Swansea University
Prifysgol Abertawe

FACULTY OF SCIENCE AND ENGINEERING

UNDERGRADUATE STUDENT HANDBOOK

YEAR 1 (FHEQ LEVEL 4)

SOFTWARE ENGINEERING

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 Croks**	
School Education Lead	Dr Neal Harman
Head of Computer Science	Professor Xianghua Xie
Computer Science Programme Director	Undergraduate: Dr Liam O'Reilly MSc: Dr Bertie Müller
Year Coordinators	Year 0 – Dr Deepak Sahoo Year 1 – Dr Mike Edwards Year 2 – Dr Giedre Sabaliauskaite and Dr Trang Doan Year 3 – Dr Jens Blanck Year 4 – Dr Tom Owen

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
Software Engineering
BSc Software Engineering[G600]
BSc Software Engineering with a Year Abroad[C60B]

Coordinator: Dr M Edwards

Semester 1 Modules	Semester 2 Modules
CS-110 **Programming 1** **15 Credits** **Dr NA Harman**	**CS-115** **Programming 2** **15 Credits** **Dr TK Astarte/Dr DW Archambault**
CS-130 **Professional Issues 1: Computers and Society** **15 Credits** **Dr N Micallef**	**CS-135** **Professional Issues 2: Software Development** **15 Credits** **Prof M Roggenbach/Dr H Nguyen**
CS-150 **Concepts of Computer Science** **15 Credits** **Dr JE Blanck/Dr M Edwards**	**CS-165** **Introduction to Data Science** **15 Credits** **Dr M Edwards/Dr AAM Rahat**
CS-170 **Modelling Computing Systems 1** **15 Credits** **Prof FG Moller**	**CS-175** **Modelling Computing Systems 2** **15 Credits** **Prof FG Moller**
Total 120 Credits	

Year 1 (FHEQ Level 4) 2022/23
Software Engineering
BSc Software Engineering with a Year in Industry[G60A]

Coordinator: Dr M Edwards

Semester 1 Modules	Semester 2 Modules
CS-110 **Programming 1** **15 Credits** **Dr NA Harman**	**CS-115** **Programming 2** **15 Credits** **Dr TK Astarte/Dr DW Archambault**
CS-130 **Professional Issues 1: Computers and Society** **15 Credits** **Dr N Micallef**	**CS-135** **Professional Issues 2: Software Development** **15 Credits** **Prof M Roggenbach/Dr H Nguyen**
CS-150 **Concepts of Computer Science** **15 Credits** **Dr JE Blanck/Dr M Edwards**	**CS-165** **Introduction to Data Science** **15 Credits** **Dr M Edwards/Dr AAM Rahat**
CS-170 **Modelling Computing Systems 1** **15 Credits** **Prof FG Moller**	**CS-175** **Modelling Computing Systems 2** **15 Credits** **Prof FG Moller**
CS-102 **Year 1 Placement Preparation** **0 Credits** **Mr N Clarke/Miss VV Wislocka**	
Total 120 Credits	

CS-102 Year 1 Placement Preparation

Credits: 0 Session: 2022/23 Academic Year

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Mr N Clarke, Miss VV Wislocka

Format: 6 hours consisting of a mix of podcasts, recorded lectures and Zoom sessions and optional 1-2-1 meetings and weekly drop-in sessions. Prior to the change it was 6 hours of face to face delivery via PC labs, and a 1-2-1 meeting where applicable / requested.

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: This generic cross-disciplinary module is a mandatory module for all students who have enrolled (or transferred)
onto the Science Industrial Placement Year. The module focuses on the underpinning and fundamental requisites required to gain, enter and progress effectively through an industrial placement. Learners will be introduced to (a) sourcing placements, CV writing, and application techniques; (b) Interview techniques, how to pitch yourself and be successful; (c) workplace fundamentals and IP awareness, behaviors and expectations; and, (d) Key employability skills; getting the most from your Industrial Placement. This module is only mandatory for students who have enrolled on a Science Industrial Year programme of study or who transfer up to the end of level 5.

Module Content: The module will focus on the key requirements to gain and be successful whilst on a placement. Directed and self -
directed activity will address the following topics:

1) Science Industrial Placements - What they are, how to search and how to apply.

2) CV writing, cover letters and application processes.

3) Assessment centres, interview techniques and a mock interview.

4) Recognizing and developing employability skills
.
5) reflecting and maximising your placement experience.

6) one to one meeting with careers and employability officers.

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

1) Demonstrate the essential skills needed to secure placement opportunities; alongside having the
skills to apply for relevant placements.

2) Perform effectively in an interview process and apply the tools and attributes that make a good interview.

3) Discuss and share what is expected within the workplace including behavioural and professional conduct.

4) Identify personal employability skills and how these will be used in a workplace setting.

5) Express a reflective view of the placement demonstrating the ability to maximise the placement experience in future career decisions.

Assessment: Participation Exercise (100%)

Assessment Description: Students are required to attend all taught sessions and the one to one meeting (if required). The module has no credit attached. However to ensure engagement a compulsory quiz will be undertaken in session 6. Students who do not attend and
have no valid reason will not be permitted to continue on a Science Industrial Placement Year programme of study.

Moderation approach to main assessment: Not applicable

Assessment Feedback: Feedback on progress and the progression through the module will be provided in the one to one meeting and MCQ quiz.

Failure Redemption: Successful completion of this module depends upon satisfactory attendance at, and engagement with, all sessions.
Therefore there will normally be no opportunity to redeem failure. However, special provision will be made for students with extenuating or special circumstances.

Additional Notes:

Module code reserved by a.h.phillips on 22/04/2016 10:55:09

This module is being piloted in 2015. This module is only available for students enrolled on the Science Industrial Year, specifically:
CS-E00
BI-E00
GE-E00
MA-E00
PH-E00

CS-110 Programming 1

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr NA Harman

Format: 30 (10 lectures, 20 laboratory)

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: This module teaches students the fundamentals of programming in Java. Students will learn to develop and debug simple programs using basic programming concepts (assignments, if statements, loops, methods); data types (scalars, arrays, arraylists); and basic object-oriented programming concepts (objects and classes). They will also learn to write programs to a professional standard - programs that both work and are accessible and maintainable by other professional programmers. The module will place less emphasis on traditional lectures - there be one per week - and instead (a) more time will be spent in laboratories gaining hand-on experience; and (b) material will be available both in the form of extensive written notes and short screen capture videos, explaining and demonstrating tools, concepts and their applications.

Module Content: What is a program? Examples of programming languages.
Introduction to Programming in Java.
The Java programming environment and tools for writing Java programs.
Declaring and Using Variables and Assignments.
Primitive data types, arithmetical operations, precedence and expressions.
Input/Output: Input from Keyboard; Output to Screen; Checking input for correctness and security.
Decisions: principles of decision-making and conditional statements in programming, if statements, if-else statement, switches, comparing numbers and strings.
Iteration: principles of loop structures and termination/continuation conditions in programming, for loops, while loops and do loops, nested loops.
Collection Data Types: Arrays and Arraylists.
Common algorithms on arrays.
Program design techniques, modularisation and methods, parameters and parameter passing.
Object Oriented Programming: basic principles and design, classes and objects.
Principles and good practice for program engineering: structure, documentation, security, readability, coding conventions and standards, maintenance, testing (this theme will run through the module).

Intended Learning Outcomes: - Students will be able to design programs to solve specific problems based on procedural programming concepts, and the object oriented programming concepts of classes, objects, methods and encapsulation.
- Students will be able to write and debug programs to solve specific problems based on procedural programming concepts, and the object oriented programming concepts of classes, objects, methods and encapsulation.
- Students will be able to write programs that meet professional standards in terms of readability and the programming conventions of Java.
- Students will be able to read and describe the function of straightforward programs based on procedural programming concepts, and the object oriented programming concepts of classes, objects, methods and encapsulation written by others.

Assessment: Examination 1 (40%)
Coursework 1 (15%)
Coursework 2 (15%)
Laboratory work (20%)
Class Test 2 - Held under exam conditions (10%)

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

Assessment Description: Examination - Multiple Choice
Coursework 1 - Practical programming assignment (basic programming) - end of Week 7.
Coursework 2 - Practical programming assignment (classes and objects) - middle of Week 12
Guided and Supported Laboratory Sessions - submit nine assessed tasks (one each in Weeks 3 to 11)
Online in-class programming test to be taken in University computer laboratory.

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

Assessment Feedback: Outline solutions provided along with analytical individual feedback for coursework's. Examination feedback summarising strengths and weaknesses of the class. Individual feedback on submissions from lecturer and/or demonstrators in laboratory sessions.
Failure Redemption: Resit examination and/or resubmit coursework(s) as appropriate.
Additional Notes: Updated July 2022. Available to visiting and exchange students.

CS-115 Programming 2

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules: CS-110

Lecturer(s): Dr TK Astarte, Dr DW Archambault

Format: 40 (20 lectures, 20 laboratories)

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: This module is a continuation of the module CS-110 Programming 1. In it, students will continue to enhance their skills in programming, as well as gain a basic understanding of algorithms and data structures.

Module Content: Objects and Classes.
Instance Methods and Fields.
Static Methods and Fields.
Object oriented programming and design techniques.
Encapsulation: Public and Private Methods, Public and Private Fields.
Basic inheritance: Sub-classes and Overriding.
Introduction to algorithms - searching and sorting.
Simple complexity analysis, introduction to data structures.

Intended Learning Outcomes: Students will be able to develop substantial programs to solve specific problems based on algorithms using standard data structures.
Students will have an awareness of efficiency considerations for different algorithms.
Students will be able to read and debug substantial programs written by others.

Assessment: Examination 1 (70%)
Coursework 1 (10%)
Coursework 2 (10%)
Laboratory work (10%)

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

Assessment Description: Standard Computer Science format unseen examination, duration 2hrs.
Coursework 1 - Practical programming assignment.
Coursework 2 - Practical programming assignment.
Laboratory Exercises.

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

Assessment Feedback: Outline solutions provided along with group and individual analytical feedback for courseworks.
Examination feedback summarising strengths and weaknesses of the class.
Individual feedback on submissions from lecturer and/or demonstrators in laboratory sessions.

Failure Redemption: Resit examination and/or resubmit coursework(s) as appropriate.

Additional Notes:

Updated July 2019. Available to visiting and exchange students

CS-130 Professional Issues 1: Computers and Society

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr N Micallef

Format: Formal contact time in total 40 hours broken down into lectures, seminars and practicals

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: Students will be introduced to the main professional issues associated with software engineering and computer science research. Students will also examine the main impacts of computing on society and social issues on the practice of computing, including legal and ethical concerns such as copyright and the data protection act. Issues of network security will be discussed. The course also includes communication skills, including the writing of a technical report and giving a formal presentation.

Module Content: Impact and reach of Computer Science and Software Engineering in society:
e.g., domains of use and influence, ethical frameworks, codes of conduct, legal constraints, freedom of speech and censorship, privacy and surveillance.
Issues around network and computer security with an emphasis on an overview of the field and how the issue pervades modern software development
The impact of these issues on the development and testing of software will be examined.

The practice of computing will also be viewed through other disciplines (e.g. Economics) to highlight the practical value of the main course material.

Intended Learning Outcomes: Students will be aware of major societal, ethical and profession-level issues associated with Computer Science; they will have had experience of writing a technical report and giving a formal presentation on technical material

Assessment: Examination 1 (60%)
Coursework 1 (10%)
Report (30%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Standard Computer Science format in person unseen examination, duration 2hrs..
Careers Portfolio and Final Report

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

Assessment Feedback: Detailed rubrics based marking and written feedback for presentation and final report.

Examination feedback summarising strengths and weaknesses of the class.

Failure Redemption: Resit exam and/or repeat assignment component(s)

Additional Notes:

Available to visiting and exchange students

CS-135 Professional Issues 2: Software Development

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof M Roggenbach, Dr H Nguyen

Format: 40 hours (20 hours lectures, 20 hours laboratory sessions)

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: The aim of this module is to give an understanding of fundamental software engineering tools, testing and design methods that are used to create reliable software. A number of state-of-the-art development environments will be shown, with hands-on experimentation and use of test systems. Students will also be given a sound grasp of the use of these systems in the different professional software engineering processes used in the software industry. Innovative software engineering methods such as Extreme Programming will be introduced and learnt in hands-on laboratory work.

Module Content: Introduction to Integrated Development Environments (IDEs).
The Software Engineering Process.
Software Engineering Strategies.
Agile Programming/Extreme Programming.
Program debugging tools and debugging strategies.
Basic unit testing and tools for unit testing.

Intended Learning Outcomes: An understanding of the methods for developing reliable software. A sound knowledge of current tools and methods for developing and testing software to ensure its reliability and to pinpoint known errors. Students will be able to explain the operation and testing of a simple computer program.

Assessment: Examination 1 (60%)
Coursework 1 (10%)
Laboratory work (20%)
Coursework 2 (10%)

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

Assessment Description: Standard Computer Science format unseen examination, duration 2hrs.
Assessed practical coursework x 2.
Supervised and assessed laboratory sessions.

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

Assessment Feedback: Outline solutions provided along with group and individual analytical feedback for courseworks.
Examination feedback summarising strengths and weaknesses of the class.
Individual feedback on submissions from lecturer and/or demonstrators in laboratory sessions.

Failure Redemption: Resit examination and/or resubmit coursework(s) as appropriate.

Additional Notes:

Updated July 2014. Available to visiting and exchange students

CS-150 Concepts of Computer Science

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr JE Blanck, Dr M Edwards

Format: 2 lectures, 1 tutorial/lecture, 1 lab per week.

Delivery Method: Delivery
On-campus/virtual lectures and lab sessions.
Contact Hours
30 hours lectures and tutorials; 10 hours lab classes

Module Aims: This module gives an overview of some of the main principles underlying computers and computing from both a theoretical and an applied point of view.

Following a brief history of computers and software an introduction to the representation of data and the basic components of a computer will be given. Students will be introduced to the principles of programming at assembly language level. Further topics include simple algorithm analysis, operating systems, file systems, computer networks, and the world wide web. A brief discussion on the limitations of computing is also given.

The module is accessible and relevant to students of all disciplines who wish to learn about, or reinforce their understanding of, computers and computer science

Module Content: Brief history of computers and software
Binary values and number systems
Data representation
Logic, gates and circuits
Computing components
Low level programming
Operating system concepts
Operating system shells and command line interfaces
Programming paradigms
Limitations of computing
Searching, Sorting, and algorithm efficiency
Computer networks and the world wide web

Intended Learning Outcomes: Students will:
- gain an appreciation of the scope and limitations of computer science and its applications;
- have a clear understanding of how software and hardware interact in a computer system;
- be fully aware of the principles behind modern computer architecture;
- be able to express simple programming constructs in assembly language;
- be fully aware of the principles behind modern operating systems, file systems and networks;
- understand the relationship between networks and the world wide web;
- be aware of the limitations of computing.

Assessment: Examination 1 (70%)
Assignment 1 (15%)
Assignment 2 (15%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Standard Computer Science format unseen examination, duration 2hrs
Assessed coursework - two problem sheets/online quizzes

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

Assessment Feedback: Outline solutions provided along with group and individual analytical feedback for courseworks.
Examination feedback summarising strengths and weaknesses of the class.
Individual feedback on submissions from lecturer and/or demonstrators in laboratory sessions.

Failure Redemption: Resit examination

Additional Notes: Updated July 2022. Available to visiting and exchange students.

CS-165 Introduction to Data Science

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr M Edwards, Dr AAM Rahat

Format: 30 hours lectures and lab classes

Delivery Method: On campus lectures and laboratory sessions.

Module Aims: We live in the age of data: it is ubiquitous in modern life. However, data in itself cannot inform or inspire. We need to “do science” with the data to extract knowledge and actionable insights. In this module, we will explore scientific methods and processes that make data so valuable to us and society and gain an insight into the world of practical data science and its challenges. We will also cover the ethical issues relating to data.

Module Content: Mathematical foundations.
Introduction to contemporary tools for Data Science (e.g., Python/R/SQL/Hadoop).
Data Science methodology (user-centric development):
- Business/context understanding.
- Requirement collection.
- Experimental design and planning.
- Data collection and cleaning.
- Visualisation and exploratory analysis.

Basic Modelling Techniques:
- Regression (Linear Regression).
- Classification (k-nearest Neighbour).
- Clustering (k-means).

Performance evaluation (e.g. hypothesis testing, ROC curves) and selection.
Deployment and feedback.
Ethics, Data Privacy and Security:
- Data science infrastructure to keep data secure.
- Legal, ethical, and privacy issues with data.
- Anonymity challenges and solutions (e.g. k-anonymity).

Intended Learning Outcomes: By the end of this module, students will be able to:
- describe and explain the importance of business context and audience, and recognise the importance of data ethics and the associated challenges.
- communicate mathematical ideas and apply basic mathematical approaches to data science problems.
- identify, evaluate and select a range of methods that are applicable and suitable for data analyses.
- implement an appropriate working solution to data projects (including framework scoping, collecting data and performing exploratory analyses, developing and deploying solutions).
- determine and employ appropriate methods for evaluation, visualisation, interpretation, and communication of results.

Assessment: Examination 1 (70%)
Coursework 1 (20%)
Laboratory work (10%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Examination. Standard unseen 2-hour Computer Science examination.
Coursework. A practical programming assignment on tackling a data science project.
Guided and Supported Laboratory Sessions.

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

Assessment Feedback: Individual feedback on coursework and report with an outline solution.
Individual feedback on submissions from lecturer and/or demonstrators in laboratory sessions.

Failure Redemption: 100% Examination Resit Instrument.

Additional Notes: This module will be open to visiting and exchange students.

CS-170 Modelling Computing Systems 1

Credits: 15 Session: 2022/23 September-January

Pre-requisite Modules:

Co-requisite Modules: CS-175

Lecturer(s): Prof FG Moller

Format: 40 (30 hours lectures, 10 hours problem sessions)

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: This module introduces students to mathematical tools and techniques for modelling computing systems.

Module Content: Introduction.
Propositional logic.
Sets.
Boolean algebras and circuits.
Predicate logic.
Proof strategies.
Functions.
Relations.

Intended Learning Outcomes: Students will become familiar with the fundamental mathematical techniques for modelling hardware and software systems and will develop skills in scientific modelling such as abstraction, the precise formulation of informal notions, rigorous reasoning and analysis.

Assessment: Examination 1 (70%)
Laboratory work (30%)
Resit Assessment: Examination (Resit instrument) (100%)

Assessment Description: Standard Computer Science format unseen examination, duration 2hrs.
Weekly tests on Canvas.

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

Assessment Feedback: Outline solutions provided along with group and individual analytical feedback for courseworks.
Examination feedback summarising strengths and weaknesses of the class.
Individual feedback on submissions from lecturer and/or demonstrators in laboratory sessions.

Failure Redemption: Resit examination and/or resubmit coursework(s) as appropriate

Additional Notes:

Available to visiting and exchange students. Updated July 2015

CS-175 Modelling Computing Systems 2

Credits: 15 Session: 2022/23 January-June

Pre-requisite Modules:

Co-requisite Modules: CS-170

Lecturer(s): Prof FG Moller

Format: 40 (30 hours lectures, 10 hours problem sessions)

Delivery Method: On-campus/virtual lectures and lab sessions.

Module Aims: This module will follow on from CS-170 and introduces students to mathematical tools and techniques for modelling computing systems.

Module Content: Inductive and recursive definitions.
Proofs by induction.
Games and strategies.
Modelling processes.
Distinguishing between processes.
Logical properties of processes.
Concurrent processes.

Intended Learning Outcomes: Students will become familiar with the fundamental mathematical techniques for modelling hardware and software systems and will develop skills in scientific modelling such as abstraction, the precise formulation of informal notions, rigorous reasoning and analysis.

Assessment: Assignment 1 (30%)
Examination (70%)

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

Assessment Description: Mathematical Coursework (weekly assignments)
Standard Computer Science format unseen examination, duration 2hrs

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

Assessment Feedback: Outline solutions provided along with group and individual analytical feedback for courseworks.
Examination feedback summarising strengths and weaknesses of the class.

Failure Redemption: Resit examination and/or resubmit coursework(s) as appropriate.

Additional Notes:

Updated July 2014. Available to visiting and exchange students