25 School of Biosciences

BI300		Introduction to Biochemistry				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Whole Year	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Autumn	C	15 (7.5)	60% Exam, 40% Coursework	

Contact Hours

Total contact hours: 47
Private study hours: 103
Total study hours: 150

Learning Outcomes

Subject specific learning outcomes. On successfully completing the module students will be able to:

Demonstrate a basic understanding of the composition, structure and function of the major groups of molecules in cells; nucleic acids, proteins, carbohydrates and lipids.
Demonstrate a basic understanding of the principles of purification, separation and characterisation of macromolecules.

Generic learning outcomes. On successfully completing the module students will be able to:
Demonstrate competence in basic laboratory skills, calculations and problem solving.
Demonstrate competence in report writing.

Method of Assessment

Practical (20%) 3 hr
MCQ Assessments – 40 questions (20%)
Exam (60%) 2 hr

Preliminary Reading

Core text:
• Nelson DL, Cox MM, Lehninger Principles of Biochemistry, 7th Edition, W.H. Freeman, 2017

Alternative core texts (buy only one of):
• Berg JM, Stryer L, Tymoczko JL, Gatto GJ, Biochemistry, 9th Edition, Macmillan HE, 2019
• Garrett RH, Grisham CM, Biochemistry, 6th (international) Edition, Cengage, 2017

Background reading:
• Alberts B, Essential Cell Biology, 5th Edition, W W Norton (ex Garland Press), 2019
• Taylor MR, Simon EJ, Reece JB, Dickey J, Hogan KA, Campbell NA, Campbell Biology: Concepts & Connections, 9th Edition, Pearson, 2018

Recommended Reading:
• Catch-Up Reading: Crowe J, Bradshaw T, Chemistry for the Biosciences: The Essential Concepts, 3rd Edition, Oxford University Press, 2014

Pre-requisites

Prerequisite: A level Biology or equivalent, or BIOS3050 Fundamental Human Biology

Synopsis *

This course will provide an introduction to biomolecules in living matter. The simplicity of the building blocks of macromolecules (amino acids, monosaccharides, fatty acids and purine and pyrimidine bases) will be contrasted with the enormous variety and adaptability that is obtained with the different macromolecules (proteins, carbohydrates, lipids and nucleic acids). The nature of the electronic and molecular structure of macromolecules and the role of non-covalent interactions in an aqueous environment will be highlighted. The unit will be delivered though lectures, formative practicals and related feedback sessions to ensure students fully understand what is expected of them. Short tests (formative assessment) will be used throughout the unit to test students' knowledge and monitor that the right material has been extracted from the lectures.

BI301 Enzymes and Introduction to Metabolism

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 38
Private study hours: 112
Total study hours: 150

Learning Outcomes

Subject specific learning outcomes. On successfully completing the module students will be able to:

Analyse kinetic data and understand the principles of enzyme kinetics
Discuss the basic structure and functions of enzymes.
Perform enzyme assays to determine the kinetic properties of enzymes and to present the data in an appropriate manner.
Write down the key pathways of metabolism in animals and micro-organisms.
Describe mechanisms of control of these metabolic pathways.

Generic learning outcomes. On successfully completing the module students will be able to:
Be able to extract and interpret information on a basic level (knowledge management).
Be able to use basic computer skills for use in spreadsheet work and data retrieval.
Be able to analyse and evaluate data (problem solving) on a basic level.

Method of Assessment

Practical (30%) 1500 words maximum
MCQ assessments – 40 questions (20%)
Exam, 2hr (50%)

Preliminary Reading

Lehninger principles of biochemistry - Nelson DL, Cox MM. New York: W.H. Freeman and Company Seventh edition, International edition. 2017 (editions 5 and 6 also suitable)

Pre-requisites

BIOS3000 Introduction to Biochemistry

Synopsis *

This course aims to introduce the 'workers' present in all cells – enzymes, and their role in the chemical reactions that make life possible.
The fundamental characteristics of enzymes will be discussed – that they are types of protein that act as catalysts to speed up reactions, or make unlikely reactions more likely. Methods for analysis of enzymic reactions will be introduced (enzyme kinetics). Control of enzyme activity, and enzyme inhibition will be discussed.
Following on from this the pathways of intermediary metabolism will be introduced. Enzymes catalyse many biochemical transformations in living cells, of which some of the most fundamental are those which capture energy from nutrients. Energy capture by the breakdown (catabolism) of complex molecules and the corresponding formation of NADH, NADPH, FADH2 and ATP will be described. The central roles of the tricarboxylic acid cycle and oxidative phosphorylation in aerobic metabolism will be detailed. The pathways used in animals for catabolism and biosynthesis (anabolism) of some carbohydrates and fat will be covered, as well as their control. Finally how humans adapt their metabolism to survive starvation will be discussed.

BI302 Molecular and Cellular Biology I

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	C	15 (7.5)	60% Exam, 40% Coursework	

Contact Hours

Contact Hours 27
Self Study: 123
Total hours 150

Learning Outcomes

Intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate a basic understanding of cell structure, organisation and division, cellular control by genetic material and the range of techniques used in investigating cell and molecular biology.
Demonstrate a basic understanding of, and practical competence, in research methods in cell and molecular biology and of problem-solving in cell and molecular biology assessed by the multiple choice question format.

Intended generic earning outcomes. On successfully completing the module students will have:
Developed and demonstrated time management and organisational skills
Developed skills at interpreting and retrieving information (knowledge management) and be able to demonstrate this in examinations
Developed, and be able to apply, problem-solving skills
Developed, and be able to demonstrate in examinations, written communication skills

Method of Assessment

Laboratory report – 1500-2000 words (20%)
MCQ assessments – 40 questions (20%)
2hr Examination 60%

Preliminary Reading

Alberts B, et al. Essential Cell Biology, 5th Edition, Garland Science Pub., 2019 ISBN: 978-0393680393

Pre-requisites

A level Biology or equivalent Or BIOS3050 Fundamental Human Biology

Synopsis *

This module addresses key themes and experimental techniques in molecular and cellular illustrated by examples from a range of microbes animals and plants . It covers basic cell structure, and organisation including organelles and their functions, cytoskeleton, cell cycle control and cell division. The control of all living processes by genetic mechanisms is introduced and an opportunity to handle and manipulate genetic material provided in the laboratory. Monitoring of students' knowledge and progress will be provided by a multi-choice test and the laboratory report, with feedback.

Functional Geography of Cells: Introduction to cell organisation, variety and cell membranes. Molecular traffic in cells. Organelles involved in energy and metabolism. Eukaryotic cell cycle. Chromosome structure & cell division. Meiosis and recombination. Cytoskeleton.

Molecular biology: The structure and function of genetic material. Chromosomes, chromatin structure, mutations, DNA replication, DNA repair and recombination, Basic mechanisms of transcription, mRNA processing and translation.

Techniques in molecular and cellular biology: Methods in cell Biology - light and electron microscopy; cell culture, fractionation and protein isolation/electrophoresis; antibodies, radiolabelling. Gene Cloning – vectors, enzymes, ligation, transformation, screening; hybridisation, probes and blots, PCR, DNA sequencing. Applications of recombinant DNA technology.

Laboratory: PCR amplification of DNA and gel analysis.

BI305 Fundamental Human Biology

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	C	15 (7.5)	60% Exam, 40% Coursework	

Contact Hours

Contact hours: 21
Private study hours: 129
Total study hours: 150

Learning Outcomes

Intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:
How cells divide and differentiate.
The major physiological systems of the body – musculoskeletal, immune, digestive, excretory, nervous, endocrine.

Intended generic learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:
Written communication
Recall and synthesis of information under time constraints

Method of Assessment

IC Test (20%)
IC Test (20%)
Exam (60%), 2 hours

Preliminary Reading

Human Biology by S.S. Mader, McGraw-Hill. Recent editions suitable; latest is 13th edition (2013)

Pre-requisites

None

Synopsis *

Cell structure and function: cell organelles; cytoskeleton; DNA/RNA structure; introduction to transcription and translation; introduction to disorders of cells and tissues.
Cell division: mitosis; meiosis; mechanisms of creating genetic variation.
Cell differentiation and body tissues: tissue types; extracellular matrix; cell junctions.

Organ systems of the body including:
Musculoskeletal system: muscle types; mechanism of skeletal muscle contraction; structure, development and maintenance of bone; types of joints.
Circulatory system: overview of circulation; composition of blood; cells of blood.
Immune system: infectious agents; lymphatic system; innate and acquired defences.
Digestive system: digestive tract and accessory organs; types of nutrients; major digestive enzymes; absorption and assimilation.
Urinary system and excretion: kidney and urinary tract; urine formation; functions in waste removal, homeostasis.
Endocrine and Nervous systems: concept of homeostatic loops; endocrine glands and hormones; organisation of nervous system; generation and conduction of a nerve impulse; synapses and neurotransmitters; comparison of neural and hormonal signalling.

BI307 Human Physiology and Disease

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Spring	C	15 (7.5)	60% Exam, 40% Coursework	

Contact Hours

Total contact hours: 27
Private study hours: 123
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successful completion of this module students will be able to:
Describe the main physiological systems of the body and the basic anatomical structure and histology of the principal organs in these systems.
Understand the role of the main physiological systems in the maintenance of whole body homeostasis.
Describe the consequences of alteration of normal physiological states and the evolution of disease.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Extract and interpret information at a first year undergraduate level.
Acquire skills in written communication.

Method of Assessment

Practical Report – 14 questions (20%)
MCQ Assessments – 40 questions (20%)
Examination (60%), 2 hours

Preliminary Reading

Human Physiology-An Integrated Approach (8th edition, 2018) by Silverthorn, D. Published by Pearson

Pre-requisites

A level Biology or equivalent Or BIOS3050 Fundamental Human Biology

Synopsis *

This module will consider the anatomy and function of normal tissues, organs and systems and then describe their major pathophysiological conditions. It will consider the aetiology of the condition, its biochemistry and its manifestation at the level of cells, tissues and the whole patient. It may also cover the diagnosis and treatment of the disease condition.
Indicative topics will include:
Cells and tissues
Membrane dynamics
Cell communication and homeostasis
Introduction to the nervous system
The cardiovascular system
The respiratory system
The immune system and inflammation
Blood cells and clotting
The Urinary system
The digestive system, liver and pancreas

BI308 Skills for Bioscientists

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	100% Coursework	
1	Canterbury	Whole Year	C	15 (7.5)	50% Coursework, 50% Exam	

Contact Hours

Total contact hours: 50
Private study hours: 100
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.On successfully completing the module students will be able to:

Demonstrate skills in the analysis and presentation of information relevant to biosciences.
Demonstrate an understanding of fundamental scientific concepts of use in biosciences, both theoretically and practically.
Demonstrate an understanding and application of the principles of concentration and molarity, pH, spectroscopy, reaction kinetics and statistics.
Demonstrate competency in the operation of some essential laboratory equipment (pipettes, pH-meter and spectrophotometer)

The intended generic learning outcomes. On successfully completing the module students will be able to:

Extract and interpret information on a basic level.
Perform data analysis and evaluation.
Use basic computing skills in data analysis, spreadsheet work and data retrieval.
Demonstrate essential practical skills and the competent use of some essential laboratory equipment

Method of Assessment

Practical (20%)
In class problem solving test, 45 minutes (15%)
15 online MCQ tests (15%)
Examination, 2 hr (50%)

Preliminary Reading

Practical Skills in Biomolecular Science, Paperback 5th ed (2016) by Reed, Weyers, Jones, Pearson, ISBN-10: 1292100737

Pre-requisites

None

Synopsis *

Subject-based and communication skills are relevant to all the bioscience courses. This module allows you to become familiar with practical skills, the analysis and presentation of biological data and introduces some basic mathematical and statistical skills as applied to biological problems. It also introduces you to the computer network and its applications and covers essential skills such as note-taking and essay writing.

BI321 Biological Chemistry A

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	100% Coursework	

Availability

BI321 is a module for Biology students without A2 Chemistry at grades A-C (or equivalent). If you have A2 Chemistry you are required to attend BI3210.
N.B. Students with A2 Chemistry or equivalent below grade C are required to attend BI321.

Contact Hours

Phase 1+2
Total contact hours: 35
Private study hours: 115
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.
On successful completion of this module students will have a knowledge and understanding of:

Fundamental concepts of atoms, molecules, states of matter, basic valences, bonding and molecular interactions, basic organic compounds, shapes and basic isomerism and reactivity and chemical and the relevance of these concepts toward biomedical science.

The molecular basis of the thermodynamics of chemical and biochemical reactions, an understanding of equilibria and an appreciation of detailed molecular bonding and equilibria applied to biological systems.

The intended generic learning outcomes.
On successfully completing the module students will be able to have:

Understanding and knowledge of problem solving, especially numerical and chemical methods.

Method of Assessment

Bi3210:
Assignment (20%): Phase 2 test with 20 MCQ and 1 Problem Question 20%
Assignment (30%): Phase 2 Coursework - Problem question
Examination (50%): 30 MCQ and 1 Problem Question from choice of 3

Bi321:
Assignment (20%): Phase 1 MCQ Assessment
Assignment (20%): Phase 2 test with 20 MCQ and 1 Problem Question 20%
Coursework (30%): Phase 1 Coursework Problem question
Coursework (30%): Phase 2 Coursework Problem question

Preliminary Reading

Crowe and Bradshaw. Chemistry for the Biosciences (3rd Ed.). The Essential Concepts. (OUP)

Burrows, Holman, Parsons, Pilling and Price. Chemistry3: Introducing Organic, Inorganic and Physical Chemistry (3rd Ed.). (OUP)

Pre-requisites

None

Synopsis *

Students without A2 Chemistry (equivalent) on entry take Phases 1+2.
N.B. Students with A2 Chemistry or equivalent below grade C will follow Phases 1+2.

Phase 1: Autumn Term (5 lectures, 6 x 2 hr Workshops)
Basic chemical concepts for biology will be taught and applied through examples in a workshop atmosphere. The five workshop topics covered are: (i) Atoms and states of matter (ii) valence and bonding (iii) basic organic chemistry for biologists (iv) molecular shapes and isomerism in biology and (iv) chemical reactivity and chemical equations.
Assessment feedback of basic chemistry (1 session/lecture)

Phase 2: Autumn Term (9 lectures, 2 x 2 hr Workshop, 3 extra support lectures)
Chemical and biochemical thermodynamics. Topics covered are: (i) energetic and work, (ii) enthalpy, entropy and the laws of thermodynamics (iii) Gibbs free energy, equilibrium and spontaneous reactions, (iv) Chemical and biochemical equilibrium (including activity versus concentration and Le Chatelier's principle). The two hour workshop is designed to be delivered as small group sessions to cover the applications and practice of thermodynamics concepts.
Chemistry applied to biological concepts: bonding, valence, hybridisation as well as biological applied thermodynamic process (biomolecular association/dissociation).
Assessment feedback (1 session/lecture)

BI3210 Biological Chemistry A

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	50% Coursework, 50% Exam	

Availability

BI3210 is a module for Biology students with A2 Chemistry at grades A-C (or equivalent). If you do not have A2 Chemistry you are required to attend BI321.
N.B. Students with A2 Chemistry or equivalent below grade C are required to attend BI321.

Contact Hours

Total contact hours: 38
Private study hours: 112
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.
On successful completion of this module students will have understanding and knowledge of:

Fundamental concepts of atoms, molecules, states of matter, basic valences, bonding and molecular interactions, basic organic compounds, shapes and basic isomerism and reactivity and chemical and the relevance of these concepts toward biomedical science.

The molecular basis of the thermodynamics of chemical and biochemical reactions, an understanding of equilibria and an appreciation of detailed molecular bonding and equilibria applied to biological systems.

Fundamental concepts of organic chemistry related to biological systems including carbon functional group chemistry (alkanes, alkyl halides, alkenes, alkynes, aromatics, heterocyclics and carbonyl compounds), bioorganic chemistry including the role of chemistry to understand biochemical processes

The intended generic learning outcomes.
On successfully completing the module students will be able to have:

Understanding and knowledge of problem solving, especially numerical and chemical methods.

Method of Assessment

BI3210
Assignment (20%): Phase 2 test with 20 MCQ and 1 Problem Question
Assignment (30%): Phase 2 Coursework Problem question
Examination (50%): 30 MCQ and 1 Problem Question from choice of 3

Preliminary Reading

Crowe and Bradshaw. Chemistry for the Biosciences (3rd Ed.). The Essential Concepts. (OUP)

Burrows, Holman, Parsons, Pilling and Price. Chemistry3: Introducing Organic, Inorganic and Physical Chemistry (3rd Ed.). (OUP)

Pre-requisites

None

Synopsis *

Students with A2 Chemistry (equivalent) on entry take Phases 2+3.

Biology students with A2 Chemistry (or equivalent) will obtain additional chemical concepts (Phase 3) as their chemistry qualification at A2 will already furnish them with concepts from Phase 1. All students will participate in the core section: Phase 2.

Phases 2+3 students will use the Phase 1 coursework test as a formative assessment to recognise their required chemical knowledgebase as obtained at A2 level. This provides an opportunity to identify students requiring additional support.
This module links to Biological Chemistry B with identically designed phases (1, 2 and 3) to maximise teaching efficiency across all programs in the School of Biosciences.

Phase 2: Autumn Term (9 lectures, 2 x 2 hr Workshop, 3 extra support lectures)
Chemical and biochemical thermodynamics. Topics covered are: (i) energetic and work, (ii) enthalpy, entropy and the laws of thermodynamics (iii) Gibbs free energy, equilibrium and spontaneous reactions, (iv) Chemical and biochemical equilibrium (including activity versus concentration and Le Chatelier's principle). The two hour workshop is designed to be delivered as small group sessions to cover the applications and practice of thermodynamics concepts.
Chemistry applied to biological concepts: bonding, valence, hybridisation as well as biological applied thermodynamic process (biomolecular association/dissociation).
Assessment feedback (1 session/lecture)

Phase 3: Spring Term (17 lectures, 2 x 2 hr workshop)
Fundamental organic chemistry with biological examples. Topics covered: (i) Introduction and basic functional chemistry, (ii) Isomerism and stereochemistry, (iii) Reaction mechanisms, (iv) Alkanes/alkyl halides/alkenes/alkynes, (v) Aromatic compounds, (vi) Heterocyclic compounds, (vii) Amines and alcohols (viii) Carbonyl compounds and carboxylic acids and (ix) Biological inorganic chemistry. The two hour workshop is designed to be delivered as small group sessions to cover the applications of reaction mechanisms and reaction schemes.

BI322 Biological Chemistry B

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	30 (15)	50% Coursework, 50% Exam	

Availability

BI322 is a module for Biochemistry and Biomedical Science students without A2 Chemistry at grades A-C (or equivalent). If you have A2 Chemistry you are required to attend BI3220.
N.B. Students with A2 Chemistry or equivalent below grade C are required to attend BI322.

Contact Hours

Total contact hours: 56
Private study hours: 244
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to have a knowledge and understanding of:

Fundamental concepts of atoms, molecules, states of matter, basic valences, bonding and molecular interactions, basic organic compounds, shapes and basic isomerism and reactivity and chemical and the relevance of these concepts toward biomedical science. (Phase 1)

The molecular basis of the thermodynamics of chemical and biochemical reactions, an understanding of equilibria and an appreciation of detailed molecular bonding and equilibria applied to biological systems. (Phase 2)

Fundamental concepts of organic chemistry related to biological systems including carbon functional group chemistry (alkanes, alkyl halides, alkenes, alkynes, aromatics, heterocyclics and carbonyl compounds), bioinorganic chemistry including the role of chemistry to understand biochemical processes. (Phase 3)

The intended generic learning outcomes.
On successfully completing the module students will be able to have:

Understanding and knowledge of problem solving, especially numerical and chemical methods.

Method of Assessment

For BI3220:

Assignment (10%): Phase 2 test with 20 MCQ and 1 Problem Question
Assignment (15%): Phase 2 Coursework- Problem question
Coursework (25%): Phase 4 Coursework Problem Questions
Exam (50%) 30 MCQ and 1 Problem Question from choice of 3

For BI3221
Assignment (20%): Phase 1 MCQ Assessment
Assignment (15%): Phase 1 Coursework Problem question
Coursework (25%): Phase 2 Coursework Problem Questions
Exam (50%) 30 MCQ and 1 Problem Question from choice of 3 50%

Preliminary Reading

Phase 1+2: Crowe and Bradshaw. Chemistry for the Biosciences (3rd Ed.). The essential concepts. (OUP)

Phase 2+3: Burrows, Holman, Parsons, Pilling and Price. Chemistry3: Introducing Organic, Inorganic and Physical Chemistry (3rd Ed.). (OUP)

Pre-requisites

None

Synopsis *

Students without A2 Chemistry (equivalent) on entry take Phases 1+2+3
N.B. Students with A2 Chemistry or equivalent below grade C will follow Phases 1+2+3

This approach allows fundamental concepts (Phase 1) to be taught to non-A2 Chemistry students. All students will participate in the core section: Phase 2.

This module links to Biological Chemistry A with identically designed phases (1, 2 and 3) to maximise teaching efficiency across all programs in the School of Biosciences.

Phase 1: Autumn Term (5 lectures, 6 x 2 hr Workshops)
Basic chemical concepts for biology will be taught and applied through examples in a workshop atmosphere. The five workshop topics covered are: (i) Atoms and states of matter (ii) valence and bonding (iii) basic organic chemistry for biologists (iv) molecular shapes and isomerism in biology and (iv) chemical reactivity and chemical equations.
Assessment feedback of basic chemistry (1 session/lecture)

Phase 2: Autumn Term (9 lectures, 2 x 2 hr Workshop, 3 extra support lectures)
Chemical and biochemical thermodynamics. Topics covered are: (i) energetic and work, (ii) enthalpy, entropy and the laws of thermodynamics (iii) Gibbs free energy, equilibrium and spontaneous reactions, (iv) Chemical and biochemical equilibrium (including activity versus concentration and Le Chatelier's principle). The two hour workshop is designed to be delivered as small group sessions to cover the applications and practice of thermodynamics concepts.
Chemistry applied to biological concepts: bonding, valence, hybridisation as well as biological applied thermodynamic process (biomolecular association/dissociation).
Assessment feedback (1 session/lecture)

Phase 3: Spring Term (17 lectures, 2 x 2 hr workshop)
Fundamental organic chemistry with biological examples. Topics covered: (i) Introduction and basic functional chemistry, (ii) Isomerism and stereochemistry, (iii) Reaction mechanisms, (iv) Alkanes/alkyl halides/alkenes/alkynes, (v) Aromatic compounds, (vi) Heterocyclic compounds, (vii) Amines and alcohols (viii) Carbonyl compounds and carboxylic acids and (ix) Biological inorganic chemistry. The two workshops is designed to be delivered as small group sessions to cover the applications of reaction mechanisms and reaction schemes.

BI3220 Biological Chemistry B

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	30 (15)	50% Coursework, 50% Exam	

Availability

BI3220 is a module for Biochemistry and Biomedical Science students with A2 Chemistry at grades A-C (or equivalent). If you do not have A2 Chemistry you are required to attend BI322.
N.B. Students with A2 Chemistry or equivalent below grade C are required to attend BI322.

Contact Hours

Total contact hours: 50
Private study hours: 250
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to have a knowledge and understanding of:

The molecular basis of the thermodynamics of chemical and biochemical reactions, an understanding of equilibria and an appreciation of detailed molecular bonding and equilibria applied to biological systems. (Phase 2)

Fundamental concepts of organic chemistry related to biological systems including carbon functional group chemistry (alkanes, alkyl halides, alkenes, alkynes, aromatics, heterocyclics and carbonyl compounds), bioinorganic chemistry including the role of chemistry to understand biochemical processes. (Phase 3)

Analytical spectroscopy and Chemical Biology. The use of spin-resonance spectroscopies in biology, amino acid, protein and enzyme chemistry and chemical biology concepts including metabolic function of globins, sugars, phosphates. (Phase 4)

Method of Assessment

Assignment (10%): Phase 2 test with 20 MCQ and 1 Problem Question
Assignment (15%): Phase 2 Coursework Problem question
Coursework (25%): Phase 4 Coursework Problem Questions

Exam (50%) 30 MCQ and 1 Problem Question from choice of 3

Preliminary Reading

Phase 2: Crowe and Bradshaw. Chemistry for the Biosciences (3rd Ed.). The essential concepts. (OUP)

Phase 2+3: Burrows, Holman, Parsons, Pilling and Price. Chemistry3: Introducing Organic, Inorganic and Physical Chemistry (3rd Ed.). (OUP)

Phase 4: Dobson, Gerrard and Pratt. Foundations of Chemical Biology. (OUP Primer)

Pre-requisites

None

Synopsis *

Students with A2 Chemistry (equivalent) on entry take Phases 2+3+4

Biology students with A2 Chemistry (or equivalent) will obtain additional chemical concepts (Phase 4) as their chemistry qualification at A2 will already furnish them with concepts from Phase 1. All students will participate in the core section: Phase 2.

Phases 2+3+4 students will use the Phase 1 coursework test as a formative assessment to recognise their required chemical knowledgebase as obtained at A2 level. This provides an opportunity to identify students requiring additional support.

This module links to Biological Chemistry A with identically designed phases (1, 2 and 3) to maximise teaching efficiency across all programs in the School of Biosciences.

Phase 2: Autumn Term (9 lectures, 2 x 2 hr Workshop, 3 extra support lectures)
Chemical and biochemical thermodynamics. Topics covered are: (i) energetic and work, (ii) enthalpy, entropy and the laws of thermodynamics (iii) Gibbs free energy, equilibrium and spontaneous reactions, (iv) Chemical and biochemical equilibrium (including activity versus concentration and Le Chatelier's principle). The two hour workshop is designed to be delivered as small group sessions to cover the applications and practice of thermodynamics concepts.
Chemistry applied to biological concepts: bonding, valence, hybridisation as well as biological applied thermodynamic process (biomolecular association/dissociation).
Assessment feedback (1 session/lecture)

Phase 3: Spring Term (17 lectures, 2 x 2 hr workshop)
Fundamental organic chemistry with biological examples. Topics covered: (i) Introduction and basic functional chemistry, (ii) Isomerism and stereochemistry, (iii) Reaction mechanisms, (iv) Alkanes/alkyl halides/alkenes/alkynes, (v) Aromatic compounds, (vi) Heterocyclic compounds, (vii) Amines and alcohols (viii) Carbonyl compounds and carboxylic acids and (ix) Biological inorganic chemistry. The two workshops is designed to be delivered as small group sessions to cover the applications of reaction mechanisms and reaction schemes.

Phase 4: Spring Term (8 lectures, 2 x 1 hr workshop)

BI323 Diversity of Living Organisms

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Spring	C	15 (7.5)	50% Coursework, 50% Exam	

Contact Hours

Total contact hours: 38
Private study hours: 112
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate an appreciation of the diversity of microbial life (bacteria, fungi unicellular and simple multicellular eukaryotes).
Demonstrate an understanding of plant structural and reproductive diversity and the colonisation of the land by plants.
Demonstrate an understanding that animals are multicellular heterotrophic eukaryotes with tissues that develop from embryonic layers.
Demonstrate the ability to safely handle and conduct experiments on a range of organisms under defined laboratory conditions.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Communicate effectively using writing.
Make observations, record and interpret data.

Method of Assessment

Practical (25%) – max word limit 2500 words
Practical (25%) – max word limit 1500 words
Examination (50%), 2 hours

Preliminary Reading

Biology: A Global Approach. Campbell, N.A., Reece, J.B., Urry, L., Wasserman, S.A., Minorsky, P.V. and Jackson, R.B. Global edition. 10th edition. 2015, Pearson

Pre-requisites

None

Synopsis *

The aim of this module is to introduce the diversity of life, evolution and development of body form in a wide variety of organisms, including prokaryotes, animals and plants.

BI324 Genetics and Evolution

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Whole Year	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Whole Year	C	15 (7.5)	50% Coursework, 50% Exam	

Contact Hours

Total Contact Hours: 40
Total Private Study Hours: 110
Total Study Hours: 150

Learning Outcomes

The intended subject specific learning outcomes.On successfully completing the module students will be able to:
Demonstrate the ability to predict outcomes in monohybrid and dihybrid crosses using Mendelian genetics.
Demonstrate a basic understanding of patterns of inheritance that do not obey Mendelian Principles.
Demonstrate the ability to analyse pedigrees and predict the inheritance of human genetic disease.
Demonstrate a basic understanding of DNA mutation and of horizontal gene transfer and their role in evolution.
Demonstrate a basic understanding of Darwin's observations and the role of genetics in speciation and evolution.
Demonstrate an ability to quantify the distribution of genes in populations.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Retrieve and interpret information.
Demonstrate knowledge and understanding of experimentation, data acquisition, analysis, and presentation.
Demonstrate knowledge of computational analysis.

Method of Assessment

Lab Report (1,500 words) – 20%
MCQ Test (40 questions) – 20%
Examination (2 hours) – 60%

Preliminary Reading

Freeman S. and Herron J.C. (2016). Evolutionary Analysis, Global Edition. (5th Edition). New York, NY: Pearson Education Inc.
Reece, J., Urry, L. Cain, M., Wasserman, S., Minorsky, P. & Jackson, R. (2017). Campbell Biology (10th Edition). New York, NY: Pearson Education Inc.

Pre-requisites

None

Synopsis *

This module is an introduction to Mendelian genetics, and it will also address human pedigrees, quantitative genetics, and mechanisms of evolution.

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CO320		Introduction to Object-Oriented Programming				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Autumn	C	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Spring	C	15 (7.5)	100% Coursework with Pass/Fail Elements & Compulsory Numeric Elements	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework with Pass/Fail Elements & Compulsory Numeric Elements	
1	Canterbury	Spring	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	
1	Canterbury	Spring	C	15 (7.5)	70% Exam, 30% Coursework	
1	Medway	Autumn	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 44
Private study hours: 106
Total study hours: 150

Learning Outcomes

On successfully completing the module students will be able to:
1 Read, understand and modify small programs.
2 Use an object-oriented programming language to write small programs.
3 Write programs with the support of an integrated development environment.
4 Structure data and information as class definitions.
5 Use object-oriented analysis, design and implementation to identify and solve practical programming problems.
6 Test solutions to programming problems.
7 Discuss the quality of solutions through consideration of issues such as encapsulation, cohesion and coupling.
8 Use effectively a range of software development tools, such as an integrated development environment, text editor and compiler.

Method of Assessment

Main assessment methods
100% Coursework

- Class definition (Programming) (15%) (approximately 16 hours)
- Collections (Programming) (20%) (approximately 16 hours)
- Code quality (Programming) (15%) (approximately 16 hours)
- Class exercises (Weekly) (20%) (approximately 2 hours per week)
- 1.5 hour timed assessment (Programming) (30%)

Reassessment methods
100% coursework

Preliminary Reading

"Objects first with Java – A practical introduction using BlueJ", David J. Barnes and Michael Kölling, Pearson Education, 2016

Pre-requisites

None

Synopsis *

This module provides an introduction to object-oriented software development. Software pervades many aspects of most professional fields and sciences, and an understanding of the development of software applications is useful as a basis for many disciplines. This module covers the development of simple software systems. Students will gain an understanding of the software development process, and learn to design and implement applications in a popular object-oriented programming language. Fundamentals of classes and objects are introduced and key features of class descriptions: constructors, methods and fields. Method implementation through assignment, selection control structures, iterative control structures and other statements is introduced. Collection objects are also covered and the availability of library classes as building blocks. Throughout the course, the quality of class design and the need for a professional approach to software development is emphasised and forms part of the assessment criteria.

CO322 Foundations of Computing I

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	70% Exam, 30% Coursework	
1	Medway	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	

Contact Hours

Total contact hours: 50
Private study hours: 100
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
1 Have gained the algebraic understanding and manipulation skills required for the mathematics that underpins computer science.
2 Have developed a knowledge and understanding of, and the ability to apply the mathematical principles and concepts behind topics that comprise the CS programmes.
3 Have developed formal reasoning skills that will be required elsewhere in the degree programmes in which this module is taken.
Whilst not being directly applicable to programme learning outcomes these learning outcomes are vital to students' ability to achieve the programme learning outcomes.

The intended generic learning outcomes.
On successfully completing the module students will be able to:
1 Have developed mathematical problem solving and analysis skills.
2 Have developed numeracy skills to understand and explain the quantitative dimensions of a problem (programme outcome D4).
3 Have exercised self-management of their own learning (programme outcome D5).
4 Have developed generic skills relating to computational thinking (programme outcome B7).

Method of Assessment

Main assessment methods
Coursework 50% and 2 hour Examination (50%)

Reassessment methods
Like for like.

Preliminary Reading

Clarke G & Cook D, A Basic Course in Statistics, Hodder Arnold, 1998.
Croft & Davison, Foundation Maths, Prentice Hall, 2003.
Dean N, The Essence of Discrete mathematics, Prentice Hall.
Nissanke N, Introductory Logic and Sets for Computer Scientists, Addison Wesley.
Page SG, Mathematics: a second start, Ellis Horwood, 1986

Pre-requisites

None

Synopsis *

Mathematical reasoning underpins many aspects of computer science and this module aims to provide the skills needed for other modules on the degree programme; we are not teaching mathematics for its own sake. Topics will include algebra, reasoning and proof, set theory, functions, statistics and computer arithmetic.

CO324 Computer Systems

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	

1	Canterbury	Spring	C	15 (7.5)	50% Coursework, 50% Exam
1	Medway	Autumn	C	15 (7.5)	80% Exam, 20% Coursework
1	Canterbury	Spring	C	15 (7.5)	80% Exam, 20% Coursework
1	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam

Contact Hours

Total contact hours: 26
Private study hours: 124
Total study hours: 150

Department Checked

Yes

Learning Outcomes

8. The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
8.1 Describe the purpose of, and the interaction between, the functional hardware and software components of a typical computer system.
8.2 Identify the principal hardware and software components which enable functionality and connectivity of systems ranging in scale from the global Internet down to tiny embedded systems like those that empower the Internet of Things.
8.3 Appreciate the principles and technologies behind the Internet, including layered architectures, and how this can be used to deliver effective network services.
8.4 Describe how networks and other computer hardware interact with operating systems, and can be shared between different programs and computers.
8.5 Assess the likely environmental impact of basic decisions involving computer hardware.

9. The intended generic learning outcomes.
On successfully completing the module students will be able to:
9.1 Communicate their understanding of basic computer hardware and software. □
9.2 Develop their understanding of how network technologies underpin the Internet.
9.3 Evaluate how computer hardware and software interact to deliver functionality and services at both small and large scales.

Method of Assessment

13. Assessment methods
13.1 Main assessment methods
Canterbury and Medway
Coursework 50%
(Test) A1 In-class Test (12.5%)
(Test) A2 In-class Test (12.5%)
(Test) A3 In-class Test (12.5%)
(Test) A4 In-class Test (12.5%)
2-hour unseen examination 50%

13.2 Reassessment methods
Like for like assessment

Preliminary Reading

McLoughlin, Ian Vince (2011) Computer Architecture: an embedded approach. McGraw-Hill, 512 pp. ISBN 9780-071311-182
Tanenbaum, Andrew & Bos, Herbert (2014) Modern Operating Systems (4th Edition). Pearson Education, 1136 pp. ISBN 978-0133591-620
Kurose, James and Ross, Keith (2009) Computer networking: a top-down approach (5th Edition). Pearson Education, ISBN 978-0131365-483
Mueller, Scott (2012) Upgrading and repairing PCs (20th ed onwards). QUE Press ISBN 978-0-7897-3954-4

Pre-requisites

None

Synopsis *

This module aims to provide students with an understanding of the fundamental behaviour and components (hardware and software) of a typical computer system, and how they collaborate to manage resources and provide services in scales from small embedded devices up to the global internet. The module has two strands: 'Computer Architecture' and ‘Operating Systems and Networks’. Both strands contain material which is of general interest to computer users; quite apart from their academic value, they will be useful to anyone using any modern computer system.

CO325 Foundations of Computing II

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Spring	C	15 (7.5)	70% Exam, 30% Coursework	
1	Medway	Spring	C	15 (7.5)	50% Coursework, 50% Exam	

Contact Hours

For those who have A level mathematics
Total contact hours: 30
Private study hours: 120
Total study hours: 150

For those who do not have A level mathematics
Total contact hours: 40
Private study hours: 110
Total study hours: 150

Department Checked

Yes

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
1 Have developed a knowledge and understanding of, and the ability to apply the mathematical principles and concepts behind topics that comprise the CS programmes.
2 Have developed formal reasoning skills that will be required elsewhere in the degree programmes in which this module is taken.
3 Have basic understanding of Propositional and Predicate Logic: their syntax (connectives, quanitifiers) and their semantics (truth tables, logical equivalences).
4 Be able to write and evaluate expressions in Propositional and Predicate Logic.

The intended generic learning outcomes.
On successfully completing the module students will be able to:
1 Have developed mathematical problem solving and analysis skills.
2 Have developed numeracy skills to understand and explain the quantitative dimensions of a problem
3 Have exercised self-management of their own learning
4 Have developed generic skills relating to computational thinking

Method of Assessment

Main assessment methods
2 hour Examination (50%)
Coursework (50%)

Reassessment methods
Like for like.

Preliminary Reading

Clarke G & Cook D, A basic course in statistics, Hodder Arnold, 1998.
Croft & Davison, Foundation Maths, Prentice Hall, 2003.
Dean N, The Essence of Discrete mathematics, Prentice Hall.
Nissanke N, Introductory Logic and Sets for Computer Scientists, Addison Wesley.
Page SG, Mathematics: a second start, Ellis Horwood, 1986.
Truss, J.K., Discrete Mathematics for Computer Scientists

Pre-requisites

Pre-requisite: COMP3220: Foundations of Computing I

Synopsis *

This module follows from CO322 and aims to provide students with more understanding of the theory behind the formal underpinnings of computing. It will build upon the abstract reasoning skills introduced in CO322. Matrices, vectors, differential calculus, probability and logic will be introduced.

CO520 Further Object-Oriented Programming

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Spring	I	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Spring	I	15 (7.5)	100% Coursework	
1	Canterbury	Spring	I	15 (7.5)	70% Exam, 30% Coursework	
1	Medway	Spring	I	15 (7.5)	100% Coursework	
1	Medway	Autumn	I	15 (7.5)	100% Coursework	
1	Canterbury	Spring	I	15 (7.5)	50% Coursework, 50% Exam	

Contact Hours

Total contact hours:44
Private study hours: 106
Total study hours: 150

Department Checked

Yes

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
1 Use advanced features of an object-oriented programming language, such as inheritance and graphical libraries, to write programs.
2 Use object-oriented analysis, design and implementation with a minimum of guidance, to recognise and solve practical programming problems involving inheritance hierarchies.
3 Design appropriate interfaces between modular components.
4 Evaluate the quality of competing solutions to programming problems.
5 Evaluate possible trade-offs between alternative solutions, for instance those involving time and space differences.
6 Thoroughly test solutions to programming problems.
7 Discuss the quality of solutions through consideration of issues such as encapsulation, cohesion and coupling.

The intended generic learning outcomes.
On successfully completing the module students will be able to:
1 Make appropriate choices when faced with trade-offs in alternative designs.
2 Recognise and be guided by social, professional and ethical issues and guidelines and the general contexts in which they apply.
3 Deploy appropriate theory and practices in their use of methods and tools.

Method of Assessment

Main assessment methods
100% Coursework

Reassessment methods
100% Coursework

Preliminary Reading

"Objects first with Java – A practical introduction using BlueJ", David J. Barnes and Michael Kölling, Pearson Education, 2017, ISBN 978-1-292-15904-1.

Pre-requisites

COMP3200: Introduction to Object-Oriented Programming

Synopsis *

This module builds on the foundation of object-oriented design and implementation found in CO320 to provide both a broader and a deeper understanding of and facility with object-oriented program design and implementation. Reinforcement of foundational material is through its use in both understanding and working with a range of fundamental data structures and algorithms. More advanced features of object-orientation, such as interface inheritance, abstract classes, nested classes, functional abstractions and exceptions are covered. These allow an application-level view of design and implementation to be explored. Throughout the course, the quality of application design and the need for a professional approach to software development is emphasised.

CH308 Molecules Matter & Energy

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Whole Year	C	15 (7.5)	70% Exam, 30% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 22
Private study hours: 128
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:
Major aspects of chemical terminology, conventions and units
The nature of electrons and the structures of atoms and molecules
The characteristics of the states of matter and the theories used to describe them
The principles of thermodynamics

The intended generic learning outcomes. On successfully completing the module students will be able to:
Demonstrate knowledge and understanding of essential facts, concepts, principles and theories
Solve qualitative and quantitative problems

Method of Assessment

Assignment 1 (30 minutes, 6.5%)
Assignment 2 (30 minutes, 6.5%)
Class Assessment 1 (45 minutes, 7%)
Assignment 3 (30 minutes, 6.5%)
Class Assessment 2 (45 minutes, 7%)
Assignment 4 (5 hours, 6.5%)
Examination (2 hours, 60%)

Preliminary Reading

Winter (1994), Chemical Bonding: Recommended for the Atomic and Molecular Structure component of this module
Jones, Clemmet, Higton and Golding (1999), Access to Chemistry: Background reading for students without A-level chemistry
Chang (2000), Physical Chemistry for the Chemical and Biological Sciences: Recommended purchase for students with a good A-level chemistry background
Atkins (2012), The Elements of Physical Chemistry: A Less Mathematical Approach

Pre-requisites

None.

Synopsis *

This module introduces and revises the basic concepts of chemistry that underpin our understanding of the stability of matter. This starts with introducing atomic and molecular structure, with a focus on understanding the electronics of bonding in the molecular compounds around us. You will then study the laws governing the behaviour of gases and origins of other interactions that hold solids and liquids together, alongside describing some of their basic properties such as conductivity, viscosity, and the way in which ions behave in solution. In the final aspect of this module, we cover the critical role thermodynamics plays in determining the stability of matter, including the fundamental laws of thermodynamics and the importance of equilibrium in reversible reactions.

CH309 Fundamental Organic Chemistry for Physical Scientists

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Canterbury	Autumn	C	15 (7.5)	60% Exam, 40% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 36
Private study hours: 114
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate:
Knowledge and understanding of core and foundation scientific physical and chemical concepts, terminology, theory, units and conventions to chemistry and forensic science. FS/FC A1. Chem A1.
Knowledge and understanding of areas of organic chemistry (organic functional groups, organic materials and compounds, synthetic pathways) as applied to chemistry and forensic science. FS/FC A3. Chem A3.
An ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to chemistry and to apply such knowledge and understanding to the solution of qualitative and quantitative problems. FS/FC B1. Chem B5.
An ability to recognise and analyse novel problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data. FS/FC B2. Chem B6.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Demonstrate:
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
Numeracy skills, including such aspects as correct use of units, significant figures, decimal places etc.
Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.
Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning.
Study skills needed for continuing professional development and professional employment.

Method of Assessment

Assignment 1 4 hours (8%)
Assignment 2 4 hours (8%)
Assignment 3 4 hours (8%)
Assignment 4 4 hours (8%)
Assignment 5 4 hours (8%)
Examination 2 hours (60%)

Preliminary Reading

Core (Compulsory) Text for all Forensic Science students taking CH309
Fundamentals of Organic Chemistry, McMurry, 7th Edition, 2011 (ISBN-10 1439049718)
It is expected and necessary that you read this textbook as an accompaniment to all lecture notes and coursework for CH309. Older editions of the above are as valid and as useful as the latest edition

Core (Compulsory) Text for all Chemistry students taking CH309
Organic Chemistry, Jonathan Clayden, Nick Greeves, Stuart G. Warren, 2nd Edition, 2012 (ISBN-10 0199270295)
It is expected and necessary that you read this textbook as an accompaniment to all lecture notes and coursework for CH309.

Pre-requisites

Co-requisites:
CHEM3080 Molecules Matter & Energy
CHEM3140 Introduction to Biochemistry and Drug Chemistry
And
PSCI3810 Chemical Skills for Forensic Scientists
Or
CHEM3820 Chemical Skills

Synopsis *

This module reintroduces the basic concepts of organic chemistry that are vital in understanding pharmaceutical and biological substances. You will study the basics of the chemistry of carbon, the element critical to underpinning life, including its basic building blocks and functional groups. We also cover the mechanisms by which basic organic reactions occur including elimination, substitution and oxidation processes.

CH314 Introduction to Biochemistry and Drug Chemistry

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Spring	C	15 (7.5)	70% Exam, 30% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 32
Private study hours: 118
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate knowledge and understanding of core and foundation scientific biological and chemical concepts, terminology, theory, units, conventions, and methods in relation to the biochemical sciences.
Demonstrate knowledge and understanding of areas of chemistry including organic functional groups, medicinal chemistry, biochemistry, and applications in drug chemistry.
Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject and to apply such knowledge and understanding to the solution of qualitative and quantitative problems.
Recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:
Generic skills needed for students to undertake further training of a professional nature.
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning.
Study skills needed for continuing professional development and professional employment.

Method of Assessment

Assignment 1 (1 hour, 10%)
Assignment 2 (1 hour, 10%)
Assignment 3 (1 hour, 10%)
Workshop (2 hours, 10%)
Exam (2 hours, 60%)

Preliminary Reading

Core Text:
An Introduction to Medicinal Chemistry, Patrick, Graham L, Oxford University Press 5th Edition, 2013 (ISBN 0199697396)

Recommended:
McMurry/Simanek, Fundamentals of Organic Chemistry. 6th Edition, 2006 (ISBN 0495125903). 5th Edition is also acceptable

Recommended for Biosciences Students:
Wade, Organic Chemistry, International Edition 4th Edition, 1998 (ISBN 0-13-010339-X)

Recommended for Forensic Science & Chemistry Students:
Solomons & Fryhle, Organic Chemistry 7th Edition, 1998 (ISBN 0-471-19095-0)

Recommended:
Bruce Alberts, Essential Cell Biology, 2010

Pre-requisites

None

Synopsis *

Chemistry in context
Using an organic chemistry perspective, you will study some fundamental aspects of biochemistry, including protein chemistry, DNA, lipids and carbohydrates.

CH315 Disasters

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 13
Private study hours: 137
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Have a knowledge and understanding of core and foundation scientific chemical, physical and biological concepts, terminology, theory, units, conventions, and laboratory practice and methods in relation to the chemical sciences.
Ability to recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.
The ability to use computational methods for the practical application of theory and to use information technology and data-processing skills to search for, assess and interpret chemical information and data.
Skills in essay writing and presenting scientific material and arguments clearly and correctly, in writing and orally, to a range of audiences. The ability to communicate complex scientific argument to a lay audience.
The ability to collate, interpret and explain the significance and underlying theory of experimental data, including an assessment of limits of accuracy.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Communication skills, covering both written and oral communication.
Generic skills needed for students to undertake further training of a professional nature.
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
Numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.
Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.
Information-technology skills such as word-processing and spreadsheet use, data-logging and storage, Internet communication, etc.
Interpersonal skills, relating to the ability to interact with other people and to engage in team working within a professional environment.
Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning.
Study skills needed for continuing professional development and professional employment.

Method of Assessment

Seminar (5 minutes, 20%)
Assignment (5 hours, 20%)
Essay (40 hours, 60%)

Preliminary Reading

Limitations of Science; Sullivan, J.W.N. (1933)
Slide Rule; The Autobiography of an Engineer; Shute, N. (1956)
War and Peace; Tolstoy, L. (1993) (NB. Epilogue ONLY)

Pre-requisites

None

Synopsis *

Chemistry in context:
In this module, you will study particular cases in which disasters occur (for example, explosions, volcanic eruptions, exposure to chemical warfare agents and accidents in the chemical industry), either as a result of human participation or in the natural course of events. We will explore how science, and in particular chemistry, is integral to the understanding and mitigation of such events. You will then focus on an aspect particular disaster and give a short oral presentation on it alongside a written report and press release. Note: this module constitutes the writing component required by the Royal Society of Chemistry.

CH316 Computing Skills For Modern Data Analysis

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Spring	C	15 (7.5)	100% Coursework	

1	Canterbury	Spring	C	15 (7.5)	100% Coursework

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 40
Private study hours: 110
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have:
A systematic understanding of how computers work according to human's instructions.
Knowledge and understanding of computing languages and principles, and their application to diverse areas of applications.
An ability to solve problems in physics/mathematics/chemistry using appropriate mathematical tools. Ability to use computational methods for the practical application of theory and to use information technology and data-processing skills to search for, assess and interpret chemical information and data.
An ability to use mathematical techniques and analysis to model physical behaviour using computer programming.
Competent use of appropriate C&IT packages/systems for the analysis of data and the retrieval of appropriate information.
An ability to present and interpret information graphically using a computer.
An ability to make use of appropriate texts, research-based materials or other learning resources as part of managing their own learning, and develop simple algorithms.
Ability to recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data. Ability to adapt and apply methodology above to solve advanced and unfamiliar problems found in computer programming.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have:
Programming skills, in the context of both problems with well-defined solutions and open-ended problems. Numeracy is subsumed within this area.
Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
Personal and interpersonal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people within a professional environment. Including the ability to communicate and interact with professionals from other disciplines.
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information .Including the demonstration of self-direction and originality.
Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.

Method of Assessment

Assignment 1 (3 hours, 10%)
Assignment 2 (3 hours, 10%)
Assignment 3 (3 hours, 10%)
Assignment 4 (3 hours, 10%)

Assignment 5 (3 hours,10%)
Assignment 6 (3 hours,10%)
Assignment 7 (3 hours,10%)
Assignment 8 (3 hours,10%)
Assignment 9 (6 hours, 20%)

Preliminary Reading

The Python language reference manual: For Python version 3.2; Guido Van Rossum (2011), ISBN: 9781906966140. Copy in library and content available online.
The Python language reference; Python Software Foundation (2019); docs.python.org
Learn Python 3 the Hard Way: A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code; Zed Shaw (2014); ISBN: 0134692888

Pre-requisites

None

Synopsis *

Introduction to the concept of programming languages.

Introduction to practical programming, including the use of variables, constants, arrays and the different data types; iteration (loops) and conditional branching (if statements).
Modular design: subroutines and functions, the intrinsic functions.
Simple input/output, such as the use of format statements for reading and writing, File handling, including the open and close statements, practical read/write of data files. The handling of character variables.
Programming to solve physical/chemistry problems.

CH320 Chemical Reactions

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Whole Year	C	15 (7.5)	60% Exam, 40% Coursework with Compulsory Numeric Elements	

Availability

This is not available as a wild module.

Contact Hours

Total Contact Hours: 66
Total Private Study Hours: 84
Total Study Hours: 150
This module is expected to occupy 150 total study hours, including contact hours.

Learning Outcomes

On Successfully completing the module students will be able to:
Demonstrate knowledge and understanding of core and foundation scientific chemical concepts, terminology, theory, and conventions.
Demonstrate knowledge and understanding of areas of chemistry including properties of chemical elements, functional groups, physiochemical principles, and synthetic pathways.
Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject and to apply such knowledge and understanding to the solution of qualitative and quantitative problems.
Recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.
Demonstrate skills in the safe handling of chemical materials, taking into account their physical and chemical properties, including any specific hazards associated with their use and to risk assess such hazards.
Demonstrate skills required for carrying out documented standard laboratory procedures involved in synthetic and analytical work in relation to organic and inorganic systems; skills in observational and instrumental monitoring of physiochemical events and changes; the systematic and reliable documentation of the above; operation of standard analytical instruments employed in the chemical sciences.
Collate, interpret and explain the significance and underlying theory of experimental data, including an assessment of limits of accuracy.
Demonstrate generic skills needed for students to undertake further training of a professional nature.
Demonstrate knowledge and understanding of numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, and correct use of units and modes of data presentation.
Demonstrate study skills needed for continuing professional development and professional employment.

Method of Assessment

Main assessment methods:
• Maths Assignment (1 hour) – 3.33%
• Maths In-Course Test (45 minutes) – 6.67%
• Chemistry Assignment 1 (1 hour) – 5%
• Chemistry Assignment 2 (1 hour) – 5%
• Lab Reports (2-4 pages each) – 20%
• Examination (2 hours) – 60%
The lab reports are compulsory sub-elements and must be passed to complete the module.

Preliminary Reading

P. Monk, Mathematics for Chemistry

P. Atkins, Elements of Physical Chemistry

J. Kotz, Chemistry and Chemical Reactivity

Pre-requisites

None.

Synopsis *

This module will introduce you to core scientific chemical concepts including chemical equations and stoichiometry, kinetics and activation energies for reactions in solutions and acid and base chemistry. You will learn the theoretical background and terminology needed to understand these core concepts, along with the mathematical skills required by a practicing chemist. Hands-on laboratory experimentation is a key component of this module, teaching you the basic methodology used for understanding the physical chemistry of reactions, with a particular focus on their kinetics and thermodynamics. As part of this you will be taught how to effectively use fundamental laboratory equipment and instrumentation (Lab component).

CH382 Chemical Skills

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	30 (15)	60% Coursework, 40% Exam	
1	Canterbury	Whole Year	C	30 (15)	60% Coursework, 40% Exam with Compulsory Numeric Elements	

Availability

This is not a wild module.

Contact Hours

Total contact hours: 82
Private study hours: 218
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have:
The knowledge and skills base to allow progression to further studies in the areas of chemistry and forensic science, with a sense of enthusiasm for chemistry and its applications.
Acquired and developed key skills, concepts, theories and practice which underpin practical chemistry problem solving and data presentation methods pertaining to scientific results dissemination.
Acquired and developed necessary practical laboratory skills, problem-solving skills and work-related safety skills, including chemical handling, scientific data presentation and standard laboratory procedures.
The ability to recognise trends within groups and across periods of the periodic table and describe chemical and physical properties of elements within those groups. Developed knowledge and skills in the identification of behavioural periodic and group trends of the elements.
The ability to explain, with the aid of diagrams and using software tools, typical structures of common compounds.
Developed numerical and mathematical skills, critical for the study of chemistry and forensic science.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have:
A transferable skills set including the use of information and communication technology.

Method of Assessment

Data presentation methods and Communication skills (3 hours, 5.4%)
Periodicity and lab safety in course test (40 mins, 15.6%)
Molecular graphics and pc skills (3.5 hours, 7.2%)
Library quiz (1.5 hours, 1.8%)
Fundamental labs (12 hours, 13.2%)
Analytical labs (11 hours, 13.2%)
Maths in course test (40 mins, 3.6%)
Examination (2 hours, 40%)

It is compulsory to pass Fundamental labs (12 hours, 12%) and Analytical labs (11 hours, 12%) overall.
It is compulsory to pass Maths in-course test (40 mins, 6%).
It is compulsory to pass Examination (2 hours, 40%)

Preliminary Reading

Burrows, Holman, Parsons, Pilling and Price, Chemistry3, Oxford University Press, 2009
Chang, Chemistry, McGraw-Hill, 1998
Monk, Mathematics for Chemistry, Oxford University Press, 2006
Higher Education Academy Physical Sciences Center, Quantitative Skills in Forensic Science: http://www.physsci.ltsn.ac.uk/Resources/DevelopmentProjectsReport.aspx?id=204
Langford, Dean, Reed, Holmes, Weyers, and Jones, Practical Skills in Forensic Science, Pearson/Prentice Hall, 2005
Inorganic Chemistry, Shriver & Atkins, OUP 1999, ISBN: 978-019850331-8
Inorganic Chemistry, Housecroft & Sharpe, Prentice Hall 2001, ISBN: 978-058231080-3

Pre-requisites

Prerequisite:
CHEM3080 Molecules Matter & Energy (and appropriate A level qualifications or equivalent)

Synopsis *

In this module you will be introduced to the key concept of periodicity and how, through a deeper knowledge of the periodic table, chemists are able to understand and predict the chemical properties, reactivity and compounds formed by the elements. You will also be introduced to redox chemistry, which plays a key role in the reactivity of the elements and the forms in which they are found.
This module also has a significant focus on experimental chemistry. You will therefore complete a set of laboratory practicals, enabling you to develop the laboratory skills and knowledge to work safely in an experimental environment and carry out fundamental organic and analytical chemistry procedures, including basic spectroscopy. This will be supplemented by teaching you the essentials of laboratory safety awareness and the skills needed to write scientific reports, including ways to clearly present data arising from experiments. To enable you to achieve this you will learn, through examples of physical science applications, the basic mathematics required to understand, plot and analyse graphical information, including differentiation and integration. This will be supported by lessons in how to use simple computer programs for drawing molecular and crystal structures and carry out basic calculations on the energy levels of chemical systems (Lab component).

PH020 Algebra and Arithmetic

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	F	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Autumn	F	15 (7.5)	70% Exam, 30% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 40
Private study hours: 110
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Understand mathematics in relation to arithmetic and other basic numerical manipulations.
Deal with the accuracy of numbers in terms of decimal places and significant figures.
Understand areas of logarithmic and exponential mathematics.
Solve a range of equations including linear, quadratic, simultaneous, logarithmic and exponential.
Split complex fractions by the method of partial fractions.
Understand binomial expansions.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Demonstrate a firm foundation in maths (in combination with similar modules) to facilitate entry into stage 1 of a science- or maths-based degree programmes in the Faculty of Sciences.
Solve problems, including an ability to formulate problems in precise terms and to identify key issues and the confidence to try different approaches in order to make progress on challenging problems. Numeracy is subsumed within this area.
Use analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
Work independently, to use initiative, to organise oneself to meet deadlines and to interact with other people.

Method of Assessment

Moodle Test 1 (15%) – 1 hour
Moodle Test 2 (15%) – 1 hour
Examination (70%) – 2 hours

Preliminary Reading

Core Text:
Maths: The Core Mathematics for A Level, by Bostock and Chandler, 1994

Supplementary texts:
Foundations Maths by Croft and Davison, 6th Ed., pub. Addison-Wesley, 2016
Foundation Mathematics, Stroud & Booth, 2009

Pre-requisites

None

Synopsis *

This module covers a range of arithmetic and algebraic aspects of maths, including: Lowest Common Multiples/Highest Common Factors, Significant Figures, Scientific/Engineering Notation, Fractions, Percentages, Indices, Functions, Logarithmic and Exponential Equations, Algebraic Long Division, Factorisation, Quadratic Equations, Linear and Simultaneous Equations, Partial Fractions and Binomial Theorem.

PH023 Motion & Mechanics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	F	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Spring	F	15 (7.5)	70% Exam, 30% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 24
Private study hours: 126
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have:
Knowledge and understanding of Physical laws and principles, and their application to diverse areas of physics including laws of motion, and covering the necessary mathematics.
An ability to identify relevant principles and laws when dealing with problems, and to make approximations necessary to obtain solutions.
An ability to solve problems in physics using appropriate mathematical tools.
An ability to use mathematical techniques and analysis to model physical behaviour.

Subject-specific skills:
An ability to present and interpret information graphically.
An ability to make use of appropriate texts, or other learning resources as part of managing their own learning.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:

Transferable skills:
Problem-solving skills, an ability to formulate problems in precise terms and to identify key issues, and the confidence to try different approaches in order to make progress on challenging problems. Numeracy is subsumed within this area. (D1)
Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly. (D4)
Personal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people. (D5)

Method of Assessment

Assignment, 2 hour (15%)
Moodle quiz, 45 minutes (15%)
Exam, 2 hours (70%)

Preliminary Reading

New Understanding Physics for Advanced Level, 4th edition, by J. Breithaupt (2000)

Pre-requisites

None

Synopsis *

Mechanics is concerned with the behaviour of physical bodies when subjected to forces or displacements. The course will introduce terminology via the topics of units, dimensions, and dimensional analysis. The motion of objects will be studied in terms of distance, velocity, and acceleration time graphs. Then the role of forces in causing motion will be studied under the topics of Newton's Laws of Motion and Friction. The relationship between forces and energy will be introduced in terms of Work and Power, which will be connected to the topics of potential energy, kinetic energy, and Conservation of energy. The topic of Linear momentum will be introduced in order to study Conservation of linear momentum. The course will then study Circular motion and Rotational systems in relation to topics such as moment of inertia and torque. The case of gravitational force will be studied to illustrate topics of force fields and potential energy in force fields.

PH025 Waves and Vibrations

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	F	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Spring	F	15 (7.5)	70% Exam, 30% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total Contact Hours: 24
Total Private Study Hours: 126
Total Study Hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate knowledge and understanding of physical laws and principles, and their application to diverse areas of physics (this will include laws of motion, electromagnetism, wave phenomena and the properties of matter), with modules covering the necessary mathematics.
Demonstrate an ability to identify relevant principles and laws when dealing with problems, and to make approximations necessary to obtain solutions.
Demonstrate an ability to solve problems in physics using appropriate mathematical tools.
Demonstrate an ability to use mathematical techniques and analysis to model physical behaviour.
Demonstrate an ability to present and interpret information graphically.
Demonstrate an ability to make use of appropriate texts, or other learning resources as part of managing their own learning.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Demonstrate an ability to formulate problems in precise terms and to identify key issues, and the confidence to try different approaches in order to make progress on challenging problems. Numeracy is subsumed within this area.
Demonstrate analytical skills, associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
Demonstrate the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people.

Method of Assessment

Assignment (1 hour) – 15%
Moodle Quiz (1 hour) – 15%
Examination (2 hours) – 70%

Preliminary Reading

Breithaupt, J. (1999). New Understanding Physics for Advanced Level, Fourth Edition. Oxford: Oxford University Press.
Breithaupt, J. (2010). Physics, Third Edition. London: Palgrave Macmillan.

Pre-requisites

None

Synopsis *

The module will cover the following:
Types of waves. Characteristics of a wave:- frequency, period, amplitude, wavelength and velocity. Introduction to transverse and longitudinal waves and polarisation. c = f?
Properties of Waves. Qualitative description of the properties of waves; motion, reflection, refraction (Snell's law), dispersion, diffraction, interference, standing waves.
Sound Waves. Description of sound - loudness, noise, note, pitch, intensity, intensity level. Properties of sound - reflection, refraction, interference (interference pattern produced by two speakers), beats, and resonance in a vibrating wire, including overtones/harmonics. Qualitative treatment of Doppler Effect.
Electromagnetic (em) Waves. Electromagnetic spectrum. Qualitative treatment of em waves from different parts of the spectrum. Refraction of light - critical angle and optical fibres. Polarisation of light, microwaves and radio waves.
Interference. Young's double slit experiment. The Michelson interferometer. Transmission diffraction grating - orders of diffraction, application in spectroscopy.
Simple Harmonic Motion (SHM). Displacement, velocity and acceleration of a body undergoing SHM Link between SHM and circular motion. Force acting on a body undergoing SHM. Qualitative description of systems displaying SHM. Detailed description of pendulum and mass on a spring. Energy in SHM. General expression for SHM.
Damping and Forced Oscillations. Qualitative treatment of light, heavy and critical damping. Qualitative discussion of the concepts of natural frequency, resonance and the behaviour of vibratory systems driven by a periodic force.

PH026 Properties of Matter

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	F	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Autumn	F	15 (7.5)	70% Exam, 30% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 24
Private study hours: 126
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Have a knowledge and understanding of:

Physical laws and principles, and their application to diverse areas of physics (this will include laws of motion, electromagnetism, wave phenomena and the properties of matter), with modules covering the necessary mathematics.

Intellectual skills:
An ability to identify relevant principles and laws when dealing with problems, and to make approximations necessary to obtain solutions.
An ability to solve problems in physics using appropriate mathematical tools.
An ability to use mathematical techniques and analysis to model physical behaviour.

Subject-specific skills:
Ability to present and interpret information graphically.
An ability to make use of appropriate texts, or other learning resources as part of managing their own learning.

The intended generic learning outcomes. On successfully completing the module students will be able to:

Have a knowledge and understanding of:

Transferable skills:

Problem-solving skills, an ability to formulate problems in precise terms and to identify key issues, and the confidence to try different approaches in order to make progress on challenging problems. Numeracy is subsumed within this area.
Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
Personal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people.

Method of Assessment

Assignment 1, (2 hours, 15%)
Assignment 2, (2 hours, 15%)
Exam (2 hours, 70%)

Preliminary Reading

Core texts:
New Understanding Physics for Advanced Level 4th edition, by J. Breithaupt (Copies of the 4th edition are in the library, + copies of earlier editions)

Background text:
Physics by J. Breithaupt (Copies of 2003 edition in the library)

Pre-requisites

None

Synopsis *

Simple model of nuclear atom. Atomic number and mass. The periodic table. The mole and Avogadro's number. Solids, liquids and gases. Interatomic forces. Excitation and ionization. The electron volt.
Spectra and energy levels. E = hf. Relation of spectra to transitions between energy levels. Bohr atom quantitatively. Photoelectric effect. Crystalline lattices. Amorphous materials. X-ray diffraction. Polymers and plastics.
Gases, liquids and solids. Pressure. Archimedes principle. Hydrostatics. Heat and temperature scales. Thermometers. Latent heat. Thermal expansion. Perfect gas laws.
Thermal equilibrium and temperature. Thermal conduction. Radiation laws. Kinetic theory of gases.
Introduction to radioactivity.

PH027 Introductory Physics Laboratory and Communication Skills

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Whole Year	F	15 (7.5)	100% Coursework with Compulsory Numeric Elements	
2	Canterbury	Whole Year	F	15 (7.5)	100% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 30
Private study hours: 120
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have:
Knowledge and understanding of physical laws and principles, and their application to diverse areas of physics (this will include laws of motion, electromagnetism, wave phenomena and the properties of matter), with modules covering the necessary mathematics.
An ability to identify relevant principles and laws when dealing with problems, and to make approximations necessary to obtain solutions.
An ability to solve problems in physics using appropriate mathematical tools.
An ability to present and interpret information graphically.
An ability to communicate scientific information, in particular to produce clear and accurate scientific reports.
A familiarity with laboratory apparatus and techniques, including relevant aspects of Health & Safety.
The systematic and reliable recording of experimental data.
An ability to make use of appropriate texts, or other learning resources as part of managing their own learning.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have:
Problem-solving skills, an ability to formulate problems in precise terms and to identify key issues, and the confidence to try different approaches in order to make progress on challenging problems. Numeracy is subsumed within this area.
Investigative skills in the context of independent investigation including the use of textbooks and other available literature, and the interaction with colleagues to extract important information.
Communication skills in the area of dealing with surprising ideas and difficult concepts, including listening carefully, reading demanding texts and presenting complex information in a clear and concise manner.
Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
Personal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people.

Method of Assessment

Assignment (3 hour lab session) – 10%
Lab Report 1 – 10%
Lab Report 2 – 15%
Lab Report 3 – 15%
Lab Report 4 – 15%
Lab Report 5 – 15%
Lab Report 6 – 20%

Preliminary Reading

Core texts:
New Understanding Physics for Advanced Level 4th edition, by J. Breithaupt. (Copies of the 4th edition are in the library, + copies of earlier editions)
L. Kirkup, Experimental Methods John Wiley & Sons, Australia, 1994

Supplementary texts:
Physics by J. Breithaupt (Copies of 2003 edition in the library)
J. R. Taylor, An Introduction to Error Analysis (Second Edition), University Science Books, US. 1997
J. Topping, Errors of Observation and Their Treatment (Third Edition), Chapman and Hall, London, 1962

Pre-requisites

None

Synopsis *

There will be laboratory sessions with eight experiments relating to both general skills and to the syllabus of the Physics lecture modules PH023, PH025 and PH026.
There will be lecture tutorials on:
Introduction to the module
Analysing experimental uncertainties
Writing reports on laboratory work

PH302 Computing Skills

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Spring	C	15 (7.5)	100% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Workshops (34 hours).
Total study time 150 hrs (including private study time).

Learning Outcomes

A systematic understanding of how computers work according to human's instructions.
Knowledge and understanding of computing programme F90 and principles, and their application to diverse areas of applications.
An ability to solve problems in physics/mathematics/chemistry using appropriate mathematical tools. Ability to use computational methods for the practical application of theory and to use information technology and data-processing skills to search for, assess and interpret chemical information and data.
An ability to use mathematical techniques and analysis to model physical behaviour using computer programming.
Competent use of appropriate C&IT packages/systems for the analysis of data and the retrieval of appropriate information.
An ability to present and interpret information graphically using a computer.
An ability to make use of appropriate texts, research-based materials or other learning resources as part of managing their own learning, and develop simple algorithms.
Ability to recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data. Ability to adapt and apply methodology above to solve advanced and unfamiliar problems found in computer programming.
Programming skills, in the context of both problems with well-defined solutions and open-ended problems. Numeracy is subsumed within this area.
Analytical skills – associated with the need to pay attention to detail and to develop an ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
Personal and interpersonal skills – the ability to work independently, to use initiative, to organise oneself to meet deadlines and to interact constructively with other people within a professional environment. Including the ability to communicate and interact with professionals from other disciplines.
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information .Including the demonstration of self-direction and originality.
Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.

Method of Assessment

Coursework 100% including class tests and homework

Preliminary Reading

Introduction to Programming with Fortran: With Coverage of Fortran 90, 95, 2003, 2008, 77; Chivers, Ian & Sleightholme, Jane, (2012) ISBN 9780857292322. Copies in library and online.

Programming in Fortran 90: A First Course for Engineers and Scientists; Smith, I., (1995) ISBN 0471941859

Pre-requisites

None.

Synopsis *

Introduction to the concept of programming languages, and to Fortran 90 in particular.

Introduction to the UNIX operating system: including text editors, the directory system, basic utilities, the edit-compile-run cycle.

Introduction to Fortran 90, including the use of variables, constants, arrays and the different Fortran data types; iteration (do-loops) and conditional branching (if statements).

Modular design : subroutines and functions, the intrinsic functions.

Simple input/output, such as the use of format statements for reading and writing, File handling, including the Fortran open and close statements, practical read/write of data files. The handling of character variables.

Programming to solve physical/chemistry problems.

PH304 Introduction to Astronomy and Special Relativity

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	C	15 (7.5)	80% Exam, 20% Coursework	
3	Canterbury	Autumn	C	15 (7.5)	70% Exam, 30% Coursework	

Availability

Not available as an elective module choice.

Contact Hours

Total Contact Hours: 30
Total Private Study Hours: 120
Total Study Hours: 150

Learning Outcomes

1 Demonstrate knowledge and understanding of the laws of physics in the areas of optics and introductory astronomy.
2 Demonstrate knowledge and understanding of physical quantities, their units, and typical values, for optics and introductory astronomy.
3 Demonstrate knowledge and understanding of physical phenomena, the terminology used to describe them, and typical circumstances in which they are found to occur, for optics and introductory astronomy.
4 Formulate and solve problems in optics and introductory astronomy.
5 Quantitatively describe and predict optics and introductory astronomy phenomena using mathematics.
6 Comment critically on how telescopes are designed, their principles of operation or their use in astronomy.

Method of Assessment

• Problem Set 1 (4 hours) – 10%
• Problem Set 2 (4 hours) – 10%
• Examination (2 hours) – 80%

Preliminary Reading

Carrol, B., and Ostlie, D. (2017). An Introduction to Modern Astrophysics. (Second Edition). Cambridge: Cambridge University Press
Morison, I. (2008). Introduction to Astronomy and Cosmology. New York: Wiley
Tipler, P. and Mosca, G. (2008). Physics for Scientists and Engineers (Sixth Edition). London: Palgrave Macmillan

Pre-requisites

None

Synopsis *

This module provides an introduction to astronomy, beginning with our own solar system and extending to objects at the limits of the universe. Straightforward mathematics is used to develop a geometrical optics model for imaging with lenses and mirrors, and this is then used to explore the principles of astronomical telescopes.

PH307 Disasters

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	100% Exam	
1	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	

Availability

This is not available as a wild module.

Contact Hours

11 lectures and 1 x 2hr presentation exercise.

Learning Outcomes

Core and foundation scientific chemical, physical and biological concepts, terminology, theory, units, conventions, and laboratory practice and methods in relation to the chemical sciences.
Ability to recognise and analyse problems and plan strategies for their solution by the evaluation, interpretation and synthesis of scientific information and data.
The ability to use computational methods for the practical application of theory and to use information technology and data-processing skills to search for, assess and interpret chemical information and data.
Skills in essay writing and presenting scientific material and arguments clearly and correctly, in writing and orally, to a range of audiences. The ability to communicate complex scientific argument to a lay audience.
The ability to collate, interpret and explain the significance and underlying theory of experimental data, including an assessment of limits of accuracy.
Communication skills, covering both written and oral communication.
Generic skills needed for students to undertake further training of a professional nature.
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
Numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.
Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.
Information-technology skills such as word-processing and spreadsheet use, data-logging and storage, Internet communication, etc.
Interpersonal skills, relating to the ability to interact with other people and to engage in team working within a professional environment.
Time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working. Self-management and organisational skills with the capacity to support life-long learning.
Study skills needed for continuing professional development and professional employment.

Method of Assessment

100% coursework consisting of: (1) Press release 20%; (2) Seminar performance/presentation 20%; (3) Essay 60%.

Preliminary Reading

Limitations of Science; Sullivan, J.W.N. (1933)
Slide Rule: The Autobiography of an Engineer; Shute, N. (1956)
War and Peace; Tolstoy, L. (1993) (NB. Epilogue ONLY)

Pre-requisites

None.

Synopsis *

Chemistry in context
In this module, you will study particular cases in which disasters occur (for example, explosions, volcanic eruptions, exposure to chemical warfare agents and accidents in the chemical industry), either as a result of human participation or in the natural course of events. We will explore how science, and in particular chemistry, is integral to the understanding and mitigation of such events. You will then focus on an aspect particular disaster and give a short oral presentation on it alongside a written report and press release. Note: this module constitutes the writing component required by the Royal Society of Chemistry.

PS021 Molecules and Analysis

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	F	30 (15)	60% Exam, 40% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 80
Private study hours: 220
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate knowledge and understanding of a range of chemistry-based topics
Demonstrate experimental laboratory skills
Solve problems
Interpret data

The intended generic learning outcomes. On successfully completing the module students will be able to:
Receive and respond to a variety of sources of information (e.g. textual, numerical, verbal, and graphical).
Problem solve by a variety of methods (especially numerical) including the use of computers.
Use self-management plus organisational skills and the capacity to support life-long learning.

Method of Assessment

LAB– Experiment A1 – 3 hours (3.34%)
LAB - Experiment A2 – 3 hours (3.34%)
LAB - Experiment A3 – 3 hours (3.34%)
LAB - Experiment A4 – 3 hours (3.34%)
LAB - Experiment A5 – 3 hours (3.34%)
LAB - Experiment A6 – 3 hours (3.34%)
Class Test 1 – 1 hour (10%)
Class Test 2 – 1 Hour (10%)
Exam - 2 hours (60%)

Preliminary Reading

Philip Matthews, Advanced Chemistry, Cambridge Univ. Press 1992
Burrows et al., Chemistry3: Introducing Inorganic, Organic and Physical Chemistry, 2nd Edition, Oxford University Press (2013)

Pre-requisites

None.

Synopsis *

The mole; chemical equations; titrations; atoms and molecules; energy levels; acids and bases; orbitals; bonds; molecular shapes; spectra; bond energies, hydrogen bonding, analytical methods - IR, UV-Vis, NMR).

PS022 Chemical Reactivity

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	F	30 (15)	60% Exam, 40% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total Contact Hours: 80
Total Private Study Hours: 220
Total Study Hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate knowledge and understanding of a range of chemistry-based topics.
Demonstrate experimental laboratory skills.
Solve chemistry-based problems.
Interpret data on chemistry-based topics.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Receive and respond to a variety of sources of information (e.g. textual, numerical, verbal, and graphical).
Employ a variety of methods to solve problems (especially numerical) including the use of computers.
Use self-management plus organisational skills and to support life-long learning.

Method of Assessment

• Lab Experiments (3 hours each) – 20%
• In-Course Test 1 (1 hour) – 10%
• In-Course Test 2 (1 hour) – 10%
• Examination (2 hours) – 60%
The lab experiments are compulsory sub-elements and must be passed to complete the module.

Preliminary Reading

Burrows, A. et al., (2013). Chemistry3: Introducing Inorganic, Organic and Physical Chemistry, Second Edition, Oxford: Oxford University Press.
Matthews, P. (1992). Advanced Chemistry, Cambridge: Cambridge University Press

Pre-requisites

None.

Synopsis *

This module will cover lattice energy; polymorphism; chemical equilibrium; the Periodic Table; solubilities; transition metals; isomerism; organic chemicals; shapes of organic molecules; organic analysis; optical activity; basic reactions of organic compounds; organic problem-solving; reaction kinetics.

PS023 Properties of Matter

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	F	30 (15)	60% Exam, 40% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total Contact Hours: 80
Total Private Study Hours: 220
Total Study Hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Demonstrate knowledge and understanding of a range of chemistry-based topics.
Demonstrate experimental laboratory skills.
Solve chemistry-based problems.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Receive and respond to a variety of sources of information (e.g. textual, numerical, verbal, and graphical).
Employ a variety of methods to solve problems (especially numerical) including the use of computers.
Use self-management plus organisational skills and to support life-long learning.

Method of Assessment

• Lab Experiments (3 hours each) – 20%
• In-Course Test 1 (1 hour) – 10%
• In-Course Test 2 (1 hour) – 10%
• Examination (2 hours) – 60%
The lab experiments are compulsory sub-elements and at least one must be passed to complete the module.

Preliminary Reading

Burrows, A. et al., (2013). Chemistry3: Introducing Inorganic, Organic and Physical Chemistry, Second Edition, Oxford: Oxford University Press.
Jackson, A.R.W and Jackson, Julie, M. (2004). Forensic Science, Harlow: Pearson Education, Prentice Hall.
Matthews, P. (1992). Advanced Chemistry, Cambridge: Cambridge University Press

Pre-requisites

None.

Synopsis *

This module will cover states of matter; radioactivity; real and ideal gases; water. Main group inorganic chemistry; phase diagrams, ideal solutions; miscibility, electrochemistry, forensic science techniques.

PS301 Introduction to Forensic Science

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	75% Exam, 25% Coursework	
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	

Availability

This is available as a wild module.

Contact Hours

Total contact hours: 28
Private study hours: 122
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have:
Knowledge and understanding of core and foundation scientific physical, biological, and chemical concepts, terminology, theory, units, conventions, and laboratory methods in relation to forensic science.
Areas of chemistry (including analytical chemistry, fires and explosions,) as applied to forensic analysis.
Areas of biochemistry, human DNA.
Numeracy (including data analysis and statistics), forensic investigation and interpretation (including image analysis, forensic archaeology, ballistics, interrogation, and the extraction, analysis, interpretation of physical evidence) and apply them to forensic examination and analysis.
Incident investigation, evidence recovery, preservation, and presentation as an expert witness within the judicial environment.
Ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to forensic science and to apply such knowledge and understanding to the solution of qualitative and quantitative problems.
Evidence recovery, preservation, analysis, and presentation to professional standards.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:
Communication skills, covering both written and oral communication. Self-management and organisational skills with the capacity to support life-long learning.
Problem-solving skills, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
Numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.
Information-retrieval skills, in relation to primary and secondary information sources, including information retrieval through on-line computer searches.

Method of Assessment

Online Moodle assignment - one hour duration (25%)
Online Moodle examination - two hour duration (75%)

Preliminary Reading

Crime Scene to Court, the Essentials of Forensic Science, 3rd edition, White, P. (ed.) (2010)
Forensic Science, 3rd edition, Jackson, A.R.W. & Jackson J. M. (2011)
Criminalistics, 10th edition, Saferstein, R. (2011)

Pre-requisites

None

Synopsis *

Forensic Science; evidence and the scene of the crime.
What is forensic science? Historical and legal background of forensic science – exchange principles and linkage theory..
Identification, characterisation, recovery and weighting of trace evidence types. Crime scene searching methodologies; the integrity and continuity of evidence. Introduction to laboratory testing dealing with glass, tool-mark, footwear mark and tyre impressions. The management of scientific support at crime scenes. Procedures at crime scenes illustrated by reference to crimes of burglary, murder and sexual offences. Fingerprint history, classification, recovery and chemical enhancement of fingermarks. Practical applications of blood pattern analysis Sexual offence investigation and body fluid identification.
Clinical indicators of death and murder scene investigation.
Drug Abuse, alcohol and forensic toxicology.
Drugs of abuse and their identification. Drugs, alcohol poisons and their metabolism. Toxicology and the role of the forensic toxicologist. Qualitative and quantitative laboratory analysis.
Document examination:
Signature and handwriting identification. Paper, inks and printed documents. Damage characterisation.
Fires and Explosions:
Arson. Fire and combustion. Types of explosives and the nature of explosions. The crime scene investigation: sampling and laboratory analysis.

PS318 Skills for Forensic Scientists

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	100% Coursework	
1	Canterbury	Whole Year	C	15 (7.5)	100% Coursework with Compulsory Numeric Elements	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 47
Private study hours: 103
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Display knowledge and understanding of core and foundation scientific physical, biological, and terminology, units, conventions, in relation to forensic science.
Areas of bioscience including cells, biochemistry, human DNA.
Demonstrate numeracy skills (including data analysis and statistics).
Understand the theory and practice of incident investigation, evidence recovery and preservation.
Display a basic understanding of the English legal system and laws of evidence.
Demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject and to apply such knowledge and understanding to the solution of qualitative and quantitative problems.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Solve problems, relating to qualitative and quantitative information, extending to situations where evaluations have to be made on the basis of limited information.
Use numeracy and computational skills, including such aspects as error analysis, order-of-magnitude estimations, correct use of units and modes of data presentation.
Use information-technology skills such as word-processing and spreadsheet use, data-logging and storage, Internet communication, etc.
Use Interpersonal skills, relating to the ability to interact with other people and to engage in team working.
Use time-management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working.

Method of Assessment

Incident Mapping Practical Work (6 hours 30%)
Law Assignment (1 hour 20%)
DNA Assignment (1 hour 20%)
Maths Assignment (1 hour 10%)
Maths in-course test (45 mins 20%)

The maths assignment and the maths in-course test are a compulsory sub-element. The Incident Mapping Practical Work is a compulsory sub-element. In order to pass the module it is compulsory to pass the sub-elements.

Preliminary Reading

Essential Mathematics and Statistics for Forensic Science - Adam, 2010, Wiley
Maths for Chemistry: A Chemist's Toolkit of Calculations - Monk, 2010, OUP
Criminalistics: An Introduction to Forensic Science - Saferstein, 2014, Pearson
Crime Scene to Court: The Essentials of Forensic Science - White, 2016, RSC
Practical Skills in Forensic Science - Langford, 2018, Pearson
Forensic Science – Jackson and Jackson, 2016, Pearson
An Introduction to Forensic Genetics - Goodwin, 2010, Wiley
Evidence - Munday, 2017, OUP
Forensic Chemistry - Bell, 2013, Pearson

Pre-requisites

None.

Synopsis *

Quantitative skills beginning with GCSE mathematics through to algebra, data analysis, graphical treatment of errors, logarithms, basic probability, trigonometry and applications in forensic science.
Incident scene assessment, management and mapping, including working in our new crime scene house and garden.
Induction to the English legal system and laws of evidence.
The structure and composition of DNA, genetic analysis and applications relevant to forensic science.

PS324 Introduction to Ballistics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	15 (7.5)	100% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 30
Private study hours: 120
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have a knowledge and understanding of:
Newtonian mechanics relating to the flight of projectiles.
Energy considerations in ballistics.
Weapon mechanisms.
Ammunition.
Overview of the main stages of ballistics (Internal, Intermediate, External and Terminal).
UK Firearms Law.
Applications of forensic science to ballistics.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have:
Increasing of students' general mathematical abilities.
The application of mechanics to different scenarios.
The application of law to ballistics.
Develop practical skills in ballistics.
Writing of reports for different audiences.
Development of oral presentation skills.
To develop the skills required for higher level ballistics modules.
Development of research skills and the use of scientific literature.

Method of Assessment

Lab Report 1 (20%) – 800 words
Lab Report 2 (20%) – 800 words
Essay (40%) – 1100 words
Presentation (20%) – 10 minutes

Preliminary Reading

Understanding Firearm Ballistics, R.A. Rinker. Mullberry Hs, USAISBN 0-9645598-4-6
Handbook of Firearms and Ballistics, Brian Heard, Wiley Blackwell. ISBN 0470694602
Small Arms, Derek Allsop & M Toomey, Brassey's (UK) Ltd. ISBN 1857532503

Pre-requisites

None.

Synopsis *

This module provides an introduction to the mathematical, physical, social and legal concepts that underpin academic study in the field of ballistics.

PS370 Skills for Physicists

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework with Compulsory Numeric Elements	

PS381 Chemical Skills For Forensic Scientists

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	30 (15)	100% Coursework	
1	Canterbury	Whole Year	C	30 (15)	100% Coursework with Compulsory Numeric Elements	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 82
Private study hours: 218
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Have:
The knowledge and skills base to allow progression to further studies in the areas of chemistry and forensic science, with a sense of enthusiasm for chemistry and its applications.
Acquired and developed key skills, concepts, theories and practice which underpin practical chemistry problem solving and in data presentation methods pertaining to scientific results dissemination.
Acquired and developed necessary practical laboratory skills, problem-solving skills and work-related safety skills, including chemical handling, scientific data presentation and standard laboratory procedures.
The ability to recognise trends within groups and across periods of the periodic table and describe chemical and physical properties of elements within those groups. Developed knowledge and skills in the identification of behavioural periodic and group trends of the elements.
The ability to explain, with the aid of diagrams and using software tools, typical structures of common compounds.
Developed numerical and mathematical skills, critical for the study of chemistry and forensic science.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Have:
Developed a transferable skills set including the use of information and communication technology.
Developed basic experimental and communication skills required for physical and forensic science.
Acquired knowledge and understanding of elementary practical chemistry.

Method of Assessment

Molecular graphics and pc skills (3.5 hours, 12%)
Periodicity and lab safety in course test (40 mins, 13.5%)
Data presentation methods and communication skills (3 hours, 9%)
Maths in course test (40 mins, 6%)
Library quiz (1.5 hours, 3%)
Fundamental Chemistry lab (12 hours, 22%)
Analytical Chemistry Lab (11 hours, 22%)

It is compulsory to average a pass for Fundamental Chemistry Labs and Analytical Chemistry Labs.

Preliminary Reading

Burrows, Holman, Parsons, Pilling and Price, Chemistry3, Oxford University Press, 2009
Chang, Chemistry, McGraw-Hill, 1998
Monk, Mathematics for Chemistry, Oxford University Press, 2006
Saferstein, Criminalistics – An Introduction to Forensic Science, Prentice Hall, 2001
Higher Education Academy Physical Sciences Centre, Quantitative Skills in Forensic Science:
http://www.physsci.ltsn.ac.uk/Resources/DevelopmentProjectsReport.aspx?id=204
Langford, Dean, Reed, Holmes, Weyers, and Jones, Practical Skills in Forensic Science, Pearson/Prentice Hall, 2005

Pre-requisites

Prerequisites:
CHEM3080 Molecules Matter & Energy
(and appropriate A level qualifications or equivalent)

Synopsis *

This module has a significant focus on experimental chemistry. You will therefore complete a set of laboratory practicals, enabling you to develop the laboratory skills and knowledge to work safely in an experimental environment and carry out fundamental organic and analytical chemistry procedures, including basic spectroscopy. This will be supplemented by teaching you the essentials of laboratory safety awareness and the skills needed to write scientific reports, including ways to clearly present data arising from experiments. To enable you to achieve this you will learn, through examples of physical science applications, the basic mathematics required to understand, plot and analyse graphical information, including differentiation and integration. This will be supported by lessons in how to use simple computer programs for drawing molecular and crystal structures and carry out basic calculations on the energy levels of chemical systems (Lab component).

In this module you will also be introduced to the key concept of periodicity and how, through a deeper knowledge of the periodic table, scientists are able to understand and predict the chemical properties, reactivity and compounds formed by the elements. You will also be introduced to redox chemistry, which plays a key role in the reactivity of the elements and the forms in which they are found.

PS717 Modern Approaches to Incident Management

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Canterbury	Whole Year	M	30 (15)	100% Coursework	

Availability

This is not available as a wild module.

Contact Hours

Total contact hours: 55
Private study hours: 245
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:
Understand the general processes involved with managing various incident types (indicative topics may include – civil infrastructure incidents, disaster victim identification (DVI), acts of terrorism and weapons of mass destruction (WMDs) and smaller scale murder scene investigation).
Understand evidential prioritisation in relation to incident investigation.
Manage evidence recovery, storage and analysis.
Manage personnel & logistics in live and simulated incidents.
Write a critical report based on their own incident scene management.
Understand the science underlying chemical, biological, radiological and nuclear (CBRN) incidents.
Use computer simulations to aid their understanding of incident investigation and interpretation.
Apply a multidisciplinary scientific knowledge to their incident investigation processes across many different possible scenarios (see the first learning outcome above for indicative topics).

The intended generic learning outcomes. On successfully completing the module students will be able to:
Manage time, resources, and personnel.
Solve problems during real-time incidents and simulated exercises.
Communicate clearly with a variety of personnel.
Write reports to a professional level.
Use computer software effectively to model various complex scenarios.

Method of Assessment

Incident Management Practical – 3 hours (25%)
Incident Report – 3000 words (15%)
Table-top incident simulation – 3 hours (25%)
Incident Portfolio – 5,000 words (35%)

Preliminary Reading

Core text:
Introduction to Emergency Management, Haddow. 2008.

Recommended reading:
Aircraft Safety, Kraues. 2003
Maritime Safety: The Human Factors. Trafford. 2009. Book Guild Publishing
Homeland Security in the UK: Future Preparedness for Terrorist Attack since 9/11: Wilkinson.2007
Blackstone's Counter-Terrorism Handbook: Stainforth. 2010 OUP
Derail: Why Trains Crash. Faith: 2000. Channel 4 Publishing
Air Accident Investigation. Owen. 2001.
The Terrorism Reader: 4th Edition. Whittaker. 2012.
Explaining terrorism; causes, processes and consequences. Crenshaw,
Techniques of crime scene investigation, CRC Press, Fisher, 2012,

Pre-requisites

None.

Synopsis *

This module will cover the core principles behind the management and investigation processes that may relate to a range of forensically-relevant incident types. Indicative areas of discussion may include investigation of civil infrastructure incidents, disaster victim identification (DVI), acts of terrorism and weapons of mass destruction (WMDs) as well as managing forensic resources over a range of major and smaller incidents.

In addition to the process-driven content above, students will further study the relevant science behind some of the incident types and develop the capability to computer model various aspects of these events. This ultimately provides students with the ability to take a modern, holistic and multidisciplinary scientific approach when interpreting what may have happened during such events.

39 School of Psychology

SP304		Introduction to Psychology I				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	80% Exam, 20% Coursework	
1	Canterbury	Spring	C	15 (7.5)	90% Exam, 10% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	90% Exam, 10% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	80% Exam, 20% Coursework	

Availability

Offered as an elective module to non-psychology students. Available to Short-Term credit students.

Contact Hours

Total contact hours: 22

Private study hours: 128

Total study hours: 150

Department Checked

02.03.2021

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

8.1 Demonstrate an introductory knowledge of psychology as a science and the research methods used within the study of psychology

8.2 Show a familiarity and awareness of how key concepts in psychology relate to current and contemporary issues in modern society

8.3 Demonstrate an awareness of sub-disciplines within psychology and how they relate to each other

8.4 Demonstrate introductory knowledge of key concepts in the study of abnormal psychology, sensation, consciousness, child psychology, motivation, emotion, memory and attitudes, and group processes

8.5 Demonstrate knowledge, understanding, and appreciation of the diversity of theoretical and empirical approaches in psychology

The intended generic learning outcomes. On successfully completing the module students will be able to:

9.1 Demonstrate an understanding of the quality of theories, methods and findings in published research

9.2 Demonstrate the use of information technology (e.g. study guides, on-line tests and other resources on the web described in the recommended text book) to support learning and personal understanding of psychology

Method of Assessment

Examination 2 hours 80%

Research Participation 20%

* An alternative assessment may be provided for those short-term students who will no longer be registered when the examination takes place. This alternative assessment will assess the same learning outcomes as the end of year exam.

Reassessment methods: Like for Like.

Preliminary Reading

Reading list (Indicative list, current at time of publication. Reading lists will be published annually)

Martin, G. N., Carlson, N. R., & Buskist, W. (2011). Psychology (Fifth European Edition). Harlow: Pearson Education.

Additional readings will be recommended from this text in each lecture

Pre-requisites

None

Restrictions

Not available to students registered on a Psychology related programme of Study.

Synopsis *

This module introduces students to the study of psychology, with the aim of providing an introductory understanding of key topics within psychology and seminal psychological research. The module explores psychology as a science and the research methods common in psychological research. The lectures will cover some of the key concepts and findings in the study of abnormal psychology, sensation, consciousness, child psychology, motivation, emotion, memory and attitudes, and group processes. The module encourages students to explore classical concepts in psychology within the context of cutting edge research and contemporary issues within modern society. There is a particular focus on how psychology and concepts within the subject can inform controversial issues in everyday society.

SP305 Introduction to Psychology II

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	
1	Canterbury	Spring	C	15 (7.5)	90% Exam, 10% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	80% Exam, 20% Coursework	
1	Canterbury	Spring	C	15 (7.5)	80% Exam, 20% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	90% Exam, 10% Coursework	

Availability

Offered as an elective module to non-psychology students. Available to Short-Term credit students.

Contact Hours

Total contact hours: 22

Private study hours: 128

Total study hours: 150

Department Checked

02.03.2021

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

8.1 Demonstrate an introductory knowledge of psychology as a science and the research methods used within the study of psychology

8.2 Show a familiarity and awareness of how key concepts in psychology relate to current and contemporary issues in modern society

8.3 Demonstrate an awareness of sub-disciplines within psychology and how they relate to each other

8.4 Demonstrate introductory knowledge of key concepts in the study of abnormal psychology, sensation, consciousness, child psychology, motivation, emotion, memory and attitudes, and group processes

8.5 Demonstrate knowledge, understanding, and appreciation of the diversity of theoretical and empirical approaches in psychology

The intended generic learning outcomes. On successfully completing the module students will be able to:

9.1 Demonstrate an understanding of the quality of theories, methods and findings in published research

9.2 Demonstrate the use of information technology (e.g. study guides, on-line tests and other resources on the web described in the recommended text book) to support learning and personal understanding of psychology

Method of Assessment

Examination 2 hours 80%

Research Participation 20%

* An alternative assessment may be provided for those short-term students who will no longer be registered when the examination takes place. This alternative assessment will assess the same learning outcomes as the end of year exam.

Reassessment methods: Like for Like.

Preliminary Reading

Reading list (Indicative list, current at time of publication. Reading lists will be published annually)

Martin, G. N., Carlson, N. R., & Buskist, W. (2011). Psychology (Fifth European Edition). Harlow: Pearson Education.

Additional readings will be recommended from this text in each lecture

Pre-requisites

None

Restrictions

Not available to students registered on a Psychology related programme of Study.

Synopsis *

This module introduces students to the study of psychology, with the aim of providing an introductory understanding of key topics within psychology and seminal psychological research. The module explores psychology as a science and the research methods common in psychological research. The lectures will cover some of the key concepts and findings in the study of abnormal psychology, sensation, consciousness, child psychology, motivation, emotion, memory and attitudes, and group processes. The module encourages students to explore classical concepts in psychology within the context of cutting edge research and contemporary issues within modern society. There is a particular focus on how psychology and concepts within the subject can inform controversial issues in everyday society.

61 School of Sport and Exercise Sciences

SS312		Sport & Exercise Psychology				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Medway	Whole Year	C	30 (15)	100% Coursework	
3	Canterbury	Whole Year	C	30 (15)	100% Coursework	
3	Medway	Whole Year	C	30 (15)	50% Coursework, 50% Exam	

Contact Hours

Lecture 1 hours per week 1 seminar bi weekly

Learning Outcomes

Students who take full advantage of the opportunities made available to them will, on successful completion of the module, be able to:
1. To describe and explain psychological theories relating to sport & exercise
2. To describe cognitive and social psychological factors that influence behaviour in a sport & exercise environment
3. To describe the theoretical principles of sports psychology underpinning applied practice
4. To describe and apply knowledge of psychological concepts to group and individual behaviour in sport & exercise environments

Method of Assessment

100% coursework will assess this module in the form of an in-class test worth 50% of the module and an essay of up to 2200 words worth 50% of the module.

Preliminary Reading

Gill, D.L., & Williams, L. (2008). Psychological dynamics of sport and exercise. Champaign, IL: Human Kinetics.

Schmidt, R.A., & Wrisberg, C.A. (2008). Motor learning and performance. Champaign, IL: Human Kinetics.

Weinberg, R.S., & Gould, D. (2007) Foundations of Sport & Exercise Psychology. Champaign, IL: Human Kinetics.

Synopsis *

The module aims to provide students with knowledge and understanding of human responses and adaptations to sport and exercise. Using a psychological approach, students acquire knowledge and understanding of sport and exercise performance and exercise adherence to promote health.
Lectures and seminars provide forums for discussion and understanding of cognitions, affect and behaviour and the complex interactions between these.
A key module aim is to provide an understanding of the application of theory to real ‘applied’ situations within sport and exercise settings.
A synopsis of topics included in this module are:
- Introduction to sport and exercise psychology
- The learning and performance process
- Feedback
- Attention and concentration
- Personality and individual differences
- Motivation
- Self-confidence
- Arousal, stress and anxiety
- Social facilitation and audience effects
- Sport and exercise psychology in action
- Introduction to exercise behaviour
- Psychological effects of exercise
- Exercise behaviour and adherence
- Exercise psychology in practice
- Group dynamics
- Leadership
- Communication
- Goal setting
- Role of research in sport and exercise psychology

SS313 Introduction to Sport & Exercise Nutrition

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Autumn	C	15 (7.5)	100% Coursework	
2	Medway	Spring	C	15 (7.5)	100% Coursework	
2	Medway	Spring	C	15 (7.5)	100% Exam	
2	Medway	Autumn	C	15 (7.5)	100% Exam	
2	Canterbury	Autumn	C	15 (7.5)	100% Exam	

Contact Hours

Total contact hours: 16
Private study hours: 134
Total study hours: 150

Learning Outcomes

1. Demonstrate understanding of the fundamentals of nutrients and their structure and function.
2. Demonstrate understanding of daily requirements of different nutrients for health and exercise performance.
3. Demonstrate understanding of how nutrients can support and enhance exercise performance and training.

Method of Assessment

Examination (2 hours) – 100%

Preliminary Reading

Burke L., Deakin V (2015). Clinical Sports Nutrition (5th Edn). McGraw and Hill
Jeukendrup A & Gleeson M. (2019). Sport Nutrition An Introduction to Energy Production and Performance. Human Kinetics Lippincott: Williams & Wilkins.

Pre-requisites

None

Restrictions

None

Synopsis *

This module provides students with an introduction to the basic principles of Sport and Exercise Nutrition. Students will explore the macronutrients and micronutrients and Fluid guidelines. A strong physiological understanding underpins much of the module content.

Indicative content includes:
• Macronutrients and micronutrients.
• Carbohydrate, protein and fat.
• Vitamins and minerals.
• Thermoregulation and fluid guidelines.

SS326 Functional Anatomy

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	C	15 (7.5)	100% Exam	
1	Canterbury	Whole Year	C	15 (7.5)	80% Exam, 20% Coursework	
1	Medway	Whole Year	C	15 (7.5)	80% Exam, 20% Coursework	

Contact Hours

Total contact hours: 44
Private study hours: 106
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
1. Identify the major bones, muscles and joints of the human body.
2. Describe the basic movements of the body.
3. Relate the interrelationship of human anatomical structure and function.

The intended generic learning outcomes.
On successfully completing the module students will be able to:
1. Communication skills – through the ability to demonstrate written communication of learning during the final exam.
2. Problem solving – achieved through the identification of different movement patterns of joints by working logically through the constraints of muscle contraction and planes of movement.
3. Ability to plan and manage learning – through completing self-directed study necessary to successfully complete the required assessments and tasks set during this module.

Method of Assessment

In-course test (autumn term) 90 minutes– 20%
Summer Examination 2 hours – 80%

Preliminary Reading

Floyd, R.T. (2006). Manual of structural kinesiology.16th edn. New York: McGraw Hill.

Netter, F.H. (2006). Atlas of human anatomy. 4th ed. Philadelphia, PA: Saunders/Elsevier.

Milner, C.E. (2008). Functional anatomy for sport and exercise quick reference. London, New York : Routledge.

Stone, R. & Stone, J. (2005) Atlas of the Skeletal Muscles. 5th Ed. Boston. McGraw-Hill.

Tank, P.W., Gest, T.R. (2009) Atlas of Anatomy Lippincott, Williams & Wilkins.

Synopsis *

The main aims of this module are to provide students with the knowledge and ability to explore and gain knowledge of anatomy and biomechanics. Students will learn to describe the structure and function of the major bones, joints, muscles and soft tissue structures of the lower limb, upper limb and trunk. Students will also be able to describe the basic movements of the body.
Students will cover the name, placement and movement of bones and muscles of the lower limb, upper limb and trunk.

The method of course delivery will include seminars and workshops and private study. Seminars will involve group discussion based on directed reading, workshops will involve practical group work where anatomical structures will be identified. The contact hours (made up by the seminars and workshops) in which the intended learning outcomes will be covered. The remainder of the time will be devoted to private study for reinforcement of knowledge. The seminars and workshops will use practical group work to help students locate, identify and observe the bony and muscular structures of the human body. Practical group work will be followed up in the directed study using reading and online resources

SS327 Introduction to Biomechanics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	
1	Medway	Spring	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 22
Private study hours: 128
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Define basic biomechanical terms including: kinematic terms such as velocity and acceleration, force, mass, work, energy.
Apply Newton's Laws and the impulse-change in momentum relationship to basic two dimensional whole body movement.
Use basic trigonometric and algebraic techniques to manipulate and solve equations of uniform acceleration.
Describe the effect of air resistance on performance in sports such as cycling and tennis.

The intended generic learning outcomes. On successfully completing the module students will be able to:

Apply knowledge to the solution of familiar and unfamiliar problems – evidenced via the selection and solution of appropriate equations to gain insight into human movement principles.
Apply communication, presentation, numeracy and IT skills – evidenced via the completion of calculations in seminars and assessments, the use of computer software to aid in the collection and processing of biomechanical data, and the interpretation in worksheets and assessments of this data.
Apply interactive group skills – evidenced via the collection and analysis of biomechanical data in groups for coursework assessment
Apply problem solving skills – evidenced via the completion of calculations and data analysis.
Self-appraise and reflect on practice - achieved through the completion of formative online quizzes and in-class exercises.
Plan and manage learning – through completing the extra self-directed study and optional online exercises necessary to successfully complete the required assignments and tasks throughout the module.

Method of Assessment

Online Quiz 1 – 15%
Written Worksheet – 40%
Online Quiz 2 - 15%
Online Quiz 3 - 15%
Online Quiz 4 - 15%

Preliminary Reading

Hamill, J. and Knutzen, K.M. (2009) Biomechanical basis of human movement. 3rd Ed. London: Lippincott Williams and Wilkins.
Hay, J.G. (1993) The biomechanics of sports techniques. 4th Ed. Englewood Cliffs NJ: Prentice-Hall.
McGinnis, P. (2005) Biomechanics of sport and exercise. 2nd Ed. Champaign, IL: Human Kinetics.
Nordin, M. and Frankel, V. H. (2001) Basic biomechanics of the musculoskeletal system. 3rd Ed. London: Lippincott Williams & Wilkins.
Nigg, B. and Herzog, W. (2007). Biomechanics of the Musculoskeletal System. 3rd Ed. Chichester: Wiley & Son.
Winter, D. A. (2009) Biomechanics and Motor Control of Human Movement. 4th Ed. Chichester: Wiley & Son

Pre-requisites

None

Synopsis *

The module aims to provide students with a basic understanding of mechanical principles and their applications to sports performance and human movement in general. We will work by specifying a question about an aspect of sports performance, and then examining the mechanical principles that allow us to answer this question.
Indicative content includes:
• Definition and computation of kinematic quantities: position, displacement, velocity and acceleration.
• Vector and scalar quantities.
• Newton's Laws of linear motion.
• Impulse-change in momentum relationship.
• Projectile motion.
• Basic fluid mechanics.
• Searching and reading the biomechanics literature.

SS338 Fundamentals of Human Anatomy and Physiology

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	C	30 (15)	60% Coursework, 40% Exam	
2	Canterbury	Whole Year	C	30 (15)	100% Coursework	
1	Medway	Whole Year	C	30 (15)	100% Coursework	
1	Medway	Whole Year	C	30 (15)	50% Coursework, 50% Exam	
1	Canterbury	Whole Year	C	30 (15)	100% Coursework	

Contact Hours

Total contact hours: 42
Private study hours: 258
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Demonstrate understanding of the structure and function of the major body systems.
Demonstrate an understanding of the roles of the body systems in maintaining the body's internal environment during rest and in facilitating movement.
Demonstrate understanding of the responses and adaptations of body systems to exercise.

The intended generic learning outcomes. On successfully completing the module students will be able to:

Demonstrate Communication and presentation skills.
Demonstrate Numeracy and Information Technology skills.
Demonstrate Problem solving skills.
Plan and manage learning.

Method of Assessment

Online assessment 1 (40 minutes) 25%
Online assessment 2 (40 minutes) 25%
Practical skills assessment (30 min) 50%

Preliminary Reading

McArdle, W, D., Katch, I, F., Katch, V, L. (2014) Exercise Physiology Energy, Nutrition and Human Performance. (8th Edn). London: Lippincott Williams & Wilkins.
Tortora, G, J & Derrickson, B. (2017) Principles of Anatomy and Physiology. (15th Edn). London: Wiley
Wilmore, J.H., Costill, D.L., & Kenny, L. W. (2019). Physiology of Sport and Exercise. 7th Edition. Champaign IL: Human Kinetics.

Pre-requisites

None

Synopsis *

This is an introductory module where students will study the structure and function of the different physiological systems in the human body. The principles of the maintenance of homeostasis and the physiological adaptation of the body systems to exercise will also be covered.

SS344 Introduction to Sport & Exercise Psychology

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Autumn	C	15 (7.5)	80% Exam, 20% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	80% Exam, 20% Coursework	
1	Medway	Autumn	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 20
Private study hours: 130
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Demonstrate knowledge of psychological theories relating to sport and exercise
Discuss how cognitive and social psychological factors can influence behaviour in a sport and exercise environment
Demonstrate knowledge of group and individual behaviour in sport and exercise environments

The intended generic learning outcomes. On successfully completing the module students will be able to:

Demonstrate communication and presentation skills.
Demonstrate interactive and group work skills.
Demonstrate the ability to plan and manage learning skills.

Method of Assessment

In-class test – 20% (45 minutes)
Examination – 80% (2 hours)

Preliminary Reading

Gill, D.L. and Williams, L. (2008). Psychological dynamics of sport and exercise. Champaign, IL: Human Kinetics.
Schmidt, R.A. and Wrisberg, C.A. (2008). Motor learning and performance. Champaign, IL: Human Kinetics.
Weinberg, R.S. and Gould, D. (2015) Foundations of Sport & Exercise Psychology. Champaign, IL: Human Kinetics.

Pre-requisites

None

Synopsis *

This module provides students with an introduction to sport and exercise psychology. This includes the learning and performance process, as well as approaches and responses to various sport and exercise situations. Indicative content includes:

• Sport and Exercise Psychology in Action
• Motor Learning and Performance
• Feedback
• Attention and Concentration
• Personality and Individual Differences
• Motivation
• Self-Confidence and Self-Efficacy
• Arousal, Stress and Anxiety
• Group and Team Dynamics

SS345 Functional Anatomy and Biomechanics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	C	30 (15)	60% Coursework, 40% Exam	
1	Medway	Whole Year	C	30 (15)	100% Coursework	
1	Medway	Whole Year	C	30 (15)	80% Exam, 20% Coursework	
1	Canterbury	Whole Year	C	30 (15)	80% Exam, 20% Coursework	

Contact Hours

Total contact hours: 60
Private study hours: 240
Total study hours: 300

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Describe the structure and function of the major bones, joints, muscles and soft tissue structures of the lower limb, upper limb and trunk.
Describe the basic movements of the body.
Explain the basic biomechanical concepts of human movement.

The intended generic learning outcomes. On successfully completing the module students will be able to:

Demonstrate numeric skills
Demonstrate Information technology skills
Demonstrate the ability to plan and manage learning

Method of Assessment

In-class Test 90 minutes (autumn term) – 20%
Exam – 2 hours (summer) - 80%

Preliminary Reading

Beil, A. (2005) Trail Guide to the Body. (3rd Ed) Canada. Books of Discovery.
Nordin, M. & Frankel, V. (2001) Basic Biomechanics of the Musculoskeletal System. Philadelphia. Lippincott, Williams & Wilkins.
Palastanga, N. Field, D. Soames, R. (2006) Anatomy and Human Movement. Structure and Function (5th Ed) London. Butterworth Heinemann.
Stone, R. & Stone, J. (2005) Atlas of the Skeletal Muscles. 5th Ed. Boston. McGraw-Hill.
Tank, P.W., Gest, T.R. (2009) Atlas of Anatomy Lippincott, Williams & Wilkins.

Pre-requisites

None

Synopsis *

Students will cover the biomechanics of movement, movement patterns of the lower limb, upper limb and trunk; bones and surface markings of the lower limb, upper limb and spine; joints of the lower limb, upper limb and spine; muscles (origin, insertion and actions) of the lower limb, upper limb and trunk; soft tissue structures of the lower limb, upper limb and trunk; and nerves of the lower limb, upper limb and trunk.

SS346 Introduction to Human Physiology

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Autumn	C	15 (7.5)	100% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 21
Private study hours: 129
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Explain basic physiological principles.
Describe and explain the structure and function of the major systems of the body.

The intended generic learning outcomes. On successfully completing the module students will be able to:
Communication and presentation skills.
Numeracy and information technology skills.
Problem solving skills.
Ability to plan and manage learning.

Method of Assessment

Coursework – 50%
Coursework – 50%

Preliminary Reading

McArdle, W, D., Katch, I, F., Katch, V, L. (2009) Exercise Physiology Energy, Nutrition and Human Performance. (7th edn). London: Lippincott Williams & Wilkins.
Tortora, G, J & Derrickson, B. (2008) Principles of Anatomy and Physiology. (12th edn). London: Wiley
Wilmore, J.H., Costill, D.L., & Kenny, L. W. (2008). Physiology of Sport and Exercise. (4th ed). Champaign IL: -Human Kinetics.

Pre-requisites

None

Synopsis *

The main aims of this module are to explore and gain knowledge of human physiology. Students will study the major systems of the human body including the musculoskeletal system, the cardiovascular system and the nervous system. Students will gain an understanding of their structure and function.

SS347 Sports Massage

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Whole Year	C	30 (15)	100% Coursework	
2	Medway	Whole Year	C	30 (15)	100% Coursework with Pass/Fail Elements	
2	Canterbury	Whole Year	C	30 (15)	100% Coursework with Pass/Fail Elements	

Contact Hours

1 hour lecture a week and 2 hours seminar a week.

Learning Outcomes

On successful completion of this module, students will be able to:
12.1 Identify indications, cautions and contraindications to sports massage and recognise clients' suitability for massage treatments.
12.2 Use a clinical notation system to record and review a series of sports massage treatments.
12.3 Identify what is meant by professional ethics and recognise health and safety issues.
12.4 Demonstrate the application of sports massage and other techniques.

Method of Assessment

30% Coursework: portfolio
80 hrs massage, 500 word self-evaluation
50% Coursework: practical assessment
20 mins: basic massage skills
15 mins: STR
40 mins: massage
20% Coursework:
in class written test

Preliminary Reading

Biel, A., (2005) Trail Guide to the Body. Boulder:Books of Discovery
A great anatomy book and palpation guide. You will be using this book in all three years and beyond

Cash, M. (1996) Sport & Remedial Massage Therapy. London:Ebury Press

A clear books on all things sports massage, clear photographs of massage strokes. This is the sports massage classic title.

Johnson, J (2009) Soft Tissue Release – A Step-by-step guide with over 160 photos
The most up-to-date book on STR

Chaitow, L (2000) Muscle Energy Techniques. London : Elsevier
A comprehensive guide for all things MET

Synopsis *

This module develops the students' ability to record and review massage treatments effectively. The module will enable students to apply a range of sports massage and soft tissue techniques effectively and safely.
'Sports Massage' will enable students to acquire the practical skills in order to demonstrate a range of sports massage skills effectively and safely. This module develops the students' ability to record and review massage treatments.
Basic and advanced massage strokes:
- Massage of the back, shoulders, gluteals, legs, arms, chest, neck and abdomen.
- Indications and contraindications to massage.
- Client consultations and record keeping: medical history, case notes.
- Professional ethics and Code of Practice
- Health, safety and security legislation
- Pre- and post-event sports massage
- Muscle Energy Techniques
- Soft Tissue Release

SS348 Introduction to Fitness Testing

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Autumn	C	15 (7.5)	100% Coursework	
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	
1	Medway	Spring	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 22
Private study hours: 128
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Demonstrate knowledge and understanding of the different components of basic physical fitness and their contribution to health and athletic performance.
Administer a fitness assessment

The intended generic learning outcomes. On successfully completing the module students will be able to:

Communication and presentation skills - via the use of student lead presentations and practical work, and working in groups on a variety of material.
Information technology and numeracy - through the preparation for presentations (including importing of graphics, word processing, internet searches) and working with software packages and evidenced via using formulae to calculate appropriate exercise prescription, conducting and interpreting fitness test results & relating data to human physiological function.
Interactive group skills – evidenced through conducting student lead presentations and tasks.
Problem solving – achieved through the identification, adaptation and correct implementation of exercise prescription.
Ability to plan and manage learning - through completing the extra self-directed study necessary to successfully complete the required assignments and tasks set during this module.

Method of Assessment

Laboratory report (2,000 words) – 100%

Preliminary Reading

ACSM. (2009). ACSM's Guidelines for Exercise Testing & Prescription. 8th ed. Philadelphia: Lippincott Williams & Wilkins.
ACSM. (2007). Resources for the Personal Trainer. 2nd ed. Philadelphia: Lippincott Williams & Wilkins.
Dick, F.W. (2007). Sports Training Principles. 5th ed. London: A & C Black.
Foran, B. (2001). High Performance Sports Conditioning. Champaign Illinois: Human Kinetics.
Hoffman, J. (2002). Physiological Aspects of Sports Training and Performance. Champaign, Illinois: Human Kinetics.
Winter, E. M., Jones, A. M., Davison, R. C. R., Bromley, P. D. & Mercer, T. H. (2008). Sport and exercise physiology testing guidelines. volume one: Sport testing. Oxford: Routledge.

Pre-requisites

None

Synopsis *

This module looks at the systematic processes involved in testing fitness. Consideration is given to the evaluation of fitness in both the field and in the laboratory. A range of fitness tests for a variety of parameters of fitness are covered. Students are taught to consider the reliability and validity of the tests as well as the specificity of the test to the population they are working with.
A synopsis of topics included in this module are:
- Health screening
- Fitness assessment & evaluation
- Principles of sport & exercise training

SS349 Introduction to Professional Skills

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Autumn	C	15 (7.5)	100% Coursework	
1	Medway	Autumn	C	15 (7.5)	100% Coursework with Pass/Fail Elements	
1	Medway	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	
1	Canterbury	Autumn	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 21
Private study hours: 129
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Implement appropriate academic skills specific to the area of study
Demonstrate understanding of basic research and statistical concepts
Understand principles of research design and ethics

The intended generic learning outcomes. On successfully completing the module students will be able to:
Demonstrate an ability to utilise communication skills
Demonstrate an ability to use information technology.
Demonstrate an ability to plan and manage their own learning.
Demonstrate an ability to solve problems.

Method of Assessment

Essay (1,500 words) – 100%
At least one formative feedback opportunity will be provided in this module that will directly support the specified summative assessment. Please see the module guide for further information.

Preliminary Reading

Gratton, C. and Jones, I. (2010). Research methods for sports studies. London: Routledge.
Ryall, E. (2010). Critical thinking for sports students. Exeter, United Kingdom: Learning Matters Ltd.
Smith, M. (2010). Research methods in sport. Exeter, United Kingdom: Learning Matters Ltd.
Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2011). Research methods in physical activity. Champaign, IL: Human Kinetics.

Pre-requisites

None

Synopsis *

This module will cover topics including, but not limited to: Introduction to referencing and plagiarism, Introduction to academic writing style, Introduction to history of science, Introduction to critical thinking, Introduction to research methods, Introduction to statistical concept and research ethics.

SS350 Introduction to Sports Industries

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Spring	C	15 (7.5)	100% Coursework	
2	Canterbury	Spring	C	15 (7.5)	100% Coursework	
2	Canterbury	Autumn	C	15 (7.5)	100% Coursework	

Contact Hours

Total contact hours: 16
Private study hours: 134
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

Identify the principle actors in sport across the Public, Private and Voluntary sectors of sport in the UK and understand their role in sport delivery
Demonstrate an understanding of contemporary patterns of provision of sport services and the role of sport in society.
Demonstrate an understanding of relevant sport policy
Understand the various methods by which sport organisations are established and governed
Understand the roles and responsibilities of sport managers in a variety of sport contexts
Identify the core business of sport organisations

The intended generic learning outcomes. On successfully completing the module students will be able to:
Communication and presentation skills
Information technology and numeracy
Interactive group skills
Problem solving

Method of Assessment

100% Portfolio - up to 3,000 words

Preliminary Reading

Gratton. C., Liu. D., Ramchandani, G., & Wilson, D. (2012). The Global Economics of Sport. Routledge: London.
Houlihan B. (2008). Sport and Society, 2nd edn, SAGE Publications: London.
Jarvie, G. (2012). Sport, Culture and Society. Routledge: London.
Kikulis, L.M., Slack, T., Hinings, B. and Zimmerman, A. (1989). A structural taxonomy of amateur sports organizations. Journal of Sports Management. 9, 135 – 152.
Robinson, L and Palmer, R. (Eds) (2011). Managing Voluntary Sport Organizations. Routledge: London.
Slack, T. and Parent, M.M. (2004). Understanding Sport Organizations: the application of organization theory. 2nd edn, Human Kinetics Publishers: Champaign, Illinois.
Taylor, P. (Ed) (2011). Torkildsen's Sport and Leisure Management, 6th Edition. Routledge: London.
Trenberth, L. and Hassan, D. (2012). Managing Sport Business – An Introduction. Routledge: London.

Pre-requisites

None

Synopsis *

Sport in the United Kingdom.
Participation in sport
Sport sectors and structures (voluntary, professional and public)
Rational for sport provision and sport policies
From grassroots to gold – the pathways for athletes, coaches and officials.
Core activities of a sports organisation
Multisport Games (Olympic, Commonwealth)
Challenges that face sport
Establishing competitive advantage

GEOG3001 Contested Environments

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	

Availability

BSc in Human Geography BA in Environmental Social Science
BSc in Wildlife Conservation
Also available as an elective module

Contact Hours

Total contact hours: 22
Private study hours: 128
Total study hours: 150

Department Checked

22.02.21

Learning Outcomes

On successfully completing the module students will be able to:

8.1 Understand the relationship between society, nature and environment from different disciplinary starting points in the social sciences, including introductory knowledge of some of the key concepts and theoretical frameworks they use;

8.2 Acquire specific knowledge about the scope of environmental issues arising from society- nature relationships across different geographical and land use contexts;

8.3 Understand the historical evolution of environmental debates in government, business and civic society;

8.4 Link understanding of environmental issues to wider ethical frameworks and approaches to the sustainable management of natural resources.

Method of Assessment

Essay 2500 words (50%)
Examination, 2 hours (50%).

Reassessment instrument: 100% coursework

Preliminary Reading

Bell, M. (2009) An Invitation to Environmental Sociology (Pine Forge)
Carter, N. (2007) The Politics of the Environment: ideas, activism, policy (Cambridge University Press)
Cudworth, E. (2003) Environment and society (Routledge)
Dickens, P. (2004) Society and Nature, Cambridge
Dryzek, J.S and Schlosberg, D. (Eds) 2005 Debating the Earth: the environmental politics reader (Oxford University Press)
Goldblatt, D. (1996) Social Theory and the Environment, Cambridge
Harper, C. (2012) Environment and Society: Human Perspectives on Environmental Issues, Pearson, Prentice Hall
Hinchliffe S, Blowers A, Freeland J (2003). Understanding environmental issues, Wiley Blackwell
Robbins, P., Hintz, J., & Moore, S. A. (2010). Environment and society, Wiley-Blackwell
Robbins, P (2012) Political ecology: a critical introduction (Wiley Blackwell)

Synopsis *

This module provides an introduction to contemporary discourses and issues surrounding the relationship between nature, environment and society. The module begins by introducing people to the idea of 'environment', and specifically, to the range of assumptions we might hold about the relationship between environmental processes and human identity and behaviour. These concerns are then situated in their historical context and examined empirically at a range of different spatial scales (global, national, regional, urban and rural), and within the context of different stakeholder and social groups (such as policy makers, pressure groups, the media, and publics), More generally we provide a framework for critically evaluating the values and ethical assumptions that lay behind human constructions and uses of the non-human world and how we might manage, respond to and construct a range of environmental issues from a government, business and civic society starting point.

SE316 How Humans Evolved

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	50% Coursework, 50% Exam	

Availability

Available as an elective module and to short-term students.

Contact Hours

Total contact hours: 26
Private study hours: 124
Total study hours: 150

Department Checked

18.02.21

Learning Outcomes

On successfully completing the module students will be able to:

8.1 Show an understanding of the basic principles of evolution.

8.2 Demonstrate a good understanding of human prehistory.

8.3 Demonstrate familiarity with a range of evidence and theory drawn from the disciplines of palaeoanthropology, evolutionary biology, comparative primatology, quaternary science, bioarchaeology, and prehistoric archaeology.

8.4 Understand the basic origins of human culture, behaviour and language.

8.5 Appreciate humans as biological entities.

8.6 Appreciate spatial and temporal change in palaeoenvironments.

8.7 Understand the basic ecology and behaviour of extant and extinct primates

Method of Assessment

Essay (2,500 words) (50%)
Exam (2 hours) (50%)

Reassessment: Like for Like

Preliminary Reading

Stanford et al. (eds. 2011), Biological Anthropology, 3rd Edition, Prentice Hall.

Shook et al. (eds. 2019), Explorations: An open invitation to Biological Anthropology. 1st Edition, American Anthropological Association.

Boyd and Silk (2009/2012), How Humans Evolved, W.W. Norton.

Jones et al. (eds. 1994), The Cambridge Encyclopaedia of Human Evolution, Cambridge University Press.

Scarre (2005), The Human Past: World prehistory & the development of human societies, Thames & Hudson.

Restrictions

Cannot be taken in conjunction with ANTB3020 (SE302)

Synopsis *

This module is an introduction to human and primate evolution, and human prehistory. It provides an exciting introduction to humans as the product of evolutionary processes. We will explore primates and primate behaviour, elementary genetics, prehistoric archaeology, and the evolution of our species (and that of our ancestors such as Australopithecines and Neanderthals). Students will develop skills in synthesising information from a range of sources and learn to critically evaluate various hypotheses about primate and human evolution. The module is also suitable for students in other disciplines who want to understand human evolution, and the history of our planet and our species. A background in science is not assumed or required, neither are there any preferred A-levels or other qualifications.

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PHAM1003 Molecules, Cells & Body systems: Physiology and Pharmacology

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
4	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	
3	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

Contact Hours

Lectures (45 hours), Practical (36 hours), MSCL/CAL (99 hours), Seminars (6 hours), Private Study (111 hours expected)

Learning Outcomes

An in depth knowledge of anatomy and physiology of selected major body systems (PO16, PO17)
An understanding of functionality, regulation and relationships between each of the selected major body systems (PO16, PO17)
A knowledge of mechanisms of pathophysiological changes which may occur in selected body systems together with relevant therapeutic interventions (PO2, PO5, PO12, PO19, PO20, PO21)
An understanding of the role of receptors, ion channels, enzymes and carrier molecules as drug targets (PO4, PO5, PO12, PO17, PO20, PO22)
A practical and theoretical knowledge of physiological and pharmacological techniques and an ability to present evaluate and interpret data derived from laboratory sessions (PO1, PO3, PO44, PO48, PO50, PO53, PO55)

Method of Assessment

60% examination, 40% coursework and satisfactory attendance and performance at all laboratories (80% minimum attendance is COMPULSORY)

Preliminary Reading

Martini, F. (2005) Fundamentals of Anatomy and Physiology 7th Ed, Prentice Hall
Martini, F. (2008) Fundamentals of Anatomy and Physiology 8th Ed, Prentice Hall
Page, C.B., Curtis, M., Walker, M., and Hoffman, B. (2006) Integrated Pharmacology 3rd Edition, Mosby
Rang, H.P., Dale, M.M., Ritter, J.M., Moore, P.K., & Lamb, P. (2003) Pharmacology 5th Edition, Churchill Livingstone
Rang, H.P., Dale, M.M., Ritter, J.M., & Flower, R.J. (2007) Pharmacology 6th Edition, Churchill Livingstone

Pre-requisites

None

Synopsis *

This module aims to provide students with a detailed knowledge and understanding of human anatomy and physiology of the major body systems. In addition selected examples of pathophysiology will introduce the concept of disease and the role of non-pharmacological and pharmacological interventions. The module also provides an introduction to the pharmacological basis of drug action which will provide the underpinning knowledge necessary to develop a deep understanding of the pharmacology and therapeutics covered later in the MPharm and Foundation courses.

PHAM1004 MDM1 - Medicines Design and Manufacture

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework	
2	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	
1	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	
1	Medway	Whole Year	C	30 (15)	60% Exam, 20% Coursework, 20% Project	

PHAM1005 Introduction to Pharmacy: Professional Skills, Law and Ethics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

Contact Hours

Lectures (28 hours), Workshops (15 hours), Labs (21 hours), MSCL (100 hours), Seminar (10 hours), Private Study (94 hours), Formal assessment (7 hours)

Numeracy: Seminars (10 hours - mandatory attendance), MSCL (8 hours), Private Study (6 hours), Exam (1 hour)

Learning Outcomes

On successful completion of this module, students will have demonstrated:
1. An understanding of the roles and the responsibilities of the General Pharmaceutical Council and a basic knowledge of the legal framework within which a pharmacist works. A26, A27, A32, A33, A36, A37, B38, D69, D70
2. An understanding of the ethical and legal responsibilities of the pharmacist. A20, A21, A23, A24, A25, A27, A32, A33, A37, B38, B39, D59
3. Practical skills and an ability to dispense prescriptions in a simulated environment including assembly manufacture and dose calculation. A7, A8, A9, A10, A11, A12, A13, B40, B41, B42, B47, C48, C49, C50, C52, C53, C54, C56
4. Knowledge and understanding of the documentary evidence required to be maintained by pharmacists to support their continuing professional development. B46, D62, D63, D65
5. An ability to undertake pharmaceutical calculations without the use of a calculator B39, B40, B41, B44, C54, D60, D61

Method of Assessment

Coursework (60%), examination (40%)

Preliminary Reading

Appelbe, G.E. & Wingfield, J. (2005) Dale & Appelbe's Pharmacy Law and Ethics, 8th Edition. Pharmaceutical Press
BMJ/RPSGB. (2011) British National Formulary, 62nd Edition. Pharmaceutical Press.
Rees, J. A. & Simth. I., (2006) Pharmaceutical Calculations Workbook. Pharmaceutical Press.

Pre-requisites

None

Synopsis *

This module aims to provide the foundation for the Pharmacy Practice modules which span all 4 years of the MPharm programme. Students will be given an introduction to dispensing and the legal and ethical responsibilities of pharmacists, and to the General Pharmaceutical Council. The Module also introduces students to the concept of continuing professional development (CPD) with the formation of a reflective portfolio. The module introduces students to the concept of safe dispensing, accurate dose and dosage calculation and commences preparation for the standards of numeracy expected of pharmacy students by the external regulator.

PHAM1008 Pharmacology and Therapeutics 1

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1009 PP2 - Pharmacy Practice 2

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework	
2	Medway	Whole Year	I	30 (15)	70% Coursework, 30% Exam	
2	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

Contact Hours

Lectures (30 hours), Workshops/Dispensing Labs (48 hours), Seminars (10 hours), Practice Pharmacy Placement (60 hours), MSCL (90 hours), Formal Assessment (6 hours), Private Study (56 hours expected)

Learning Outcomes

An increasing awareness of the ethical and legal responsibilities of the pharmacist, including their accountability in relation to supply, dispensing, medical and non-medical prescribing of medicines and appliances.
Verbal and non-verbal communication skills appropriate to the situation.
An awareness of the patient as an individual including factors that may influence health behaviour such as age, gender, ethnicity, faith, illness and cultural background.
An insight into professional and social relationships in relation to patients and other health and social care professionals.
An ability to describe a consultation model based on concordance and discuss issues related to compliance and medicine taking.
An ability to undertake an assessment of health care needs with respect to patient history taking, differential diagnosis, appropriate referral and responding to symptoms.

Method of Assessment

60% examination, 40% continuous assessment and satisfactory attendance and performance at all scheduled coursework sessions which are workshops, dispensing laboratories, placements and seminars.

Preliminary Reading

Bonner, M., Wright, D. & George, B. (2010) Practical Pharmaceutical Calculations, Radcliffe
Appelbe, G.E. & Wingfield, J. (2009) Dale & Appelbe's Pharmacy Law and Ethics 9th Ed, Pharmaceutical Press
Blenkinsopp, A., Paxton, P. & Blenkinsopp, J. (2008) Symptoms in the Pharmacy 6th Edition, Blackwell Publishing
BMA/RPS. (2011) British National Formulary 62nd Edition, Pharmaceutical Press
RPS. (2011) Medicines, Ethics and Practice Guide 35th Edition, Pharmaceutical Press
Rutter, P. (2008) Community Pharmacy: Symptoms, Diagnosis and Treatment 2nd Edition, Elsevier
Wingfield, J. & Badcott, D. (2007) Pharmacy Ethics and Decision Making, Pharmaceutical Press

Pre-requisites

A successful completion of all modules at stage 1 MPharm, or graduation from the Foundation Degree in Pharmacy Practice. Co-requisite modules are MDM2, PDDA3 and PDDA4.

Synopsis *

The aims of this module are to integrate the ethical, legal, professional and social issues relevant to professional practice and the patient-pharmacist relationship. The module furthers an awareness of patients as individuals in order for the pharmacist to meet healthcare needs as appropriate.

PHAM1011 RM1 - Research Methods

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Whole Year	H	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1013 PP3 - Pharmacy Practice 3: Medicines Management

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Whole Year	H	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1054 Introduction to Biosciences

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	
4	Medway	Whole Year	C	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1055 MDM2 - Medicines Design and Manufacture 2

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework	
2	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

Contact Hours

Lectures (45 hours), Practical/Workshop (45 hours), MSCL/CAL (97 hours), Seminars (10 hours), Private Study (100 hours expected)

Learning Outcomes

An ability to discuss powder technology in pharmaceutical manufacture and measure various properties of powders (PO7, PO48, PO49, PO53)
An ability to apply their knowledge of preformulation properties and powder technology to the formulation of proprietary dosage forms discussed in this module and the manufacturing processes involved in the preparation of these dosage forms (PO6, PO7, PO8, PO11, PO12, PO24, PO48, PO49, PO50, PO52, PO53, PO54)
A deep understanding of how drugs are absorbed from various formulations, the physiological and physico-chemical factors which modify the process and an ability to describe how drugs are distributed, metabolised and eliminated from the body. (PO4, PO8, PO17, PO18)
An ability to interpret pharmacokinetic data and extract specific pharmacokinetic parameters from given data (PO4, PO18, PO48)
A deep understanding of the theoretical basis of spectroscopic and chromatographic methods (PO1, PO3, PO48, PO54, PO55)
An ability to correctly use extraction, purification and pharmaceutical analysis methods for identification and quantification of pharmaceuticals (PO1, PO3, PO51, PO53, PO54, PO55)

Method of Assessment

60% examination, 40% continuous assessment and satisfactory attendance and performance at all scheduled coursework sessions (workshops and laboratories).

Preliminary Reading

Aulton, M.E. (2001) Pharmaceutics - The Science of Dosage Form Design, Churchill-Livingstone
Banker, G.S. & Rhodes, C.T. (2002) Modern Pharmaceutics (Drugs & the Pharmaceutical Sciences S.), Marcel Dekker Ltd
Florence, A.T. & Attwood, D. (2005) Physiochemical Principles of Pharmacy, Pharmaceutical Press
Shargel, L. & Yu, A.B.C. (2004) Applied biopharmaceutics and pharmacokinetics, Appleton and Lange
Thomas, G. (2000) Medicinal Chemistry - An Introduction, Wiley
Watson, D.G. (2005) Pharmaceutical Analysis: A Textbook of Pharmacy Students Pharmaceutical Chemists, Churchill-Livingstone
Williams, D.A., Foye, W.O. & Lemke, T.L. (2002) Foye's Principles of Medicinal Chemistry

Pre-requisites

A successful completion of all modules at stage 1 of MPharm

Synopsis *

This module aims to provide students with a detailed knowledge and deep understanding of the formulation of solid dosage forms, powder technology and other pharmaceutical factors affecting the manufacture and delivery of oral dosage forms. Students will develop a critical understanding of key aspects of physiochemical and biopharmaceutical properties of drug substances. In addition, the module will cover key concepts and principles of pharmacokinetics and drug metabolism. Instrumental analytical methods used in a pharmaceutical context and their bases in theory will be strengthened by giving students practical experience of using a variety of analytical instruments in exploring selected pharmaceutical applications.

PHAM1056		Body Systems 2:Physiology, Pathophysiology and Pharmacology of Selected				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	
3	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework	
4	Medway	Whole Year	I	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1073		MDM3 - Medicines Design and Manufacture 3				
Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	H	30 (15)	60% Exam, 40% Coursework	
1	Medway	Whole Year	H	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1074 PDDA5 - Clinical Phamacokinetics, Cancer Biology and Infection Control

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	H	30 (15)	60% Exam, 40% Coursework with Pass/Fail Elements	

Contact Hours

Lectures (45 hours), Practicals/Workshops (165 hours), MSCL/CAL (90 hours)

Learning Outcomes

A systematic understanding of the pathogenic processes by which a wide range of organisms cause disease in humans and how these are spread (PO16, PO19, PO38, PO39, PO43)
An ability to identify the general symptoms exhibited by patients suffering from conditions caused by an infection and make judgements about treatment options taking into account modes of action of chemotherapeutic agents, patterns of resistance and the clinical needs of the patient (PO4, PO5, PO17, PO20, PO21, PO38, PO39, PO53)
An ability to critically review pharmacokinetic data and interpret in the light of factors which may affect patient variability (PO18, PO20, PO38, PO40, PO53)
A systematic understanding of key aspects of the cellular basis of oncology and describe the principles of neoplastic therapy (PO1, PO5, PO16, PO17, PO18, PO20, PO21, PO38, PO50, PO52)
A systematic understanding of the need for and methods used to monitor drugs which require individualised dosing and an ability to interpret associated clinical data (PO38, PO41, PO44, PO53)
An ability to investigate and critically appraise recent therapeutic advances in the prevention and treatment of viral, bacterial and other infective conditions (PO7, PO8, PO22, PO41)

Method of Assessment

60% examination, 40% continuous assessment and satisfactory attendance at laboratory/ workshop/ seminar sessions is required

Preliminary Reading

Greenwood, D. (2005) Antimicrobial chemotherapy, Oxford University Press
Greenwood, D. (2007) Antimicrobial chemotherapy, Oxford University Press
Mims, C.A. et al (2004) Medical Microbiology 3rd Edition, Mosby
Goering, R. et al (2007) Medical Microbiology 4th Edition, Mosby
Heyman, D.L. (2008) Control of Communicable Diseases Manual, American Public Health Association
Pecorino, L. (2005) Molecular Biology of Cancer, Oxford University Press
Pecorino, L. (2008) Molecular Biology of Cancer 2nd Revised Edition, Oxford University Press
Rowland, M. & Tozer, T. (1995) Clinical Pharmacokinetics: Concepts and Applications 3rd Edition, Lippincott, Williams & Wilkins
Tozer T. & Rowland, M. (2006) Introduction to Pharmacokinetics and Pharmacodynamics: The Quantitative Basis of Drug Therapy, Lippincott, Williams & Wilkins
Winter, M.E. (1994) Basic Clinical Pharmacokinetics 3rd Edition, Lippincott, Williams & Wilkins
Winter, M.E. (2003) Basic Clinical Pharmacokinetics 4th Revised Edition, Lippincott, Williams & Wilkins

Pre-requisites

Stage 1 & 2 MPharm; and in particular PHAM1054

Synopsis *

A synopsis of the curriculum;
Infectious diseases:
- Microbial infection and control
- Infections by body systems
- Chemotherapy and Infection Control
- Vaccines

Clinical Pharmacokinetics:
- Variability in drug handling
- Dosage regimen design and therapeutic drug monitoring (TDM)

Cancer Biology:
- Introduction to cell biology of cancer
- Genetic damage, repair and mutation
- Tumour growth
- Growth factors and oncogene
- Growth inhibition and tumour suppressor genes
- Diet, hormones and cancer
- Treatment of cancer

PHAM1086 ASC2:Advanced Cell and Molecular Biology

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework	
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1087 ASC1:Advanced Neuroscience

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework	
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework with Pass/Fail Elements	

PHAM1089 Advanced Therapeutic Agents

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework with Pass/Fail Elements	
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework	

Contact Hours

Lectures/Seminars (30 hours), Workshops (12 hours), MSCL (105 hours), Private Study (50 hours expected)

Learning Outcomes

A comprehensive understanding of the concepts that underpin advanced therapeutic agents.
A critical awareness and understanding of current problems and/or new insights associated with pharmaceutical agents and their design.
The properties of medicinal substances, and their relationship to molecular structure (PO4)
The design of medicinal agents and approaches to their discovery (PO5)
The principles of medicine formulation and systems for medicine delivery in the body (PO8)
The actions of medicines within living systems: molecular; cellular; biological and physical aspects (PO17)
Absorption, distribution, metabolism and excretion (ADME) of medicines, including routes of administration, concepts and mathematical modelling (PO18)
The clinical evaluation of new medicines (PO22)
Medicine delivery devices, wound management products and other medical devices (including diagnostic agents and devices) (PO24)

Method of Assessment

60% examination, 40% continuous assessment and satisfactory attendance and performance at workshops

Preliminary Reading

Chabner B. (2005) Chemotherapy and the war on cancer. Nature Reviews Cancer, 5, 65-72.
Tomasz M. (1995) Mitomycin C: Small, fast and deadly (but very selective). Chemistry & Biology, 2, 575-579.
Bailly C. (2000) Topoisomerase I poisons and suppressors as anticancer drugs. Current Medicinal Chemistry, 7, 39-58.
Avendano C. and Menendez J. C., Medicinal Chemistry of Anticancer drugs.
Lemke T.L, Williams D.A, Roche VF, Zito SW. (Eds) (2002) Foye's Principles of Medicinal Chemistry.
DA Williams and TL Lemke (2002) Foye Principles of Medicinal Chemistry, fifth edition, Lippincott Williams & Wilkins pp. 831-850
J. H. Powers (2004) Antimicrobial drug development – the past, the present, and the future, Clinical Microbiology and Infection, 10:4, 23–31.
Eric Sauvage, Ailsa J. Powell, Jason Heilemann, Helen R. Josephine, Paulette Charlier, Christopher Davies and R. F. Pratt, (2008) Crystal Structures of Complexes of Bacterial DD-Peptidases with Peptidoglycan-Mimetic Ligands: The Substrate Specificity Puzzle, J. Mol. Biol. 381, 383–393.
Mo´ nica Oliva, Otto Dideberg, and Martin J. Field, (2003) Understanding the Acylation Mechanisms of Active-Site Serine Penicillin-Recognizing Proteins: A Molecular Dynamics Simulation Study, PROTEINS: Structure, Function, and Bioinformatics, 53, 88–100
Anderson GP et al (1994) Why are long-acting beta-adrenoceptor agonists long-acting?, Eur Respir J, 7, 569–578
Barnes PJ (2008) Drugs for airway disease, MEDICINE, 36, 181-190
Barnes PJ and Adcock IM. (2009) Glucocorticoid resistance in inflammatory diseases. Lancet, 373, 1905–1917
Ortega V E and Peters SP (2010) Beta-2 adrenergic agonists: focus on safety and benefits versus risks. Current Opinion in Pharmacology, 10, 246–253

Pre-requisites

Successful completion of stage 1, 2 and 3 of MPharm program

Restrictions

Maximum 45 students

Synopsis *

A synopsis of the curriculum:
1. Cancer Chemotherapeutic Agents
• DNA
• Carcinogenesis
• DNA interactive agents
• Drugs acting on enzymes: Antimetabolites
• Antitumour antibiotics and DNA topoisomerase inhibitors

2. Novel antibacterial agents
• Antibacterial drug development
• Overview to the antibacterial drug classes
• Beta-lactam antibiotics

3. The scientific basis for the discovery and clinical utility of drugs to treat asthma
• Pathogenesis and drugs
• Adrenaline and beta adrenoceptors agonists
• Discovery and clinical use of inhaled beta 2 agonists
• Beta 2 agonists treatments including combination therapy.
• Anti-inflammatory actions of corticosteroids

4. Carbohydrates as drugs
• The structure and biological role of carbohydrates
• Carbohydrates as therapeutic agents
• Future development and limitations

PHAM1090 ASC4:Advanced Drug Delivery Technologies

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework	
1	Medway	Spring	M	20 (10)	60% Exam, 40% Coursework with Pass/Fail Elements	

Contact Hours

Lectures (30 hours), Workshops (8 hours), MSCL (90 hours), Private Study (69 hours expected)

Learning Outcomes

A comprehensive understanding of the concepts that underpin advanced therapeutic agents and their delivery.
A critical awareness and understanding of current problems and/or new insights associated with pharmaceutical agents and their delivery.
The principles of medicine formulation and systems for medicine delivery in the body (PO8)
The properties of materials used for the delivery of biologically active molecules (PO7)
Biotechnology products and excipients; pharmaceutical application of the technologies of genomics and proteomics (PO6)
The actions of medicines within living systems: molecular; cellular; biological and physical aspects (PO17)
Absorption, distribution, metabolism and excretion (ADME) of medicines, including routes of administration, concepts and mathematical modelling (PO18)
The clinical evaluation of new medicines (PO22)
Medicine delivery devices, wound management products and other medical devices (including diagnostic agents and devices) (PO24)

Method of Assessment

60% examination, 40% coursework and satisfactory attendance and performance at workshops.

Preliminary Reading

C. Li and S. Wallace (2008) Polymer-drug conjugates: Recent development in clinical oncology, Advanced Drug Delivery Reviews, 60, 886–898
Merisko-Liversidge, E., Liversidge, G. and Cooper, E. (2003) Nanosizing: a formulation approach for poorly-water-soluble compounds. Eur. J. Pharm. Sci., 18, 113 – 120.
Rieux, A., Fievez, V., et al. (2006) Nanoparticles as potential oral delivery systems for proteins and vaccines: A mechanistic approach J. Control. Release, 116, 1-27.
J.H. Parka et al (2008) Polymeric nanomedicine for cancer therapy, Progress in Polymer Science, 33, 113–137
J.R. Junutula et al (2008) Site-specific conjugation of a cytotoxic drug to an antibody improves the therapeutic index, Nature biotechnology, 26, 925-932
O.H. Brekke et al. (2003) Therapeutic antibodies for human diseases at the dawn of the twenty-first century, Nature Reviews Drug Discovery, 2, 52-62

Pre-requisites

A successful completion of all modules from Stages 1, 2 and 3 of MPharm programme

Restrictions

Maximum 45 students

Synopsis *

A synopsis of the curriculum:
• Nanoparticles for drug delivery
• Polymers for drug delivery
• Vaccine delivery

PHAM1096 Sustained Research Project

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Medway	Whole Year	M	40 (20)	100% Coursework with Pass/Fail Elements	
1	Medway	Whole Year	M	40 (20)	100% Coursework	

PHAM1125 Preparing for Practice

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
3	Medway	Autumn	M	60 (30)	60% Exam, 40% Coursework with Pass/Fail Elements	

MA022 Graphs, Geometry and Trigonometry

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	F	15 (7.5)	90% Exam, 10% Coursework	
1	Canterbury	Whole Year	F	15 (7.5)	80% Exam, 20% Coursework	
1	Canterbury	Whole Year	F	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Whole Year	F	15 (7.5)	85% Exam, 15% Coursework	

Contact Hours

Total contact hours: 44
Private study hours: 106
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

1 demonstrate understanding of the basic body of knowledge associated with standard functions and their graphical interpretation, geometry, trigonometry and vectors;
2 demonstrate the capability to solve problems in accordance with the basic theories and concepts of functions, trigonometry and geometry, whilst demonstrating a reasonable
level of skill in calculation and manipulation of the material;
3 apply the basic techniques associated with functions, trigonometry and geometry in several well-defined contexts;
4 demonstrate mathematical proficiency suitable for Stage 1 entry.

The intended generic learning outcomes. On successfully completing the module students will be able to:

Demonstrate an increased ability to:
1 manage their own learning and make use of appropriate resources;
2 understand logical arguments, identifying the assumptions made and the conclusions drawn;
3 communicate straightforward arguments and conclusions reasonably accurately and clearly;
4 manage their time and use their organisational skills to plan and implement efficient and effective modes of working;
5 solve problems relating to qualitative and quantitative information.
6 demonstrate an increased level of skill in numeracy and computation.

Method of Assessment

80% Examination, 20% Coursework

Preliminary Reading

Core Maths for Advanced Level, L Bostock and S Chandler, Nelson Thornes Ltd, 2013.
Foundation maths, T Croft, Pearson, 2016.

Pre-requisites

Pre-requisite: an achievement at A-level (or equivalent) that is sufficient for entry into the Foundation year

Synopsis *

This module introduces fundamental methods needed for the study of mathematical subjects at degree level.

a) Functions and graphs: plotting, roots, intercepts, turning points, area (graphical methods), co-ordinate geometry of straight lines, parallel and perpendicular lines, applications to plots of experimental data, quadratics, introduction to the trigonometric functions

b) Trigonometry: radians, properties of sine and cosine functions, other trigonometric functions, compound angle formulae and subsequent results, solving trigonometric equations

c) Geometry: circles and ellipses, right-angled triangles, SOHCAHTOA, trigonometric functions, inverse trigonometric functions, sine and cosine rule, opposite and alternate angle theorems, applications to geometry problems

d) Vectors: notion of a vector, representation of vectors, addition, subtraction and scaling, magnitude, scalar product, basis vectors in 2 and 3 dimensions

MA306 Statistics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	C	15 (7.5)	80% Exam, 20% Coursework	
1	Canterbury	Spring	C	15 (7.5)	100% Exam	
1	Canterbury	Spring	C	15 (7.5)	90% Exam, 10% Coursework	

Contact Hours

Total contact hours: 47
Private study hours: 103
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes. On successfully completing the module students will be able to:

1 demonstrate knowledge of the underlying concepts and principles associated with statistics;
2 demonstrate the capability to make sound judgements in accordance with the basic theories and concepts in the following areas, whilst demonstrating a reasonable level of
skill in calculation and manipulation of the material: graphical and numerical summaries of data using R, point estimation, including maximum likelihood estimation for
discrete data, interval estimation, hypothesis testing, association between variables;
3 apply the underlying concepts and principles associated with introductory statistics in several well-defined contexts, showing an ability to evaluate the appropriateness of
different approaches to solving problems in this area;
4 make appropriate use of the statistical computer package R.

The intended generic learning outcomes. On successfully completing the module students will be able to:

Demonstrate an increased ability to:
1 manage their own learning and make use of appropriate resources;
2 understand logical arguments, identifying the assumptions made and the conclusions drawn;
3 communicate straightforward arguments and conclusions reasonably accurately and clearly;
4 manage their time and use their organisational skills to plan and implement efficient and effective modes of working;
5 solve problems relating to qualitative and quantitative information;
6 make use of information technology skills such as R, online resources (moodle), internet communication;
7 communicate technical and non-technical material competently.
8 demonstrate an increased level of skill in numeracy and computation;
9 give an oral presentation;
10 work in small groups.

Method of Assessment

80% examination and 20% coursework.

Preliminary Reading

J. Devore and R. Peck. Introductory Statistics. (West 1990)
F. Daly et al. Elements of Statistics. (The Open University 1995)
G.M. Clarke and D. Cooke. A Basic Course in Statistics. (5th edition. Arnold. 2004)
D.V. Lindley and W.F. Scott. New Cambridge Statistical Tables (2nd edition. C.U.P. 1995)
J. Verzani. Using R for Introductory Statistics (2nd edition, CRC Press, 2014)

Pre-requisites

MAST4006 (Mathematical Methods 1), MAST4009 (Probability)

Synopsis *

Introduction to R and investigating data sets. Basic use of R (Input and manipulation of data). Graphical representations of data. Numerical summaries of data.

Sampling and sampling distributions. χ^2 distribution. t-distribution. F-distribution. Definition of sampling distribution. Standard error. Sampling distribution of sample mean (for arbitrary distributions) and sample variance (for normal distribution) .

Point estimation. Principles. Unbiased estimators. Bias, Likelihood estimation for samples of discrete r.v.s

Interval estimation. Concept. One-sided/two-sided confidence intervals. Examples for population mean, population variance (with normal data) and proportion.

Hypothesis testing. Concept. Type I and II errors, size, p-values and power function. One-sample test, two sample test and paired sample test. Examples for population mean and population variance for normal data. Testing hypotheses for a proportion with large n. Link between hypothesis test and confidence interval. Goodness-of-fit testing.

Association between variables. Product moment and rank correlation coefficients. Two-way contingency tables. χ^2 test of independence.

MA309 Business Economics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
2	Canterbury	Whole Year	C	15 (7.5)	80% Exam, 20% Coursework	

Contact Hours

Total contact hours: 60
Private study hours: 90
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
1 show a systematic knowledge, understanding and critical awareness of key areas of economic theory;
2 show comprehensive understanding of the complex techniques used to solve problems in economics;
3 demonstrate appreciation of recent developments and methodologies in economics and the links between economic theory and its practical application in business and to
critically evaluate such methodologies.

The intended generic learning outcomes.
On successfully completing the module students will be able to:
1 demonstrate a logical mathematical approach to solving complex problems including cases where information/data is not complete;
2 apply skills in written communication to both technical and non-technical audiences;
3 apply skills in the use of relevant information technology;
4 apply skills in time management, organisation and studying so that tasks can be planned and implemented at a professional level.

Method of Assessment

80% Examination, 20% Coursework

Preliminary Reading

John Sloman, Dean Garratt, Jon Guest, Elizabeth Jones (2016) Economics for Business 7th Ed (Pearson)
The Actuarial Education Company Subject CT7 (CB2 from 2019) study notes support the synopsis.

Pre-requisites

None

Synopsis *

The aim of this module is to introduce students to core economic principles and how these could be used in a business environment to understand economic behaviour and aid decision making, and to provide a coherent coverage of economic concepts and principles. Indicative topics covered by the module include the working of competitive markets, market price and output determination, decisions made by consumers on allocating their budget and by producers on price and output, and different types of market structures and the implication of each for social welfare, the working of the economic system, governments' macroeconomic objectives, unemployment, inflation, economic growth, international trade and financial systems and financial crises.

MA315 Financial Mathematics

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	C	30 (15)	80% Exam, 20% Coursework	

Contact Hours

100 hours

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
1 describe how to use a generalized cashflow model to describe financial transactions, making allowances for the probability of payment;
2 describe how to take into account the time value of money using the concepts of compound interest and discounting;
3 show how interest rates or discount rates may be expressed in terms of different time periods;
4 demonstrate a knowledge and understanding of real and money interest rates;
5 calculate the present value and the accumulated value of a stream of equal or unequal payments using specified rates of interest and the net present value at a real rate of interest, assuming a constant rate of inflation;
6 define and use the more important compound interest functions including annuities certain;
7 define an equation of value;
8 describe how a loan may be repaid by regular instalments of interest and capital;
9 show how discounted cashflow techniques can be used in investment project appraisal;
10 describe the investment and risk characteristics of typical assets available for investment purposes;
11 analyse elementary compound interest problems;
12 calculate the delivery price and the value of a forward contract using arbitrage free pricing methods;
13 show an understanding of the term structure of interest rates;
14 show an understanding of simple stochastic interest rate models;
15 appreciate recent developments in Financial Mathematics and the links between the theory of Financial Mathematics and their practical application.

The intended generic learning outcomes.
On successfully completing the module students will be able to:
1 demonstrate a logical mathematical approach to solving problems;
2 demonstrate enhanced skills in written communication;
3 demonstrate skills in time management and organisation;
4 demonstrate enhanced study skills.

Method of Assessment

80% Examination, 20% Coursework

Preliminary Reading

The material is covered by the Actuarial Education Company’s notes for Subject CT1 – Financial Mathematics.

Synopsis *

The aim of this module is to provide a grounding in financial mathematics and its simple applications. The idea of interest, which may be regarded as a price for the use of money, is fundamental to all long-term financial contracts. The module deals with accumulation of past payments and the discounting of future payments at fixed and varying rates of interest; it is fundamental to the financial aspects of Actuarial Science. The syllabus will cover: Generalised cashflow models, the time value of money, real and money interest rates, discounting and accumulating, compound interest functions, equations of value, loan schedules, project appraisal, investments, elementary compound interest problems, arbitrage-free pricing and the pricing and valuation of forward contracts, the term structure of interest rates, stochastic interest rate models.

EL021 Calculus

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Whole Year	F	15 (7.5)	90% Exam, 10% Coursework	

Contact Hours

Total contact hours: 44
Private study hours: 106
Total study hours: 150

Learning Outcomes

1 demonstrate a knowledge of Calculus to a level suitable for Level 4 courses;
2 apply this knowledge to elementary problem solving;
3 undertake more advanced study of these subjects.
4. Demonstrate the ability to manage time.

Method of Assessment

Main assessment methods
• Exam 2 hours (90%)
• Four Homeworks, each 2-3 A4 pages, each weighted 2.5% (10%)

Preliminary Reading

Core Mathematics for Advanced Level, L. Bostock and S. Chandler, Nelson Thornes (Publishers) Ltd., 2000, ISBN 0 7487 55098.

Synopsis *

This module introduces students to the mathematics of calculus and its applications in engineering. Examples classes are provided to support the student learning.

EL024 Electromagnetics for Engineers

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Spring	F	15 (7.5)	70% Exam, 30% Coursework	

Availability

Spring Term

Contact Hours

Total contact hours: 39
Private study hours: 116
Total study hours: 150

Learning Outcomes

On successfully completing the module students will be able to:

1. Understand basic laws of electrostatics and magnetism;
2. Perform simple calculations on electromagnetic phenomena.

Method of Assessment

Examination 70%
Laboratory Reports 20%
Moodle Quizes 10%

Preliminary Reading

ROBERTSON, C R..Fundamental electrical and electronic principles. (Third edition) Elsevier (Newnes.) Amsterdam: 2008.

Restrictions

None

Synopsis *

This module introduces students to the basic principles of electro-magnetism and electrostatics that are necessary in order to understand modern electronic and communications systems. Practical work and examples classes are included to assist the student learning.

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CB312 Introduction to Management

Version	Campus	Term(s)	Level	Credit (ECTS)	Assessment	Convenor
1	Canterbury	Autumn	C	15 (7.5)	70% Exam, 30% Coursework	
1	Canterbury	Spring	C	15 (7.5)	100% Coursework	
1	Canterbury	Spring	C	15 (7.5)	60% Exam, 40% Coursework	
1	Canterbury	Autumn	C	15 (7.5)	100% Exam	
1	Canterbury	Spring	C	15 (7.5)	70% Exam, 30% Coursework	

Contact Hours

Total contact hours: 22
Private study hours: 128
Total study hours: 150

Learning Outcomes

The intended subject specific learning outcomes.
On successfully completing the module students will be able to:
- understand key theories of management
- understand the development of management thinking and the continuities and changes embedded in this
- understand the interplay between management and organizational forms
- understand the impact of management thinking on processes such as control, decision-making and communication
- understand the connection between management practices and the business environment

The intended generic learning outcomes.
On successfully completing the module students will be able to:
- communicate management theories and ideas in writing
- present empirical examples
- interpret empirical examples through the lens of management theories
- retrieve information from a variety of sources
- plan work and study independently

Method of Assessment

Main assessment methods:
Group Presentation (10%)
In-Course Test (Essay), 45 minutes (20%)
Examination, 2 hour (70%)

Reassessment method:
100% exam

Preliminary Reading

Core Textbook
Clegg, S. Kornberger, M. & Pitsis, T. 2016: Managing & Organizations: An Introduction to Theory and Practice, Fourth Edition. London: Sage.

Restrictions

CANNOT BE TAKEN WITH CB302 - NOT AVAILABLE AS A WILD MODULE
This module is available only to students taking single and joint honours Business Administration and International Business degrees. Students taking Accounting & Finance and Business Administration (joint honours) will take CB302.

Available to short-term/exchange students

Synopsis *

The module introduces students to theories of management beginning with classical management perspectives through to contemporary management concepts. It will illustrate the continuities and transformations in management thinking throughout the 20th and 21st century. The main topics of study include: Scientific Management; Human Relations Approach; Bureaucracy and Post-Bureaucracy; The Contingency Approach; Culture Management; Leadership; Aesthetic Labour; Extreme Management.