



School of Engineering and Built Environment

Dept. of Computer, Communications & Interactive Systems

**Honours Project (CCIS)
Study Guide**

(MHW222996)

for students on :

BSc Computing

BSc ITMB

BSc SdFB

BSc Cyber Security and Networks

BEng Networked Systems Engineering

BEng Digital Security, Forensics and Ethical Hacking

BSc Computer Games (Design)

BSc Computer Games (Software Development)

BSc Computer Games (Indie Development)

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Prepared by Brian Shields and Yan Zhang

From original documents developed by Richard Foley and Caroline Parker

Table of Contents

1	Introduction to this Guidance Material.....	4
1.1	Contents and Purpose of this Handbook/Study Guide	4
1.2	Co-ordination and Management of the Honours Projects	5
1.3	The importance of the Honours Project.....	6
1.4	The importance of understanding the project module, planning it and the amount of effort involved.....	7
1.5	Support and Assistance in undertaking your Honours Project	10
1.6	A common student misconception regarding the role of an Honours Project Supervisor	10
1.7	Outlining the Material in this Guidance Handbook.....	11
1.8	Learning what is meant by a research-based project at Honours Level	12
1.9	Research Question / Problem Statement	13
1.9.1	Examples of Problem Statements	13
1.10	Using “supplementary” methods	15
1.10.1	Developing an IT product/computer based solution.....	17
	Common Pitfalls in developing an IT product/computer based solution	18
1.10.2	Experimental Projects	19
	Experiment Examples	19
	Key Points	20
1.10.3	Practical or Simulated Network/Security based Evaluation	20
	Common Pitfalls in a Network/Security-based Experimental Project	21
1.11	The distinction between Primary and Secondary Research.....	22
1.12	BCS Accreditation Requirements.....	22
2	Steps in undertaking your Project	24
2.1	Step 1 - Selecting your topic - done in RSPI	24
2.2	Step 2 - Undertaking the Initial Literature Review to identify a research question - done in RSPI	24
2.3	Step 3 – The Main Literature Review and Technology Assessment , learning what others have found out about your area	24
2.4	Step 4 – Fully design methods for Primary Research.....	27
2.5	Step 5 – The practical implementation (Execution) phase	27
2.6	Step 6 – Collating and analysing results.....	28
2.7	Step 7 – Thinking critically about your approach and the data	29
2.8	Step 8 – Drawing overall conclusions	29
2.9	Writing up.....	29
3	The Honours Project Timescales and Milestones.....	31
3.1	Summary of Honours Project Process and Timetable	31
3.2	Additional Guidance Sessions and Material.....	34
3.3	Project planning	35
3.3.1	Ensuring your plan includes keeping a secure back up of your project work.....	35
4	Dealing with Ethical Approval of your Project	37
5	Interim Report format	38
5.1	Interim Report Chapters	38

5.1.1	Some further initial notes about writing a Literature Review.....	40
6	Final Project Report format	42
6.1	Report structure	42
6.2	Preliminary pages	43
6.2.1	Title page	43
6.2.2	Abstract	43
6.2.3	Acknowledgements.....	43
6.2.4	Table of contents/Table of Figures	44
6.3	Introduction	44
6.4	Literature Review and Technology Assessment	44
6.5	Execution	44
6.5.1	For development-type projects :	45
6.5.2	For experimental-type projects :	46
6.6	Evaluation and Discussion.....	46
6.7	Conclusions and Further Work.....	47
6.8	References	48
6.9	Appendices	50
6.10	Final words on the report.....	50
6.11	Writing style	50
6.12	Report size	51
7	Handing in your Honours Report	52
8	Honours Conference and Project Poster Presentation	53
9	Assessment of the Project.....	55
9.1	Supervisor awarded marks for Student Effort and Supervisory Meeting Records..	56
10	Supervision of Projects.....	57
10.1	Project Monitoring and Grievance Mechanism.....	57
10.1.1	What is expected of students.....	57
10.1.2	What is expected of supervisors	58
11	Turnitin and Plagiarism.....	59
11.1	Using Turnitin.....	59
11.2	Plagiarism	59
11.2.1	SMILE.....	59
11.2.2	Code of Student Conduct	60
12	Appendix A: Ethics guidelines for Honours Project students.....	62
12.1	Outline Guide to the General Process.....	62
12.2	Ethical Consideration and Approval Form (for UG Student Projects).....	65
	Appendix B: University Policy on Project and Dissertation Supervision	68
	Appendix C: Supervisory meeting record sheet.....	72

1 Introduction to this Guidance Material

1.1 Contents and Purpose of this Handbook/Study Guide

Your Honours Project is, without a shadow of a doubt, the most important aspect of your final year. It is a 40 credit module and is undertaken across both Trimesters. It is a practice-based capstone project.

A practice-based capstone is a project in which the student develops a solution to a specific, and challenging, problem using an approach related to professional practice within his or her area of study. The term ‘capstone’ comes from the final decorative ‘cap-stone’ used to complete a building or monument: a capstone project is the culmination of a programme and requires application in a “real-world” setting of knowledge and theory learned during the programme.

It is expected that the project should involve the **creation of an artefact of some kind that implements a solution to a specified problem**. The nature of that artefact will depend on the discipline and on the nature of the specific problem addressed within that discipline. Examples of such artefacts may include: software applications (which may involve coding or may involve configuring and adapting “off-the-shelf” software for a specific problem); process models; network designs; and so on.

That is, the project will require you to utilise specific skills of research and enquiry which, amongst other things, will require you to review and critically analyse (secondary sources of) academic literature to provide academic rigour to support your primary work.

These are skills which are not particularly well-developed in the earlier years of BSc/BEng programmes (or at least not as well developed as, say, in BA students). Thus, you were “prepared” for it through the **Research Skills and Professional Issues (RSPI) module** at Level 3. This module provided you with information and practice in the main research and planning techniques which you will need to use and understand to succeed when you undertake your project.

The RSPI module culminated with its **assessment** which **is a fully detailed project proposal and outline plan for your Honours Project**. The proposal was assessed as a “free standing” piece of academic work. However, guidance and support for both the technical and process aspects of your Honours Project are the responsibility of your allocated project supervisor.

This Study Guide is a collection of all of the guidance material to help final year Honours students undertake their Honours Project. By reading it and following its advice you should be better prepared for your Honours Project.

The University also issues guidelines on Project and Dissertation Supervision. These also apply, as are appropriate, to the arrangements for this Honours Project. This study guide also acts as the Module Handbook for that purpose and it meets all of the requirements of the University Guidelines. For completeness, a copy of the university guidelines is included within the appendices of this handbook.

Whilst the requirements of the University Guidelines are covered in the course of the material contained in this guide, the regulations ask students to take particular note of specific assessment regulations. These are:

- Penalties for late submission
- Cheating and Plagiarism

Assessment Regulations are available on the University web-site.

1.2 Co-ordination and Management of the Honours Projects

A number of different BSc and BEng programmes take the same Honours Project modules. There is a single overall Module Leader for those Honours projects. However, there is separate individual Honours Project Co-ordinators for each Programme Suite.

The overall Module Leader for the Honours Projects is Brian Shields.

Students should address any issues concerning the management or co-ordination of their project to the individual Project Co-ordinator for their Programme Suite. The details of each project suite co-ordinator are given below:

Programme Suite	includes	Project Co-ordinator
Software Engineering Suite	<ul style="list-style-type: none"> • BSc Computing • BSc ITMB • BSc SDFB 	Brian Shields M605a (B.Shields@gcu.ac.uk)
Computer Games Suite	<ul style="list-style-type: none"> • BSc Computer Games (Design) • BSc Computer Games (Software Development) • BSc Computer Games (Indie Development) 	David Moffat M622 (D.C.Moffat@gcu.ac.uk)
Networking-Security Suite	<ul style="list-style-type: none"> • BSc Cyber Security & Networks • BEng Digital Security, Forensics & Ethical Hacking • BEng Networked Systems Engineering 	Ali Shahrabi M620d (A.Shahrabi@gcu.ac.uk)
Module Leader :		Brian Shields M605a (B.Shields@gcu.ac.uk)

The Digital Design Suite of programmes will use **SEPARATE** teaching material *provided by Bruce Wood*.

<i>Digital Design Suite</i>	<ul style="list-style-type: none"> • <i>BSc Digital Design (Graphics)</i> • <i>BSc 3D Animation and Visualisation</i> • <i>BSc Computer Games (Art and Animation)</i> 	<i>Bruce Wood</i>
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Note the Project Co-ordinator for your specific programme.

All queries regarding the management and co-ordination of your project should be addressed to him.

1.3 The importance of the Honours Project

The Honours Project is probably the most crucial module of the Honours year for a number of key reasons:

- It is worth more credit than a "standard" module and thus has a greater overall weighting in determining the class of Honours degree you can obtain.
- Under the **“best 180” credits system** for calculating the classification for an Honours Degree, this module must be included in the calculation. It cannot “drop out” if there are other taught modules across levels 3 and H which have a higher mark.
- If you fail (even marginally) in your Honours Project, you will **not** be awarded any class of Honours degree in your named programme. Your performance in a project module **cannot**, under the University regulations, be compensated.
- If you are allowed to resubmit a failed Honours Project as a second attempt¹, then (as with any resit module included in the Honours re-calculation) the mark used for calculation purposes will be considered to be **capped at 40%** and with the Honours project being more credit points this weighting will have a greater influence of your overall award level.

However, notwithstanding all of this, the Learning and Teaching Strategy for, and **the associated skills needed by a student to succeed in, the Honours Project are quite different from those which you will previously have experienced** on any previous (or current) taught modules.

A recurring comment we hear from students during the course of their final year goes something like "I cope with doing the taught modules okay; it was just the project I couldn't get a grip on". This phrase clearly demonstrates the naivety of students (even in the final year). An Honours degree (achieved after year 4) is quite different in academic terms from an Unclassified degree (achieved after year 3). A BSc/BEng unclassified is all about a student demonstrating "routine competencies and skills" across a range of related subjects in their chosen programme discipline area. Essentially these often include most of the "bread and butter" technical skills which you would initially require as a foundation for your first job. However, an Honours degree is distinctive since it is about additional (more academic/research related) skills, such as:

- Systematic & extensive knowledge of ... incl. some at the forefront of the subject
- Critical understanding ... including advanced and emerging ... and ability to deploy techniques of analysis and enquiry within the subject
- Comprehensive knowledge in advanced techniques and skills ... incl. some at the forefront of the subject

¹ Being allowed to resit one or more failed Honours modules is now generally a "normal" decision of the Assessment Board, but not guaranteed. If you are allowed a resit in one or more Honours modules by the Board you are only allowed one additional attempt, not the 3 possible resit attempts at modules, previously available, in years 1, 2 and 3.

- Skills for ... and interpretation from a range of evaluated sources including current research, scholarly and/or professional literature

It is in the final year Honours Project (in all University Degrees) that these distinctive characteristics are found. Not being disrespectful to the other (taught) modules in your final year, whilst some elements of their material is obviously a bit more advanced than previous years and you are expected to be that little bit more independent in your studying of them, it is in the Honours Project where all of these independent (and comparatively new) skills need to be exhibited by yourself to get on well with it. **Remember, you already have most of the study skills to be able to cope with the study of "taught" modules; it is the Honours project that you probably don't (at the start of the process) have the distinctively different required study skills for!**

The other (possibly unfair!) characteristic of an Honours Award is that generally (in a BSc/BEng) you haven't seen these skills much in the previous three years, but nonetheless are expected to develop them to the appropriate standard! That (in our programme design) is why we have the "pre-cursor" RSPI module to help you. This module (at least) gives you the opportunity to learn and develop these skills. However, the module's Learning and Teaching style does include a significant amount of independent (but directed) learning (so that hopefully you then become independent and self directed in your project itself).

Anyway, what all of this commentary should indicate to you is that the last thing you want to do is jeopardise your chance of a good Honours Award by not understanding the distinctions in this type of (project) module, not appreciating and/or putting in the necessary balance of effort, and not developing the distinctive new skills necessary to cope with it.

1.4 The importance of understanding the project module, planning it and the amount of effort involved

The Honours Project is a substantial piece of individual work concerned with a problem that is of practical value to the discipline of your programme (e.g. Computing, Computer Games, Networking, Security), and which (hopefully) reflects your own interests. This study will include the development and identification of an appropriate research question/problem statement. The will also generally require a computer-based implementation/or experimentally based implementation involving computer software, of some type.

The role of the Honours Project is to allow the student to:

- Demonstrate the ability to plan and carry out an in-depth research or practice-based capstone project as appropriate to the area of study and to work independently
- Demonstrate a clear understanding, as appropriate to the problem, of techniques, technologies and tools for the chosen area of work.
- Demonstrate literature review, analysis, synthesis and critical evaluation skills appropriate to an Honours level award.
- Evaluate the success of the project work and the corresponding project process.

- Analyse the professional and ethical issues which apply within the context of the project.
- Demonstrate the ability to communicate all aspects of the project in a written, visual and oral form.

Thus, the honours project will involve the student in carrying out/developing:

- A critical literature/technology survey of the research material related to the project problem area and directly focussed on the specific objectives of the student's own project
- An in-depth study of the project area and its context.
- The design work for a solution to a real practical problem which utilises the outcomes of your survey and context analysis.
- A significant practical investigation/development of relevance to the project.
- A critical evaluation of the approach adopted, technologies used and work undertaken.
- The "reporting" of the finished project via a Project Report and a (Poster-style) Final Presentation.

This guide provides you with information you will need if you are to produce a successful project. If you have never undertaken an independent Project Module on your course before you may be quite apprehensive about it and this guide will provide some reassurance. Even if you have undertaken an (Integrated) application or design-based project at degree or HND level, remember that you need to be aware that the Honours Project is **fundamentally different** to that type of project. If you don't pay attention to the differences you will do badly.

Past experience has shown that because there is no "formal" class contact in the Honours Project and less "official" staged deadlines, then for some reason, the work of the Honours Project is given a lesser priority by some students. You too may be tempted to leave aside project work to concentrate on more imminent coursework deadlines. You may think that as you have plenty of time to do your project you can leave it to concentrate on a specific piece of coursework. You would be cheating yourself if you did these things. **Students who fail the Honours Project normally do so due to poor planning, and poor underlying foundation work, both during the preparation module and then during the course of the project itself.**

If you still don't think that this advice makes sense - look at the arithmetic. Many standard modules have two course works and an exam. In many cases the weighting of exam/coursework is 50/50. Thus if you spend some time on one coursework you are spending time on something worth 25% of one module (in other words probably on only 5 credits worth of your year). If, however, you spend time on your project, which consists of "coursework" only, then you will be spending time on something worth 200% of one module (i.e. on 40 credits worth of your year)! Ask yourself, which piece of effort is more likely to have a greater impact on your final overall grade of Honours award?

We are not saying that you should forget everything else and only concentrate on your project. What you need to do is put things in perspective and ensure that you strike a balance. What you certainly must not do is just to forget your project to concentrate on your coursework and taught modules. **Self discipline and realistic planning are primary requirements in succeeding in the Honours Project.** If you simply follow the “let’s just forget about it until nearer the deadline” mode of organisation, then you are very likely to fail.

Consider the following norms of student effort and the spread across the 2 Trimesters on the Honours Project.

- The Honours Project is a 40 credit module: i.e. 400 hours of student effort over two Trimesters (i.e. 200 in Trimester A **AND** 200 hours during Trimester B)

Let us do the arithmetical for this calculation:

- **In both Trimesters** : During each and every week you will need (and be expected) to spend 200/15 per Trimester i.e. approx. **13 hours per week on work for your project.** Even if you “average” one meeting a fortnight with your supervisor, it still means approx. 12½ hours per week of your own time must be spent on project activities.

It is absolutely astounding the numbers of students we have seen who cheat only themselves and don’t even attempt to spend anywhere near this amount of effort on their project. They seem to think that they can follow the same study pattern which (they think) has served them well during their first 3 years of study, i.e. do nothing much in the weeks running up to a deadline and then try to “cram it all in” in one big rush week or so before the hand in!

Beware!! – A number of Honours Students last year dropped out during Trimesters a and B. In only a few cases was this due to failure in taught modules! In many cases the reason cited was the Honours Project and the fact that those students were just not coping with it. In a number of these cases (in my view) it was because the student had clearly not grasped the fact that the Honours Project could not be treated “just like any other coursework”. I.e. do nothing much, then cram everything in at the end using the tactic of looking at another student's example and just changing some of the words! Also, students often cite the "age old problem" of "I have got to work to finance myself" as a reason for not "putting in the hours". Whilst we empathise with this dilemma, it is all the more critical in the Honours Year that you strike a "balance" and ensure that if you do work outside university, it does not impinge upon your study time! Unfortunately it will have to impinge upon your leisure time rather than your study time. This is all the more important because the Honours Project is an individualised piece of work. The topics are all essentially different, you will need to independently learn (on your own) both subject and technical knowledge which has not previously been taught to you (and isn't going to be taught to you)! Different literature sources will be required to support and contextualise what you are proposing to do, different project and research methods could be used, and different methods are more practical and realistic for different project types, depending on the project’s objectives.

1.5 Support and Assistance in undertaking your Honours Project

The Honours Project, like any project in a University programme, is a major piece of independent work undertaken by the student. However, support is provided to assist you with this undertaking. The support comes in 4 key forms:

- **The Research Skills and Professional Issues (RSPI) module (M3I323074):** This module at level 3 provided you with guidance on the nature of research, project planning and the methods that can be used to carry out, analyse and report your project work. This allowed you to produce your initial project proposal. The proposal (and module teaching material) are very relevant to your Honours project
- **This Study Guide:** This gives guidance on the nature of the project, its stages and how it should be undertaken. It is essentially a self teaching document! **Thus, you should thoroughly read this Guide within the first few days of the commencement of Trimester A (remember you have at least 10 hours independent effort even in the first week!).** You should also then continually refer to it for guidance as you progress through each stage of the project.
- **Additional Guidance Material :** This will be provided for the Interim and Final Report
- **Your Supervisor:** The role of your individual project supervisor is also crucial to your project. You should use your supervisor appropriately and wisely.

1.6 A common student misconception regarding the role of an Honours Project Supervisor

Over the years, we have found that a number of students still don't seem to grasp that the Honours Project is different and that, as consequence of that, the role of an Honours Project Supervisor is also "different". Certainly, the University guidelines indicates that the key role of a Project Supervisor is (although we are paraphrasing here) "**to provide advice and guidance**". However, we have found that some students don't quite understand that "advice and guidance" on an "essentially independent" Honours level project is quite different from the "advice and guidance" a student would get on an Integrated Project in level 1 through 3 of their previous study.

To illustrate this, if you look at the more detailed "definition" of this "advice and guidance", given in the formal University Guidance procedures (in Appendix B of this Study Guide), nowhere does it say that the "role" of the supervisor is to "solve the student's project problem's for them". To us the key phrases in that list are:

- to be constructively critical
- to be aware of future pitfalls in the research topic

Some supervisors tend to take a "questioning" approach (and often a very direct approach) to both of these aspects. That is, **when a student** tells the supervisor what he/she might (want to) do (or even **asks what he/she** think they should do, or **would be "better" to do**), **the supervisor do not give them an "answer"**. Instead, supervisors ask them a series of "directed" questions. The aim of these questions is to get the student to "think for themselves" and in that thinking try to get them to consider the alternatives, the reasons why each might be suitable, and the criteria they

need to consider/investigate/weigh up (and then pursue) for their project to enable them to make their decision.

We think that the most important phrase (in these self same University guidelines) in terms of "**what is expected of a student**" is the phrase: "**to take ultimate responsibility for the direction and content of the dissertation/project**". We may be wrong, but at times we get the impression that some students (mistakenly) think that the role of the Supervisor is:

- To tell them what to do next
- To help them when they get "stuck" by physically solving their problems (technical or otherwise) for them
- To "teach" them the new skills (both intellectual and technical) which they may have to master in order to successfully undertake the project
- To write their project report for them
- To be available 24/7 to answer their questions (however trivial)

However, we want you to take the clear underlying message that in order to succeed in this type of project, at the level of an Honours year, then it is about you identifying what you have to do in the project and what might thus be interesting (to you) to investigate and you have to develop an appropriate project "vehicle" to do this.

1.7 Outlining the Material in this Guidance Handbook

In terms of the remainder of this Study Guide/Booklet

- Chapter 2 gives a thorough explanation of the nature and format of the Honours Project. It identifies the key concepts of research and takes you through the types of projects you might undertake.
- Chapter 3 takes you through the stages involved in the process of developing and completing an honours project one step at a time.
- Chapter 4 gives you an overview of the timescales and project deliverables.
- Chapter 5 deals with the Ethical approval process
- Chapter 6 provides some detail on the Interim Report.
- Chapter 7 takes you through the Honours Final Report structure and gives you an outline of the content expected in each section. The sub-sections about **referencing and writing style** are also very useful for your Interim Report and so you would do well to study these early in the process
- Chapter 8 describes the hand in process and requirements.
- Chapter 9 outlines the Honours "Conference" and your Project's Poster Presentation
- Chapter 10 discusses the assessment process and gives you an outline of the type of marking profile that might be applied.
- Chapter 11 describes the supervision process and a bit more about the roles and responsibilities of yourself and your supervisor.
- Chapter 12 describes the use of Turnitin and also formal definitions of Plagiarism.

Finally there are a number of supporting documents in the appendices.

1.8 Learning what is meant by a research-based project at Honours Level

Research is about investigation. An honours project in Computing/Networking/Security (CNS) is a detailed investigation of a practical problem. That project is encapsulated and represented by a research question / problem statement, and the identification of some form of potential solution. Once the student has identified/developed these, then s/he needs to develop some objectives and a detailed plan for the project. Only then can it be undertaken (with any hope of being completed successfully).

CNS projects are generally centred on some aspect of systems development or systems evaluation but may be slanted towards the topic of one of the course modules of your named programme. They may also address human, organisational and behavioural aspects of an IT based problem, although care must be taken to ensure that these can still be considered CNS projects and are still viewed as suitable for your programme.

Projects may also vary widely in the nature of the work to be carried out but they are all investigative in nature. That means that you are trying to investigate the usefulness or appropriateness of a (software, system or support) technology or approach in solving some kind of, or aspect of, a practical problem. To a great extent you are trying to provide some insight into your topic area that might provide some useful lessons for others. Think of it as finding out answers to questions that other people might be interested in. One "myth" is that your Honours project has to be "original". That is actually quite wrong. In order to get a PhD, a student has to demonstrate an "original" contribution to the subject knowledge. A PhD is a 3 year project (!) and so how could we possibly expect you to do an "original" project as only part of a single undergraduate year! Certainly, there has to be some degree of "novelty" or "uniqueness" in your project.

You can adopt different research methods to investigate different research questions / problem statements and each type of investigation will result in your learning and having insights into different aspects of your chosen topic. Indeed the "same" research question could be investigated using different research methods, in which case this would produce "different" projects. Either way, your research question / problem statement needs to be really quite specific to succeed although in some cases it can be software related or more comparative (potentially speculative) in nature.

The research question was developed in the RSPI module – this was presented through the discussion of the initial literature review which was then incorporate within the Introduction/Background sub-section of the Project Proposal.

1.9 Research Question / Problem Statement

In your Project Proposal from RSPI – there was a single **Research Question**. The Proposal was centred on this research question.

In your Honours Project - the **Research Question** can be refined/modified – or it **may** be replaced by a **Problem Statement**. Either can be used – you should discuss this with your Supervisor at your First meeting

For a **practice-based capstone project** – you **could** use a **Problem Statement** which summarises:

1. *what you intend to develop*
- and**
2. *what problem it will solve.*

Thus, you **may** want to consider changing your **Research Question** to a **Problem Statement**

If the product of your development will serve the purpose of allowing an investigation to be done then you can also express this using a **Research Question**

Since you have already developed a Research Question for your Proposal – you may decide, after discussing with your Supervisor, that you do not want to change the **Research Question**.

The structure of you Honours Project will still be the same if you use a Research Question or a Problem Statement – that is, primary/secondary objectives, literature review, execution etc

1.9.1 Examples of Problem Statements

You have been provided with Sample Interim Reports (and will also be provided with sample Final reports). The following students used a Research Question . Their **Research Question** could have been modified to be a **Problem Statement** similar to the following

Student AA_1718 :

Actual Research Question :

Can an educational mobile application making use of augmented reality used alongside textbooks help to provide a greater level of engagement and understanding than textbooks alone?

Possible Problem Statement

To develop an educational mobile application making use of augmented reality used alongside textbooks to help provide a greater level of engagement and understanding than textbooks alone

Student BB_1718 :

Actual Research Question :

Develop mobile application for the purpose of locating animal through the Android platform by using Google Map and Firebase technologies?

*(Note : as highlighted in the marking of the project – this is not a Research Question
!!!! In fact, it could be argued that it is very similar to being a Problem Statement)*

Possible Problem Statement :

To develop a mobile application using Google Map and Firebase technologies for the purpose of locating animals

Student CC_1718 :

Actual Research Question :

To what extent are the established relationships in a graph database reliable in predicting the outcome of sporting events?

Possible Problem Statement :

To develop a graph database for the purpose of predicting the outcome of a sporting event

Early warning for those developing software or other implementation solutions

A polished “commercial” type implementation will gain you no more marks than a well-developed prototype, if the prototype can be successfully used to demonstrate or refute a point. Your implementation is supposed to demonstrate an underlying approach or the use of a specific type of base technology. It may be used to investigate the applicability of suitable techniques or technologies to specific application areas. However, even if it is a prototype implementation, it still has to be sufficient an implementation to be able to demonstrate a detailed evaluation. Thus if you develop a poor and inadequate “prototype” you are likely to obtain a poor and inadequate mark.

1.10 Using “supplementary” methods

Depending of the type of project, a student might utilise some data gathering/analysis techniques to **support their practise-based project.**

For example some of the “supplementary” methods² that could be used include :

- **Documentary Analysis:** This could be process manuals, project records, management statistics, process/product metrics, historical development metrics, and/or strategy documents. It could also be the analysis of performance monitoring logs when case studying the efficiency of an organisation’s network.
- **Interviews:** This would be with key personnel to obtain highly specific information or clarification.
- **Questionnaires:** These would be issued to a large number of individuals to obtain specific information (but often “higher level views”) on a wider basis. (Also a main technique used in Survey only projects)
- **Direct Observation:** You would arrange to physically observe key aspects of personnel undertaking (an aspect of) the task involved.

Thus you may very well utilise one or more of these supplementary methods in your project. For example, there are several ways in which a case study could be used to provide parts for your primary methodology. E.g.:

- In a Development-type project: You could use a particular organisation’s “case” to perform the requirements gathering for your Development and indeed you might even “test it” (evaluate it) using existing data/scenarios from that case study organisation. Or even trial it in their organisation if you had the resources/permission.
- In a (Network/Security-based) Experimental project: You could use a particular organisation’s configuration (e.g. topology and/or data traffic scenarios and/or security configurations) as the basis for a simulated scenario which you would set up and then you could configure this to run several realistic simulated scenarios/experiments which you gather your data to evaluate a new/amended network protocol/security configuration. To find this out you might use Documentary Analysis of their material/manuals/procedures/ logs.
- In an Experimental project: The participants in your project could all come from a single case study organisation. Indeed this could provide a much more realistic evaluation as the people involved could be experienced users in the domain area for the (possibly new) software/HCI approach which you have created the “practical” experiment for.

² We use the term “supplementary” methods because these are not, in themselves, an overall form of primary research method. As such some of these methods may also be used within other forms of primary research, i.e. questionnaires could be used within an Experimental Evaluation project.

An understanding of the combination of both an acceptable underlying primary methodology along with that of the range of individual methods which cross all project methodologies is crucial for understanding and thus undertaking a research project acceptable to any specific discipline domain.

One very important point to continue to emphasize about these (so-called) supplementary methods (e.g. Documentary Analysis, Interviews, Questionnaires, Observations) is that these are techniques which are not very familiar to students in your programmes. **Thus we cannot emphasize enough that you need to undertake your own detailed study of such techniques as key preparatory tasks as you undertake your project. Thus again, you really should source your own more detailed textbooks about these sorts of research methods.** You will find that there are plenty in the University Library. If you enter keywords such as; “Business research Methods” or “Case Study Research” you will find that there are plenty of books for you to peruse which will give more detailed information about these sorts of techniques.

In order, to more fully understand the process of research, what you have to understand is that whilst the project types might “look different”, the process of research, the objectives, the concepts of collecting and analysing “data”/investigatory results, is actually all the same no matter what type of project.

Projects are all essentially the same and are all essentially “built on the same foundations”.

To summarise, as also covered in the RSPi Module, the complete project has to:

1. Be introduced and justified on a sound academic basis (through an Initial Literature based review/discussion).
2. Be centred on a **detailed single research question** (or **Problem Statement**)
3. Have a series of objectives which are stepping stones in the “tasks” of building the specific primary research for the project. Also you may sometimes see me/others refer to these objectives as "sub-questions". These are “questions” which “drive” the "outputs" of the objectives required for the project once its specific direction has been decided upon.
4. Draw out the “answers” to some of the sub-questions/objectives as a literature review which is clearly linked (by your discussion of them) to the project’s specific investigatory aspects and its activities. Thus some of these “sub-questions” are really specific objectives of the main literature review. However phrasing them as questions can help you know when you have completed enough literature review for a particular aspect of that project phase.
5. Develop and execute a piece of primary research, which uses your clearly identified conclusions of the literature review to direct/justify its “construction” and analysis.
6. Gather “data” from the development and execution of the primary research.
7. Demonstrate and present critical analysis of the results of the primary research which discusses and reflects on the issues and draws conclusions about the specific project being investigated.

For every different “type” of project this process is exactly the same. Only the actual piece of primary research which is “constructed” is different. In each case, although the primary research “instrument” is different, its purpose within this research based framework is exactly the same. Data is gathered through the construction and/or use of the primary research instrument and that data is analysed/evaluated in order to provide discussion, reflection, conclusions and thus insight into the project being investigated.

For various ‘types’ of projects, what now follows is a brief outline of its characteristics and underlying research methodology as well as some “pitfalls” to be considered.

1.10.1 Developing an IT product/computer based solution

The focus of the primary research is the development of this new product/solution. This does involve analysing, designing and developing a computer based product (e.g. a website, group support system, computer based animation/game, a program which enables a new technology to be used). However, what distinguishes the research aspect of this project from a “standard” application development to solve a standard commercial application is that it is intended to explore the feasibility (or otherwise) of an underlying technique, algorithm, or technology as a potential solution. Some examples are:

- An IT application which uses IT in a new domain/problem area. You are trying to explore/demonstrate the technical feasibility of its use. You would thus have to develop an appropriate application and evaluate it through a scenario which demonstrates its potential use or assesses its technical feasibility.
- An IT application which incorporates a new theory or uses an existing theory in a different domain, e.g.
 - An educational theory incorporated into a computer aided learning package
 - A game genre which uses a new I/O device or HCI approach. Either new to games, or an existing device/approach which is new to the genre.
 - Development of a web site using a new architectural model, HCI approach, application framework or development tool
- An IT application is developed in order to examine the use of a particular development method. E.g. a new/novel OO methodology could be used to develop a “Typical” commercial web-system in a particular application area to assess the use of this approach either as an approach or for its application to that domain.

In each case, whilst the application developed is often viewed as a “Prototype” it has to have sufficient functionality to be viewed as “Typical” of a “full-scale” application, or at least sufficient to enable a sufficiently sizable and valid evaluation of the scenario of application. As with all types of project the evaluation method used in conjunction with the primary research instrument has to have sufficient depth and rigor as well. Often this is done through a “fitness for purpose” discussion of the implementation against the initially identified domain problem characteristics (which

are often derived through a literature review and/or a "real" problem analysis). Or there may be a number of key "benchmark" tests which you could undertake which would provide an "evaluation" of your implementation's suitability (or otherwise) for the problem domain.

All too often we have seen rather "thin" (indeed pathetic) "prototypes", which could never be used for any form of realistic evaluation any, and so that generally means a "thin" (indeed pathetic) final project. However, also, we have seen that students immediately say "oh I will carry out an HCI evaluation of my product using a questionnaire". In most cases such an evaluation is wholly inappropriate, since their (and your) project is generally trying to investigate a technology solution to a technology problem and that problem is nothing to do with HCI! These points should be considered (and taken on board) if you undertake this type of project.

Common Pitfalls in developing an IT product/computer based solution

A common pitfall for a student undertaking this type of project often involves the use of a new **technology**. Very often, the development environment is different or unknown to the student. Or the underlying language/API is new to the student. Here the most common pitfall is that students don't familiarise themselves sufficiently early on in the project period with the new technologies. Also students think that they can best learn the new technology by "browsing through web tutorials/forums/FAQs" about them!

In terms of the first "pitfall" students often "schedule" development from the end of Trimester A. For whatever reason students often think that means "I start to try to learn the technology" from the end of Trimester A! This approach is completely flawed! You should have actually began some element of familiarisation (at least at overview level) **during the project proposal phase**. Then definitely you should do your "Learning" of the technology as part of your project work during your Interim Report (i.e. during September-November).

All too often, possibly because it is a research based project, which is a "New concept" for most, students think that all that they should be doing during the September-November period is their main literature review. That is also a misconception. Essentially we expect at least one of your literature review objectives to be a **technical assessment/review of the technology used**. Sometimes you may be making a choice of technologies (which obviously would be the main thrust of that technical element of the review). In other cases it may be that the technology has already been determined and so we expect some form of review (support by literature as required) of that technology covering elements such as its architecture/paradigm/ its evolution from previous technologies/ the sorts of problems it is aimed at solving which the other technologies don't/ its uses in similar or related areas of application (not all of these areas might be applicable, it would all depend on your project and technology). Obviously that means that during that period you will need to gain familiarity regarding the technology (and that should include learning it and actually trying to do some coding "in anger").

The second common pitfall is the student's approach to **learning the technology**. My view is that "nothing beats a good textbook"! If we take an example, Mobile applications (of various forms) are currently quite popular. In most cases, that paradigm and associated API is quite different and not one which students are too familiar with. Certainly much of the architecture of mobile applications is based around the event driven paradigm and the use of GUI "objects", but often the details of that is dependent on the mobile phone platform and associated underlying programming language and API. My advice is to purchase a good teaching textbook for your platform/API. Simply going to www.amazon.co.uk and searching using some simple keywords is often sufficient to "highlight" a number. Then you can often "look inside" the contents and/or read reviews on the book to see which one(s) might be worthwhile purchasing. In the main, although this is not always the case, we find the various web tutorials/ forums aren't useful as a "teaching vehicle". Certainly these are often the best mechanisms if a developer is familiar with the basics of the technology/platform (say when it is just a new API for one aspect of the technology), but you have to remember that in those cases the developer is already familiar with much of the platform/technology and so it is more of a reference guide it is being used for and not a teaching guide. My advice is to buy a good textbook, if one is available, and get started on learning the environment "in anger" as soon as you submit your proposal.

1.10.2 Experimental Projects

Formally an Experiment is a research strategy which tries to find "cause and effect". It involves the development of an "experiment". The experiment is a scenario which can be realistic or artificial/simulated

Choosing a clear testable hypothesis is important. It is really only in a "controlled experiment" that the investigator potentially has sufficient control over the "variables" involved to enable proper "measurement" and thus enable a hypothesis to be properly tested. Thus, if you undertake this type of project we are ultimately looking for specific hypotheses associated with your research question which you use to enable you to develop the details of your experiment and its associated evaluation criteria.

This research approach/project type is categorised by:

- Observation and measurement: you construct your experiment and make precise and detailed observations of outcomes and changes when a specific factor is added/removed.
- You are trying to at least demonstrate appropriate relationships between two or more factors. Indeed, ideally, you should be trying to identify the causal factors.
- You are looking to "Explain" the link between factors involved so that understanding of the scenario being investigated can be gained.

Experiment Examples

Some examples which might illustrate this type of experimental project are:

- You might develop a prototype and conduct user observations testing against a set of usability goals to gauge whether or not it is suited for the intended audience

- You may want to run an experiment that investigates how emotion affects problem solving in games
- You may design a level for a game and conduct playtest sessions to observe how players engage with navigation aids

Key Points

Again some students think this is a “soft option”. However, the construction of the experiment has to be quite complex to enable appropriate demonstration, and the selection and development of an appropriate method is key. There are a very significant number of potential HCI evaluation techniques, which all use different approaches, which could be used as the basis for an experiment. Each has different characteristics, pros and cons, suitability and practicalities. Also you have to deal with the (often complex) logistics of obtaining appropriate numbers and range of “test subjects” to perform the evaluation of an experiment involving human subjects is used. This also tends to have “ethical considerations” and thus you need to arrange for ethical clearance through the associated University procedures.

Considering the who, what, why, when and where is a good place to start when designing your plan for conducting your experiment. Designing an experiment should be detailed and provide a clear rationale for your choice of approach.

The experiment may be complex, for example it may include a prototype/artefact to test, users to gather and arrange test sessions, several data gathering tools (i.e. focus groups, interviews, questionnaires). Make sure you chose appropriate evaluation methods, justify these through literature findings and run a pilot test to make sure your plan can be smoothly executed

TIP – conduct a pilot test with every tool and method you intend to use for your experiment. This way the any issues will be highlighted earlier rather than “On the day”

1.10.3 Practical or Simulated Network/Security based Evaluation

This is very common amongst networking/security students. Networking and Security is all about IT infrastructure, the technology and the associated “software”/ protocols etc. The efficiency of a technology, or protocol or similar when applied to a specific situation is of paramount importance to the network or security designer/configurer. Thus when “testing out”/evaluating a technology/protocol etc. setting up an experiment is often the most “practical” approach.

Of course in most cases it is not practical for a student to construct and implement a full-scale network to evaluate some form of technology, or they may not be able to find a co-operative organisation which uses the protocol/technology they wish to investigate. Thus some form of experiment has to be developed. Typical examples are:

- You wish to investigate the efficiency of a new routing protocol for use in a particular type of enterprise wide network configuration. This might even be a comparative study with another protocol, or you might be trying to evaluate the potential benefit of a suggested new approach to an existing routing protocol's underlying algorithm. You would need to develop a suitable set of experimental configurations/scenarios using real kit or in an appropriate simulation package (e.g. OPNET, although this is more complex to use than students first think). These would be developed, and then run, and from these explicit (and academically derived) evaluation criteria, tools may used to capture data which can then be analysed to enable judgements/conclusions to be formed.
- You might wish to investigate the security aspects of a particular technology. To do this you would need to create a set of "realistic" practical experiments using some network/security/forensics software tool or "kit" to do so. As with the simulated type of experiment, you need to ensure that an appropriate set of experiments and associated scenarios are developed and that appropriate and realistic criteria are used for data capture, analysis and evaluation.

Common Pitfalls in a Network/Security-based Experimental Project

On the face of it, these types of projects sound fairly straight forward, but there are some common pitfalls:

- Simulation packages (such as OPNET, NS3) can be quite complex to use. There is often no explicit teaching of such packages and thus you need to develop your own plan for learning its use sufficiently. Luckily some exposure is given to OPNET in one/two of the Networking taught modules in the final year. However, this often lulls students into a false sense of security. Very often a deeper understanding and use of a tool such as OPNET is needed for a project of this type and, so again, you must build on that through further independent learning to do that. Also, you may have to use a different (independently sourced) simulator tool (e.g. NS3 is quite popular). Thus, again it is very much about taking the "generic" skills about a "generic" technology/environment and applying that to your independent learning of a different "implementation" of that. Too often students leave this until later, by which time the learning curve is too steep for the time remaining. Your supervisor is neither expected to teach you, nor to sit with you and "debug" your simulation development. Sometimes we find that some students decide to use OPNET just because "it is there" and haven't actually tried to find out if it has what is required for their specific project. While developing your test-bed, have a backup tool /kit should the primary tool prove non feasible.
- Practical experiments require certain physical "kit"/resources. You need to be aware of the resources which are required and you need to see if they are available to you. You also require some practical knowledge and skills in order to set them up. The School might have some suitable equipment, but even if it has you will have to arrange access to it. Other students may be competing for this resource, thus negotiation and compromise may be involved. Again, all too often students "put this off" until they need to do the experiment and again they find that they run out of time or get nothing but stress since they did not identify and obtain commitment for the resources during (or shortly after) the proposal stage.

- Often students set their primary goal to get the first set of results as quick as possible and ignore the development phase for a valid test-bed. A strong understanding behind the choice of methodology/framework or algorithm can pave the way for a good set of valid results, expand primary/ secondary objectives, provide a good vision for future works on the project etc.
- The other main pitfall, which applies to this type of project generally, is that you have to be able to demonstrate that your experiment scenarios and configurations are “typical” and “legitimate” as vehicles for enabling demonstration of the real-life situations you are focusing your investigation on. Again there are also skills in data analysis techniques which are required to analyse the results of the simulation/practical experiment.

1.11 The distinction between Primary and Secondary Research

Often you will hear the terms Primary and Secondary Research used within the research community. Indeed, we have used the term Primary Research (Instrument) a lot already.

Primary Research is what you actually do as the main aspect of your project. I.e. you develop a piece of software/program or you develop an experimental (set of) scenario(s), execute it, capture and analyse the results.

However, just like most other things to do with your Honours Project, you can't just “invent” the details of these primary research instruments/activities “out of your head”. You have to use Secondary Research to form a key part of its foundation. Secondary research is often termed “the work of others”. By that we mean findings from other research which has been “published” in appropriate sources of literature.

Very often, students comment in their report that their Primary research included an “extensive literature review”. This is wholly incorrect! A literature review is not Primary Research; it is Secondary Research! A literature review is used as a foundation for your project. It supplies both context for your project objectives (which is also used as the background and justification for your project and in the development of your primary research question / problem statement) and foundation for the detail of what you are undertaking/developing as your primary research. we must admit that we also find it confusing that the term Secondary Research is used when talking about something which chronologically comes before undertaking your Primary Research! Nonetheless, those are the accepted definitions³.

1.12 BCS Accreditation Requirements

³ It is termed Secondary Research because it is using what is termed “secondary sources”, i.e. sources of material/information which you have not produced yourself, i.e. literature, published reports, textbooks written by other people about the work they have done/ideas they have.

The British Computer Society (now just known as BCS, The Chartered Institute for IT) is the Professional Body to whom we submit some of our BSc programmes⁴ for Accreditation and Exemption in relation to their requirements for Professional Membership.

The BCS has several levels of exemption in relation to its Professional Examinations, which provide a framework for its professional membership structure. Probably most relevant to our programmes is the educational requirement for their Chartered IT Professional (CITP) grade of membership. The BScs in the applicable programme suite all have that level of Accreditation in order to meet the educational requirement for CITP. This exemption is available for those students who undertake a **practice-based capstone project**.

Thus, any student on the **applicable programmes** who feels that they may wish to consider applying for BCS Professional Membership at some stage in their career, should be aware that the achievement of that membership's educational requirements via their Honours Degree, will be available to students who have successfully undertaken this Honours Project module (MHW222996).

The applicable programmes are :

- **BSc(Hons) Computing**
- **BSc(Hons) Software Development for Business**
- **BSc(Hons) IT Management for Business**
- **BSc(Hons) Computer Games (Software Development)**
- **BSc(Hons) Computer Games (Design)**
- **BEng(Hons) Network Systems Engineering**
- **BEng(Hons) Digital Security, Forensics and Ethical Hacking**

⁴ The applicable programmes are the Software Engineering Suite of programmes as well as BSc(Hons) Computer Games(Software Development), BSc(Hons) Computer Games (Design), BEng(Hons) Network Systems Engineering and BEng(Hons) Digital Security, Forensics and Ethical Hacking

2 Steps in undertaking your Project

2.1 Step 1 - *Selecting your topic - done in RSPI*

Identify Project topic – discuss with Supervisor

2.2 Step 2 - *Undertaking the Initial Literature Review to identify a research question - done in RSPI*

Identify the research question (*or Problem Statement*) for your project. You were required to source and read a significant amount of initial up to date and relevant literature

After completing an Initial Literature Review and decided upon a question you then fully developed your detailed proposal. This was assessed and you were given feedback in the RSPI Module

2.3 Step 3 – *The Main Literature Review and Technology Assessment, learning what others have found out about your area*

NOTE : The **Literature Review** is also referred to as the **Literature Review and Technology Assessment**. The title has been updated to emphasise that it should also include a technology/technical assessment – if appropriate to the project.

The literature review (and Technology Assessment – if appropriate) is a very important aspect of the project and so it has to be done thoroughly. Although, when you undertake the main literature review after the project proposal has been completed (you undertook an initial literature review in the Project Proposal in order to justify your project), this main review generally should only take place **during the first 6 weeks** of the actual project period itself (i.e. it should be completed before week 6 of Trimester A).

You should also note that it should **not** be the only project activity which you undertake during that first 6 week period!

For some reason, a number of students seem to think that the Interim Report is only about the Main Literature Review, and nothing else! **No, the Interim Report is to be submitted about 2 weeks after you should have completed your main literature review** and so you are expected to have commenced some of the objectives of the Primary project work by that stage also.

Nonetheless, the literature review provides the theoretical and conceptual basis and foundation for your project. Without it the project would not be of Honours standard and you wouldn't be able to justify your Primary Research instrument without it anyway. Remember, you actually commenced an initial literature review during the course of your proposal development. You require to source and review appropriate literature to provide a background and justification for your project as well as using it to support your research question / Problem Statement and the project objectives. Your initial literature review

should have been an annotated bibliography with at least 20 sources of an appropriate mix and quality.

Thus once you have completed your Main Literature review, and added to these, a total of 40 cited sources, in the completed Interim Report, are not unusual.

Once you have narrowed your area of interest down sufficiently, you need to search through more journals and other (hopefully high quality) sources to find examples of work carried out (by other people) directly related to your topic area (or in some cases even tangentially related to your own work). There are many sources of electronic journals on the web but an efficient way to see what has been published in your area is to use the facilities of the bibliographic databases provided to you directly through the Athens mechanism and to which the University has subscribed. The first example database you are introduced to in your lab exercise is Proquest. Another is the Web of Science (wos.mimas.ac.uk). The Web of Science contains the titles and summaries of millions of science articles. There are also many more databases of relevance to your discipline area, such as IEEE Xplore or the ACM Digital Portal. Thus you really need to consider a number of specific databases which are available and whether/in what way any might be useful to your area. You access this through a (separate) sign-on process which uses your GCU Domain Username/Password for all of these services - the RSPI module provided an introduction to this and advice about searching and sourcing.

Your aim in doing a (main) literature review is to understand, and summarise, what is already known about your topic area, but presenting it as a literature based discussion/argument which relates those issues directly to your project, research question / problem statement, and objectives (as appropriate). All the time you present this you are “slanting” your argument/presentation of it towards your chosen topic area and associated project. You also need to identify the methods that other people use to conduct research (and test hypotheses) similar to your own. This reading may cover a much broader range of disciplines than you might have imagined and may be found in a wide range of journals/sources.

The term “learning what others have found out about your area” may be another misnomer and using that term could inadvertently misrepresent the task involved and its purpose if a naïve reader takes it “at face value”. When you undertake a literature search and associated review you need to do so with focus and purpose. That is why a detailed and well focussed research question / problem statement is paramount. You will find that a good research question / problem statement has a lot of detail about the “strands”/areas involved in the project. Thus, when searching you have to look for sources/papers etc. which might relate to one of those (sub) areas. Also since your proposal will have identified the objectives and the overall project type/approach used, it should be clear the steps you need and the elements you must develop. If it is not really clear to you, then this is probably because you have not properly focussed and phrased your research question / problem statement and developed a set of objectives consistent with it (and thus with your project)! Often it is a good idea for (particularly in very good proposals) to also initially phrase these (objectives) as a series of “sub” questions to which you need some “answers” to enable you to construct an appropriate Primary Research instrument. That way you are really just looking for any kind of “evidence” (from the published work of others) which will support what you are doing and/or which you can discuss within the context of your

project objectives to determine what you are going to do. This is a very important aspect of the Literature review and Technology assessment.

For example, if you are going to assess a network routing protocol in a particular scenario, then you really need to “find out” the answers to some questions so that you can justify and develop your primary experiment? E.g.

- What are the main characteristics of routing protocol X!
- What are the existing problems in terms of efficiency etc. of using existing/other protocols and how is it being “suggested” that this protocol can overcome these?
- What criteria could be used as a basis for evaluating the performance of routing protocols?
- and more

If you have identified these sorts of “sub” questions then when you are looking for sources, these can give you ideas for searching and keywords and then for evaluating the “hits” you get back from using the search databases.

You should also note that there is a “reason” for each sub-question. It is effectively a separate “line of enquiry” in your main investigation. For example, the reason that you need to know and have discussed the nature of the “main characteristics of routing protocol X” will generally be because you have to implement these characteristics in your simulated experiment!

This should all serve to illustrate that the literature review is a **time consuming and intensive process (but then so is the entire project!)**, the ratio of searching to success can be something like 100:10:3:1. For each 100 titles you look at you will see 10 that seem to be useful, only 3 of these may actually turn out to be very relevant when you read the abstract. Finally, because the library only has a limited number of subscriptions you may not be able to get your hands on all the ones you want. However, we have to say that the range of journal subscriptions (essentially all via electronic access) is now very, very impressive indeed and so generally you will get the “three”. **Overall, the University spends of the order of £1M per year on these subscriptions.** This is a very substantial sum of money and it provides access to a literally enormous range of varied and excellent literature. Make sure you get your money’s worth from using these facilities!

It never fails to astound us that some students still totally ignore the material given to them about using these facilities and somehow think that they can “Google” their way to a project! Generally those we have seen doing this are those students who haven’t actually bothered to go through the lab/tutorial material of the RSPI module and thus don’t actually have a clue about how to go about things. All they end up getting is a handful of crap web references of essentially “advertising” or high level informational material rather than detailed and authoritative research based findings or even just academic commentary on the issues and material.

Do not underestimate the size of this step; leave plenty of time to do it (by that we mean make sure you start it early). **Remember 12-13 hours per week is allocated (each Trimester) for the Honours Project and so you can see how the time should be spent during that Trimester.**

2.4 Step 4 – Fully design **methods** for Primary Research

At this point in the process (for which most of the detail should also be completed by the Interim Report) you decide the fine detail of the methods you want to use to conduct the detail of your primary research (and thus test any specific hypotheses – if appropriate to the project). There are always a number of ways you might go about doing this and your choice will depend on a number of factors.

- a) the type of data you need to collect
- b) the methods other people have found to be successful (from your literature review)
- c) the limitations of the time available to you
- d) the limitation of the equipment available in the school

The overall outline methodology should have been decided upon as part of your proposal. At the proposal stage it should be "outlined". However, you should be very clear that "outlined" does not mean "vague". You should be able to explain the overall nature of the project methodology; you should be able to outline each stage of that overall project. Thus, in the main project itself, most of this phase is about using the conclusions you have identified from your focussed (main) literature review and plan/develop and implement the finer detail of them to construct your primary research instrument. By the way, that generally means that you have to explicitly identify conclusions in your literature review!

There may be some leeway even within that. In a Development-type project, you will be mostly using the results of your main literature review (which remember included a degree of technical review) to justify/develop your software architecture/ algorithmic development/ selection of the components of the program etc. However, you will have to select evaluation criteria and an evaluation method. Thus you need to have investigated these relevant elements as another part of that literature review and, of course, a decision has to be made about the one(s) you intend to use.

In the other category of project there is probably a much wider potential set of methods which could be used. Thus you need to select and detail the specific ones you are going to use and also then you will have to develop the detail (both intellectual and logistical) of them in terms of the development of the associated primary research of your project. You are trying to identify the Why, What, Where and with whom for each aspect of the method in your project.

Your aim must be to reach this point by week 8 of Trimester A, since it is these steps which are essentially what the expected Interim Report must contain.

2.5 Step 5 – The practical implementation (**Execution**) phase

This phase should be ready to start immediately after the Interim Report (at the latest). Indeed, since the projects are “practice-based”, some of the previous stage will be likely to involve some practical element, e.g. the decision and initial familiarity of the development technologies to be used and/or a reasonably detailed initial requirements analysis. The same would also really apply (say) to a Network/Security experimental project (whether a

simulated or physical experiment). Once you have agreed and identified your detailed specifics of the methods and the nature of their use in your project, you need to be able to start generating the data you need to test your hypotheses. Essentially that means developing your primary research instrument and “executing it”. This stage may take many forms: software development, mocking up interfaces, developing and running controlled experiments or usability trials, carrying out supplementary case study activities, developing questionnaires and collating a significant number of survey responses, etc. Whatever its form however, it is the point in your project where you really get your hands dirty!

This is the part that students (should) enjoy most since it is (at last) work of your own that you are doing, but it is also the part most prone to delays caused by unexpected events (software problems, people not turning up, equipment failures etc). Although one has to say - are these events really unexpected! That is why it is crucial to have developed a good plan as part of your proposal so that you have contingencies (or indeed your plans ensure that the contingencies aren't required) and don't leave critical things to the "last minute". You should be starting this by **week 8 of Trimester A** at the very latest, since it is normally the first actual phase after the Interim Report deadline. All of the logistics should have been “dealt with” before then and it should just be a matter of getting ahead with the actual work.

Again we remain “flabbergasted” by the students who think that they can “have a rest” after the Interim Report Submission and somehow (either by misjudgement or design) leave these issues for a few weeks before they seem to get started with the Primary Research development. Then they wonder why they run out of time or end up developing a “flimsy” project which is “savaged” during its assessment. Then, of course, they make “even flimsier” excuses, such as “If I had more time”! we often find that laughable, since there is plenty of time across the project. Their reality is that there was plenty of time, it was just that the student didn't use that time particularly wisely!

2.6 Step 6 – Collating and analysing results

This is where you pull together all the data from your practical work – data which may be in the form of functionality evaluation, timing differences, performance differences, user opinions, rating scales and so on. Although this step logically comes after the generating of data it is again one you have to think about, plan and to a significant extent develop, before you start the first line of code or speak to your first experiment participant. You have to have considered this stage at the same time you decide on your methods.

If you don't collect the right type of data you won't be able to test any hypotheses you may have, and you might not be able to say very much about the results. For example take the hypothesis ‘users will like site A more than they like site B’. If all you collect are users' verbal opinions you will not be able to test the differences between the results in any statistical sense (an introduction to the use of statistical tests will be covered in RSPI, but it is barely more than a definition of terms, the details of the techniques you will need to study yourself if you intend to use them). Conversely, if all you collect is numeric data you may not (depending on the nature of a project) get any insight into why the differences occurred.

2.7 Step 7 – Thinking critically about your approach and the data

At this point in the project you look back at what you've done and think about it critically. This is not always easy to do, we are understandably wary of pointing out our failings to others in case they think less of us (and we lose marks!). However it is vital if you are to show the reader that you have made progress in your understanding of research. The honours project is a learning process and you are not expected to have necessarily got all aspects of it all right first time. Think about the things you have learned as a result of doing the work and describe the things you would do differently if you had to do it all again.

2.8 Step 8 – Drawing overall conclusions

It's almost all over now and so it is time to give consideration about how everything fits together. You have collected a lot of data. Now you need to think about what this means in the context of your research question / problem statement and the results other people obtained. Did you get the results you thought you would? Why do you think this was so? Were there any strange results? What might have caused them? How do your results fit in with those (or the views) of other peoples? Finally, what do you think you can tell other people as a result of all this hard work, what are your overall conclusions in relation to the investigation you have undertaken?

2.9 Writing up

Although this is listed as a final step it is something you will be doing as soon as you start your project (proposal) and continuing throughout it. The honours project is a very substantial piece of work and no-one can leave the writing to the end and expect a good pass. Basic advice is to start your writing early and keep adding to it every time you do something. Indeed, you will find, as you go through each of these "milestones" that you are actually "evolving" parts of the final written report as you develop them.

To help you with writing the final report, there are essentially two “stepping stones”:

- The Project Proposal, which was the formal assessment of the RSPI module
- The Interim Report, which is submitted in week 8 of Trimester A

The next section gives detail about the milestones for the project, and for handing in the associated written work and deliverables. The other sections then give more guidance about the structure of the main “written” elements, i.e. the Interim Report and the Final Report. However, as you go through these sections, and then the project itself, you will find that the two main "stepping stones", if done well actually produce different bits which form parts of the next/final report. E.g.

- **In the Project Proposal:** Its Introduction/Background section will become the actual Introduction/Background section of the first chapter of the Final Report (refined through that same section in the Interim Report). Its objectives

(particularly the secondary research objectives) will form a plan (and to some extent a synopsis) for your main Literature Review for your Interim Report.

- **In the Interim Report:** Its main Literature Review will become the actual Literature Review chapter of your Final Report. Its Methods section will form a plan (and to some extent a synopsis) for the Execution chapter of your Final Report. Indeed, the first part of that Interim Report Methods section should "textually evolve" directly into the equivalent first part of the Final Report Methods section.

Essentially, your Honours year programme structure, with its "linked" RSPI & Honours project modules, have been explicitly designed so that you are "evolving" your final report, by writing different elements at different stages, a number of which actually end up "verbatim" in that final report, whilst others provide the plan for the remaining elements of that final report.

If you find writing hard, or wonder how on earth you will ever manage to write so much, read other guidance about "academic" writing, e.g. 'How to write a thesis' by Rowena Murray (OU Press). She offers some excellent guidance and techniques for breaking through the writing barrier. In fact, reading generally is actually the most effective way of improving your own writing.

3 The Honours Project Timescales and Milestones

Within the previous sections the various stages/processes of the honours project have been indicated. This section draws this all together to describe and summarise the overall process, its stages and timescales etc.

3.1 Summary of Honours Project Process and Timetable

Mid - End September

By the end of week 1 of Trimester A

Friday 28th September

1. Arrange initial meeting with Supervisor.
 - The responsibility for advising you on undertaking the project and all guidance on its feasibility/undertaking in both practical and technical terms lies with your supervisor. You **MUST** make a formal appointment with your Project Supervisor in week 1.
2. Email project proposal and feedback (from RSPI) to supervisor **BEFORE** meeting
3. At meeting the following must be discussed :
 - a. **proposal and feedback** - ensure project is capstone-based
 - b. student must provide a single sheet with :
 - any **proposed changes/update** (e.g project topic /research question) - this **MUST** be agreed with Supervisor
 - summary of **project work done** since RSPI proposal submission
 - brief **project plan** overview
 - c. **Ethical Issues/Approval** – this was initially done in RSPI
 - d. Regular **meeting dates/arrangements** agreed with supervisor.

September – mid-October

- Complete an Ethics Approval form (to also be signed by your supervisor), if required, and then submit that to the Honours Project Co-ordinator for your Programme suite.⁵

Specific deliverable

End of week 3 of Trimester A

Friday 12th October

- This is the maximum deadline by which any student requiring Ethical Approval for their project should have submitted their (fully completed and signed also by supervisor) Ethical Approval form to your Honours Project Co-ordinator, i.e., **Brian Shields** for the Software Engineering suite, **David Moffat** for the Computer Games Suite, and **Ali Shahrabi** for the Networking-Security suite.

⁵ **Important Note:** If your project requires Ethical Consideration and Approval you must follow the School's Ethical procedures for this approval. Whilst it is a comparatively stream-lined process, normally managed by your programme suite's Honours Project Co-ordinator, it is still totally your responsibility to do so.

September - November

Whilst the goals and activities of the projects will vary depending upon the project type it is expected that much (but not all) of this period will be taken up with the students' survey of the literature around their topic and centred on their research question / problem statement and project requirements. Thus the meetings with the student and Project Supervisor should mainly concentrate on the student reporting their progress towards their literature survey conclusions.

Depending on the type of project, the student would be expected to have reviewed and familiarised themselves with the proposed development environment/technologies and may also have commenced some of the specific project development work by November

Mid-November

An Interim Report is to be produced which includes an introduction, a detailed but concise literature review and a detailed explanation/specification of the primary research work (including the specific detail of the intended methods to be used). The interim report is marked at this stage by the Supervisor and Second Marker⁶.

Specific deliverable

Week 8 of Trimester A

Friday 16th November

- 2 hard copies of Interim report to be handed in to supervisor and second marker, and soft copy submitted for Originality Checking via the Turnitin Assignment link on GCU Learn

Week 11/12 of Trimester A

Arrange meeting to get feedback about Interim report from Supervisor.

It is the student's responsibility to arrange this meeting – and it MUST be been done before the end of Trimester A

⁶ Second Markers will be allocated (and advised to students) by your Honours Project Co-ordinator by the end of the week before the submission deadline for the Interim Report.

Trimester B

Week 1 or 2 of Trimester B

Arrange meeting with supervisor.

- student must provide a single sheet with :
 - overview of updates to Interim report – based of feedback
 - current status of project

upto mid-April

Continue regular meetings with supervisor. Most of your work during this time should concentrate on developing the primary research instrument/work to enable (as required) gathering and collecting data, and collating and implementation. Reflect on what worked and what didn't as you finish this practical phase. **You should be writing up as you go.**

By mid April

Will have finished pulling it all together, drawing your conclusions, topping up and checking your references, and completing your write up.

Specific deliverable(s)

End of Trimester B

THURSDAY 18th April*

(* *Due to Easter in 2019 – this is the FINAL day of Semester B*)

- Full project report (2 bound hard copies) to be handed to supervisor and soft copy submitted for Originality Checking via the Turnitin Assignment link on GCU Learn
- **Depending on the type of project, the application/artefact may have to be fully demonstrated (discuss with supervisor) and so you must agree meeting date/time with supervisor and second marker for that purpose.**

During Trimester B Examination Period

- Give poster presentation to Honours Project conference day. This is an all day event which normally takes place near the **very end of the Trimester B examination period**. You will be advised of the date during the course of the session. The School ensures that the presentation day does not clash with any final exams you may be sitting.

3.2 Additional Guidance Sessions and Material

There will be several additional support presentations and/or guidance material will be given by the Honours Project Module leader, to give overall guidance to students at key stages/deadlines, i.e.

Trimester A:

- **Week 1 : Introduction to Module/Interim Report** (2 hours)
- **Week 9 : Introduction to Final Report** (2 hours)

Trimester B:

- **Week 1 : Welcome back / Final report Reminder** (1 hour)
- **Week 9 : Final report review / Submission information / Poster Day** (1 hour)

You must check that these presentations are on your timetable

3.3 Project planning

For your own benefit, and as part of the submitted RSPI proposal, you would have established approximate dates by which you intend to complete the various sub-tasks particular to your project (as discussed with your supervisor and within the overall set of deadlines). Try to be realistic, but bear in mind that students are generally “optimistic” when initially considering things and activities tend to take longer than you expect on some tasks.

Three specific suggestions for progressing the work of your project are:

- i) **Make a regular arrangement to see your project supervisor.** This might be, on average, every two weeks. However, for example, you may not have meetings that regularly you may have meetings on about a 6 weekly basis, but these meetings tend to be more substantial and longer. Anyway, whatever arrangement you have it should be mutually agreed with your supervisor and it is a pattern which should be agreed immediately after you submit your proposal and see your supervisor formally for the first time. You should start the meetings by reporting on progress against your Gantt chart and against agreed targets from the previous meeting. Every meeting should end with the identification of the specific tasks you need to complete before the next one. A record sheet is provided for you in the appendices to this booklet. As we said, some supervisors go for less frequent but longer meetings driven by much more substantial “interim” deliverables.
- ii) **Keep a log of project activities**, including details of meetings with your supervisor, notes on ideas considered but rejected and time spent working on the project. Such material may be useful when writing your project report. However such material and approaches are also useful in supervisory meetings. We are amazed the number of students who seem to come to see their supervisor totally unprepared, with no written notes by which to report their progress and take no notes when their supervisor is advising them. Then they wonder why they don't seem to follow any ideas given to them and why they don't get a very good mark under Student Effort & Self Reliance when the project assessment is done!
- iii) **Build a project folder as you go along**, containing not only final versions of your work, but also earlier versions (again, these might be useful when writing the report), your notes on the literature, quotes from useful articles (note down the page number, you'll need it for the reference) and a growing list of properly formatted references.

3.3.1 Ensuring your plan includes keeping a secure back up of your project work

One interesting piece of advice given to me for "storing" your work (which is related to this last point about "versions" of your work) is to use one of the publicly available "Cloud" storage services (such as www.dropbox.com). Over the years we have had a few students who have come to us a week (or even a day) or so before any deadline saying that they have "lost" (or got corrupted) their work so far. They then somehow think that this is a valid reason for asking for an extension. They are then very surprised indeed when we refuse that request and indicate that this is not an unforeseen situation which is out with

their control. Indeed, often their own proposal document had explicitly identified it as a risk and even told me how they would deal with it (usually via taking regular back-ups on separate media) to make sure that it would be dealt with! Thus, how could it then be a valid reason for asking for an extension? For back-up, you may decide to use "Cloud" storage, or you may decide to use pen drives. However, you now know that **"loss of data" is not going to be a circumstance which will be accepted as an extension request to the Module Leader!**

4 Dealing with Ethical Approval of your Project

Your Project Proposal for RSPI should have included a commentary on any ethical issues which might be involved in your project, indicating whether or not you will be using “human” subjects and would thus require ethical approval

(Note : Ethical and professional issues should be also discussed within your Interim and Final reports. Refer to the Guidance documents for further information)

As you now commence on the Interim report – you should review whether Ethical Consideration and Approval is required - based on any updates to your project.

If it does, then **it is your responsibility to arrange for this and you should attend to that without delay** as soon as possible **at the start of Semester A**.

Appendix A of this guide provides all of the information about the process you must follow. However, in summary:

If your project requires participation from human participants then it must obtain ethical approval before you commence that element of the project. Some obvious examples of “participation from human participants” are:

- Conducting an evaluation or experiment where you get users/human participants to carry out specific tasks/exercises and data is captured from them about the experiment
- If your project involves formally interviewing an individual(s) to ask for views or information
- If your project uses focus groups to obtain information
- If your project uses questionnaires to capture information/views from participants

In these cases you must obtain the necessary forms and guidance material (details in Appendix A, but electronic copy of the form available from GCU Learn).

You must then **complete the form, discuss the completed form with your supervisor (BEFORE the deadline) and return it** (signed by yourself and the supervisor) to your Honours Project Co-ordinator (i.e. either **Brian Shields, David Moffat** or **Ali Shahrabi**, depending upon your programme suite).

For Undergraduate projects, the process is streamlined and generally dealt with at local level, i.e., if the approval is straight forward, then it is approved by your Honours Project Co-ordinator. However, if it highlights specific "unusual ethical issues/concerns", then it would have to be considered by the full School processes. Generally in the latter case, we would have a discussion with the student (and supervisor as required) to adapt the project/evaluation so that it doesn't then raise "unusual" ethical issues/concerns). You will be informed of the outcome within a couple of weeks of your submission. When it is approved, you must collect the signed approved form back from your Honours Project Co-ordinator and hold it during the length of the project as confirmation of approval.

Note : If Ethical Approval is NOT required – then an Ethics Approval Form should NOT be submitted

5 Interim Report format

This section outlines the format of the interim report. This is the main report which has to be developed and submitted prior to the final report hand-in.

This is the first formal deliverable of your Honours Project. It is due for hand-in by the end of week 8 of Trimester A. It is formally assessed by your Supervisor (and 2nd Marker) and contributes to your final Honours Project Marks. It makes up 20% of the total mark for the Honours Project.

The reason for having the project proposal and this “interim” deliverable is to provide you with “stepping stones” to prepare you for the various stages of the work of the Honours Project, to enable you to get feedback at key stages of the project and to try to help you plan and manage your time on the project.

5.1 Interim Report Chapters

The function of the interim report is to demonstrate to your assessors the progress you are making on your project and to confirm the detail of the methods you are actually going to use. This report is due in about one-third through your project life.

As indicated, at key points during the Honours Project, the Honours Project Module Leader will arrange for key preparation/guidance sessions at which further detailed information and advice will be given.

You will be issued with a further detailed guidance booklet, explicitly related to the project activities you should be undertaking up to the development of your Interim Report. This will be issued at the lecture in week 1.

Also, several “real” sample Interim Reports, and the marks and comments they received will be made accessible to you.

While the precise nature of the report’s content has some dependency upon the type of project you undertake, the document itself generally consists of the same 3 distinct chapters and should be **4,000 words approx** (sometimes more depending upon the nature of the project).

It should contain the “core” elements of what will actually form the first two chapters of your final report and a detailed outline of your proposed methods (which of course by that point will no longer be “speculative” or high level, but will have to be in a significantly detailed form).

Thus these chapters should be:

Introduction:

This should (if you have done it well) be a clear development from the introduction and background you had in your Initial Proposal. Clearly however, it will be “beefed up” since you have done more investigation into the related areas and you may even have further developed/refined your research question / problem statement and any associated hypotheses (**if required**).

Literature and Technology Review:

This should be complete and should be driven by the sub-questions you should have identified within your research question / problem statement. It should also be structured around these and it has to clearly draw conclusions which you will use (and ultimately refer to) in the development of your primary research instrument(s).

Project’s Primary Research Methods:

At this stage you should be clear about the finer detail of the stages in the development and execution of the Primary Research, including its logistics. You will therefore be able to provide an argued justification for these and describe the detailed plans you now have for them, and the extent to which these plans have been progressed.

This Interim Report format will be covered in some detail in the guidance session to be delivered in the first week of Trimester A and will also be in the additional guidance booklet.

Note : *A Title Page Pro-Forma will be made available on GCULearn*

5.1.1 *Some further initial notes about writing a Literature Review*

A literature review (which forms a substantial element of the Interim Report, but is also within the proposal as the Initial Literature Review of the Project Background subsection) is a summarised and concise critical analysis, of your sources of information in relation to the specific research question / problem statement you are addressing and should end in a set of justified and relevant conclusions. It would also include a Technology assessment – where appropriate.

It is not a series of synopsis or précis's (summaries) of your sources (although you will need to do that during the course of developing your review as you are considering your sources, this is why you should first develop an annotated bibliography of all of your sources). A literature review is written as an integrated narrative based discussion with appropriate use of citations to support your statements and your arguments.

For example, if your topic is 'potential use of Smartphones by security firms', your own notes during your literature search as you are developing your initial literature review would probably list/comment on examples of the relevant research relating to use of Smartphones and the problems security firms face, the main issues and concerns for each subject, the methods they use, and may also suggest how the two things could be brought together. To do this you would need some form of annotated bibliography which you add to as you go along and you would need to use some appropriate techniques (such as a mind map or spider diagram) to collate and categorise how you think all of the sources (and which ones) relate to the different "strands" of your research question / problem statement and thus your investigation of appropriate secondary research.

A (Main) **literature review** on the other hand demands a far greater level of thought on your part. The material you gathered and initially consider during your more detailed literature **search** (from week 1 of Trimester A) has now to be digested, rearranged and summarised. Your literature review section has to explain how the main issues in your area of research relate to your specific research question / problem statement. It should compare and contrast different approaches to answering your type of question. It would explain how much value you think should be placed on the results of the research and why. Finally your review should bring together all of the earlier material and show the reader exactly why you are proposing any hypotheses (if required), and how they have emerged as a result of your knowledge of other peoples work. Obviously, you should now see how the use of specific Secondary Research phase objectives helps you in directing and focusing this main literature review. Often the naive student thinks that a literature review has to be very wide (and exhaustive). However, you should now appreciate that the purpose of the specific Secondary Research objectives is actually to "narrow" the focus of the "deeper" literature review needed for the specific conceptual and intellectual elements of your project. We often use the phrase that as you develop your project you are "learning more and more about less and less". This is another of those phrases which, on face value, seem not to make sense. However, what it really means is that your literature review is not "wide". Instead the reality is that you are "drilling down" "deeper and deeper" in a more focussed (i.e. "lesser") area of the overall topic.

As with all aspects of academic writing style in this project, the model you should be following is that of a journal paper. You will know when you read one that flows, that it

takes you, the reader, along with the argument it is making. Adopt that style. Remember it is vitally important that you **do not** merely present the work of others, i.e. do not simply regurgitate what you have read (since that is plagiarism), your review should provide **critical discussion** of the material, using citations to support your points.

For example, if your project is based around a programming technique – i.e. a particular technology - you should include a summary of the main points of that technique and a discussion of its advantages and disadvantages. (This is also an example of assessing the technologies that may be used within the project.)

The literature review must also be presented with sourced references. You cannot make assertive statements in your literature review to present a justification of your approach without proper references within the text of the discussion. **These should be from journals/conferences and similar relevant sources** as you delve deeper into the main literature. The Reference section (which is one of your reports appendices) should give a full list of all of those that are **actually** referenced within the text of the report.

In both your Interim and Final Report, you should not include any reference unless it has actually been cited explicitly in the report. Most important of all, ensure that all of the material in your literature review is **relevant** to your project.

(**Section 7.8** of this handbook is titled “**Referencing**” - this gives more information about citing and referencing which is directly relevant to this aspect of your project, at both of the Interim and Final report stages).

Study that material at this stage (as you are developing your review for your Interim Report).

6 Final Project Report format

The process of research isn't completed until its results have been communicated, and proper communication of your findings is a critical component of the Honours project. **Read this section thoroughly at the start of your project and plan plenty of time for the production of the final report (particularly since it gives some advice about referencing and writing style which you need to further develop in your Interim Report).** You should start writing as early as you can and write up your work as you go along, leaving the last few weeks for tidying up what you've already written, polishing it and ensuring that your formatting meets School guidelines. Every year there are students who fail to do justice to the hard work they have put in because they don't leave enough time to write it up properly.

6.1 Report structure

The structure of your report may vary according to the nature of your project. The most likely structure is suggested here although it is possible that variations (if merited) can be devised to suit yourself with the agreement of your supervisor.

	Title page
	Abstract
	Acknowledgements
	Contents
Ch 1	Introduction
Ch 2	Literature Review and Technology Assessment
Ch 3	Execution
Ch 4	Evaluation and Discussion
Ch 5	Conclusions and Further Work
	Appendices

The next sections will give you more information on what each of these headings may contain.

However, again, as indicated earlier, the Honours Project Module Leader will arrange for key preparation/guidance sessions at which further detailed information and advice will be given.

There will be a specific guidance session for the structure and format of the Final Report and it normally takes place around week 9 of Trimester A.

At that session, a further detailed guidance booklet, explicitly related to the Final Report will be given.

Also, several "real" sample Final Reports, and the marks and comments they received will be made accessible to you.

6.2 Preliminary pages

6.2.1 Title page

There will be a Title Page Pro-Forma made available on GCULearn

The title page must include the following information:

- a) your name and matriculation number,
- b) the title of your project,
- c) your programme and year,
- d) your supervisor's and second marker's names,
- e) the sentence 'Submitted for the Degree of BSc/BEng in XXXX, 2017-2018'.
- f) (at the bottom) the statement: *“Except where explicitly stated, all work in this report, including the appendices, is my own original work and has not been submitted elsewhere in fulfilment of the requirement of this or any other award”* followed by....
- g) your signature and date.

6.2.2 Abstract

This is a very important and often neglected part of the final report. The function of an abstract is to give the reader a complete overview of your work, why you did it, how you did it, and what you found (for a final report) in less than a page of A4. It is **not** a teaser or a trailer for your work but a concise summary of it. Abstracts are the main way that researchers find out about each other's work, and it will be the main way that you will determine what scholarly articles are of relevance to you.

You will become more familiar with abstracts as you undertake your literature reviews and should use the format of the **best** of them (those you find most useful as a guide to the paper that follows) to structure your own. It is also a part of the Project proposal and there is an RSPI tutorial exercise on your proposal abstract. Thus you should be able to develop some useful experience in it before the final report. However, there are also many sources of material giving advice about how to write effective abstracts, such as:

<http://www.ece.cmu.edu/~koopman/essays/abstract.html>
<http://writing.colostate.edu/guides/documents/abstract/>

The above are only some example sources; you would be able to find plenty using a simple Google search of your own. Some of these sources also give guidance about how to read abstracts for critical purposes when you are undertaking your own literature review and this is a very important skill to learn and a key feature of the purpose of an abstract.

The fact that the abstract is a part of the final report is another reason for also including an abstract in the Proposal this session. Of course the abstract in the proposal will be of what you intend to do, whilst the proposal in the final report will be about what you have done.

6.2.3 Acknowledgements

This is where you can thank those people who have contributed to the success of your project, your parents, partner, supervisors, sponsors, etc. The only rule here is to write it a few weeks before you finish your project and read it again before you print. If you find yourself cringing then you probably need to tone it down a little.

6.2.4 Table of contents/Table of Figures

The function of these tables is to allow the reader to see the structure of the report and to go to the exact section they wish to see. Explore and make use of the table of contents and table of figures features of Microsoft Word. To use them you will need to set your document structure up with Styles and Caption features but it is worth it as they save you a lot of time and effort in the long run.

6.3 Introduction

The introduction performs four functions. Firstly, and most importantly, it should convince the reader that they should read on. It helps if you avoid excessive technical detail at this stage. Secondly, it should place your work in context, i.e. it should describe the problem you set out to solve (if a detailed project brief was supplied by your supervisor or other client it should be included in the appendices), and give relevant background to introduce the topic and the project area. Thirdly, it should clearly state the aims of your project: what is the question you are addressing, what is your approach to addressing them and how will you know if you are successful? Lastly, it should outline, in reasonable detail, the structure of the rest of the report. This outline should also give some indication of the outcomes of the project and any specific conclusions you will go into in more detail in the body of the report. Thus it is again a further development of the similar material initially started in the Proposal and refined in the Interim Report.

6.4 Literature Review and Technology Assessment

This chapter should also be a development of your Literature Review and Technology Assessment from the Interim Report stage. You should have arranged to meet your supervisor to specifically discuss your Interim Report, shortly after its submission. You are expected to act upon that feedback and in the final report; you are assessed on how you have taken on board that feedback and enhanced the literature review as required. If that feedback was minor, then you won't actually have much further development of the main literature review to do.

6.5 Execution

This chapter will provide detailed information about **the development of your project's primary research "instrument"**. This will be different depending upon your particular project. However, you must remember to "link" it back to the conclusions of your literature review as you are presenting it.

It is also worthwhile (and expected) that you make a simple case for your overall research methodology which you have used for your project. This will include justification (cited

as required) as to why the method you have used is appropriate for the objective of your project and that your adaptation of it is suitable.

As previously stated – This section is dependent on the nature of the project. Thus, you must provide a **detailed account** of the development of the application/artefact using appropriate methodologies.

Here are some examples – BUT you must discuss and agree the methodologies that you plan to use with your supervisor to ensure that they are appropriate for your project

6.5.1 For development-type projects :

This could include detailed information about :

- Analysis
- Design
- Implementation
- Testing
- Etc

This may include functional and non-functional requirements - you will have a detailed discussion of the original problem in relation to your literature review (referring back to its conclusions as required) so that you can justify functionality and requirements you have incorporated.

You should *justify* design decisions; for example, why particular techniques and methods for solving the problem have been adopted (with direct reference to your literature review as required).

Flesh out your design with implementation details. Take care to highlight how you tackled particularly tricky or interesting problems that arose during the course of your work. It is not necessary to describe all aspects of your system in detail, but you should describe and explain the key parts of your system down to the code level, with properly explained illustrative code fragments as required. This will help others (i.e. developers) who may wish to replicate your technique on a wider scale.

Outline the test and evaluation procedures you adopted during and after the implementation stage. The test results themselves should form a separate appendix.

Your project may include user testing or will involve some other evaluation technique. You should also link this to your earlier discussions on user requirements and system design.

If, for example, your project is a prototype application that has been developed based on the requirements of a “real” client, then you should conduct some kind of at least “semi-structured” evaluation of how successful the prototype was. How it

improved the performance of the task it was intended to address. You might do this using a structured interview with key personnel or through the collection of actual usage data in a “real-life” situation.

In many cases, you are not developing a project for a “real-client”. In such cases you must still try to get it used in a “pseudo” realistic environment and perform an evaluation based on this.

6.5.2 For experimental-type projects :

The aim of this section is to describe the way the study/experiment/evaluation was carried out in detail. This section should be broken down into a number of separate parts (and again it is about discussing and justifying your decisions and choices) not just “presenting” them as a “fait accompli”:

You should discuss and then describe the reason that the experiment/evaluation is structured in the way that it is: why a certain user group/method/expert was chosen; the types of measures used; the allocation of subjects/users to experimental conditions; the structure, content and detail of questionnaires/interviews etc. Also put copies of these materials in the appendices.

It may also cover :

User Subjects - including appropriate justification as to why this group is appropriate for the purposes of your project.

Apparatus - Any equipment used; its configuration and layout. Diagrams may be useful.

Procedure

A discussion, justification and description of exactly how you conducted the project, stage by stage, including the instructions given to the subject and any timing. These may be referred to in general terms and presented as appendices if lengthy. Preparatory work or pilot trials should also be described here.

6.6 Evaluation and Discussion

This will be the detailed presentation of your results and your **evaluation** and **discussion** of them. In this chapter you have to discuss the detail of your findings and you should clearly discuss and suggest reasons for your findings and what you feel that they mean in terms of what it is that you are trying to investigate and what conclusions this might mean (both individually and collectively) for this precise project area.

You will need to think carefully about how to structure and present your results. Also you need to think about the level of detail in the chapter. What you will be presenting and

discussing in this chapter is the results and so it will tend to be presented in a summary style (i.e. as a series of charts which you then discuss in detail and derive initial conclusions from).

This should also include a commentary on any **ethical/professional issues** which were involved in your project. This should be updated as necessary from your Interim Report.

In terms of the structure of this chapter, the presentation will depend upon your actual project.

6.7 Conclusions and Further Work

This section is really where you need to put in some serious thought and effort (as if you hadn't already)! It is where you show that you understand how the results of your work address your research question / problem statement and where appropriate how these link into the work of others. You are also trying to discuss the results and your conclusions of them with respect to any potential "impact" or "lessons" they may have for the wider topic area. It is also where you reflect on the success of your work and the ways in which you could improve and extend on it.

When preparing for this section you might ask yourself the following questions. What have you actually achieved? Did the data support or disprove your hypotheses? What do you think the answers to your questions are having carried out this work? Do they differ from the results of others or support their findings? Do they differ from what you might have expected? If they differ why do you think this might be?

Project critique

This is where you demonstrate what you have learned about the process of research while carrying out your project. It is where you critically appraise your own work. How successful were you in achieving the original project aims (as stated in the introduction), what problems arose in the course of the project which could not be readily solved in the time available, why do you think they arose, what would you do differently if you had to do it all again?

Further work

Most journal papers have a section like this, it is where you explain what you think should be done next to take your work further. If research was a relay race this is where you would hand the baton on to the next person. In the real world it is where you make a case for more funding. Where would you take this research next if someone paid you to do so or had more access to resources (people, organisations or equipment)? You are essentially expected to suggest other potential projects (which might form the basis of other Honours Projects, or even larger scale projects at a higher level of research). What questions do you think should be answered next?

Conclusions

This is the final paragraph or two of the report. Use it to pull together your findings. What, after all the discussion, can you finally conclude about the study? What did you find out? What did you produce? Who will it be useful to? Was it a success?

6.8 References

Not to be confused (as has been indicated before) with a Bibliography. A reference list contains the material you have directly cited in the text of your report, a bibliography contains a list of materials you have used but not necessarily referred to. **You will have a reference list in your Interim and Final project report, not a bibliography.** Every reference in your list must be cited at some point in your project report and all citations must have an accompanying reference in the list. It is amazing how many students submit poor, incomplete and inconsistent references and reference styles in their list. It is also amazing how many use poor, incomplete and inconsistent citation formats within the report text. In order to do this you were advised of the availability to use the REFWORKS system which enables you to compile, maintain and automatically incorporate citations and references into a word processing document. You were given some guidance on this within the RSPI module. In terms of quality, your reference list should contain a spread of sources including a high proportion of journal articles.

There is a specific format for Reference sections in all books and journals and your Honours Report is no exception. There are actually a number of different referencing systems across the research community but **your programme uses (and thus your Reports must use) the Harvard convention for referencing.**

You should pay special attention to the way that the references are formatted in the reference list. There are standard ways to list different sources to such things as books, book chapters, journal articles, web-pages, magazine articles and reports. You should use the appropriate format within the Harvard system for each different type of source. Also, remember whilst most of your sources are obtained “via the Internet” (i.e. through Internet based access to scientific and scholarly search engines which allow you to download the article) the vast majority of them are not actually Internet/Web sources (and thus should not be referenced as a web source!). REFWORKS assists with this automatically so why bother with anything else!

Thus you must use the Harvard System of Citing and Referencing for all of your sources. The examples given here are only a subset of examples. Further details and explanation of this system is given on the University Student Site via SMILE :

<http://www.gcu.ac.uk/library/smile/plagiarismandreferencing/referencing/>
(Make sure that you examine the full set of pages at the site for detailed advice)

There is really no excuse for poor quality citing and referencing, particularly since a system like REFWORKS makes it much easier for you. Whilst REFWORKS does make it easier for you, it too is not absolutely comprehensive and so occasionally manual correction is required. Thus if you are unsure of how a literature source should be recorded in your reference/bibliography, then you should source (and use) a more comprehensive Harvard reference guide.

It is essential to give sources for all statements in your text that are not derived directly from your own observations or as a result of a previous presented discursive argument. There are three generally accepted situations when you must cite a reference within the main text of a dissertation:

- When you make a direct quotation of their words; or
- When you state what they are saying, but in your own words; or
- When you make assertive statement during the presentation of your discussion/argument, then you must use a reference to support it.

Let us look at the way you might incorporate them in each of these three cases.

If you use another writer's words verbatim, you must put them between quotation-marks. You would certainly do this if the quotation is in-line with the main text. Alternatively, if it is a longish extract you might indicate it by indenting the text thus:

CSCW has emerged as an identifiable research area which focuses on the role of the computer in group-work and involves researchers across a range of disciplines. (Rodden,1993)

Notice here that, as with all references within the text, it should be referred to via the author surname and year of publication, all within parenthesis. This makes it easy for the reader to look up the list of references at the back of your dissertation for full details if it is desired (as they will be in alphabetic order on surname).

If you use someone else's words without acknowledging them, this constitutes plagiarism which is an offence (and it is punishable by failure!). It is also silly, because you lose the opportunity to display your breadth of reading.

If you use someone else's ideas, you should also acknowledge the source, even if you state the idea in your own words. For example:

Piercemuller (Piercemuller, 1993) has drawn attention to the confusion between nominal and virtual groups: Bandstone's results (Bandstone & Moss, 1991) were obtained with nominal groups, but the Bandstone-Lapping model assumes these results can be applied to virtual groups (Bandstone et. al., 1992).

You should see in this example, that the text is a flowing narrative. Clearly, however, you are using three difference reference sources to construct an argument. You may, however, just use a reference to support an assertive statement which is not attributed to anyone specifically. For the purposes of illustration, let us re-write the above. Here the first phrase is written as a general assertive statement.

Attention has been drawn to the confusion between nominal and virtual groups (Piercemuller, 1993): Bandstone's results (Bandstone & Moss, 1991) were obtained with nominal groups, but the Bandstone-Lapping model assumes these results can be applied to virtual groups (Bandstone et. al., 1992).

You will probably use a combination of all three of the above within your dissertation. The particular method you will use on each occasion will very much depend on the point you are trying to make or the argument you are trying to construct.

The integration of citations within the flow of a piece of academic writing is a skill which a number of students find difficult. Again the University Web site gives some good guidance about this (which also emphasises the pitfalls of Plagiarism in academic writing). Further details and explanation of this is given at:

<http://www.gcu.ac.uk/library/smile/plagiarismandreferencing/>

6.9 Appendices

Appendices are used to include detail which supports the content of the main report, but which would interrupt the flow if it were included in the main body. For example, requirements specification and design detail, test or experimental results, survey data, program listings, and project log. You need however, to ensure that you strike the appropriate balance between explanation and illustration in the main report and “Raw detail” in the appendices and refer to them appropriately.

6.10 Final words on the report

Also, anyone reading the full report should be able to replicate your work; make sure you include all the necessary information without becoming tediously detailed.

Leave plenty of time to write your report; it is likely that you will have to re-draft it several times. If you have a first draft of your report completed at least a fortnight before the final handing-in date this gives you a chance to look through it and improve its presentation. Also, make use of the technology available to you. In particular, use a spelling checker.

Finally, remember that this is **YOUR** project. You must make clear what your contribution to the topic is, and in particular, **justify decisions**, not just document them.

6.11 Writing style

Whilst writing style is very personal, remember that the reader should find your work interesting and understandable. To avoid boring and complex prose a good rule of thumb is ‘If you can’t imagine yourself saying it, then don’t write it!’.

Some report guidelines suggest that you should write your report as if it will be read by an intelligent relative who knows nothing of your subject and if you do this you’ll be sure to write it at the right level. Why should you do this? Well, although your supervisor will be familiar with your project when they come to mark it, the second marker, and the external assessors, may know nothing of your work other than what is set out in the report. If you think

about writing for that relative you will ensure that you include all the important information about your project. It is also worth trying it out on someone in that category to see if it can be understood. You should also write (as a general rule) in the third person.

Aside from your supervisor, you can also get help on writing from books. For example Partridge's *Usage and Abusage*, Roget's *Thesaurus*, or Strunk and White's *Elements of Style*.

6.12 Report size

A good final year project report should be detailed enough to allow the examiner to assess your work, yet should not be so detailed that it is tedious to read.

As a rough guide, the main body text of the project (*excluding contents pages, figures, tables, references and Appendices*) should be **approximately 10,000 words** in length, (single spaced using any standard 12 point font).

You should highlight innovative work in the body of the report and relegate certain details (such as listings, test cases, etc.) to appendices.

You may find that your report may be a bit larger in cases; some of this can depend upon the type of project undertaken. However it should certainly not be significantly less. If you find that you have a significantly shorter main report, then it is highly likely that you either haven't appropriately undertaken your project and don't actually have a very significant Primary Research element, or you haven't properly written up/reported upon the development and execution of your Primary Research. One thing you certainly should not try to do is to "bulk up" a report by having extraneous and unnecessary material in your "literature review" as some form of "compensation".

In the last few years some reports have been over-large, you may find examples of these (and others) in those final reports which are made available to you. We always try to give you the Good, the Bad and the Ugly as "exemplars" of previous projects. We will be encouraging students to deliver concise rather than bulky reports this year. **Remember, you get no additional marks for extra bulk.**

7 Handing in your Honours Report

Your report must be word-processed on A4 paper and “soft” bound together using any appropriate method (such as plastic spiral or thermal binding and a clear plastic protective front covering).

You should submit TWO hard copies of your report to your supervisor. You need only include appendices with one of the bound report copies. One of the hard copies may be returned to you, at the discretion of your supervisor, at a later date if requested, but you are really best just to keep your own soft copy as accessing project reports once they have been placed in archive storage can take some time if you need your report in a hurry.

You are also required to separately submit a soft copy of your report for Originality Checking via the Turnitin Assignment link on GCU Learn

If for any reason your supervisor is not available on the submission deadline then you may submit to your Honours Project Co-ordinator. Make sure that, in either circumstance your submissions is receipted.

You are responsible for the binding of your project reports and they **must** be submitted by the due date.

Requesting Extensions for any project submission deadline: Please also note that **under no circumstances whatsoever is your supervisor at liberty to authorise an extension to the submission deadline of your project report(s). All requests for extension must be addressed directly to your Honours Project Co-ordinator, by the student themselves, with appropriate documentary-based supporting evidence.**

Please also note that pressures of time or poor time management on your part (which include "I have ran out of time" or "I cannot do it") are not legitimate reasons for an extension request.

It is the **complete responsibility of the student** to schedule their project within the normal activities of course-works and examinations for their other course modules (as well as the normal “ups and down” of life).

Neither, as already indicated, is loss of data (through machine failure or otherwise) a legitimate reason. You should use some form of widely available (and generally free) Cloud based storage application - there are plenty around! Dropbox is one of the examples.

8 Honours Conference and Project Poster Presentation

At the end of your project you are expected to present your work in the form of a short conference style poster and presentation. In the academic and research world this is commonly how researchers let each other know about their work, particularly if it is at research student level or preliminary work. Very often a Poster style Presentation will take place in the foyer area or hallway of a large conference centre. The A1 sized poster presenting the work is displayed on a board with the researcher standing in front of it and giving a short talk about it and answering any questions those listening might have.

Whilst your event is not an actual conference based poster presentation, it is run in the same fashion. In your case it is an opportunity to demonstrate what you've learned and it is also valuable practice for both visual presentation and public speaking (something which we all hate but have to learn how to do).

You will give your poster presentation as part of the School's Poster Day Conference. This is an all-day event during the Trimester B exam period (in previous sessions it has generally been on the last day or so of the 3 week assessment period). We arrange that no examinations for our students take place during that day so that your schedule is completely free. You have to attend at the start of the day to set up your A1 sized poster on your designated stand within the room/hall used. Your formal oral presentation of this poster/work will be scheduled during a half hour slot in the event's timetable. All the posters are displayed at the same time in the same area and a number of presentations are taking place simultaneously. Sometimes it sounds (and looks) a bit "chaotic" with the numbers and people milling around, but this is actually how it happens in a real life conference.

At your designated slot, you will talk for 10-15 minutes and then you will be asked questions. You will give your presentation to two designated members of staff, neither of whom will be your supervisor. The aim of the questions is to find out how well you understand your topic and to clarify any points raised during your talk or on your poster. Thus, whoever is attending your poster presentation, you should assume that the "audience" has no "pre-knowledge" of your work.

Again, as indicated, at key points during the Honours Project, the Honours Project Module Leader will arrange for key preparation/guidance material through which further detailed information and advice will be given. **There will be specific guidance material issued for the Honours Project Presentation. This is normally done electronically a week or so before the end of the Trimester B teaching period.**

However, there is again plenty of widely available (web based) resources giving advice about developing a Poster. Examples are:

<http://www.gcu.ac.uk/student/coursework/presentations/posterpresentations/>

<http://www.ncsu.edu/project/posters/>

<http://www.stars.rdg.ac.uk/poster.html>

<http://clt.lse.ac.uk/workshops-and-courses/Course-resources/Poster-Design-Tips.php>

Your Poster should be A1 sized Portrait version. Some examples you might see in the materials are A1 sized Landscape. For printing your poster you will need to use specialised poster printing facilities. The University does have this facility, which is normally available as

part of the general student Print Design Services from the Print Centre (on Level 1 of the Saltire Centre). However, it is the only such printing facility available to all students of the University and so it does get very busy around that time. Thus you should not leave the development of your poster to the “last minute” and you might actually be well advised to find out about other commercial printing facilities in the City Centre area.

As with the submission of your Interim and Final Report, you are also required to separately “post” a soft copy on GCU Learn. This will, however, not be a Turnitin-based submission, but will be using the standard Assignment submission mechanism of GCU Learn. More details will be given regarding this and details of the format and assessment of the final poster presentation event will be given to you during the course of the session as part of the final guidance information about the Honours Project Presentation given around the end of the Trimester B teaching period.

9 Assessment of the Project

As mentioned above, there are three elements of the project to be assessed within the honours project module: the interim report, the final presentation, and the final report. The initial proposal was assessed as part of the RSPI module. At all stages the honours project assessment is carried out by the project supervisor (assisted by the second marker).

In assessing the project, the markers will keep the following criteria in mind:

- i) The quality of the work undertaken in the project, particularly with respect to the originality and difficulty of the project,
- ii) The aims, specification and identified deliverables of the project and the extent to which these have been achieved.
- iii) The level of individual thought and effort displayed by the student, e.g. through critical appraisal of their own work and the work of others.

The following outline marking scheme gives a more detailed breakdown of how marks are generally awarded; examples of actual marking are provided to you as part of the additional specific guidance session concerning the format of the final report⁷.

	Mark
<u>Interim report</u>	20
- Introduction, Lit review, outline problem and systems analysis	
<u>Honours project report</u>	
Literature and Technology Review update	5
Execution	30
Evaluation, Discussion, Conclusion and Further Work	15
Format, appearance and referencing	10
Student Understanding	5
Student effort & self reliance	5
<u>Poster Presentation</u>	10

To remind you the honours classifications are: 1st - 70-100 marks; 2.1 - 60-69 marks; 2.2- 50-59 marks; 3rd - 40-49; Fail 0-40 marks

Further details of the marking criteria for each heading will be given during the course of the project period, again as part of the associated additional guidance sessions/material provided by the Honours Project Module Leader.

⁷ Marking schemes are continually being reviewed and so this structure may change from year to year. Any changes will be clearly communicated to you in advance.

9.1 Supervisor awarded marks for Student Effort and Supervisory Meeting Records

One particularly important point to note at this stage is that there is a Supervisor awarded element for “Student effort & self reliance” within the final project marking scheme. The supervisor allocates this (without any reference to the second marker) and bases it upon the conduct of the student in terms of contribution to supervision meetings, achievement of deliverables, and the innovation and independence of the student in achieving their objectives and deliverables, throughout the entire project period.

Thus, in your dealings with your supervisor you would do well to follow, what is termed, the “3Ps” model, of being Polite, Professional and Prepared. The Supervisory Meeting Record Sheet (copy in Appendix) is also one of the methods used to help the supervisor make a judgement under this heading. If you study that Record Sheet you will note that it is you who should bring a copy of it to any supervisory meeting that has been arranged. Before every meeting (except your very first meeting) you should complete the first part of it which is the section where you must make some notes on your progress since the last meeting and identify the issues you would like to discuss at this meeting. The rest of the form is completed at the meeting (normally by the supervisor) and signed by both parties. The final point in the record sheet is that an arrangement should be made for a next meeting along with the identification of the goals you should achieve by that meeting (and of course which you will have to comment upon in the Record Sheet you prepare and bring to that next meeting). If you come to meetings without even attempting to complete this Meeting Record Sheet, then don’t be surprised if you get a poor mark under the “Student effort & self reliance” section!

Please note that these sheets are as much about being used by you to measure and monitor your own progress (and provide feedback on it) as it is for the Supervisor to monitor and guide you. You should make the most of this system.

10 Supervision of Projects

Staff will be involved in a number of different functions associated with the project. These are:

The Project Supervisor	who acts as an advisor to the student in terms of project planning and control and provides technical advice.
The Projects Co-ordinator	who is responsible for the overall management of projects.
The Internal Examiners	who are responsible for assessing the project. There are two internal examiners, your project supervisor and a designated second marker. This second marker is appointed after project proposal submission time. Remember also that one or both of your supervisor/second marker may not be examining your poster presentation. It may be two completely different members of staff.
The External Examiners	They moderate (check marking of) all projects.

If you have any problems with your project you should talk to your supervisor in the first instance. If you feel you are having problems with your supervisor, then see your Honours Project Co-ordinator. All problems must be brought to the attention of the appropriate member of staff as soon as possible.

10.1 Project Monitoring and Grievance Mechanism

The University Guidelines require each type of project to have a grievance mechanism, should students be unhappy with any aspect of their project or its supervision. They also require a process for ensuring that a student's progress is monitored. However, it is important when considering this, to see what the University guidelines expect from both Supervisors and Students.

10.1.1 What is expected of students

- * student to be independent
- * student to seek advice and comment on their work from others
- * to have regular meetings with supervisor
- * student to be honest when reporting on progress
- * student to follow advice which has been specifically requested by the student
- * student to be interested in the work
- * student to take ultimate responsibility for the direction and content of the dissertation/project

Note that the clear responsibility for the project rests wholly with the student. Staff during supervision will give guidance, which occasionally students ignore or misinterpret! Guidance is normally given by supervisors to try to get the student to continually improve (and hopefully succeed in) their project. Should a student fail to heed clear advice, then the Supervisor cannot be held responsible.

Note also that the student has obligations to have regular meetings with the supervisor (not the other way around!). As a guide, you should always end one meeting by setting a date for the

next, as is required by the meeting record. You cannot simply turn up, without any notice, at your convenience and expect a Supervisor to "drop everything" at short notice. Members of academic staff, like all professionals, have several different areas of responsibility and they must manage their time in a reasonable fashion to discharge all of these appropriately. It is normal in any professional situation to make appointments, giving due notice. You are expected to do the same. Similarly if you do not attend for a pre-arranged meeting, you are expected to provide a satisfactory explanation. Again normal professional practice would expect such protocol. If the supervisor does think it is satisfactory or that you don't seem to be "pulling your weight" then he/she is expected to be blunt with you.

As well as the project plan being used by your supervisor to monitor your progress, the project co-ordinator also tries to ensure that the major milestones are being kept to. At key points during the project period, the co-ordinator will take reports from staff. If a student is missing meetings and/or project milestones, then the project co-ordinator will be expected to call the student to account and take any action which is deemed appropriate. Again, this sort of mechanism is simply a reflection of the standard business practice one would expect in a professional situation.

10.1.2 What is expected of supervisors

- * to read the student's work and be familiar with it
- * to be available when necessary, and within reason
- * to be friendly, open, supportive
- * to give students serious attention during interviews
- * to be constructively critical
- * to have a good knowledge of the research area and to exchange ideas freely
- * to be aware of future pitfalls in the research topic

Should a student feel, during the course of undertaking their project, that they are not receiving what can reasonably be expected from their Supervisor and they cannot satisfactorily resolve the matter with their supervisor, then the student should bring the matter to the attention of the Project Co-ordinator. This would be the essential mechanism for dealing with any grievances. You are also expected to bring up such matters as early as possible and as close to the time of occurrence as possible. The School cannot be held responsible for matters if the student has been deemed not to take appropriate steps to resolve (or bring to our attention) any matter in a timely fashion. The purpose of these procedures is precisely to ensure that problems or difficulties are dealt with speedily so that they can be resolved satisfactorily.

Please remember, however, that in all your dealings with the supervisor, you are being treated like an adult. Both you and the supervisor are expected to be honest and frank with each other. Please also note that, as per the University regulations, no appeal against the mark awarded for the project will be entertained unless the student has initiated the grievance procedure prior to submission.

11 Turnitin and Plagiarism

11.1 Using Turnitin

Turnitin was used extensively in RSPI. There was detailed lab material which explained the purpose and the use of Turnitin. (RSPI Week 4 lab material)

Turnitin will also be used for all stages of your Honours Project, in particular, the Interim and Final reports.

Many students seem to **ONLY** use Turnitin as a means of submitting work.
BUT ... Its MAIN use is to detect Plagiarism !!!!!

In particular, you should note that :

- You should be using Turnitin **frequently** to check the similarity score of your report.
- You **do NOT check it only** on the final day of submission
- There can be **upto a 24-hour turnaround** before you can re-submit on Turnitin for checking – especially at the busy times of the year

Note :

The definition of **Self Plagiarism** below only applies to a **NEW** assignment

The Honours Project consists of various stages : a Proposal, Interim Report and Final Report. Each Report is more detailed as your project progresses.

Thus, the re-use of material throughout these Reports is **NOT** self-plagiarism

For example, the re-use of material from your RSPI Proposal in your Interim Report is **NOT** self-plagiarism – since it is part of the process of producing your Honours Project

11.2 Plagiarism

This is a very important aspect on your work on your Honours project. There are two main resources which define Plagiarism.

11.2.1 SMILE

SMILE is an excellent GCU Resource

<http://www.gcu.ac.uk/library/smile/plagiarismandreferencing/>

It is an information and digital literacy training package which aims to teach the basic skills for GCU students. It also contains help on communication and other academic skills in bite sized sections.

In particular, it contains very useful information about Plagiarism. You should refer to this resource for detailed information.

It provides the following examples of plagiarism:

There are many different ways to plagiarise but the most common ones are:

- **Copy and Paste:** when a student copies a piece of text from any source and pastes it into their assignment without acknowledging their source.
- **Collusion:** when one student produces work and allows another student to copy it. If both students submit the work, BOTH students will have colluded.
(Not relevant to Honours project :
Collusion differs to group work - some assessments will involve students working together on a particular project. Such assignments may require:
you to share ideas, research and have joint responsibility for the development of a project
you to work together and produce a joint piece of work for assessment
you to work together but then produce an independently written piece of work
Check with your lecturer so that you are sure of what is required of you!)
- **Concealing sources:** If a student cites a piece of work from a source more than once they must reference it each time. No matter how many times they refer back to the source they must acknowledge it, even if it is in the very next paragraph.
- **Ghost writing:** If you pay someone to write your assignment for you, (like if you sign up to an internet service), then this will count as plagiarism as you are passing someone else's work off as your own. If you are found guilty, then you will be subject to our disciplinary procedures.
- **Self plagiarism:** Self plagiarism is when a student reuses their own previously written work or data in a new assignment and does not reference it appropriately. This could be conceived as deceiving their lecturer.
- **Word switch:** If a student copies a sentence or paragraph into their assignment and changes a few words it will still be classed as plagiarism.

11.2.2 Code of Student Conduct

The formal definition of Plagiarism is stated in the “ Code of Student Conduct “

<http://www.gcu.ac.uk/gaq/appealscomplaintsstudentconduct/>

For the purposes of this Code, Plagiarism is interpreted in its widest sense and includes self-plagiarism.

Plagiarism is considered to be either the unacknowledged incorporation of the academic material (published or unpublished) of another person or persons, or the re-use of a student’s own previous written work or data presented for assessment on a previous occasion (self-plagiarism).

Depending on the circumstances it may be classified as poor academic practice, minor offence of plagiarism or a major offence of plagiarism. Examples of Plagiarism include:

- i. The use of another person's academic material (writing, drawings, ideas, and data) without reference or acknowledgement;
- ii. summarising another person's written material by changing some words or altering the order of presentation without acknowledgement
- iii. use of the ideas of another person without acknowledgement of the source;
- iv. copying the work of another student with or without that student's knowledge;
- v. use of commissioned material, without reference or acknowledgement – often termed ghost writing;
- vi. use of additions or corrections by a proof reader with relevant knowledge in the subject;

- vii. collusion with another student or other students;
- viii. self-plagiarism (as defined above).
- ix. reproduction of model answers, in whole or in part, from any source in assessments and examinations.

12 Appendix A: Ethics guidelines for Honours Project students

12.1 Outline Guide to the General Process

All students have to complete a university ethics approval process and all projects have to be subject to School and University ethics procedures.

This document is designed to get you through this process with the minimum of pain. Check through the questions below and follow the instructions.

Q1. Does your project involve any interviews or questionnaires, experimental studies or procedures involving human beings?

NO

- No ethics form needed – more time to do the research.

YES – go to Q2.

Q2. Are you planning to interview, send questionnaires or run an experimental study using people under 18?

NO - go to Q3

YES – you need to make sure that

- you would require to obtain (at your own expense) the necessary PVG/Disclosure certification prior to undertaking the study
- you obtain parental consent before you carry out any interviews, questionnaire surveys or experimental studies
- you do not carry out interviews or experimental studies in situations where you are alone with the young people concerned
- you have the full approval of any school or college involved
- you follow the general ethical guidelines listed in section 2
- Your submitted ethics form will, when/if approved, be subject to your supervisor vetting your questionnaire/ data gathering instrument prior to its use.

Q3 - Are you planning to interview or send questionnaires to anyone involved in health or community care?

NO – go to Q4

YES - you have to be careful that the procedures defined under the Research Governance Framework (<http://www.show.scot.nhs.uk/cso/ResGov/Framework/RGbrowse.htm>) have been followed. In brief **forget anything that involves patients or community care ‘clients’** because this area has so much red tape associated with it that you will never get through it in time. The only exceptions may be where the project is part of a

larger one (e.g. MRC, CEC) and the team experts have cleared all of the relevant hurdles in advance.

If you are dealing with medical or community care practitioners and you can be certain that your activities do not affect or involve patients or community care clients then you need to make sure that:

- you follow the general rules in questions 2 & 3
- You must submit a full proposal to the Ethics Committee with a completed ethics form and checklist (using their processes, not the streamlined local process). The committee may then ask you to submit copies of your questionnaires and surveys to them when they are ready to be used. It may take up to 2 weeks to get approval for your questionnaire or survey so make sure you leave plenty of time to get this approval.

Q4 - Does your project involve any of the following:

- deceiving participants about the nature of the study;
- inducing moderate or high levels of negative emotion (including self-esteem) or physical stress; (**NOTE: playing Computer Games in some form of experiment IS NOT generally viewed as inducing either moderate or high levels of emotion, negative or otherwise.**)
- a focus on a sensitive subject area e.g. serious physical illness, mental illness, addiction, criminal activity, sexual conduct, racism, religious intolerance etc.

NO – you need to make sure that:

- you follow the general rules in questions 2 & 3
- You submit your proposal to your Honours Project Co-ordinator via the streamlined local process.

YES – Warning: you need to have a good case for carrying out this type of research. You will need to seek specific guidance from the Ethics committee by submitting a copy of the ethics form and your initial proposal, once it has been agreed by a supervisor, at the earliest possible opportunity.

If your research does not fall into any of the categories covered above you need to seek guidance from the School Ethics Officer

General ethical guidelines for carrying out surveys and questionnaires

Think about people's feelings

- Look over your questions, are any of them likely to make the people you give them to feel uncomfortable or stupid? Are you asking people to admit to something they may feel uncomfortable about?
- Make sure you don't ask anything about sensitive areas e.g. race, sexuality, weight unless it is absolutely necessary

Maintain confidentiality

- Use numbers to identify participants. Make sure that you don't keep the person's name, matriculation number or contact details with the questionnaire or survey data. Don't keep these details at all unless you need them for contacting the person later in the study.
- Don't talk or write about a participant's responses in any way that might identify them.
- Reassure participants that their responses are confidential

General ethical guidelines for carrying out experiments or other procedures involving human subjects.

Be honest

- Tell people exactly what they are expected to do and why before the experiment.
- Write the introduction and instructions and read it out to make sure you don't miss anything.
- Fully debrief people after the experiment – explain how what they've done will be used.

Get consent

- Ask participants to sign participation agreement forms after they've heard about the nature of the procedure to make sure they are happy with everything.
- Tell participants that they can stop and leave at any time if they want to.

Maintain confidentiality

- Use numbers to identify participants. Make sure that you don't keep the person's name, matriculation number or contact details with the questionnaire or survey data. Don't keep these details at all unless you need them for contacting the person later in the study.
- Don't talk/write about a participants responses in any way that might identify them.
- Reassure participants that their responses are confidential

Be reassuring

- Make sure they understand that not being able to do something on a computer is a fault of interface design or instruction and not a fault of theirs
- Make people feel that their participation is valued and useful

Check for comfort

- If using monitoring equipment, head-sets etc make sure there is a process for checking comfort levels and making adjustments if necessary.

GLASGOW CALEDONIAN UNIVERSITY

School of Engineering & Built Environment

Undergraduate Student Project - Proposal Stage: Ethical Approval

Instructions:

- 1 This form should be used for Undergraduate Student Research-related projects which involve Human Participants. Part A is to be completed by the Student (and signed by both student and supervisor). Part B will be completed by the Project Co-ordinator and will confirm (or otherwise) ethical approval. If approval is granted at this stage, Part C gives the key general requirements which the student must adhere to.
- 2 This form should be used at the stage of the Project Proposal. This form should be accompanied by:
 - i) a brief Project Outline or a Project Abstract; and
 - ii) a brief outline of the reasons why ethical approval is sought including the type of Participants and the detailing the data collection methods.
- 3 This form once completed by the student, and signed by the supervisor, should be forwarded (by the student) to their designated Project Co-ordinator for consideration. If, after consideration, the project does not raise any ethical issues of concern, it shall be approved (possibly subject to specific requirements). These requirements should be checked by the Student's supervisor prior to participant involvement.
- 4 If the Project Co-ordinator feels that there are significant ethical issues raised which require further consideration, then the student will be informed and will have to follow the full School-based ethical approval process.

Part A: To be completed by the Student

Student name:

Programme and Year of Study:

Project title:

Supervisor name:

Please tick to confirm attachments:

- **Project Outline/Abstract attached**
- **Outline of reasons Ethical Approval required
(include participant details and nature of data collection)**

I confirm that I will adhere to the requirements outlined in Part C of this form.

Signed (Student)

Date:

Signed (Supervisor)

Date:

GLASGOW CALEDONIAN UNIVERSITY
School of Engineering & Built Environment
Undergraduate Student Project - Proposal Stage: Ethical Approval

Part B: To be completed by Honour Project Co-ordinator (*i.e., either Brian Shields, David Moffat or Ali Shahrabi, depending upon your programme suite*) after consideration of the information supplied with the completed form

Comments

I have checked the application for accuracy and I am satisfied that the information provided is an accurate reflection of the intended study. I confirm that the form contains all relevant information.

- *There are no ethical issues that cause concern*
- *The ethical issues raised by this project require further consideration and the student must submit to the School-based ethical approval process*

Ethical approval granted? Yes/No

This approval is subject to (please tick as appropriate):

PVG/Disclosure application to be made by the student and approval confirmed to supervisor []

Letter indicating parental permission will be sought []

Permission letter from organisation agreeing to the work []

Consent forms being approved by supervisor []

Information for participants being approved by supervisor []

Project Co-ordinator (Name):

Signature:

Date:

GLASGOW CALEDONIAN UNIVERSITY

School of Engineering & Built Environment

Undergraduate Student Project - Proposal Stage: Ethical Approval

Part C: The Approval granted here, for this Undergraduate Student project, is subject to the student ensuring the following during the conduct, data gathering/analysis and presentation of the work where Human participants are involved.

1. You will not involve participants in any aspect of your project until ethical approval has been granted.
2. You will not use junk mail or spam mail to recruit participants.
3. You will provide a brief but clear explanation of the project to the participant and the purpose of their participation (this may be verbal or oral).
4. You will include in that explanation that the participants will not directly benefit from your study.
5. You will ask the participant to fill in a consent form (although Informed Consent can be assumed is a questionnaire is returned completed).
6. You will explain to the participant that participation on their part is entirely voluntary and that they can decline to take part and even if they consent, to participate, they can withdraw at any stage.
7. You will confirm to the participant that the data which you gather during your study will be held securely and confidentially.
8. You will confirm to the participant that your data analysis and presentation in your report will be fully anonymous.
9. You will otherwise adhere to the provisions of the Data Protection Act 1998

Appendix B: University Policy on Project and Dissertation Supervision

This Policy is available on the University web-site (within “*University Assessment Regulations and Associated Policies*”)

Policy on Project and Dissertation Supervision

1. ADMINISTRATION OF SUPERVISION

- 1.1 The Module Leader for a dissertation/project module shall normally discharge the duties of Dissertation/Project Co-ordinator. Responsibility for the implementation of these guidelines shall (unless otherwise specified) rest with the School.
- 1.2 The duties of the Dissertation/Project Coordinator will normally include overseeing the processes by which:
 - * research methods are taught (where these form part of the learning outcomes of the module) (see also 2 below);
 - * titles are approved (see also 3 below);
 - * supervisors are allocated;
 - * guidelines are issued to students and supervisors;
 - * students' progress is monitored;
 - * students' work is assessed;
 - * grievances are dealt with (see also 4 below).
 - * ethical approval is given for any research, including questionnaires and surveys, involving human participants
 - * enhanced disclosure is sought, if necessary
 - * proposals comply with health and safety legislation;

2. RESEARCH METHODS

Programme Boards shall ensure that the programme of study of each student who is required to submit a dissertation/project is structured so as to ensure that s/he is adequately prepared in research methods appropriate to their discipline and programme.

Programme Boards shall be required within their Approved programme documentation to identify where such preparation in research methods is received.

3. APPROVAL OF OUTLINE PROPOSALS

3.1 Schools shall have in place mechanisms which ensure the feasibility of a student's choice of title is established at the earliest possible date.

The criteria used in the approval of a dissertation/project title might include:

- * is it related to the student's own range of interests?
- * is it related to the aims and objectives of the student's programme?
- * does it combine an academic approach with some practical work?
- * is the problem reasonably open-ended?
- * will it require an original contribution from the student?
- * are the resources required readily available?

3.2 In cases where students are required to produce an outline proposal for approval, such a proposal should be submitted by students to the Dissertation/Project Co-ordinator as early as possible. Schools may give consideration to the outline proposal being formally assessed so as to encourage students to produce an outline proposal of high quality.

It is noted that in respect of certain dissertation/project modules, students choose a topic from a list of suitable topics provided by the Module Leader. In such cases the outline proposal would discuss how the student intended to approach the chosen topic.

4. GUIDELINES TO STUDENTS AND STAFF

Schools shall ensure that for dissertation/project modules, a Module (Dissertation) Handbook is issued to students. The handbook should also be issued to supervisors.

It is required that within the handbook there are clear arrangements for a grievance procedure and it must be explicitly stated that where the student's grievance relates to the standard of supervision, no appeal against the mark awarded for the dissertation/project will be entertained unless the student has initiated the grievance procedure prior to submission of the dissertation/project.

The Module (Dissertation) Handbook must contain a copy of this Appendix and also material relating to:

- * a timetable for dissertation/project stages and submission

- * the organisation and management of the dissertation/project
- * the procedure for approval of outline proposal and title
- * supervision arrangements (internal and external as appropriate) - including a statement of the respective responsibilities of supervisor and supervisee
- * the presentation of the dissertation/project
- * the assessment schedule/statement of assessment criteria
- * arrangements for: student support
 - mechanisms for feedback from students
 - a grievance mechanism
 - ethical approval
 - enhanced disclosure

5. MONITORING OF STUDENT PROGRESS

- 5.1 It is required that supervisors keep a formal record of contact with students. Schools should develop and issue a suitable pro forma for this purpose.
- 5.2 It is required that Dissertation/Project Co-ordinators ensure that supervisors provide them with regular progress reports. It is required that these should be in a standard format developed by the School for this purpose.

6. RESPECTIVE ROLES OF SUPERVISOR AND STUDENT

- 6.1 It is recommended that the supervisor should meet the student regularly. The ultimate responsibility lies with the student for making contact and maintaining contact with the supervisor.
- 6.2 The supervisor and student should agree a set of control points for monitoring progress.
- 6.3 Supervisors are expected to warn students where there is a possibility of the student failing the dissertation/project or of not realising their full potential in respect of the dissertation/project component. However supervisors must avoid raising a student's expectation of a particular classification and students should not be given any indication of the actual mark which the dissertation/project is likely to be awarded.

What is expected of students?

- * student to be independent
- * student to seek advice and comment on their work from others
- * to have regular meetings with supervisor
- * student to be honest when reporting on progress
- * student to follow advice which has been specifically requested by the student
- * student to be interested in the work
- * student to take ultimate responsibility for the direction and content of the dissertation/project

What is expected of supervisors?

- * to read the student's work and be familiar with it
- * to be available when necessary, and within reason
- * to be friendly, open, supportive
- * to give students serious attention during interviews
- * to be constructively critical
- * to have a good knowledge of the research area and to exchange ideas freely
- * to be aware of future pitfalls in the research topic

7. ASSESSMENT OF DISSERTATIONS

- 7.1 A marking schedule or statement of assessment criteria must be made available to both students and supervisors. It is required that this be included in the Module (Dissertation) Handbook.
- 7.2 There should be independent second marking of all dissertations/projects. The second examiner should have no knowledge of the mark given by any other examiner. Where there is a failure to agree a mark, it shall be the responsibility of the Dissertation/Project Co-ordinator to organise the reassessment of the dissertation/project in order to reach a formal mark.
- 7.3 All markers should be required to complete a pro-forma statement/report to justify the mark awarded.
- 7.4 It is required that a representative sample of dissertations/projects should be scrutinised by the appropriate external assessor. Agreement should be reached with the external assessor in respect of the nature of the sample which will be scrutinised.
- 7.5 Students should incorporate into their dissertation/project the following statement:

“this dissertation/project is my own original work and has not been submitted elsewhere in fulfilment of the requirements of this or any other award”

Students are advised to retain all the data and materials relating to their dissertation/project (including lab books) until after they have graduated.

8 Deviation from these procedures

8.1 If there are particular reasons for not following the procedures, then approval is required at the School board that hosts the module, with clearly defined reasons minutes. Any approved deviation must be highlighted in the Module Handbook

Appendix C: Supervisory meeting record sheet

Computing Programmes

Honours Project – Record of Meeting

Name _____ Programme _____ Date _____

Summary of progress since last meeting (to be completed by student before the meeting)

Main issues/questions to be raised with the supervisor at this meeting (to be completed by student before the meeting)

1

2

3

Issues discussed at the meeting (to be completed at the meeting)

1

2

3

General comments (to be completed at the meeting)

Agreed goals for the next meeting (to be completed at the meeting)

1

2

3

Student Signature _____ Supervisor Signature _____

Date and time of the next meeting _____