currently understood about the chemical conditions under which life began on Earth, the processes that were required in order to produce the first life forms and how early life developed from unicellular to multi-cellular..
- Discuss how all of the above are related to the creation of suitable conditions for life and evolution of life on Earth and extrapolate these principles to exoplanets.
- Apply subject knowledge to address research problem/question.

Teaching and Learning Methods

Problem-based learning
Lectures
Workshops
Group work
Tutorials
Coursework: Group and individual

Assessment Methods

Coursework: Group and Individual

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Preparation for workshops (including reading, videos,online activties)
Short Answer exercise sets

Last Published: 19 September 2021

Module Specification

NT2002 Evolution

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	7
Synchronous Practical Classes/ Workshops/Professional Placements	16
Synchronous Other	
Asynchronous Lectures/Presentations	8
Asynchronous Other	
Guided Independent Study	119
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Sarah Gretton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Textbook Chapter	60				
002	Audio Recording	40				

Period: Semester 2
Occurence: E1
Coordinator: Sarah Gretton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Final)	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Discuss how variation arises in evolution and provide examples of its significance.
- Discuss the following concepts: Hardy-Weinberg law, genetic drift, Wright-Fisher model, gene flow, speciation, natural selection.
- Describe how molecular changes in these developmental genes underpins evo-devo (evolution of development) at the levels of macro- and microevolution.
- Apply mathematical approaches to interpret Evolution and Ecology.
- Describe and critically appraise the different theories of hominid evolution.
- Evaluate DNA evidence to interpret hominid evolution

Teaching and Learning Methods

Problem-based learning
Lectures
Group work
Tutorials
Coursework:
Short Answer exercise sets
Podcast (Group)
Report (Group)

Assessment Methods

Coursework: Short Answer exercise sets, Report (Group) Podcast (Group)

Pre-Requisites

Co-Requisites

NT2003

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Preparation for seminars (including reading, videos, multiple choice questions)
Short Answer exercise sets

Last Published: 19 September 2021

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Module Specification

NT2003 Laboratory, Mathematical and Scientific Skills II

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	10
Asynchronous Lectures/Presentations	35
Asynchronous Other	
Guided Independent Study	
Total Module Hours	

Period: Academic Year
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Maths multiple choice questions	24				
002	Maths end of module assessment	16	30			
003	Python code portfolio	25				
004	Interdisciplinary science lab report	25				
005	Personal development portfolio (final)	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
[Maths] Solve first and second order ordinary differential equations and carry [Maths] Carry out basic algebraic calculations with complex numbers and represent them using exponential and De Moivre's theorem.
[Maths] Use maple to find fourier series of a function [Maths] Describe a number of different probability distributions and apply them to appropriate data sets.
[Skill] Reflect on and articulate motivations, strengths and skills in relation to a future, work-related learning opportunity (e.g. placement, internship, employer-led project).
[Laboratory] Demonstrate advanced analysis techniques on data collected from experiments and present this analysis in an appropriate format in written reports (e.g. graphically, qualitatively, quantitatively)
[Laboratory] Reflect upon and apply core scientific knowledge from other modules within an experimental context
[Laboratory] Detail experimental accounts with sufficient clarity and completeness that the report would enable other experimentalists to reproduce the experiment. Formulate experimental plans for testing models and hypotheses by experimental means
Analyse Python code: predict what a section of Python code computes when executed.
Compare Python code written by different individuals to implement a given task.
Implement a given task in Python code writing in VS Code and Jupyter Notebooks.
Construct Python programs that can be executed by other users.
Handle Python debugging in order to test Python code and correct errors during code development.
Operate Python code for plotting, data analysis and modelling

Teaching and Learning Methods

[Maths] Seminars
[Maths] Coursework:Short answer sets
[Maths] 24 hours open book assessment
[Skills] Workshop sessions: The module will provide explicit guidance on how to relate strengths, transferable skills and motivations to a professional opportunity, how to evaluate results from a psychometric test, and how to produce a tailored application (e.g. tailored CV and cover letter). This will be delivered through a combination of course materials and appropriately contextualised instruction.
[Laboratory] Laboratory Practical sessions
[Laboratory] Coursework: Experimental Summary and Formal Laboratory Reports
Lectures impleneting ignite princuiples

Assessment Methods

Maths coursework 24%
Maths 24 hours open book assessment 16%
Python computing coursework 25%
Interdisciplinary Laboratories coursework 25%
Personal development portfolio (10%)

Pre-Requisites

NT2003 Laboratory, Mathematical and Scientific Skills II

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

[Maths] Preparation for workshops (including reading, short answer exercise sets)
[Maths] Short Answer exercise sets
[Skills] On-line materials to support completion of Leicester Award Gold qualifying activities. Workshops on exploring career options and application and selection processes
[Laboratory] Multiple Choice Question sets (Pre-Laboratory Questions)
[Laboratory] Preparatory reading for experiment
[Laboratory] Additional analysis required for Experimental Summaries
[Laboratory] Short Answer exercise sets that support data analysis skills

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Module Specification

NT2004 The Molecules of Life - An Introduction to Biochemistry and Molecular Biology

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	22
Synchronous Small Group Teaching	10
Synchronous Practical Classes/ Workshops/Professional Placements	15
Synchronous Other	16
Asynchronous Lectures/Presentations	15
Asynchronous Other	
Guided Independent Study	222
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Sarah Gretton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Lab Practical Report 1	8				
002	Lab Practical Report 2	8				
003	Essay	16				
005	End of Module Assessment (open book)	40		3		
006	Interdisciplinary Assessment	20	40			
007	Engagement	8				

Period: Semester 1
Occurence: E1
Coordinator: Sarah Gretton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework - Interdisciplinary (Final)	100	40			

Intended Learning Outcomes

On completion of the module, students should be able to:
- Explain the basic chemical principles that underpin biochemistry.
- Describe the structures of biological macromolecules and their components.
- Explain the basic mechanisms of DNA replication, transcription and translation.
- Discuss concepts of gene expression and control in prokaryotes and eukaryotes.
- Discuss the relationship between protein structure and function.
- Outline the key metabolic processes in cells and identify important mechanisms of metabolic regulation.
- Demonstrate an ability to analyse experimental data.
- Use scientific literature to produce written reports.
- Determine kinetic parameters of an enzyme catalysed processes in terms of Michaelis Menten theory.
-

Teaching and Learning Methods

Research-based learning
Lectures,
Laboratory practical sessions,
Review sessions and group work,
Small group tutorials
Revision sessions

Assessment Methods

Practical report, essay, end of module assessment, engagement mark.

Pre-Requisites

Co-Requisites

Excluded Combinations

-

NT2004 The Molecules of Life - An Introduction to Biochemistry and Molecular Biology

Guided Independent Study: Indicative Activities

Preparation of laboratory reports, completion of pre-lab tests, reading practical books in preparation for laboratory classes, researching and evaluating scientific literature, preparation of formative talks/presentations for small-group tutorials, problem-solving in support of small group tutorials, guided reading to support module material, Preparation for tutorials (including reading, videos)

UNIVERSITY OF LEICESTER

Module Specification

NT2005 Physiology, Pharmacology and Neuroscience

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	9
Synchronous Practical Classes/ Workshops/Professional Placements	2
Synchronous Other	12
Asynchronous Lectures/Presentations	30
Asynchronous Other	100
Guided Independent Study	147
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Katherine Clark
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Test 1	24				
002	Test 2	24				
003	Lab Practical Report	24				
005	Coursework - Interdisciplinary	20	40			
006	Engagement	8				

Period: Semester 2
Occurence: E1
Coordinator: Katherine Clark
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Test 1	15				
002	Test 2	15				
003	Report	25				
004	Coursework - Interdisciplinary	45	40			

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Describe general aspects of the organisation, function and operating principles of the main physiological systems in the human body.
Apply basic concepts of pharmacology to classes of cell surface receptors for neurotransmitter, hormones and local mediators.
Describe the properties of cell surface receptors, their functions and relevant signalling pathways.
Explain how individual physiological systems work together to achieve whole body homeostasis.
Demonstrate understanding of human physiological measurement.
Handle, manipulate, display and statistically analyse physiological data.
Describe the basic quantitative methods of spike train analysis, and to be able to implement them in a high level programming language (e.g. Python)

Teaching and Learning Methods

Research-based learning
Lectures,
practical classes,
tutorials

Assessment Methods

Tests
Report
Coursework - Interdisciplinary
Engagement

Pre-Requisites

Co-Requisites

Last Published: 19 September 2021

NT2005 Physiology, Pharmacology and Neuroscience

Excluded Combinations

-

Guided Independent Study: Indicative Activities

• Read a variety of relevant source material including textbooks and scientific articles. Specific reading tasks will be posted as part of the course material and on Blackboard.
• Prepare report including data handling.
• Revise module content guided by module activities as well as external sources.
• Prepare and revise material covered in tutorials.
• Prepare for practical sessions assisted by module activities.
• Complete formative online tests to check understanding of material and prepare for summative online test

Module Specification

NT2006 Genetics, Biodiversity and Behaviour

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	1
Synchronous Small Group Teaching	10
Synchronous Practical Classes/ Workshops/Professional Placements	24
Synchronous Other	34
Asynchronous Lectures/Presentations	44
Asynchronous Other	6
Guided Independent Study	181
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Moya Burns
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of Module Assessment - Biodiversity and Behaviour (Final)	24		1		
002	End of Module Assessment - Open Book (Genetics)	24		2		
003	Statistics - Biodiversity & Behaviour	6				
004	Blackboard Test - Genetics	12				
005	Coursework - Interdisciplinary	20	40			
006	Presentation - Biodiversity and Behaviour	8				
007	Engagement - Biodiversity and Behaviour	2				
008	Engagement - Genetics	4				

Period: Semester 2
Occurence: E1
Coordinator: Moya Burns
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Statistics - Biodiversity and Behaviour	15				
002	Blackboard Test - Genetics	30				
003	Coursework - Interdisciplinary	20	40			
004	Presentation - Biodiversity and Behaviour	20				
005	Engagement - Biodiversity and Behaviour	5				
006	Engagement - Genetics	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Describe and discuss:
Phylogeny and the tree of life
Basic animal and plant development
Animal and plant origins and diversity
Biodiversity/ecology and its importance
Animal behavioural/physiological adaptations
Use appropriate statistical analysis software to analyse data
Explain how chromosomes are inherited through mitosis and meiosis and how genetic variation is generated.
Perform elementary genetic analyses.
Perform elementary statistical analyses.
Recognise genetic diseases and genetically influenced disorders and appropriate methods of screening.
Explain genetic variation and methods to measure it.
Explain what factors influence global patterns of genetic diversity.
Describe basic elements of molecular evolution of genes and genomes
Define DNA sequencing technologies and their use in modern genetics
Identify simple bioinformatics tools
Demonstrate competent skills in data analysis and in the preparation and presentation of written work
Apply the Hardy-Weinberg principle to determine whether a population is evolving.

Module Specification

NT2006 Genetics, Biodiversity and Behaviour

Teaching and Learning Methods

Research-based learning
A combination of synchronous and asynchronous delivery methods including slides, presentations, exploration of scientific topics, general summaries, tutor-led sessions, statistical/experimental/data analyses

Assessment Methods

Coursework assessment, engagement and end of module assessments
Coursework (Interdisciplinary)
Students earn Genetics engagement marks by submitting 5 out of 6 formative assessments (or 80% of the due number if they have mitigating circumstances)

Pre-Requisites

Co-Requisites

Excluded Combinations

-

Guided Independent Study: Indicative Activities

Preparation for tutorials (including reading, videos)
Preparing for and revising all synchronous and asynchronous material delivered through the module. Consulting textbooks/ papers. Preparing for and producing coursework. Preparing for the final end of module assessments.

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Module Specification

NT2007 Introductory Analytical and Physical Chemistry

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	62
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	8
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	222
Total Module Hours	300

Period: Academic Year
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam - Physical Chemistry (Final)	30		2		
002	Coursework - Analytical	10				
003	Coursework - Physical Chemistry	10				
004	Coursework - Interdisciplinary	20				
005	Exam - Analytical	30		1.5		

Period: Academic Year
Occurence: E1
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework - Analytical	25				
002	Coursework - Physical Chemistry	25				
003	Coursework - Interdisciplinary	50				

Intended Learning Outcomes

On successful completion of the module, students should be able to:Discuss the role of ethics in the pursuit of scientific discovery and befamiliar with some of the underlying philosophical principles of scienceCoursework (Analytical)Describe the different types of analytical problems, the methods thatcan be used to solve them and the errors associated with each methodand how they can be dealt with; use this knowledge to select the besttechnique to solve specific analytical problemsCoursework (Analytical)Know the basic principles of electrochemical, chromatographic andUV/Vis and elemental spectroscopic techniques and discuss andevaluate their application in qualitative and quantitative analysesCoursework (Analytical)Know the principles and underlying chemistry of titrimetric andgravimetric quantitative methods of analysisCoursework (Analytical)Evaluate and interpret the results from qualitative and quantitativeanalyses and solve problems involving analytical dataCoursework (Analytical)Describe and explain the aims and terminology of thermodynamicsincluding the first and second laws, basic thermochemistry, enthalpyand entropy, Gibbs energy, acid-base equilibria, simple statisticalmechanics and phase diagrams. Discuss electrochemical process andhow they relate to thermochemistryCoursework, Exam (Physical Chemistry)Describe and explain the properties of ideal and non-ideal gases Coursework, Exam (Physical Chemistry)including the use of virial coefficients, Maxwell distributions and collision rates.Know the basic principles of reaction kinetics and how they can be measured; use these principles to calculate the effect of various parameters on the rates of chemical reactions.Perform qualitative and quantitative analyses of and solve problems involving thermodynamic and kinetic dataApply the principles of core analytical and physical chemistry to interdisciplinary contexts (e.g. the role of thermodynamics and kinetics in metabolic pathways).

Teaching and Learning Methods

Research-based learning,Lectures,example problems,tutorials,marked work,group problem solving classes& VLE directed activities

Assessment Methods

Coursework (Analytical)Coursework (Physical Chemistry)Coursework (Interdisciplinary)

Pre-Requisites

-

Co-Requisites

-

Last Published: 19 September 2021

NT2007 Introductory Analytical and Physical Chemistry

Excluded Combinations

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Guided Independent Study: Indicative Activities

Preparation for tutorials (including reading, videos),directed reading,set problems,group problem solving exercises,formative quizzes

Module Specification

NT2008 Introductory Organic and Inorganic Chemistry

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	64
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	10
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	214
Total Module Hours	300

Period: Academic Year
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam - Organic Chemistry (Final)	30		2		
002	Exam - Inorganic Chemistry	30		2		
003	Coursework - Organic Chemistry	10				
004	Coursework - Inorganic Chemistry	10				
005	Coursework - Interdiscilinary	20				

Period: Academic Year
Occurence: E1
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework - Organic Chemistry	25				
002	Coursework - Inorganic Chemistry	25				
003	Coursework - Interdisciplinary	50				
004						

Intended Learning Outcomes

On successful completion of the module, students should be able to:Recognise functional groups, anticipate their reactivity andinterconversions and the reagents required for these transformationsIdentify and explain the relationships between isomers and conformersof organic molecules.Rationalise and predict reactivity based on curly arrow mechanismsand diagrams; explain how structure and bonding controls theoutcome and rate of organic reactionsInterpret and discuss the differences between a variety of reactionmechanisms including nucleophilic substitution, elimination reactions,reactions of alkenes, reactions of carbonyls and electrophilic aromaticsubstitutionPredict and interpret spectroscopic data for organic molecules whosestructures are known; deduce structures of molecules usingspectroscopic and analytical dataCalculate oxidation states and dn configurations for transition metalcomplexes and identify the common types of ligand and methods ofcomplex preparationDescribe bonding in transition metal complexes using ionic (crystal field theory) and covalent (molecular orbital) models; calculate crystal field stabilisation energies and use these to explain and predict magnetic and spectroscopic properties of transition metal complexesPredict the geometries of complexes, recognising rotational axes, mirror planes and centres of inversion and draw these on diagrams of molecules; use these to assign point groups to molecules and identify the possibility of distortions from ideal geometries and isomerismDescribe the inorganic chemistry of a range of main group compounds and discuss the broader applications of descriptive inorganic chemistryInterpret solid state structures in terms of the type of unit cell adopted, the coordination number and coordination geometry of each atom, the radius ratio, and the relevant bonding models for ionic and metallic solids.Apply the principles of core organic and inorganic chemistry to interdisciplinary contexts (e.g. the role of of organic chemistry in drug synthesis and the role of solid-state chemistry in rationalising the bulk properties of materials)

Teaching and Learning Methods

Research-based learning,Lectures,example problems,tutorials,marked work,group problem solving classes& VLE directed activities

Assessment Methods

Coursework (Organic Chemistry, Inorganic Chemistry)Coursework (Interdisciplinary)

Pre-Requisites

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Last Published: 19 September 2021

NT2008 Introductory Organic and Inorganic Chemistry

Co-Requisites

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Excluded Combinations

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Guided Independent Study: Indicative Activities

Preparation for tutorials (including reading, videos),directed reading,set problems,group problem solving exercises,formative quizzes

Module Specification

NT2009 Mechanics, Electricity and Magnetism

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	4
Synchronous Practical Classes/ Workshops/Professional Placements	16
Synchronous Other	
Asynchronous Lectures/Presentations	32
Asynchronous Other	
Guided Independent Study	246
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam - Mechanics (Final)	30		2		
002	Exam - Electricity & Magnetism (Final)	30		2		
003	Coursework - Mechanics	10				
004	Coursework - Electricity and Magnetism	10				
005	Coursework - Interdisciplinary	20	40			

Period: Semester 1
Occurence: E1
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework - Mechanics	25				
002	Coursework - Electricity and Magnetism	25				
003	Coursework - Interdisciplinary	50	40			

Intended Learning Outcomes

On completion of the module, students should be able to:
Be able to state mathematically the laws of classical dynamics, both linear and rotational.
Understand the definitions and use of concepts such as energy,momentum and angular momentum
Be able to state the properties of linear elasticity (Hooke's law,Young's modulus)
Be able to state the basic properties of fluids including Archimedes'principle and Bernoulli's theorem
Solve relevant problems at an appropriate level using these concepts
Be able to organise appropriate private study time, obtain new information from text books, communicate physics concepts and ideas to your peers and to staff.
State mathematically the laws of electric and magnetic fields and the use of related quantities such as field strength, potential, energy, charge and current.
Solve basic problems in electromagnetism, set out solutions to physics problems correctly and describe experiments and applications in clear, simple prose.
Understand basic circuit theory involving resistors and capacitors and solve basic circuit problems
Apply scientific knowledge from 'Mechanics' and 'Electricity and Magnetism' to provide unique insight, or deeper analysis, of an interdisciplinary topic related to these concepts. For example construct and apply mathematical models to demonstrate how fluid flow equations or electrical field theory can be applied to a range of systems in nature.
Conduct independent research of the literature in order to support such models/discussions

Teaching and Learning Methods

Research-based learning
Tutorials
Lectures,
Real-time problem solving classes,
Assessed homework problems,
Discussions with peers and staff members,
Guided independent study

Assessment Methods

Coursework (Mechanics and Electricity and Magnetism)
Coursework (Interdisciplinary)

Last Published: 19 September 2021

Module Specification

NT2009 Mechanics, Electricity and Magnetism

Pre-Requisites

Co-Requisites

Excluded Combinations

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Guided Independent Study: Indicative Activities

Preparation for tutorials (including reading, videos)
Working through the example problems, and practice problems.
Discuss problems and solutions with your peers,
Review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

Last Published: 19 September 2021

Module Specification

NT2010 Light and Matter, Waves and Quanta

Academic Year: 2021/2
Module Level: Year 2
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	4
Synchronous Practical Classes/ Workshops/Professional Placements	16
Synchronous Other	
Asynchronous Lectures/Presentations	32
Asynchronous Other	
Guided Independent Study	246
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam - Light and Matter (Final)	30				
002	Exam - Waves and Quanta (Final)	30				
003	Coursework - Light and Matter	10				
004	Coursework - Waves and Quanta	10				
005	Coursework - Interdisciplinary	20	40			

Period: Semester 2
Occurence: E1
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
006	Coursework - Light and Matter	25				
007	Coursework - Waves and Quanta	25				
008	Coursework - Interdisciplinary	50	40			

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- Know the simple properties of matter, heat and light, the laws of thermodynamics and the basic laws which describe the behaviour of light.
- Know where the basic laws come from and how they are derived.
- Know the laws in mathematical form and define all the terms used.
- Be able to derive mathematical relationships which describe the properties and behaviour of heat and light.
- Be able to solve simple problems involving thermodynamics and optics.
- Be able to state the basic language and equations used to describe oscillations and oscillators; apply this knowledge to solve basic problems in simple harmonic motion, damped simple harmonic motion, forced oscillations and resonance.
- Be able to demonstrate the need for a quantum theory of matter, as evidenced by the photo-electric effect, UV catastrophe, Compton scattering and electron diffraction.
- Be able to demonstrate knowledge of the wave and particle natures of light and matter as described by De Broglie and Heisenberg, including the description of wave functions, expectation values and probability densities.
- Be able to state and apply the basic theory of the Bohr atom and quantized electron energy levels, in order to demonstrate the origin of spectral lines.
- Have gained experience in the use and organization of private study time including background reading, and the discussion of physical ideas and problems with your peers and staff
- Connect scientific knowledge from 'Light and Matter' and ‘Waves and Quanta' to provide unique insight, or deeper analysis, of an interdisciplinary topic related to these concepts. For example construct and apply mathematical models employing thermodynamical concepts and wave-particle theory to biochemical scenarios. Carry out independent research of the literature in order to support such models/discussions.

Module Specification

NT2010 Light and Matter, Waves and Quanta

Teaching and Learning Methods

Research-based learning
Tutorials
Lectures,
Real-time problem solving classes,
Assessed homework problems,
Discussions with peers and staff members,
Guided independent study

Assessment Methods

Coursework
Coursework (Interdisciplinary)

Pre-Requisites

Co-Requisites

Excluded Combinations

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Guided Independent Study: Indicative Activities

Preparation for tutorials (including reading, videos)
Working through the example problems, and practice problems.
Discuss problems and solutions with your peers,
Review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material.

UNIVERSITY OF LEICESTER

Module Specification

NT3002 Molecular Analysis and Design

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	10
Synchronous Small Group Teaching	10
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	130
Total Module Hours	150

Period: Semester 1
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	60				
002	Departmental Examination (Final)	40		2		
003	Departmental Examination (Final)	100		2		Y

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Describe the role of enzymes as biological catalysts in terms of enzyme substrate interaction and kinetic models, and describe a range of enzyme inhibition mechanisms. Analyse kinetic data to predict which mechanism applies in a given situation. ~- Determine the structure of biological molecules from evidence collected using a variety of different analytical approaches.~- Recognise the modular nature of signalling proteins, and describe the components of a signalling system.~- Discuss the following principles in electrical and biological signalling pathways: noise; channel capacity; sensitivity and selectivity; optimal coding.~- Design a theoretical biological signalling circuit to sense a particular stimulus and produce a cellular response; discuss the ethical implications of the approach."

Teaching and Learning Methods

- Problem-based learning~- Lectures~- Group work~- Coursework: podcast (group)~- Data analysis examination

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

"Preparation for seminars (including reading, videos, multiple choice questions)"

Module Specification

NT3003 Interdisciplinary Research Journal

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	19
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	129
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Journal of Interdisciplinary Science Topics (Final)	100				

Intended Learning Outcomes

On successful completion of this module, students should be able to:
To engage with academic literature by preparing an assigned academic paper for presentation to peers. This presentation should: clearly highlight the importance of the research topic; the underlying theory and how this relates to modules already studied; the research methodology and analysis used; key conclusions.
Write short scientific papers, based on their synoptic knowledge of the course so far, using existing knowledge in novel situations for publication in an open access, online undergraduate journal.
Reviewing peers' papers and presenting their critique and decision regarding publication in a clear and concise manner so that their review is an effective resource for an editorial board.
Participate in editorial board duties (chairperson, note keeper and ordinary member) and make unbiased, critical decisions on which papers should be published in light of referee comments.
Reflect on scientific literature encountered and use this to inform their own writing style.
Plan their time effectively to meet the editorial board deadlines for this module in tandem with other module commitments.

Teaching and Learning Methods

Work environment (Project-based):
• The cohort will convene to form a research group supported by academics.
• Students will be supported to engage with recent scientific literature not previously encountered in other modules. Students will present these academic papers to their peers within a research seminar format and respond to questions posed by both peers and academics. Students will critique the scientific literature encountered and reflect upon how this can inform their own writing style. This activity aims to replicate the real experience of presenting new discoveries and scientific data within a research group environment, without having to conduct original research.
• Building upon the experiences of engaging with existing scientific literature students will be supported in generating their own short academic papers, either individually or in groups up to three in size. These papers should use existing scientific knowledge from other modules but applied to new contexts, including new mathematical models or calculations in support of the conclusions drawn. These papers will be submitted via an online journal portal of the type used by professional academic journals.
• Students will critically evaluate their peers' papers and write referee reports suggesting improvements where necessary and summarizing whether the paper should be accepted for publication.
• Students will participate in editorial board meetings and take responsibility for assigning referees to papers and deciding whether individual papers meet the publication standards of the journal according. Students will be expected to formulate a forward planning proposal to demonstrate how they will meet all of the commitments listed above. This activity aims to replicate the experience of the academic publishing process and will provide students with a starting portfolio of peer-reviewed work to showcase in their CV and future job applications.

Assessment Methods

(Research Seminar / coursework): Presentation of two papers from the recent scientific literature to our peers in research seminars; respond to questions from your peers and academics on these papers.
(Research Seminar / coursework): Write a reflective statement critiquing the style and content of the scientific literature encountered.
(Journal / coursework): Publication of short scientific papers in an online undergraduate journal.
(Journal / coursework): Writing referee reports on scientific papers submitted by peers.
(Journal / coursework): Writing a forward planning proposal for individual contributions to the undergraduate journal highlighting how you will complete these task in tandem with other modules. Identify good practice that will contribute to future project work and career goals.

Pre-Requisites

NT3003 Interdisciplinary Research Journal

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Preparation for workshops (including reading, videos)
Production of referee's reports and short scientific papers
Engage with the University Press Office if a student paper is selected for a Press release or is otherwise picked up by the wider media.

Module Specification

NT3004 Molecular Cell Biology and Genomes

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	14
Synchronous Practical Classes/ Workshops/Professional Placements	12
Synchronous Other	30
Asynchronous Lectures/Presentations	41
Asynchronous Other	6
Guided Independent Study	197
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Sarah Gretton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of Module Assessment (Open Book) - Molecular Cell Biology (Final)	24		3		
002	End of Module Assessment - Genomes	22				
003	Lab Practical Report - Molecular Cell Biology	10				
004	Lab Practical Report - Genomes	14				
006	Coursework - Interdisciplinary	20	40			
007	Tutorial Test 1 - Molecular Cell Biology	2				
008	Tutorial Test 2 - Molecular Cell Biology	2				
009	Tutorial Test 3 - Molecular Cell Biology	2				
010	Engagement Marks - Genomes	4				

Intended Learning Outcomes

On successful completion of the module, students should be able to:
- describe how prokaryotic and eukaryotic genomes are organised
- discuss mechanisms operating to influence this organisation
- explain basic processes of genome maintenance
- analyse experimental data
- perform simple bioinformatic analyses
- propose experimental strategies to study and manipulate genomes
- Describe the principles and outline the steps involved in common cell biology techniques.
- Explain how membrane and secreted proteins are post-translationally processed and targeted to different subcellular and extracellular locations.
- Explain how signalling pathways integrate extracellular signals to allow the regulation of complex cellular processes such as metabolism and cell proliferation.
- Explain the respective roles of microtubules, actin and intermediate filaments in the maintenance of cell architecture and function.
- Describe the processes involved in mitotic cell division and eukaryotic cell cycle control.
- Develop a strategy to address a specific scientific hypothesis and be able to critically analyse the results of such experiments.

Teaching and Learning Methods

Asynchronous lectures; synchronous discussion groups, tutorials and clinics; laboratory and computer practical classes. Lecture activity sheets, weekly review sessions.

Assessment Methods

Practical analysis, End-of-Module Assessments, Engagement marks for Genomes associated with Practical, Tutorial and Lecture programme components (e.g. submission of answers to a variety of tasks to Bb, TopHat etc.). Tutorial multiple choice question tests, practical report, Coursework (interdisciplinary).

Pre-Requisites

NT2004, NT2005

Co-Requisites

Excluded Combinations

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NT3004 Molecular Cell Biology and Genomes

Guided Independent Study: Indicative Activities

Preparation for lectures and reviewing lecture presentations. Reading based on lecture topics. Preparation for tutorials and review of tutorials. Analysing experimental and bioinformatic data and considering experimental design. Preparing Practical Analysis (including experimental and bioinformatic components) for submission. End-of-Module Assessment preparation.
Weekly tasks involving guided further reading from course text book and other materials, watching videos, answering associated questions and carrying out online laboratory simulation exercises.
Preparation of answers to tutorial questions and MCQ tests. Analysis of data and preparation of practical report.
Formative exam-practice question.
Consolidation of information and revision for end of module assessment.

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Module Specification

NT3005 Bioinformatics and Biochemistry of Nucleic Acids

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	45
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	26
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	214
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Sarah Gretton
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Computer practical report - Bioinformatics	5				
002	Bioinformatic analysis	5				
003	Examination - Bioinformatics (Final)	30		2		
004	Examination - Biochemistry of Nucleic Acids	30		2		
005	Scientific Summary Task (1000 words) - Biochemistry of Nucleic Acids	5				
006	Summary of practical (data analysis) - Biochemistry of Nucleic Acids	3				
007	Computer practical (molecular interactions) - Biochemistry of Nucleic Acids	2				
008	Coursework - Interdisciplinary	20	0.4			

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Use computer systems to access bioinformatic databases.~- Explain the use of computers in analysing genomic data.~- Describe how protein structures are determined and modelled.~- Compare DNA and protein sequences to analyse gene structure and function.~- Demonstrate competency in accessing information, organising references and writing and producing practical reports.~- Describe how information encoded in DNA is transcribed into RNA and how primary transcripts are processed to achieve their final, functional form.~- Demonstrate an appreciation of the principles of the genetic code and translation of genetic information from messenger RNA into protein.~- Carry out and interpret simple experiments illustrating aspects of the above.~- Explain the principles underpinning of the regulation of gene expression in prokaryotes and eukaryotes.~- Describe molecular mechanisms of DNA manipulation by specified enzyme(s).~- Develop transferable skills in writing and data analysis.~- Investigate biophysical approaches to research gene expression."

Teaching and Learning Methods

"Research-based learning, lectures, directed reading, computer-based practical exercise and analyses, problem-solving tutorials."

Assessment Methods

Pre-Requisites

"NT2004, NT2005"

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

"- Preparation for tutorials (including reading, videos).~- Preparation for lectures, including background reading.~- Reviewing and annotating lecture notes and lecture capture resources.~- Additional reading based on lecture topics.~- Preparation (directe"

Module Specification

NT3006 Genomes, Global Change and Conservation

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	2
Synchronous Small Group Teaching	15
Synchronous Practical Classes/ Workshops/Professional Placements	10
Synchronous Other	19
Asynchronous Lectures/Presentations	37
Asynchronous Other	16
Guided Independent Study	201
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Moya Burns
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of Module Assessment - Genomes (Final)	22	30	3		
002	End of Module Assessment - Global Change Biology and Conservation	20	30	3		
003	Lab Practical Report - Genomes	14	30			
004	Field Report - Global Change Biology and Conservation	17	30			
006	Engagement - Genomes	4				
007	Engagement - Global Change Biology and Conservation	3				
008	Coursework - Interdisciplinary	20	30			

Intended Learning Outcomes

On successful completion of the module, students should be able to:
Describe how prokaryotic and eukaryotic genomes are organised and discuss the mechanisms operating to influence this organisation.
Explain basic processes of genome maintenance.
Analyse experimental data.
Perform simple bioinformatic analyses.
Propose experimental strategies to study and manipulate genomes.
Explain the major threats to global and UK biodiversity, including habit loss, invasive species, overexploitation and climate change.
Explain the legal and administrative basis for biodiversity conservation in the UK and Europe at species and ecosystem level.
Demonstrate, from both fieldwork and a review of the literature, how conservation management can ameliorate the threats to particular, important UK habitats.
Evaluate the management of habitats and ecosystems in terms of the perceived benefits for named species.
Explain the extinction risks faced by small, isolated and unconnected populations.
Make a balanced assessment, based on both fieldwork and the literature, of the conflicts between conservation and competing land issues.
Apply evolutionary/genetic algorithms to demonstrate the evolution is a generic process and applicable to a wide variety of disciplines.

Teaching and Learning Methods

Asynchronous lectures, synchronous discussion groups, tutorials and clinics, laboratory and computer practical classes. Online lectures (including guest lectures from industry), asynchronous online activities, tutorials and online interactive activities.

Assessment Methods

Practical analysis, end of module assessments. Engagement marks for genomes associated with practical, tutorial and lecture programme components (e.g. submission of answers to a variety of tasks to Blackboard, Top Hat, etc). Field course report, continuous participation assessment, coursework (interdisciplinary)

Pre-Requisites

NT2004, NT2006

Co-Requisites

Excluded Combinations

Last Published: 19 September 2021

NT3006 Genomes, Global Change and Conservation

Guided Independent Study: Indicative Activities

Preparation for lectures and reviewing lecture presentations.Reading based on lecture topics. Preparation for tutorials and review of tutorials. Analysing experimental data and considering experimental design. Preparing practical analysis (including experimental and bioinformatic components) for submission. End of module assessment preparation. Preparation of field course report. Follow up reading on lectures.

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Module Specification

NT3007 Neurobiology, Animal Behaviour and Evolution in the Field

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	31
Synchronous Small Group Teaching	6
Synchronous Practical Classes/ Workshops/Professional Placements	28
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	149
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Moya Burns
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	End of Module Assessment - Neurobiology Behaviour (Final)	30	30	2		
002	Exam - Evolution in the Field	20		2		
003	Practical Report - Neurobiology and Behaviour	15				
005	Project Seminar - Evolution in the Field	10				
006	Project Report - Evolution in the Field	15				
007	Coursework - Interdisciplinary	10				

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Explain and critically discuss the main topics with reference to appropriate source material, including primary research papers.~- Plan and carry out experiments investigating different aspects of animal behaviour.~- Formulate hypotheses and test them using appropriately chosen and interpreted statistical techniques.~- Discuss basic ecological phenomena as they relate to communities, including biodiversity, succession and inter-specific~interaction.~- Explain species concepts and speciation mechanisms in the context of natural selection, population differentiation and~adaptive radiation.~- Design observational and experimental approaches to study aspects of evolutionary biology:~a) Formulate and test hypotheses, using rigorous statistical techniques on data collected in observational field surveys or~experiments.~b) Master quantitative survey skills and sampling techniques for different organisms.~c) Operate appropriate collection, recording and documentation protocols.~- Operate appropriate health and safety protocols in fieldwork.~- Prepare and deliver oral and written reports.~- Appraise mathematical approaches to understanding ecology."

Teaching and Learning Methods

"- Research-based learning~- Traditional lectures, supported by Panopto lecture recordings.~- One laboratory (experimental) practical class and one computer practical class. The practical classes integrate experimental work and training in generic data ana"

Assessment Methods

Pre-Requisites

"NT2004, NT2006"

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

"- Preparation for tutorials (including reading, videos)~- Reading textbooks and primary research papers from the reading list to support the framework set out in the lectures.~- Independently finding further relevant sources (text books and research paper"

UNIVERSITY OF LEICESTER

Module Specification

NT3008 Spectroscopy and Physical Chemistry

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	66
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	8
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	216
Total Module Hours	300

Period: Academic Year
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam - Spectroscopy Chemistry (Final)	30		1.5		
002	Exam - Physical Chemistry	30		2		
003	Coursework - Spectroscopy Chemistry	10				
004	Coursework - Physical Chemistry	10				
005	Coursework - Interdisciplinary	20	40			

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Identify and explain at a quantum level the nature of the transitions induced when specific wavelengths of electromagnetic radiation interact with molecules.~- Interpret or predict data (from more than one spectroscopic technique) and hence identify structural or bonding characteristics and/or determine the full structure of molecules.~- Analyse molecular spectroscopic data and conduct calculations relating to the properties of molecules.~- Choose appropriate physical methods to solve chemical identification and characterisation problems.~- Recognise elements of symmetry and use these to determine point groups of molecules; use this analysis to predict vibrational spectra.~- Describe the thermodynamics of solution formation. Distinguish the different ways a species can be transported through a solution. Explain the factors that affect ion migration and diffusion.~- Describe what a colloid is and how gravitational and Brownian motion control colloidal stability. Explain how different techniques are used to determine the size and shape of colloidal particles. Discuss the formation of electric double layer around charged surfaces and describe the interplay between the attractive and repulsive interactions between colloidal particles.~- Know the principles of collision theory and transition state theory. Describe the different methods use in the determination of reaction rates in fast reactions. Discuss the different variety of reactions and their associated mechanisms.~- Describe how the kinetics of chemical reactions are influenced by homogenous and heterogeneous catalysts. Discuss the mechanisms associated with homogenous and heterogeneous catalytic processes. Describe different techniques used to monitor and model catalytic processes. ~- Perform qualitative and quantitative analyses of and solve problems involving the movement of charged and neutral species in solutions and kinetic data.~- Apply relevant chemical approaches and theories to the measurement and description of molecules of interdisciplinary relevance (e.g. the use of spectroscopy in drug design)."

Teaching and Learning Methods

- Research-based learning~- Lectures~- Example problems~- Tutorials~- Marked work~- Group problem solving classes~- VLE directed activities

Assessment Methods

Pre-Requisites

"NT2008, NT2009"

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

"- Preparation for tutorials (including reading, videos)~- Directed reading~- Set problems~- Group problem solving exercises~- Formative quizzes"

Last Published: 19 September 2021

UNIVERSITY OF LEICESTER

Module Specification

NT3009 Organic and Inorganic Chemistry

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	66
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	8
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	216
Total Module Hours	300

Period: Academic Year
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam - Organic Chemistry (Final)	30		2		
002	Exam - Inorganic Chemistry	30		2		
003	Coursework - Organic Chemistry	10				
004	Coursework - Inorganic Chemistry	10				
005	Coursework - Interdisciplinary	20	40			

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Discuss the structure and reactivity of amino acids and the application of this chemistry for the synthesis and structure determination of peptides.~- Represent important conformations of alicyclic systems (especially 6-membered); predict and rationalise their relative stability and their influence on the stereoelectronic requirements of reaction pathways.~- Interpret and discuss the differences between a variety of reaction mechanisms including nucleophilic substitution, elimination reactions, reactions of alkenes, reactions of carbonyls and electrophilic aromatic substitution.~- Discuss and explain the electronic structure of aromatic carbocycles and heterocycles and its effect upon reactivity; use this information to propose effective reaction sequences to synthesise and interconvert aromatic species.~- Rationalise and predict reactivity based on curly arrow mechanisms and diagrams; explain how structure and bonding controls the outcome and selectivity of organic reactions.~- State the methods of preparation, and describe the bonding, relative stability and reactivity of metal-carbonyls, -alkyls, -carbenes, -hydrides; as well as alkene, diene, allyl, cyclopentadienyl and benzene complexes.~- Be able to use spectroscopic (IR, NMR and Mass Spectrometry) microanalytical data and structural methods in the characterisation of organometallic species.~- Apply the concepts of chemical kinetics to inorganic chemistry including making connections between the kinetics of a process and the mechanism of a reaction.~- Appreciate the importance of inorganic chemistry in catalysis and describe the mechanistic steps in a number of industrially important catalytic cycles.~- Apply a range of synthetic approaches in contexts relevant to biology (e.g. drug synthesis) and material science (e.g. the role of transition metal catalysts in the synthesis valuable comodities)."

Teaching and Learning Methods

- Research-based learning~- Lectures~- Example problems~- Tutorials~- Marked work~- Group problem solving classes~- VLE directed activities

Assessment Methods

Pre-Requisites

"NT2008, NT2009"

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

"- Preparation for tutorials (including reading, videos)~- Directed reading~- Set problems~- Group problem solving exercises~- Formative quizzes"

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UNIVERSITY OF LEICESTER

Module Specification

NT3010 Electromagnetic Fields and Relativity, Quantum Physics and Particles

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	48
Synchronous Small Group Teaching	6
Synchronous Practical Classes/ Workshops/Professional Placements	20
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	226
Total Module Hours	300

Period: Semester 1
Occurence: E
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework Electromagnetic Fields	10				
002	Coursework Relativity, Quantum Physics and Particles	10				
003	Coursework Interdisciplinary	20	40			
004	Exam Electromagnetic Fields (Final)	30		2		
005	Exam Relativity , Quantum Physics and Particles (Final)	30		2		

Period: Semester 1
Occurence: E1
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework Electromagnetic Fields	25				
002	Coursework Relativity, Quantum Physics and Particles	25				
003	Coursework Interdisciplinary	50	40			

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Solve problems involving the electric field and electric displacement, the magnetic field and magnetic intensity, polarisation and magnetisation.~- State mathematically the integral and differential forms of Maxwell's equations.~- Use Maxwell's equations to derive the wave equation for electromagnetic (EM) waves, to solve basic problems in electromagnetism.~- Solve problems involving calculations of electromagnetic energy density and electromagnetic energy propagation.~- Define and derive the boundary conditions for EM waves, and solve problems involving waves at boundaries under a number of geometries.~- State the concepts developed in Einstein's theory of Special Relativity, and apply basic formulae, including the Lorentz transforms, to predict behaviour in physical situations where velocities are high; use the energy-momentum relationship to solve problems involving the collision of relativistic particles ; explain the principles underlying the General Theory of Relativity.~- Describe the wave-like properties of matter at the quantum level; state the time dependent and time-independent Schrodinger equations; be able to solve simple 1-dimensional problems involving infinite and finite wells and barriers, including the calculation of expectation values and probability densities; use the De Broglie relations and Uncertainty principle to estimate physical properties in quantum systems.~- Demonstrate knowledge of the basis concepts of the Standard Model of particle physics, including stating the properties of elementary particles such as leptons and quarks; use the conservation laws to deduce whether a decay or reaction is allowed; be able to explain how quarks combine to form hadrons and mesons; be able to state the properties and use appropriate mathematical descriptions of Fermions and Bosons.~- Apply scientific knowledge from 'Electromagnetic Fields' and 'Relativity, Quantum Physics and Particles' to provide unique insight, or deeper analysis, of an interdisciplinary topic related to these concepts. For example construct mathematical models to demonstrate how electrical field theory or quantum mechanics can be applied to a range of systems in nature.~- Conduct independent research of the literature in order to support such models/discussions.~- Organise appropriate private study time, obtain supplementary information from text books to consolidate your understanding, and communicate the physical principles underlying Maxwell's equations and electromagnetic waves to your peers and to staff."

Teaching and Learning Methods

"In this course you will benefit from lectures, real-time problem solving classes, assessed homework problems, discussions with peers and staff members, and guided independent study."

Assessment Methods

Pre-Requisites

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NT3010 Electromagnetic Fields and Relativity, Quantum Physics and Particles

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

"You will work through the course text, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material. As part of the revision you should work through the past papers provide on blackboard and make reference to your course handouts and the numerical answers provided to ensure you have mastered the subject."

UNIVERSITY OF LEICESTER

Module Specification

NT3011 Condensed Matter and Statistical Physics

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 30

Student Workload (hours)

Synchronous Lectures	48
Synchronous Small Group Teaching	6
Synchronous Practical Classes/ Workshops/Professional Placements	20
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	226
Total Module Hours	300

Period: Semester 2
Occurence: E
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework Condensed Matter	10				
002	Coursework Statistical Physics	10				
003	Coursework Interdisciplinary	20	40			
004	Exam Condensed Matter (Final)	30		2		
005	Exam Statistical Physics (Final)	30		2		

Period: Semester 2
Occurence: E1
Coordinator: Cheryl Hurkett
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework Condensed Matter	25				
002	Coursework Statistical Physics	25				
003	Coursework Interdisciplinary	50	40			

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Sketch simple crystal structures adopted by solid materials; perform simple calculations relating to crystal structures.~- Describe simple models for lattice vibrations.~- State and apply the laws governing the behaviour of electrons in various condensed matter environments including metals, insulators, semiconductors and superconductors relations.~- Derive the three distribution functions appropriate to fermions, bosons and classical particles; use the partition function to obtain the properties of simple systems.~- Describe mathematically and solve problems involving electrons in the free electron gas.~- Solve simple problems involving the magnetic properties of matter.~- Connect scientific knowledge from 'Condensed Matter' and 'Statistical Physics' to provide unique insight, or deeper analysis, of an interdisciplinary topic related to these concepts. For example construct and apply mathematical models employing condensed matter approaches and statistical approaches to biochemical scenarios.~- Carry out independent research of the literature in order to support such models/discussions.~- Organise appropriate private study time; obtain new information from text books; apply mathematical techniques to solving problems in statistical physics; be able to discuss basic physics and communicate mathematical ideas with your peers and staff; be able to set out solutions to problems clearly and correctly."

Teaching and Learning Methods

"In this course you will benefit from lectures, small group tutorial classes, workshops, discussions with peers and staff members, and guided independent study."

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Last Published: 19 September 2021

NT3011 Condensed Matter and Statistical Physics

Guided Independent Study: Indicative Activities

"You will work through the course, including working through the example problems, and practice problems. You will discuss problems and solutions with your peers, and review other texts on the subject to find alternative strategies to problem solving and alternative descriptions of the material."

Module Specification

NT3201 Independent Project III

Academic Year: 2021/2
Module Level: Year 3
Scheme: UG
Department: Biological Sciences
Credits: 15

Student Workload (hours)

Synchronous Lectures	
Synchronous Small Group Teaching	
Synchronous Practical Classes/ Workshops/Professional Placements	
Synchronous Other	
Asynchronous Lectures/Presentations	
Asynchronous Other	
Guided Independent Study	
Total Module Hours	150

Period: Semester 2
Occurence: E
Coordinator: Pietro Roversi
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	50				
002	Dissertation (Final)	50				

Intended Learning Outcomes

"On successful completion of the module, students should be able to:~- Demonstrate independent research/study skills including: locate relevant (additional) research materials, time management, maintain a record of written sources, organise regular meetings with your supervisor, obtain a greater depth of knowledge in a discipline specialism.~- Critically analyse a variety of written sources.~- Prepare and deliver a lecture that focuses on an aspect of your research.~- Demonstrate core presentation skills.~- Construct a report that synthesises information from a variety of sources."

Teaching and Learning Methods

- Guided independent research~- Review report~- Presentation

Assessment Methods

Pre-Requisites

Co-Requisites

Excluded Combinations

Guided Independent Study: Indicative Activities

Directed reading

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