UNIVERSITY of STIRLING

REDEFINE

Faculty of Natural Sciences

REDEFINE AT STIRLING

Computing Science, Software Engineering, Business Computing, Data Science, Software Development with Cyber Security
Programme Handbook 2024/2025

This Programme Handbook should be read in conjunction with the Core Handbook. Please download a copy to your personal records for future reference.

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Welcome from the Head of Division

Hello and welcome to the Division of Computing Science and Mathematics at the University of Stirling. Our students are the lifeblood of the Division and your education is of utmost importance to us. We are here to support, encourage and enable your learning, and you are here to learn! All of our students make an important contribution to the Division and, as with so many things in life, the more you put in, the more you get out. Your education is perhaps the most important thing you will ever have. It will form the foundations you build the rest of your life on and it won't end when you finish your degree. I encourage you to engage fully in your studies and make the most of the opportunities provided by a university education.

During your time at Stirling, you will make new lifelong friends, discover new passions and enjoy new experiences. You will also face new challenges and sometimes it will not all be plain sailing. During those times, remember that we are here to help you. The staff in Computing Science and Mathematics are a friendly and helpful bunch and you should not be shy of approaching us. You will each have a personal tutor, who is your first port of call if you have problems to discuss. We want you to be happy and healthy and the University has many resources to help in achieving that.

Every generation has its challenges and yours will no doubt be different from mine, but the one thing that has remained true for centuries is the importance of knowledge, science, technology and reason. Whether the challenge is climate change, food security or public health, learning is the universal tool at our disposal. You have come to university to play a part in that. You are part of something big: part of the University of Stirling, part of the quest for knowledge and part of a community who want to make the world a better place. I hope you enjoy it, I hope you make the most of it, and I hope in years to come that you will look back fondly on your time at the University of Stirling.

Professor Kevin Swingler

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Structure

1. Divisional Key Contacts

Name	Role	Location
Dr David Cairns david.cairns@stir.ac.uk	Programme Director for Computing Science, Software Engineering, Business Computing	Cottrell 4B87
Dr Mario Kolberg mario.kolberg@stir.ac.uk	Programme Director for Data Science	Cottrell 4B123
Grace McArthur, Stacey MacKay & Kayleigh Bartlet csm@cs.stir.ac.uk	Learning and Teaching Administrators	Cottrell 3A91
Dr Paul McMenemy	Health and Safety Officer	Cottrell 4B129
Domagoj Bagic dob00056@students.stir.ac.uk	Faculty Officer	Cottrell 3AX

2. Divisional Staff

You can view the full list of staff within the Division and their contact details by visiting the divisional staff list.

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3. Programme Structure and Module Details

The structure of your programme and descriptions of each module can be found under the Degree Programme Tables tab on your Portal page. A typical set of modules for each degree programme are shown in the table below although the option choices can vary. For students on the Software Development with Cyber Security programme, you will follow a structure similar to the Computing Science programme from semester 5 onward.

BSc (Hons) Computing Science - example programme

Semester	Modules taken
1	Introduction to Computing Science Discrete Structures *Building Planet Earth (option)*
2	Programming and User Interface Design *Introduction to Data Science (option)* *Global Environmental Issues (option)*
3	Data Structures, Objects and Algorithms Database Principles and Applications *Scripting for Data Science (option)*
4	Systems Managing Information *NoSQL Databases and Data Warehousing (option)*
5	Software Engineering I *Code Analysis and Performance (option)* *Introduction to Machine Learning (option)*
6	Software Engineering II *Computer Games Development (option)* *Operating Systems Concurrency and Distribution (option)*
7	Computing Science Project Computer Security and Networks *Artificial Intelligence (optional half module)* *Mobile App Development (optional half module)*
8	Computing Science Project, continued *Natural Language Processing and Computer Vision (option)*

BSc (Hons) Software Engineering - example programme

Semester	Modules taken
1	Introduction to Computing Science Discrete Structures *Building Planet Earth (option)*
2	Programming and User Interface Design *Introduction to Data Science (option)* *Global Environmental Issues (option)*
3	Data Structures, Objects and Algorithms Database Principles and Applications *Scripting for Data Science (option)*
4	Programming Language Paradigms Managing Information *NoSQL Databases and Data Warehousing (option)*
5	Software Engineering I *Code Analysis and Performance (option)* *Introduction to Machine Learning (option)*
6	Software Engineering II UX Design *Operating Systems Concurrency and Distribution (option)*
7	Computing Science Project Computer Security and Networks *Artificial Intelligence (optional half module)* *Mobile App Development (optional half module)*
8	Computing Science Project, continued *Natural Language Processing and Computer Vision (option)*

BSc (Hons) Data Science - example programme

Semester	Modules taken
1	Introduction to Computing Science Discrete Structures *Building Planet Earth (option)*
2	Programming and User Interface Design Introduction to Data Science *Global Environmental Issues (option)*
3	Scripting for Data Science Database Principles and Applications *Data Structures, Objects and Algorithms (option)*
4	NoSQL Databases and Data Warehousing Practical Statistics *Managing Information (option)*
5	Introduction to Machine Learning UX Design *Code Analysis and Performance (option)*
6	Data Strategy Natural Language Processing and Computer Vision *Programming Language Paradigms (option)*
7	Computing Science Project *Computer Security and Networks (option)* *Artificial Intelligence (optional half module)* *Mobile App Development (optional half module)*
8	Computing Science Project, continued *Other optional module*

BSc (Hons) Business Computing - example programme

Semester	Modules taken
1	Introduction to Computing Science The Global Business Environment: An Introduction *Discrete Structures (option)*
2	Programming and User Interface Design The Management Challenge: An Introduction *Introduction to Data Science (option)*
3	Data Structures, Objects and Algorithms Database Principles and Applications Fundamentals of Business and Management
4	Programming Language Paradigms Managing Information The Organisation of Business
5	Software Engineering I Introduction to Machine Learning International Business
6	Software Engineering II Entrepreneurship *Computer Games Development (option)*
7	Computing Science Project Computer Security and Networks *Strategic Management (option)*
8	Computing Science Project, continued *Natural Language Processing and Computer Vision (option)*

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4. Programme Learning Goals and Outcomes

In general, the Computing Science modules and programmes are principally designed to instil specific skills in relation to the academic discipline of Computing Science and its applications. However, the following transferable skills are also regarded as important:

- An understanding of the scope and power of modern computing facilities, and their significance for industry and society.
- The ability to use a range of IT tools to manage textual and numeric data in any context.
- Skills in the study of systems so that they can be analysed, their behaviour explained and changes planned in a methodical manner.
- Ability to plan work, to understand how tasks can be specified, to undertake independent creative activity and to bring it to a successful conclusion.
- Ability to write a coherent and informative account of work done.
- An understanding of the issues and responsibilities of being an IT professional.

Programme Structures and Aims

Teaching takes place during an Autumn semester and a Spring semester. In each semester you will usually take three modules, with each having its own assessment (usually consisting of coursework and an examination). Computing Science modules are coded as CSCU9XN (where CSC indicates Computing Science, 'U' indicates Undergraduate, '9' is a placeholder, 'X' indicates the stream of the modules, and 'N' usually indicates the semester in which a module is normally taken, e.g. 'CSCU9B3').

All undergraduate degrees at Stirling contain modules from more than one subject. In the normal pattern, in each of your first three semesters you take modules in three subjects. If you are taking a degree in Computing Science, Business Computing, or Software Engineering, you will take one at least one compulsory Computing Science module in your first three semesters and may take a further Computing Science module in semesters two and three. From semester four onward, it is possible that all three of your modules will be in Computing Science.

By passing modules you acquire SCQF credits with each module usually worth 20 credits and normally undertake 120 credits worth of modules per year. By the end of your third year you should have achieved 360 SCQF (18 Full modules) making you eligible for a General degree or the named BSc in Computing Science. At the end of your fourth year, you are required to achieve 480 SCQF credits (24 Full Modules) for an Honours degree. Note that some modules are core to your degree programme, and some you can choose within the options available.

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Progression & Entry to Honours

Details of the regulations for all Honours degree programmes are given in the University Calendar. In particular, the rules governing progression and graduation criteria are available at:

https://www.stir.ac.uk/about/professional-services/student-academic-and-corporate-services/academic-registry/student-information/progression/

The following is a brief summary, intended only to clarify those regulations. In no way does it supersede them so if in doubt, please use the above link to check the current regulations and detailed criteria.

For the award of an Honours degree, a minimum of 480 credits must be achieved, with a minimum of 180 at SCQF levels 9 and 10, including a minimum of 90 credits at SQCF level 10 as defined by the Degree Programme Table. Normally, 240 of these credits will be obtained in years 1 and 2, and these will include the credits required in subjects outside the main subject(s). In years 3 and 4, therefore, students will normally obtain a further 240 credits in one subject (for Single Honours) or two subjects (for Combined Honours).

Final Year *Project*

During your final Honours year you will undertake a project leading to a dissertation. This is an important part of your degree and counts as 60 SCQF credits (three full modules). To qualify for an Honours degree it is mandatory that you pass your project. Towards the end of your third year, you will be given advice on the kinds of project that are possible and the staff you should approach as supervisors for various topics. If you are taking a combined Honours degree, your project may be in Computing Science only or may have aspects of both subjects. The rules vary from degree to degree as to the nature and length of the project, so check what applies to you. The co-ordinator for projects is Dr Patrick Maier.

For more detailed information on policy and progression rules, please refer to the University's Policy and Procedures pages.

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5. Assessment and Assessment Methods

Submission of Assessment

A module may be taught by several lecturers, but for each module there is a single lecturer who is designated the module's 'co-ordinator' and who is responsible for overall control of the module.

Most modules contain assessed coursework which are often programming assignments or design documents. Normally there are one or two assignments or exams per module. Assignments usually account for around 50% of the final mark, and an examination usually accounts for the remaining marks. This differs in specific cases and some modules are assessed based on a single assignment so please ensure you are aware of the weighting of the assessments since that will relate to how much work is involved in completing it.

Since you will typically be taking three modules per semester, you might have up to six assessments to complete per semester. In some semesters, assessment deadlines are close together so you will need to develop your time management skills and decide what is the best order to approach them yourself. A close set of deadlines does not mean they can all be attempted close to the deadline - it should mean the exact opposite. The best you can do is to start work on assignments as soon as they are handed out, so that you do not have to rush everything at the last minute and gain an early understanding of what is needed.

In most modules, assignments are submitted via Canvas with full details of the submission process given on the assignment description on Canvas. After submission, please ensure that you keep your own personal copy of any assignment submission for reference (i.e. do not further modify code unless you have a back up of the submitted version of it).

In case of any issues with the submission process, staff may contact you via your University email address. It is therefore important to check your University email regularly. Failure to read and respond to these emails can have significant consequences and will not be excused as a reason for queries regarding your submissions.

Under normal circumstances, the lecturer who set the assignment will make feedback and grade available on Canvas within three teaching weeks of the submission date. If an assignment is submitted late or has an extension, this will also extend the point at which feedback will be received.

Please note that the return of feedback and a grade only applies to an assignment. Marks related to an exam and the module as a whole are generally only available after the exam board has completed and the grades are uploaded to the Portal. Exam boards typically take place around 4 weeks after the date of the last exam period and the upload of grades to the Portal will then take a couple of weeks after that since they must all be checked and confirmed before being released. We do not generally release direct feedback on Canvas

with regard to exam submissions but you can contact your module coordinator if you wish to arrange a one to one discussion of your exam submission.

Please note that when submitting and assignment or exam on Canvas, do not leave this to the last minute. It is generally advisable to submit your answers with at least 5-10 minutes to go since you can usually submit a further update before the final deadline. Assignments submitted after the deadline may not be accepted and can receive no grade.

Please also check that you have submitted the correct document for your assessments, whether they be an assignment or an exam. We have had cases of students contacting us shortly after an assignment or an exam was completed saying they had just realised they submitted the wrong document. If you submit 5 minutes before an assessment is due, this should enable you to check that you have submitted what you intended to submit.

We are unable to accept an updated document after the deadline has passed. Students usually have to resit the assessment and at best will receive a capped grade of 40 for the module. Timestamps showing that documents were completed before the deadline are not accepted since these can be easily modified.

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Undergraduate Common Marking Scheme

The University marking schemes for undergraduate programmes are detailed in the following table. A student's level of achievement is denoted by the mark (a whole number in the range 0 – 100) achieved under the University's Common Marking Scheme. The descriptors are used, where appropriate, in marking coursework, examinations and dissertations. They should be used in parallel with subject-specific mark descriptors.

Mark	Class	Result	Descriptor of Attainment of Learning Outcomes
90+	1st	Pass	Meets all the requirements to attain 80 – 89 but in addition demonstrates an exceptional degree of originality and exceptional analytical, problem-solving and/or creative skills.
80–89			Meets all the requirements to attain 70 – 79 but in addition demonstrates outstanding quality evidenced by an ability to engage critically and analytically with source material, exhibits independent lines of argument, is highly original and uses an extremely wide range of relevant sources where appropriate.
70–79			Excellent range and depth of attainment of intended learning outcomes, secured by discriminating command of a comprehensive range of relevant materials and analyses, and by deployment of considered judgement relating to key issues, concepts or procedures
60-69	2:1	Pass	Attainment of virtually all intended learning outcomes clearly grounded on close familiarity with a wide range of supporting evidence, constructively utilised to reveal appreciable depth of understanding.
50–59	2:2	Pass	Attainment of most of the intended learning outcomes, some more securely grasped than others, resting on a circumscribed range of evidence and displaying a variable depth of understanding.
40–49	3rd	Pass	Acceptable attainment of most intended learning outcomes, displaying a qualified familiarity with a minimally sufficient range of relevant materials, and a grasp of the analytical issues and concepts which is generally reasonable, albeit insecure.
30-39	Fail - Marginal	Fail	Appreciable deficiencies in the attainment of intended learning outcomes, perhaps lacking a

			secure basis in relevant factual or analytical dimensions.
0-29	Fail - Clear	Fail	No convincing evidence of attainment of intended learning outcomes, such treatment of the subject as is in evidence being directionless and fragmentary.
X	Fail	Fail	Failure to comply with published module requirements

A student registered on a module will be given a mark for each component of assessment listed in the module descriptor.

The overall mark for the module is calculated from the sum of weighted component marks, rounded to the nearest whole number; a pass may not be required in each component. This module mark represents a summary of performance on that module.

An 'X' (Fail) is given if a student does not engage with the module so it is really important to let staff know if you have good cause for lack of engagement with the module.

Marking

Assignments and examinations are all marked within the Division. For each element of assessed work a sample (10% or 5 whichever is greater) is then independently reviewed by another staff member. Comments by the reviewer may lead to adjustments of marks in individual cases or across the whole class.

Marking is anonymous (i.e. your submission is identified only by student number and not by name), or anonymised (i.e. your submission is identified by your computer user ID and not by name). The latter is usually the case for electronically submitted coursework.

If you have reasons to believe that an assignment has not been fairly marked you may ask for a re-assessment by a second marker. However, the re-assessed mark will stand and could be *lower* than the original assessment.

Academic Misconduct

It is generally understood why cheating in examinations is wrong: it is an attempt to gain undeserved credit by presenting the work of another as one's own. For the University not to treat cheating as an extremely serious offence would be unfair to its students and would jeopardise the standard of its awards. Exactly the same is true of coursework submitted for assessment. Plagiarism is the equivalent of cheating in an examination because it involves the reproduction of another's work, whether ideas, data or expressions, without due acknowledgement. This is plagiarism, whether the source is printed, electronic or handwritten, whether it is reproduced verbatim or is paraphrased, and whether it is drawn on extensively or in brief.

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The University has an agreed policy setting out procedures and penalties for dealing with academic misconduct. This policy can be found on the University's portal. The policy also gives guidance on proper and adequate acknowledgement of source material, but if students are in any doubt at all about the nature of plagiarism, or the means by which to avoid it, students are strongly advised to consult their tutor. Students should clearly understand that it is their responsibility to be sure they understand these matters. Ignorance is not accepted as a defence for plagiarism.

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6. Study Skills

Organising Your Study

The University gives you a great deal of latitude in how you spend your time. If you organise your study efficiently, it is possible to get a good education and a good degree result at the end and still have plenty of time to enjoy other activities. On the other hand, you will need to do much more than the bare minimum of assessed work that is required if you are to do justice to your abilities.

Start any task promptly. Avoid wasting time at the start by doing trivial jobs. Examine sceptically any reasons you invent for postponing the work.

Ensure that your study time is genuinely productive. Are you really learning, or just wasting your time? For example, time is wasted if you copy out notes without thinking about what you write, or attend a lecture without paying much attention to what is said. Beware of satisfying your conscience by doing undemanding tasks which save you the effort of thinking.

Review your work for the day (and also for the week and for the semester) to make sure that you allot an appropriate amount of time to each of your subjects and to each part of each subject. Give the important or difficult tasks priority. Tackle them first, or at least arrange your study so that the work which needs careful thought or special attention is done while you are still fresh.

Recognise the appropriate time to stop for a break. Studying when you are tired may be uneconomical: five minutes' rest may refresh you so much that you get through the next stage of the work ten minutes more quickly. Or is your weakness the opposite? Do you stop too readily? If you get stuck on a particular point, taking a short break to think about something completely different often means that it ‘clicks’ when you return to the point.

Leave plenty of time to write any piece of work to be done in your own time. Start work on it well before the submission date. It will usually be clear from the lecture schedule when you have finished the lecture coverage of the topic. (It may be helpful to look at the question before the lectures on it so that you know what to listen out for.) If you leave too little time, it will probably be better to do a later topic instead if there is a choice of submission dates. But don't leave work so late that you end up with no flexibility in when you have to submit your work. Planning to do the last topic may seem attractive at the beginning of semester but runs the danger that something unexpected will prevent you from devoting as much time as you would have liked. Bear in mind that your exams may be very soon after the end of teaching. Getting coursework out of the way early will give more time for revision.

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Attendance Requirements/Compulsory Classes/Notification of Absence

On each module you will have lectures (usually 2-3 per week). Lectures start at nominally 5 minutes past the hour and finish at nominally 5 minutes to the hour. In addition, you will have tutorials, computer laboratory sessions or both.

Engagement

You are required to inform the Academic Registrar if you are absent through illness. If the absence is short (less than seven days) self-certification is sufficient (via the Student Portal).

For longer absences, and in all cases of absence from prescribed tests and examinations, a medical certificate is required. Further details on the attendance policy may be found on the University web pages, at:

https://www.stir.ac.uk/about/professional-services/student-academic-and-corporate-services/academic-registry/policy-and-procedure/attendance-and-engagement/

Understanding and Learning

Aim to understand not just to memorise. Modules are chiefly devoted to concepts that are designed to be understood rather than facts to be learned by rote. Understanding the principles will make it easier to remember all the material covered. It is also important to recognise that earlier content often provides a foundation for later material in the degree and that if you do not fully understand content from your first couple of years, you will find the later content more difficult to comprehend.

There will be some points you will have to learn and remember. When trying to memorise something, put the material aside from time to time to test yourself. This helps you to identify the points that are hardest to recall. Give these points special attention: mnemonics may help. Just reading the details over and over again is wasteful of time and effort. It is always easier to learn details if you can relate them to some principle or fit them into a logical system.

If you do not understand a topic, look it up in a textbook by using the index. Or discuss it with another member of the class. Or ask your tutor or lecturer to help you. Also, think out examples and applications.

Talk to other students about lecture material and what you have read. Trying to explain points to someone else can help you to learn and others may be able to fill gaps in your understanding. Discussion of coursework assignments can be helpful but take careful note of the regulations on plagiarism.

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Seek to develop the skills listed below when working privately and with other students, not just in formal teaching situations. For example, practise explaining points clearly and concisely to others (including those with little or no knowledge). This will stand you in good stead for job interviews.

Transferable skills

Written and oral communication

The ability to:

- present arguments clearly and concisely both in writing and orally;
- give a direct answer to a question;
- present both brief summaries that identify the key points and fuller treatments of a topic that are well structured;
- present a balanced view of different opinions on an issue;
- separate fact from opinion, yet present your own views where appropriate;
- use suitable means of presenting arguments, e.g. visual aids in oral presentations, diagrams in written work;
- contribute constructively to a group discussion;
- communicate with different audiences.

Analysis and problem-solving

The ability to:

- abstract and simplify in order to identify the essence of a problem;
- identify what should be taken as given or fixed for the purpose of solving a problem;
- set up and analyse a model;
- develop logical arguments;
- marshal and evaluate evidence;
- assimilate, structure and analyse qualitative and quantitative data;
- apply general principles to a specific case;
- make use of previous work but be prepared to develop original ideas where appropriate;
- exercise independent judgement;
- draw conclusions and decide what to do;
- think critically about the limits of your analysis;
- draw policy conclusions and recognise the potential constraints on their implementation;
- evaluate alternative strategies;
- keep an open mind about different methodological approaches;
- relate issues to a wider context;
- think imaginatively and creatively.

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Learning
The ability to:

- search out relevant material;
- frame and ask questions that elicit the information required;
- synthesise relevant material;
- learn independently;
- make use of the services of libraries and other sources of help and information.

Self-management
The ability to:

- work under pressure;
- meet deadlines;
- manage your time effectively;
- plan projects;
- prioritise tasks;
- work methodically;
- set personal goals and evaluate your own performance;
- work without supervision;
- take initiative and develop ideas independently.

These transferrable skills contribute to achievement of the University Graduate Attributes: high-level qualities and skills that students develop through their learning activities while at university. These attributes are what set graduates apart from those without a degree, and represent the added value graduates offer.

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Making the Most of Lectures

You should aim to attend *all* the lectures. Later lectures often build on material covered in earlier lectures so missing a lecture will seriously impair your understanding not only of the topics covered in that lecture but of later topics as well.

Outlines of lectures and recordings may be provided on *Canvas*, but it is still a good idea to take your own lecture notes. This will help you to stay alert to what is being said and to identify points of difficulty.

Look at coursework questions and specimen exam questions on a topic before the lectures. Thinking how to answer specific questions will help you to stay alert and identify the key points.

Do not try to write down everything that is said in the lectures. Distinguish the main points from the detail and summarise briefly any important main points that are not in any notes that have been provided. Some of the detailed points in the lectures may be available in a textbook or mentioned only for illustration. If you find you cannot make as many notes as you want, then you are probably trying to write too much and will be unable to follow the lecture.

Taking notes involves following the lecturer's argument and summarising points so that you can recall and revise the material. Try to ensure that your notes fall into the same main sections and subsections as the lecture material.

Leave plenty of space when you take notes, so that you can add material later. Write lists vertically, not horizontally along the line.

It often helps to use underlining and capitals to emphasise key words, and to use subheadings and indented text to emphasise the different sections of the notes.

Making the Most of Seminars/Tutorials

Full attendance at tutorials is an essential requirement of the programme. Materials which are discussed in detail in tutorial sessions are closely linked to the questions posed in exams and other assignments. Students who do NOT attend tutorials therefore, place themselves at very high risk of failure. These sessions provide a great opportunity to clarify your understanding of a given topic so make the most of them.

Seminars and tutorials are provided so that you can get help. Go with your own agenda of what you want to learn. Usually a tutor will specify work to be done for the session but will always be happy to answer questions – as long as the question is not seeking specific help with assessed work.

Do read and go over your lecture notes early enough so that you have a chance to ask about any points you do not understand before you have to do assessed work on the topic and while the topic is still fresh in your mind.

It may help you to feel more confident in asking questions if you join a group with someone you know, and collaborate before each tutorial on what questions to ask.

Reading

If there is one main textbook for a module, you should be able to access this via the University Library in electronic format. If there are other books recommended or there are several books recommended rather than one main book, these books will normally be in the University Library but you may need to reserve a copy to make sure that you can get it when you need it. If you are referred to a journal article, this may be available in hard copy in the University Library as a photocopy or in the original bound volume of the journal but increasingly journal articles are available online – the Library catalogue will specify the formats available.

Before starting to read a book or a chapter, glance quickly through it to get a general idea of what it covers. Stop periodically and review in your mind the main points of what you have read so far. At the end, look back over the text for a quick revision.

Adjust your speed of reading to suit the level of difficulty. You should be able to read straightforward material rapidly, but you should also recognise the tricky sections when you must go more slowly. You will need to go more slowly over sections that refer to complicated diagrams, or include bits of, for example, mathematics or many abbreviations.

When you come to a difficult or important part in a book, tackle it systematically, noting the theme of each paragraph, picking out key phrases or key sentences, and asking yourself questions as you read. Do not just read it over several times in the hope that somehow it will come clear.

Make notes and summaries as you read to help you remember what you read.

If you find useful material on a website or in some other electronic form, make notes on it. If you think the ideas are relevant to an essay, write them up from your notes *in your own words*, without looking at the original, unless you need to check a note for accuracy. Only copy and paste electronically if you are careful to put the material in quotation marks – indenting or changing the font can also help to differentiate the quotation from your own words. It is often tempting to copy and paste liberally but it is all too easy to forget where the material came from and to present it as your own work. There are severe penalties for

this – see regulations at https://www.stir.ac.uk/about/professional-services/student-academic-and-corporate-services/academic-registry/policy-and-procedure/.

Look at the questions you have to answer or are likely to be asked on a particular section before reading it. This will help you to concentrate.

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Writing Coursework Answers

This section relates to the writing of any form of answer in your own time that requires some text and is more than just a sentence or two. It may be called, for example, an essay or a project or a paper.

Read the question carefully. Identify the instruction word, e.g. "describe", "analyse", "state" as this will help you to decide what sort of answer is required. Look for the key words that tell you what the question is about. Use any information provided in the question. Occasionally, information may be just a descriptive gloss that does not affect your answer but usually information provided is intended to help you focus your answer on a particular topic.

Start by jotting down points as they occur to you, then flesh them out (or discard them if, on reflection, they are irrelevant) and reorganise them into a logical structure. Allow time to go through one or more drafts before producing the final version. Don't expect to be able to write out a good answer straightaway.

Make sure that everything in your final answer is relevant. Organise your material to answer the specific question, not some more general question like "Write down all you know about . . ." Irrelevance will be penalised.

The page limit is a maximum, not a target. Often the best answers are well below the limit. To keep within the limit:

Avoid introductions that are generalities having little to do with the question. Introductions can serve a useful function: use them to state any assumptions that are general to your analysis, to avoid repetition in the different parts of an answer and to give the reader an idea of the structure of your answer if this is not imposed by the question.
Avoid conclusions that merely repeat what you have said earlier or are vague generalisations that are at variance with your earlier analysis or say nothing.
Do not paraphrase large chunks of textbook. Recognise that a different style is needed. Textbooks need to explain points very fully and in different ways to get the point across. You should aim to be more concise.
Questions are designed with the length limit in mind. If you find that there is a lot of textbook material on the general topic, tailor it to the specific question by being selective and putting it in your own words.

Put your ideas into your own words. An occasional quotation can enhance a report if you think that the author's words are particularly apt, but generally using your own words will gain more credit for understanding the topic. Heavy reliance on quotations or paraphrasing will not produce a good essay as it will not reveal your capacity for independent thought. You must not use the words or ideas of another person without attribution.

Write the final version in clear, concise, grammatical English. Write in sentences (not notes) and use paragraphing to separate the main points. Pay attention to spelling.

It is acceptable to use abbreviations for common terms, e.g. TCP for Transmission Control Protocol. The first time you use an abbreviation, you should explain what they stand, e.g. Transmission Control Protocol (TCP).

State your assumptions before you start the analysis and avoid making unnecessary assumptions as this may mean that you miss interesting possibilities.

A change in a system can often have many possible effects. In general, you should cover all the possibilities, though not necessarily in the same detail. Avoid tediously repetitive coverage of a number of cases that are only slightly different. Those that seem to be remote possibilities may only deserve a brief mention. *It is generally your analytical skills that are being tested, not your empirical knowledge*: beware of completely ignoring cases just because they seem unlikely to you.

Diagrams are often needed for effective answers. Make your diagrams are big enough to show all the features clearly. Hand-written diagrams will usually need to be larger than printed ones to be clear. Number them Fig. 1, Fig. 2 etc. Refer to each diagram in the text, using these numbers, and explain what the diagrams show. Little credit will be given for diagrams that are not mentioned in the text. Try to arrange diagrams to be near the text that refers to them. Putting all the diagrams in an appendix may be easier for you but think how irritating it would be if textbook writers did this.

If you are asked to answer a specific question, e.g. “What will be the effect of . . .” rather than “Discuss . . .” conclude your essay by giving a direct answer to the question, with any necessary qualifications.

Avoid value judgements, i.e. stating opinions. Generally you will get credit for analysing what could happen. An opinion cannot be marked as right or wrong so you will not get any credit for it - you need to be objective. An important part of learning is to distinguish carefully between normative and positive statements.

Present arguments in a balanced and dispassionate way. Avoid journalistic exaggeration and political prejudice. Model your style on that of professionals, not the tabloid press or political manifestos.

Use technical terms. Give a clear definition the first time you use a term. They have usually been introduced in the literature as a short-hand, so using them will save space and enable you to be precise. If a result can be expressed mathematically, and you understand the maths, use maths for the same reasons.

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Read over your answer before submitting it. You will lose marks unnecessarily if the marker has to correct errors that you could have spotted yourself. It is best to do this sometime after writing it so that you come to it afresh. Sometimes a sentence that seemed clear when you wrote it will be much less clear on second reading.

Many of the points above become much easier to put into practice if you use word-processing software from the first draft stage onwards. Microsoft Word is available in the University's computer labs. If you need training, contact the Information Services Help Desk in the University Library.

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Examinations and Class Tests

Look also at the points in the previous section about writing coursework answers. Most of these apply equally to answers written under examination or test conditions.

Check the time and venue carefully. Be available in good time and compose yourself.

Read the instructions on the paper carefully so that you answer the correct number of questions and (if there are sections) the correct number from each section. If you answer fewer questions than expected, you will be awarded no mark for the missing answers. This will seriously impair your chance of getting a good overall grade. For example, if you only write two answers in the time instead of three, you will lose one third of the available marks and so you would have to do well on the questions you do answer even to pass. You may think that you can write better answers if you allow more time per question but this is very unlikely to be the best way to improve your overall grade, as the example shows.

Plan your use of the allotted time carefully. Take time at the beginning to read each question carefully and decide which questions you are best equipped to answer if there is a choice. Allocate your time in proportion to the marks for each question. If, for example, you have two hours to write three sets of questions, spend at least 15 minutes reading the paper and sketching out answers, then about 30 minutes on each question. Keep a few minutes at the end of the exam to read over your answers so that you can eradicate any slips of the pen.

Make sure that you know exactly what a question is looking for *before* you start to answer it. Realising too late that you have answered a different question can be very costly in terms of marks. Avoid rushing into writing all you know about a general topic without reading the question carefully. This will waste time on irrelevant material which will receive no marks.

Do not be deterred from attempting a question simply because it takes longer to read than the others. Long questions generally give you more help on what answer is expected.

Tailor your answers to the time available. Examiners are well aware of the time available to answer a question and will not be expecting long answers, but will be expecting all the main points to be mentioned. If a question is similar to one that you have written before without the time constraint, do not attempt to write the same answer, just aim to get the main points down. An expansive treatment of the first few points will be achieved at the expense of missing later points (and losing the marks for them) or reducing the time for other answers.

Practise writing answers against the clock so that you know how much you can write in the time available for an answer in the exam.

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Write notes before starting any answer that requires a logical argument and organise them, so that the answer is well argued. This will attract more credit than an answer that makes the same points in the order that they occur to you.

Even if a question does not ask for a diagram or example, please include them if you think it helps demonstrate your point more clearly. The examiner is looking to see if you understand the answer to the question and an appropriate and specific example will often demonstrate your understanding.

Writing Assignment Reports, Dissertations & Referencing

The following are some general pointers to help you think about writing reports.

- Make sure you answer the question. It does sometimes happen that students misinterpret what is being asked when reading assignment titles, so make sure you understand exactly what you are being asked to do. Ask your tutor if you are unsure.
- Prepare thoroughly: read, make notes, and think about the subject well in advance.
- Try to structure your report so that everything you say takes its place in an overall developing argument or discussion. Random, disconnected points generally don't add up and don't convince the reader that you have much of a grasp of the topic. To help do this it's always a good idea to plan the structure of your assignment before you write it.

It's also a good idea to inform the reader of what you're doing and why you're doing it. This is called signposting: a brief introduction will map out the direction you intend to take and what you intend to achieve, and signposts along the way will guide the reader through your argument. A short concluding paragraph is also helpful in summing up what you have written and stating what conclusion you have reached.

- Try to be concise and to the point. Think of the most economical way of putting every point across.
- Similarly, try to be as clear as possible. If you don't understand what you have written, the chances are that nobody else will either. Avoid the use of jargon unless you are sure what it means.
- Following on from this, try to put things in your own terms. There is no sense in regurgitating passages from books that you clearly don't understand, and this in any case carries the risk of the serious offence of plagiarism. A good assignment report demonstrates both an understanding of relevant sources and independent thought about a topic.
- Illustrative examples may make what you have to say more vivid, immediate and obvious. Relating an abstract argument to something concrete, perhaps in your own experience, can bring an idea alive and convince the reader that you know what you are talking about.

Similarly a well-chosen quote can often clarify and enliven a point you are trying to make and can demonstrate that you have grasped the essence of a reading. Don't use too many quotes, though – the assignment is meant to be your own work, after all – and don't use quotes if they add nothing to your argument. If a point you are making is clearly derived from a published source, and when quoting from published sources, you must acknowledge this.

- Include a complete bibliography of sources used, in proper bibliographical form (see below).
- Finally, review what you have written to check that it makes sense. No matter how good your ideas are, if they are poorly expressed your grade will be lowered. Check your spelling, grammar and punctuation and make sure that no mistakes have slipped through. This process takes only minutes but can make a difference to your grade.

Referencing Your Work

A crucial part of your academic studies will often include reading extensively around your subject and integrating other people's research with your learning. You need to use 'evidence' from the literature to support your arguments and answer questions. As part of this process you need to make sure the reader knows where you are getting your information and how it relates to your own ideas and conclusions.

When using ideas, research, data, evidence, facts, diagrams etc. from other sources they need to be clearly distinguished from your own ideas. They must be carefully acknowledged to give credit to the authors and allow the reader of your work to trace the original resources if they wish to. Referencing will help you in this process.

Acknowledge the sources you have used by citing them within the text of your work and also in a list of references at the end of your assignment.

7. Guest Lectures

Guest lectures typically take place on Friday afternoons between 13.00 and 14:00 in room 4B96 in the Cottrell building.

We believe it is very important to provide opportunities for students to engage with professionals to complement the theory that you learn during formal classes.

We are already preparing an exciting line-up of guest lectures, so please keep an eye open for announcements on Canvas detailing who will be speaking on a given week.

8. Student Competitions and Prizes

This Programme Handbook should be read in conjunction with the Core Handbook. Please download a copy to your personal records for future reference.

Throughout your programme, you will have the opportunity to participate in the following competitions, with the chance to win prizes and awards that recognise your achievements and excellence. The Division may award the following prizes:

- Best CSCU9Z7 Honours project.
- The prize for the best third year student (across semesters 5&6).
- The prize for the best second year student (across semesters 3&4).
- The prize for the best first year student.
- The Faculty prize for Research-Based learning.

In addition, the Division nominates students for 1 national prize:

- ScotlandIS Young Software Engineer of the Year

9. Accreditation

The Software Engineering degree is accredited by the BCS. This accreditation process requires that students have taken a very specific set of modules that are listed in the Software Engineering programme requirements. The Computing Science, Business Computing and Data Science degrees are more flexible and provide more choice. These programmes cannot therefore guarantee that all modules required for accreditation have been completed by a particular student and were therefore omitted from the accreditation process.