Swansea University
Prifysgol Abertawe

FACULTY OF SCIENCE AND ENGINEERING

UNDERGRADUATE STUDENT HANDBOOK

YEAR 1 (FHEQ LEVEL 4)

APPLIED MATHEMATICS

DEGREE PROGRAMMES

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

DISCLAIMER

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

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

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

The 22-23 academic year begins on 26 September 2022

Full term dates can be found here

DATES OF 22-23 TERMS
26 September 2022 – 16 December 2022
9 January 2023 – 31 March 2023
24 April 2023 – 09 June 2023

SEMESTER 1
26 September 2022 – 27 January 2023
SEMESTER 2
30 January 2023 – 09 June 2023
SUMMER
12 June 2023 – 22 September 2023

IMPORTANT

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

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

Please ensure that you read the University webpages covering the topic – procedural guidance here and further information here. You should also read the Faculty Part One handbook fully, in particular the pages that concern Academic Misconduct/Academic Integrity. You should also refer to the Faculty of Science and Engineering proof-reading policy and this can be found on the Community HUB on Canvas, under Course Documents.

Welcome to the Faculty of Science and Engineering!

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

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

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

At Swansea University and in the Faculty of Science & Engineering, we believe in working in partnership with students. We work hard to break down barriers and value the contribution of everyone. Our goal is an inclusive community where everyone is respected, and everyone's contributions are valued. Always feel free to talk to academic staff, administrators, and your fellow students - I'm sure you will find many friendly helping hands ready to assist you.

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

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

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

Faculty of Science and Engineering	
Interim Pro-Vice Chancellor/Interim Executive Dean	Professor Johann Sienz
Head of Operations	Mrs Ruth Bunting
Associate Dean – Student Learning and Experience (SLE)	Professor Paul Holland
School of Mathematics and Computer Science **Head of School: Professor Elaine Crooks**	
School Education Lead	Dr Neal Harman
Head of Mathematics	Professor Vitaly Moroz
Mathematics Programme Director	Dr Kristian Evans
Year Coordinators	Year 0 – Dr Zeev Sobol Year 1 – Dr Noemi Picco Year 2 – Professor Jiang-Lun Wu Year 3 – Dr Grigory Garkusha Year 4/MSc – Professor Chenggui Yuan

STUDENT SUPPORT

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

Standard Reception opening hours are Monday-Friday 9am-5pm.

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

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

Call: +44 (0) 1792 295514 and 01792 6062522 (Monday-Friday, 10am–12pm, 2–4pm).

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

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

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

READING LISTS

Reading lists for each module are available on the course Canvas page and are also accessible via http://ifindreading.swan.ac.uk/. We've removed reading lists from the 22-23 handbooks to ensure that you have access to the most up-to-date versions. Access to print material in the library may be limited due to CV-19; your reading lists will link to on-line material whenever possible. We do not expect you to purchase textbooks, unless it is a specified key text for the course.

THE DIFFERENCE BETWEEN COMPULSORY AND CORE MODULES

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

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

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

Year 1 (FHEQ Level 4) 2022/23
Applied Mathematics
BSc Applied Mathematics[G120]
BSc Applied Mathematics with a Year Abroad[G121]
BSc Applied Mathematics with a Year in Industry[G122]

Coordinator: Dr N Picco

Compulsory Modules

Semester 1 Modules	Semester 2 Modules
MA-101 **Introduction to Analysis 1** **15 Credits** **Prof ECM Crooks** **CORE**	**MA-102** **Introduction to Analysis 2** **15 Credits** **Prof ECM Crooks** **CORE**
MA-111 **Foundations of Algebra** **15 Credits** **Dr EJ Beggs** **CORE**	**MA-112** **Introductory Linear Algebra** **15 Credits** **Dr G Garkusha** **CORE**
MA-131 **Geometry: Mathematics, Logic and Communication** **15 Credits** **Dr S Lyakhova**	**MA-142** **Mechanics and Dynamics** **15 Credits** **Prof IM Davies**
MA-181 **Introduction to Modelling and Simulation** **15 Credits** **Dr N Picco**	
Total 120 Credits	

Optional Modules
Choose exactly 15 credits

MA-182	Introduction to Biomathematics	Dr N Picco	TB2	15
MA-192	Probability and Statistics	Prof C Yuan	TB2	15

MA-101 Introduction to Analysis 1

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules: MA-111

Lecturer(s): Prof ECM Crooks

Format: 33 hours: This will be a mixture of sessions which may include for example lectures, quizzes, exercises.

11 hours: In Person Interactive Small Group Sessions. This will be an examples class. If it is not possible to deliver these sessions in person then they will take place as Live Online Teaching.

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Module Aims: The module introduces basic concepts such as sets, functions, completeness, sequences and series.

Module Content: • sets, basic properties and set operations
• examples of sets of numbers: natural numbers, integers, rational numbers, real numbers
• arithmetic and ordering properties of real numbers
• the absolute value, inequalities, intervals
• mathematical induction
• functions (domain, co-domain, range), examples including polynomials, rational functions
• injective, surjective, bijective functions, composition of functions, inverse functions
• upper and lower bounds of subsets of real numbers, infimum and supremum
• completeness of the real numbers, Archimedean property
• sequences of real numbers, limits of sequences
• algebra and ordering of limits of sequences
• monotone sequences, recursively-defined sequences
• Cauchy sequences, subsequences, Bolzano-Weierstrass
• series, convergence of series, examples of convergent and divergent series
• absolute convergence of series
• comparison, ratio, root, alternating and integral tests for series convergence

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

1) explain basic set theory
2) give a formally correct proof
3) use the concept of mathematical induction
4) determine properties of functions such as injectivity, surjectivity, bijectivity
5) discuss the completeness of the real numbers
6) identify well-known sequences and series
7) apply various techniques to determine whether or not sequences and series converge

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

Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Examination: A closed book examination to take place at the end of the module.
Assignment 1: formed of a number of coursework assignments along with participation in the module during the semester. The assignments will develop student's skills in problem solving, and developing and writing logical arguments.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the homework assignments, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.
For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance.
Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary examination.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students

MA-102 Introduction to Analysis 2

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules: MA-101; MA-111

Lecturer(s): Prof ECM Crooks

Format: 33 hours: This will be a mixture of sessions which may include for example lectures, quizzes, exercises.

11 hours: In Person Interactive Small Group Sessions. This will be an examples class. If it is not possible to deliver these sessions in person then they will take place as Live Online Teaching.

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Module Aims: The module introduces fundamental concepts such as limits, continuity, differentiability and integrability.

Module Content: • open and closed subsets of real numbers
• limits for real-valued functions, properties of limits
• continuous functions, examples and properties of continuous functions
• Intermediate Value Theorem
• continuous functions on closed bounded intervals
• uniform continuity
• derivatives, basic properties of derivatives
• Rolle's Theorem, Mean Value Theorem
• local extreme values of functions
• L'Hopital's rules
• exponential, trigonometric and hyperbolic functions
• partition of an interval, lower and upper Riemann sums
• Riemann integral
• inequalities and Mean Value Theorem for integrals
• fundamental theorem of calculus
• improper integrals

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

1) use the definition of limit to prove results about the limits of real-valued functions
2) outline properties of continuous and differentiable functions
3) use properties of the derivative to investigate the behaviour of functions
4) sketch the graphs of the exponential, trigonometric and hyperbolic functions
5) determine whether or not functions are Riemann integrable

Assessment: Examination (80%)
Assignment 1 (20%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Examination: A closed book examination to take place at the end of the module.
Assignment 1: formed of a number of coursework assignments along with participation in the module during the semester. The assignments will develop student's skills in problem solving, and developing and writing logical arguments.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the homework assignments, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.
For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance.
Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary examination.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students

MA-111 Foundations of Algebra

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules: MA-101

Lecturer(s): Dr EJ Beggs

Format: 44

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Module Aims: An introduction to logic and algebraic structures. The course covers the basics of logic, proof and algebraic manipulation before introducing the abstract algebra of groups, rings and fields.

Module Content: Logic: statements, connectives, truth tables, quantifiers, what does it mean 'to prove'.
Binary operations on sets: commutative, associative operations, manipulations with brackets.
Introduction to groups and group homomorphisms, symmetric group, integers modulo n
Introduction to rings and ring homomorphisms, integers, rationals.
Introduction to fields, rationals and reals.
Polynomials, polynomial division, roots, irreducibility.
Complex numbers, roots, algebraically closed fields.
Matrices, 2 by 2 determinants.

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

1) explain and apply the basic principles of logic, proof and algebraic manipulation,
2) define groups, rings and fields and describe their basic properties,
3) solve basic algebraic problems in concrete and abstract situations,
4) apply appropriate techniques of algebraic manipulation to a given situation,
5) recognise patterns underlying a variety of algebraic situations,
6) work with and explain the need for complex numbers,
7) state the fundamental theorem of algebra.

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

Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Examination: A closed book examination to take place at the end of the module.
Assignment 1: formed of a number of coursework assignments along with participation in the module during the semester. The assignments will develop student's skills in problem solving, and developing and writing logical arguments.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the homework assignments, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.
For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance. Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary examination.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students

MA-112 Introductory Linear Algebra

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules: MA-101; MA-111

Lecturer(s): Dr G Garkusha

Format: 44

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Module Aims: An introduction to combinatorics, vectors, matrices and abstract vector spaces.

Module Content: Divisibility, Euclid algorithm for numbers and polynomials.
Relations and orders.
Combinatorics and the binomial theorem.
Countability, Russell's paradox.
Matrices and linear equations, Gauss elimination.
Determinants, PLU decomposition.
Introduction to vector spaces and linear transformations, subspaces, bases, matrix representation of linear transformations.

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

1) explain set orderings and the concept of countability,
2) apply basic combinatorial techniques,
3) calculate the greatest common divisor and otherwise manipulate the Euclidean algorithm,
4) define the concept of a vector space and subspace and give standard examples of vector spaces,
5) explain the relationships between vectors, matrices, vector spaces and linear transformations,
6) solve systems of linear equations using Gaussian elimination,
7) define the concepts of bases and coordinates in vector spaces and subspaces,

Assessment: Examination (80%)
Assignment 1 (20%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Examination: A closed book examination to take place at the end of the module.
Assignment 1: formed of a number of coursework assignments along with participation in the module during the semester. The assignments will develop student's skills in problem solving, and developing and writing logical arguments.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the homework assignments, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.
For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance. Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary examination.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students

MA-131 Geometry: Mathematics, Logic and Communication

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules: MA-101; MA-111

Lecturer(s): Dr S Lyakhova

Format: 44

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Module Aims: An introduction to Euclidean geometry and the axiomatic method, as a basis for developing general mathematical skills including logic and communication.

Module Content: - The elements of mathematics: axioms, definitions, propositions, proofs,
- Euclid's axiomatic approach to geometry,
- Theorems of congruence, Thales, Pythagoras, Playfair's axiom,
- Use of LaTeX to typeset mathematics, including diagrams
- Other axiomatic geometries: hyperbolic, spherical, incidence.
- Peano's axioms for arithmetic
- Writing mathematics,
- Giving and using feedback,
- Presenting mathematics orally,

Intended Learning Outcomes: At the end of this module students should be able to:
1) solve simple problems in Euclidean geometry,
2) construct basic logical proofs using the axiom systems of Euclid, Peano and hyperbolic geometry,
3) understand and apply classical geometrical theorems such as those of Pythagoras, Thales,
4) typeset mathematics using LaTeX, including diagrams where appropriate,
5) give oral presentations on their work,
6) demonstrate an understanding of the differences between well-written mathematics and poorly-written mathematics.

Assessment:
Examination (60%)
Coursework 1 (10%)
Project (20%)
Presentation (10%)

Assessment Description: 1) Coursework 1: formed of a number of coursework assignments along with participation in classes during the semester.
2) Project: This component consists of a short written report on a specified topic in geometry, including a commentary on how feedback has been used
3) Presentation: Each student will give a 5-6 minute presentation to their tutorial group on the topic of their project
4) Exam: A 2-hour written closed-book exam in January

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: Lecturer feedback will be provided on the coursework homework assignments and presentation.
Students will receive peer feedback on their project draft, and more feedback on the final submission.
Generic cohort feedback will be provided on the examination performance, with individualized feedback available on request

Failure Redemption: Redemption of failed components

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

Available to visiting and exchange students

MA-142 Mechanics and Dynamics

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof IM Davies

Format: 44

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Module Aims: An introduction to the concepts and principles of classical mechanics. The course covers the use of vectors to model physical problems and various quantities from physics. It then introduces Newton’s laws of motion and considers some of the fundamental examples such as rocket motion and planetary motion.

Module Content: Vectors for mechanics.
Statics: forces and moments, representation by vectors.
Kinematics: position, velocity and acceleration using vectors.
Momentum and collisions.
Impulse.
Newton's laws and Galilean relativity.
Conservation laws: Energy, momentum, angular momentum. Stability of motion.
Conservative fields.
Resisted motion: air resistance, Stoke's drag.
Variable mass problems: Rocket motion.
Introduction to Keplerian motion: basic planetary motion.

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

1) use vector techniques to model physical problems involving systems of particles,
2) explain the concepts of momentum, forces, moments, energy and impulse in mathematical terms,
3) solve given dynamical problems using appropriate methods,
4) apply Newton's laws to form a mathematical model of physical problems involving particles,
5) solve problems involving standard models such as resisted flow, rocket motion and the Kepler problem,
6) identify and apply the correct techniques from calculus and differential equations to solve problems.

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

Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Examination: A closed book examination at the end of the module.
Assignment 1: formed of a number of coursework assignments along with participation in the module during the semester.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the homework assignments, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.
For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance. Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary examination.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students

MA-181 Introduction to Modelling and Simulation

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr N Picco

Format: 44 hours of lectures, examples classes and PC labs

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Lectures supported by examples classes and PC labs

Module Aims: The module provides a basic introduction to mathematical modelling of the real world and use of computer programming to analyse and simulate such models. It will include basic modelling techniques, basic calculation methods, and computational approaches to solve simple models.

Module Content: 1) Introduction to mathematical modelling
2) Introduction to programming
3) Numerical methods and implementation
4) Discrete-time population growth
5) Analytical and computational techniques for Difference Equations
6) Continuous-time population growth using Ordinary Differential Equations (ODEs)
7) Analytical and computational techniques for ODEs
8) Numerical schemes to solve ODEs

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

1) Interpret mathematical models describing population growth dynamics.
2) Interpret and write basic algorithms.
3) Perform basic computations in Matlab.
4) Make appropriate changes to a basic model to describe dynamics of a different nature.
5) Interpret how variations in the model equations reflect in the resulting dynamics.
6) Select appropriate analytical and numerical methods to study a model.
7) Analyse difference equations models.
8) Solve simple ODEs using basic numerical and analytical techniques.

Assessment:	Examination (70%)
	Assignment 1 (20%)
	Assignment 2 (10%)
Resit Assessment:	Examination (Resit instrument) (100%)

Assessment Description: Examination: is a written, closed-book examination at the end of the module.
Assignment 1: is formed of a number of coursework assignments during the semester along with participation in the module during the semester. The assignments will develop skills in problem solving, mathematical modelling of the real world and the use of computers to simulate real world problems.
Assignment 2: is a computing test to be taken in controlled conditions at the end of the module to assess skills in the use of computers to investigate models of real world problems.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the coursework assignments and computing test, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.

For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance. Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary examination.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students.

MA-182 Introduction to Biomathematics

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules: MA-181

Lecturer(s): Dr N Picco

Format: 44 hours of lectures, examples classes and PC labs

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Mixture of lectures, examples classes and PC labs.

Module Aims: The module illustrates how mathematical modelling and simulation can be applied to problems from biology and medicine. It introduces students to models of population growth, interacting species and spread of infectious diseases, and develops appropriate techniques for model construction, analysis, solution and simulation.

Module Content: 1) Introduction to mathematical modelling in biology
2) Discrete and Continuous-time models for single species
3) Discrete-time models for interacting species using systems of difference equations (DEs).
4) Analytical and computational techniques for DEs: implementation in Matlab.
5) Continuous-time models for interacting species using systems of Ordinary Differential Equations (ODEs).
6) Computational methods to solve coupled systems of linear and non linear ODEs
7) Advanced applications in infectious disease modelling and cancer modelling

Intended Learning Outcomes: At the end of this module, students should be able to
1) Understand the role of mathematical modelling in biosciences
2) Translate biological problems into mathematical models
3) Know different types of modelling techniques
4) Interpret mathematical models describing non-linear dynamics of interacting species
5) Apply analytical approaches to mathematical models to learn how the system evolves in time. Translate an observed interaction into the appropriate term in an ODE model
6) Explain various applications of modelling and model building in different areas of biology
7) Select and implement an appropriate computational method to study a model

Assessment:	Examination (70%)
	Assignment 1 (20%)
	Assignment 2 (10%)
Resit Assessment:	Examination (Resit instrument) (100%)

Assessment Description: Examination: is a written, closed-book examination at the end of the module.
Assignment 1: is formed of a number of coursework assignments during the semester along with participation in the module during the semester. The assignments will develop skills in problem solving, mathematical modelling of the real world and the use of computers to simulate real world problems.
Assignment 2: is a computing test to be taken in controlled conditions at the end of the module to assess skills in the use of computers to investigate models of real world problems.

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the coursework assignments and computing test, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.

For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance. Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary exam in August.

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students.

MA-192 Probability and Statistics

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof C Yuan

Format: 44 hours: Primarily lectures, additional support classes and lab classes

Delivery Method: All programmes will employ a blended approach to delivery using the Canvas digital learning platform.

Lectures on campus

Module Aims: The module is an introductory course on applied statistics. It will cover a variety of statistical tests, criteria for choosing appropriate tests, and the use of statistical software in dealing with large data sets.

Module Content: This module will treat the following topics:

Basic probability;
Confidence intervals;
Hypothesis testing;
Regression;
Parametric techniques;
Statistical computing.

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

1) Use basic results in probability;
2) Construct confidence intervals;
3) Test hypotheses including the use of t-tests and ANOVA;
4) Choose correct statistical tests;
5) Use parametric techniques to treat data sets;
6) Use regression techniques;
6) Use statistical software to deal with large data sets.

Assessment: Examination (70%)
Assignment 1 (20%)
Assignment 2 (10%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Component 1 is a written closed book examination to take place at the end of the module. Component 2 is formed of a number of coursework assignments along with participation in classes during the semester. The assignments will develop skills in problem solving and applying techniques to real world problems. Component 3 is formed of a computing based controlled test to assess skills in the use of computers to investigate and analyse real world problems.”

Moderation approach to main assessment: Universal second marking as check or audit

Assessment Feedback: For the coursework assignments, students will receive feedback in the form of marks, model solutions, overall feedback on the cohort performance, and some individual comments on their work.
For the exam, students will receive feedback in the form of marks and overall feedback on the cohort performance. Further, individualised feedback, can be provided upon request.

Failure Redemption: Supplementary exam

Additional Notes: Delivery of teaching will be on-campus. Continuous assessment will be submitted online.

Available to visiting and exchange students