Department of Computer Science

CS3605 Business Computing
CS3072 Computer Science
Final-Year Project
Undergraduate Study Guide for 2022/23

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Module Details

Module Leader	Dr Fang Wang
Department	Computer Science
Credits	40
Other staff	Alina Miron, Isabel Sassoon, Rob Macredie, Emma Batley
Contact and private study time	Lectures 5 hours Supervision Meetings 20 hours Labs/Seminars 126 hours Coursework Study 250 hours Total 400 hours
Assessment	Coursework 100%

Access to Support Material and Additional Information

Most teaching, learning and support material is provided electronically via the University's Brightspace system. Note that the details provided in this study guide are based on the formal module syllabus for this module which sets out the agreed content, learning outcomes, assessment and teaching methods. Module syllabus and scheme of studies documents for your programme of study can be found by on the University's Quality Assurance web pages.

Introduction/Aims/Background

The aim of this module is to *enable students to demonstrate an integrated approach to the topics covered in the degree programme. In particular:*

- *acquire analytical and problem-solving skills*
- *recognise and define a problem to be explored and the work to be completed through experiential rather than passive learning*
- *develop skills for independent research and development*
- *develop the ability to describe and solve a problem in such a way that it can be measured*
- *adapt and apply academic knowledge and skills in the investigation and solution of a problem*

Some of these aims relate to high-level concepts, such as independent inquiry, whilst others are lower level, more practical concepts, such as report writing. Nevertheless, they all have a part to play. The final-year project is an opportunity for you to demonstrate your ability to tackle a substantial problem. Within the project, you will investigate the relevant literature and make informed decisions regarding the approach through which the problem is solved. This process, of considering alternative approaches and deciding which one to apply, is an integral part of the project. Thus, it is vital that your final report reflects this process by discussing the choices made rather than simply outlining your solution.

The project is a 40-credit core module, and is a component in all undergraduate programmes. This module brings together **knowledge and skills accumulated throughout the undergraduate programme** and provides an opportunity to research a topic in your discipline in depth. It will require you to work under your own initiative (with the guidance of a supervisor) and to use and demonstrate your analytical, critical and development skills in the context of a problem-solving project.

LEARNING OUTCOMES

Whatever module or programme of study you are studying for at Brunel University London, there are learning outcomes (LO) that you must meet/achieve in order to be awarded the credits which comprise the module and programme of study. In order to get a pass grade (D- or above) in this module, you must meet these learning outcomes below; that is, you must demonstrate ability to:

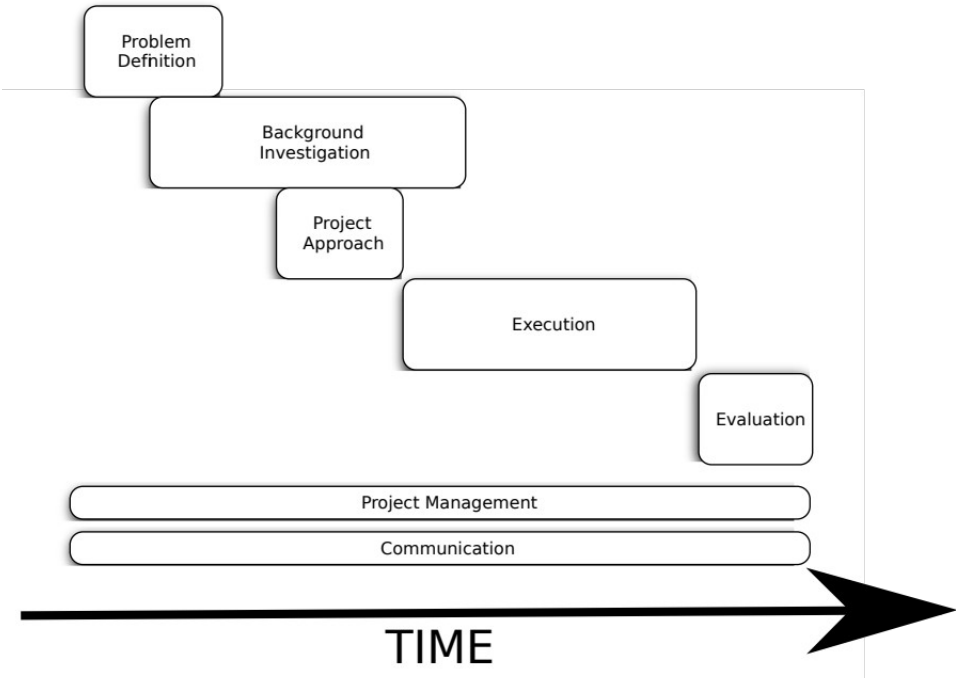
1. Clearly define a problem which demonstrates a real need, and set aims and objectives which, if met, will result in: (i) an appropriate solution to the problem and (ii) an evaluation of the extent to which the solution addresses the problem.
2. Undertake relevant background investigation using appropriate sources, analysing and evaluating the information found in order to: (i) clearly define the problem being addressed and (ii) identify ways in which a solution may be developed and evaluated.
3. Apply practical and analytical skills to develop an information system solution which addresses the problem set out in the aims and objectives. This should include the use of relevant methods, tools and techniques. For Computer Science students, this must include the implementation of a non-trivial software solution. For Business Computing students, this must include a detailed focus on design[1].
4. Identify and use appropriate methods to evaluate the proposed solution and draw conclusions as to its effectiveness.
5. Use project and self-management skills to plan and monitor the project process, and to undertake a critical self-evaluation which identifies how the project could have been better undertaken.
6. Effectively communicate relevant project ideas, approaches, solutions, and evaluation.
7. Demonstrate engagement with the University's ethics process and, where required, gain formal ethical approval from the University and evidence this in the project report.

In meeting LO 7, the project will also allow you to demonstrate awareness of ethics and professional issues in accordance with the British Computer Society guidelines for professional software development practice.

[1] Please note that, in this context, design does not mean that you should design a system or its interface but not implement it. It means that if you choose, as a BC student, not to implement software, that there should be more effort put into the design of your project, solution, and the underlying methodology. For example, you may undertake a more complex evaluation, or you may undertake more primary data gathering.

The Project Process

The diagram below captures the process that you are going to be going through as you complete your project. The learning outcomes, the lectures and the activities that we run in the lectures and seminars, the deliverables that we ask for, and the supervisor support that we offer are all designed to play into this process. Of course, each student's path through this process will be slightly different, but this diagram should give you a starting point for understanding the project and the process and phases you will go through.



In the first month, you should be defining what your problem is. We will provide you with support to clearly identify your problem, and aims and objectives to focus your project. You will also start to explore background material that is useful for you to produce a good project. We will help you to understand how to search for relevant literature in different locations, and evaluate the material that you find to ensure that, as a result, you add value, not just content, to your project and final report.

We will help you to design how you are going to go about your project. It is important to recognise that you need a suitable design for your project – you cannot just follow a set recipe in a prescriptive fashion. A drug trial, a software product in a start-up company, business modelling exercise and a building re-design are all significant projects, but ones which will be run in very different ways to achieve good outcomes.

You will need to motivate yourself, use previous skills and develop new skills to follow your approach and complete the substantive work for your project. The nature of this will vary from project to project.

Finally, you will need to evaluate the results of your project. To what extent did the outcome of your project meet the aim you set right at the beginning?

Throughout your project, you will need to manage yourself, your supervisor, your colleagues and maybe outside parties. You can draw your experience of project management and develop more in this area through personal research, but you will also be given dedicated support in the FYP lectures, and you have a project supervisor who will offer advice. You also need to learn to write …. a lot. Do not see writing just as the end-product. You will find that it is essential to write, draw diagrams and present material in order to clarify your thoughts.

What Can My Project Be About?

Computing is a broad subject and, as such, you have a wide choice as to what to focus on for your project. However, you need to be aware that there are certain requirements that must be met because of the particular programme that you are following. Some of these requirements are set by the British Computer Society, the professional body that accredits our programmes. In general, your project needs to pose a problem which is then addressed with an Information Systems solution.

Computer Science or Business Computing

If you are registered for **Computer Science**, your project must include a technical solution. Usually, this will be in the form of a significant piece of software that you design, implement and test, using a modern programming language (e.g., C, C++, Java, Scala, C#, etc.). A few web-pages with a small amount of JavaScript or PHP would not meet the requirements, and nor would producing a package using a 4GL, such as Dreamweaver. On the other hand, constructing a solution which requires the configuration of a particularly complicated framework, for example a complex distributed/cloud framework with some software demonstrators may well be sufficient. As students work on such diverse and ever-changing areas, it is difficult to be prescriptive, but your supervisor, and the final-year project team, will be able to advise on whether your project is technical enough.

There is no explicit requirement for **Business Computing** students to implement a technical solution, however there is no reason why you should not implement software. A Business Computing project is not simply a Computer Science project without the coding – students who take this approach should be unsurprised if they are awarded a D grade or lower. Whatever you do, you should still keep in mind that you are producing a solution to a problem which you will evaluate. This might be, for example, a new kind of e-Commerce business model for a retailer; a different kind of user interface design for a mobile phone; the design of an IT system to help parking at the university. In each case, these projects could be evaluated by implementing and testing the software, but could also be evaluated with simulations, mock-ups, interviews, focus groups, etc.

In all cases, the best way forward is to discuss your ideas with your supervisor, and work out a way to design a project which will meet the requirements.

Specialisms

If you are registered for a programme with a specialism you must make sure that your project is aligned with your specialism. If it is not, then the university will only award the non-specialised version of the programme. You should seek guidance from your final-year project supervisor and/or the final-year project team, but the following may help.

BSc Computer Science with a specialism:

- **Artificial Intelligence**: Software artefacts (or programs) that display apparently intelligent behaviour (including machine learning paradigms) applied to the production of innovative and useful artefacts.
- **Digital Media and Games**: Software artefacts targeted at the entertainment market and their development and implementation.
- **Network Computing**: The ways distributed information systems work and their development and implementation.
- **Software Engineering**: The management, organisation and execution of large-scale software design and development activities including reuse and integration. During the development process, you need to demonstrate the use tools and techniques such as those covered in the software Engineering module for developing good quality code that is maintainable in the future (e.g., fault reduction strategies). You should use a good tool set during your development, e.g., proper version and build control tools. In summary, you need to develop a software system (not necessarily a huge one) using a range of real-world sophisticated techniques to ensure the end-product is of good quality.

BSc Business Computing with a specialism:

- **e-Business**: Business processes where transactions between organisations (or organisations and individuals) are executed across electronic systems such as the Internet and other public networks.
- **Human-Computer Interaction:** The interface with a computer-based system and its ability to facilitate or frustrate business processes and social activities.
- **Social Media:** The nature and value of computer systems that support Information exchange and social behaviour within the community.

Ethics Approval

The university requires that **all** project work follows ethical procedures and conforms to ethical standards. Consequently, you are required to discuss the ethical aspects of your proposed work with your dissertation project supervisor and, under their guidance, complete the ethics approval process using the BREO system (this is required to meet LO 7). The ethics process will be explained in a separate document that will be released on Brightspace and will be discussed in detail, together with a BREO demonstration, in the Lecture in Week 3.

Once you have received the formal ethics approval letter, you may start your data collection. **You MUST NOT carry out any activity that involves other people in your project before you obtain this letter.** When no other people are involved and only secondary data is used in your project, **you SHOULD NOT use secondary data until the NER (No Ethics Required) email has been received as a result of a BREO submission.**

Working with Outside Companies

Sometimes students have the opportunity to involve outside companies in their dissertation work. Please be aware that Brunel University London accepts no liability for any advice or software provided to case study companies in such cases. Furthermore, in supervising dissertation work, staff members accept no duty of care in relation to any work undertaken within case study companies. Students working with outside companies as part of their dissertation should make those companies aware that the student retains the copyright of any software developed as part of their project. Formal collaboration agreements can be negotiated between an outside company and the University (via the Research Development Support Office) if needed. If it is a necessary condition of working with a company, it is possible (although rare) to restrict the finished dissertation reports to within the university, and not to publish them for a specified period of time. Please speak with a member of the FYP team for more advice on your specific case.

Method of Teaching

You will complete most of the work for your final year project independently. We have put together a programme to support your work, which comprises lectures, weekly meetings with your supervisor, a set of seminars and drop-ins, and support material and discussion boards on Brightspace.

LECTURE/SEMINAR/LAB PROGRAMME

This module has been scheduled to run during Term 1 and 2 and the lectures are scheduled as follows:

Term 1

Week	Lecture Topic	FYP Friday
1	**Introduction** Project Overview, Aims and Objectives	
2	**Getting Started** Project Approach	**ASK Seminar: Topic Selection and focusing** **Project Drop-In** *FYP-Team*
3	**Ethics and Synopsis**	**Seminar: Ethics, Project Approach & Help I'm lost** **Project Drop-In** *FYP-Team*
4		**Project Drop-In** *FYP-Team*
5		**Project Drop-In** *FYP-Team*
6	**Task 1 SYNOPSIS HAND IN 28 October**	**Project Drop-In** *FYP-Team*
7	**Effective Learning Week**	
8	**Task 2 FEEDBACK HAND IN 11 November**	**Project Drop-In** *FYP-Team*
9		**ASK session: Basic Statistics** **Project Drop-In** *FYP-Team*
10		**Project Drop-In** *FYP-Team*
11		**Project Drop-In** *FYP-Team*
12	**Plenary Session** Interactive Q & A **Task 3 ETHICS CONFIRMATION HAND IN 09 December**	**Project Drop-In** *FYP-Team*

Term 2

Week	Lecture Topic	FYP Friday
17	**Evaluating your project** How to evaluate your project, and discussion of a case study of an evaluation method.	**Project Drop-In** *FYP-Team*
18		**Seminar: User Evaluation** **Project Drop-In** *FYP-Team*

Week	Lecture Topic	FYP Friday
19		**Project Drop-In** *FYP-Team*
20		**Project Drop-In** *FYP-Team*
21		**Project Drop-In** *FYP-Team*
22	**Effective Learning Week**	
23	**PRESENTATION WEEK**	
24		**ASK Seminar: Thesis Writing** **Project Drop-In** *FYP-Team*
25		**Project Drop-In** *FYP-Team*
26		**Project Drop-In** *FYP-Team*
27		**Project Drop-In** *FYP-Team*
28	**Dissertation electronic submission 31 March 2023**	

Please note: Week 7 in Term 1 and week 22 in Term 2 are weeks during which there are no scheduled lectures, labs, seminars or tutorials. Week 17 is the first week back after the Christmas break.

FYP Friday

Every Friday from week 2 onwards is scheduled as FYP Friday. Although this is by no means the only day you should work on your project, you should take advantage of the fact that this day will only be interrupted by other modules on a few occasions. An area will be booked exclusively for Level 3 project students, and members of academic staff will be running a series of drop-in troubleshooting sessions throughout the year. Some are noted in the schedule above and details of others will be published in due course. Sessions can be organised on specific topics where enough people in the cohort want them (for example, on conducting user evaluation). Where the schedule above does not identify a specific topic being covered in a drop-in session, members of the FYP team will be available at certain times during the day for general support. You can arrange support directly with them for these sessions or they will be available for 'drop-ins' at set times to offer support if anyone requires it.

Project Supervision

You should usually meet with your supervisor on a weekly basis. Your attendance at meetings with your supervisor will be recorded. If, for any reason, you cannot attend a scheduled meeting you should let your supervisor know in advance of the meeting.

Individual supervisors will vary in the way that they supervise – some will use individual meetings, but many meet with a group of students. Each lecturer's style of supervision will vary, but the lists below should help to set your expectations.

You should expect your supervisor to:

Provide guidance on the project process
Guide you in finding suitable background material
Help you to scope your project
Help you critically review information that you find
Challenge the ideas that you present to them
Review each deliverable of your dissertation at least once

Help you to monitor your progress and plan accordingly
Help you to troubleshoot when things don't go to plan

You should not expect your supervisor to:
Provide you with a prescriptive 'to do' list for your project
Proof-read your dissertation
Write your deliverables
Write software for you
Review work at short notice
Meet you at short notice because you did not attend a scheduled meeting

READING LIST

Core reading list
There is no core reading list for the Final-year Project.

Supplementary Reading

Berndtsson, M., Jorgen Hansson, B. Olsson, Lundell, B. (2007) Thesis Projects: A Guide for Students in Computer Science and Information Systems. 2nd edition. Springer (previous 2002 edition: Planning and Implementing your Final Year Project - with Success! A Guide for Students in Computer Science and Information Systems).

Coolican, H. (2019) Research Methods and Statistics in Psychology. 7th Revised edition. Taylor & Francis Group.

Cornford, T. and Smithson, S. (2006) Project Research in Information Systems - a Student's Guide. 2nd Edition. London: Macmillan.

Cottrell, S. (2011) Critical Thinking Skills: Developing Effective Analysis and Argument. 2nd edition. Palgrave Macmillan.

Cottrell, S. (2013) The Study Skills Handbook, 4th Edition, Palgrave Macmillan

Dawson, C.W. (2015) Projects in Computing and Information Systems: A Student's Guide, 3rd Edition, Pearson Education.

Dawson C.W. (2009) The Essence of Computing Projects; A Student's Guide. 2nd Edition. Addison Wesley.

Oates, B.J. (2022) Researching Information Systems and Computing. 3nd Edition. Sage, Los Angeles.

Phillips, J. (2010) IT Project Management: On Track from Start to Finish, 3rd Edition. McGraw-Hill Osborne.

Rudestam, K.E. and Newton, R.R. (2015) Surviving Your Dissertation: A Comprehensive Guide to Content and Process. 4th Edition. Sage Publications.

Saunders, M., Lewis, P. and Thornhill, A. (2019) Research Methods for Business Students. 8th edition. Pearson.

Weaver, P. (2004) Success in Your Project: A Guide to Student System Development Projects. FT Prentice Hall.

Wysocki, R.K. and McGary, R. (2006) Effective Project Management: Traditional, Adaptive, Extreme. 4th Edition. Wiley.

Please note that there is a wealth of material, much of it freely available on the web or in the library. The above are suggestions but you are encouraged to search for and make use of other sources.

It is important that you learn to become self-reliant and able to access and assimilate material for yourself. Many of the topics necessary for this project will not be covered by lectures. Therefore, you will need to work through the exercises and guidance material provided in labs, via Brightspace or from your own investigations.

ASSESSMENT

The main element of assessment on which your FYP grade will be determined is a dissertation, which you will submit at the end of the academic year. Because this is a significant piece of work, there are two other points at which we will assess your performance with a view to providing you with feedback which you should use to improve your work.

Synopsis
Early in the project process, you will submit an outline of your project, which you will discuss with your supervisor at a review meeting. You will document the feedback you receive from discussions with your supervisor as a record of your understanding of your supervisor's assessment of your progress. If your supervisor is satisfied with the synopsis, you can proceed with your project, but, if not, then we will invite you to a kick-start programme through which you will receive additional support to ensure that you are on track with your project. The synopsis will also lead you into the ethics process using the BREO system. If you do not engage with the ethics process and secure ethical approval (or a clear statement that your project does not require ethical approval), your project will not pass (since it will not meet LO7).

Project Presentation and Made in Brunel Software Innovation.
By the end of February 2023, you should be at a stage where you have completed the substantive part of your project and will be in the process of evaluating your results, finishing your writing, and refining your overall project. In week 23 (20 – 24 February 2023) you will be invited to give a short presentation to a member of the academic staff, and other students as part of the Made in Brunel programme. The best projects will feature in the main Made in Brunel evening event which will be attended by a number of our commercial partners. During your project presentation session, you should expect to answer questions, and will receive advice on how to make any further improvements to your project.

Software
You must demonstrate your software to your supervisor during your usual supervision meetings, and to your second marker during your presentation. If you have not been able to demonstrate your code, you will be invited to a short viva. It is very important that you can demonstrate authorship of your code, and clearly identify in your dissertation, and during any presentation or viva what is your work, and where you have included software written by others. It is acceptable and normal practice to incorporate code written by others in a software solution. What is unacceptable is deliberately, or recklessly, passing off other's work as your own.

A Computer Science student who does not demonstrate their software will fail their overall project. A Business Computing student who does not demonstrate their software will have that software disregarded, which is likely reduce the grade for the overall submission.

Late Coursework
The clear expectation is that you will submit your coursework by the submission deadline stated in the study guide. In line with the University's policy on the late submission of coursework (revised in July 2016), coursework submitted up to 48 hours late will be accepted but capped at a threshold pass (D- for undergraduate or C- for postgraduate). Work submitted over 48 hours after the stated deadline will be graded as Non-Submission (NS), without accepted Extenuating Circumstances. Work submitted more than 5 days late will not normally be accepted.

Deliverables and Feedback – Important Dates
You should prepare and submit all coursework according to the instructions in the relevant assessment brief. You should make sure that you are fully aware of the University's policy on plagiarism and collusion. You should also be aware that you *cannot* later claim that you did not know the rules and regulations as you must make yourself familiar with them. If you cannot complete any work on time, you should look at the Department's instructions on what to do. The Department policy is that all coursework must be submitted electronically via the WISEflow system. Please navigate to the Brightspace pages for this module for further details. You will get feedback on your performance via WISEflow for this module. If do not receive your feedback by the given date, you should first contact the module leader. If it proves necessary, you should also contact the Director of Undergraduate Studies.

The important dates:
In the table below, the key dates and tasks associated with the assessment for the module are set out.

Task	Assignment Title	Available on Brightspace	Submission deadline	Feedback due	Weighting (%)
T1	**Project Synopsis**	19 September 2022	28 October 2022	11 November 2022	0%

T2	**Synopsis Feedback** (**Ethics – Checklist** is integrated with Task 2 Feedback, but you must use the **BREO** system to formally record the ethics process)	19 September 2022	11 November 2022	25 November 2022	0%
T3	**Ethics – BREO Online Submission** (all projects must go through ethical consideration and, where appropriate, approval)	This uses the BREO system; you must submit an ethics application using BREO	09 December 2022*	Normally within three working weeks	0%
T4	**Presentations**	19 September 2022	20 – 24 February 2023	Informally, during presentation	0%
T5	**Dissertation**	19 September 2022	**31 March 2023**	With final results	100%

* ethics submission deadlines are not compulsory, but it is at your risk if you fail to submit by these deadlines, as you may not receive ethical approval in time to undertake a satisfactory evaluation, which in turn could affect your final grade. Not securing ethical approval (or a clear statement that your project does not require ethical approval) will lead your project to fail (since it will not meet LO7). You must not collect any primary data gathering activity before you have ethical approval.

Note: all deadlines are at **11.00 a.m. UK time** on the stated date (e.g., if the deadline is 1 February, it means the deadline is 11 a.m. UK time on 1 February)

Additional Vital Information

The College Student Handbook can be found on the University's web pages. The handbook is a useful source of information for all aspects of your studies, including procedures of how to inform us of problems you are facing with your studies, how to apply for an extension to your coursework, plagiarism, house style for assignments, joint and group work submissions and other important matters. The Department assumes that you familiarise yourself with this information, so you will need to look at these pages carefully at various times throughout your studies. The Department also operates within the rules and regulations of the University more generally, and you should also look at what are known as 'Senate Regulations' on the University's web pages. These policies and procedures might change from one academic year to another, and it is in your interest to review them on an on-going basis.