LEVEL 5

COMPUTING PROJECT

Lecturer Guide

Modification History

Version	Revision Description
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CONTENTS

1. Module Overview and Objectives

The aim of the unit is to provide a student with the opportunity to employ the skills necessary to develop a computing artefact in the context of a loosely specified problem, which involves research, analysis, design, coding, testing and project management knowledge and skills.

Through the combination of project sessions, private study and tutorial supervision on this module, students will produce for assessment a proposal, report, demonstration and presentation of their project.

2. Learning Outcomes and Assessment Criteria

Learning Outcomes; The Learner will:	**Assessment Criteria;** The Learner can:
1. Identify a suitable computing artefact and development method	1.1 Select and justify an appropriate computing artefact to develop
2. Project manage the analysis, design, development and deployment of a computing artefact	2.1 Select and justify the use of an appropriate development method 2.2 Produce a viable project plan 2.3 Check progress against a project plan 2.4 Evaluate his/her performance against a project plan 2.5 Select and justify the use of an appropriate risk management approach 2.6 Select and justify the use of an appropriate configuration management approach
3. Carry out the analysis for a computing artefact	3.1 Elicit requirements 3.2 Prioritise requirements 3.3 Produce a requirements specification 3.4 Produce an analysis specification
4. Design a computing artefact	4.1 Enhance requirements 4.2 Produce a design specification
5. Develop a computing artefact	5.1 Select and justify the use of an appropriate development environment 5.2 Write the code for a computing artefact
6. Test a computing artefact	6.1 Develop appropriate test scripts 6.2 Test that a computing artefact meets its requirements by using test scripts

3. Syllabus

Syllabus			
Topic No	Title	Proportion	Content
1	Introduction	1/12 2 hour project session 2 hours of tutorials	• Appropriate Artefacts • Planning your Project • Appropriate Development Methods • Appropriate Risk Management • Appropriate Configuration Management ***Learning Outcome: 2***
2	Analysis Specifications	1/12 2 hour project session 2 hours of tutorials	• Structure of an Analysis Specification • Content of an Analysis Specification ***Learning Outcome: 3***
3	Design Specifications	1/12 2 hour project session 2 hours of tutorials	• Structure of a Design Specification • Content of a Design Specification ***Learning Outcomes: 4 & 5***
4	Test Scripts	1/12 2 hour project session 2 hours of tutorials	• Types of Testing (Reminder) • Choosing Appropriate Tests • Applying Tests • Documenting Tests ***Learning Outcome: 6***
5	Planning the final report	1/12 2 hour project session 2 hours of tutorials	• Structure of Final Report • Content of Final Report • Citations and Referencing (Reminder) • Appropriate Appendices ***Learning Outcomes: 1, 2 & 3***

6 -12	Project and Report Completion	1/2 71 hours private study 4 hours (minimum) meetings with tutor	• Private study time should include weekly meetings with your tutor to discuss your progress. • Project production ***Learning Outcomes: 1 - 6***

4. Related National Occupational Standards

The UK National Occupational Standards describe the skills that professionals are expected to demonstrate in their jobs in order to carry them out effectively. They are developed by employers and this information can be helpful in explaining the practical skills that students have covered in this module.

Related National Occupational Standards (NOS)
Sector Subject Area: 6.1 ICT Professionals **Related NOS:** 4.1.P.3 – Manage the outcomes from the data analysis assignment; 4.2.S.1 – Prepare for data analysis activities; 4.2.S.2 – Manage effective data analysis activities; 4.2.S.3 – Maintain effective data analysis deliverables; 4.3.P.1 – Manage, under supervision, information to direct human needs analysis assignments; 4.3.P.2 – Produce, implement and maintain, quality human needs analysis activities; 4.3.P.3 – Provide human needs analysis findings to others; 4.4.P.1 – Prepare, under supervision, for a systems analysis assignment; 4.4.P.2 – Carry out, as required, systems analysis activities; 4.4.P.3 – Monitor the effectiveness of systems analysis activities and their deliverables; 4.4.S.1 – Design, implement and maintain systems analysis activities; 4.4.S.2 – Manage the systems analysis assignment activities; 4.4.S.3 – Liaise with others on matters relating to systems analysis activities; 4.4.S.4 – Review and sign off systems analysis outcomes; 4.5.P.1 – Assist with the development for data design activities; 4.5.P.2 – Manage, under supervision, the maintenance of data design assignments; 4.5.P.1 – Provide others, when requested, with specified information relating to data design activities; 4.5.S.1 – Select and implement appropriate data design processes; 4.6.P.1 – Prepare for human interaction and interface (HCI) design activities; 4.6.P.2 – Implement, under supervision, human interaction and interface (HCI) design activities; 4.6.P.3 – Manage the needs of different users of HCI design activities; 4.7.P.1 – Prepare, under supervision, for system/solution/service design activities;

4.7.P.2 – Assist with the design of system/solution/service design;
4.7.P.3 – Monitor the progress of system/solution/service design activities;
5.1.P.1 - Perform systems development activities;
5.1.P.2 - Contribute to the management of systems development;
5.3.S.3 - Manage systems development activities;
5.1.L.2 - Control systems development activities;
5.2.P.1 - Plan software development activities;
5.2.P.2 - Perform software development activities;
5.2.P.3 - Control software development activities;
5.2.P.4 - Contribute to the management of software development;
5.3.A.1 - Carry out IT/Technology solution testing activities under direction;
5.3.P.1 - Carry out IT/Technology solution testing;
5.3.P.2 - Contribute to the communication of the results of IT/Technology solution testing;
5.4.P.2 - Perform systems integration activities;
5.5.P.1 - Perform systems installation, implementation and handover activities;
5.5.P.2 - Document and present systems installation, implementation and handover activities

5. Resources

Lecturer Guide: This guide contains notes for lecturers on the organisation of each topic, and suggested use of the resources. It also contains guidance on how to run the activities presented in the Student Guide.

PowerPoint Slides: These are presented for each topic for use in the lectures, which form part of the Project Sessions. They contain a brief overview of the key concepts. Handout versions of these slides are also available for distribution to students.

Student Guide: This guides the student through the project and presents details of the tasks they should undertake during private study time in order to complete their project.

Project supervisors should direct students to additional relevant resources (books, journal articles, websites etc.) according to their particular projects.

6. Pedagogic Approach

Suggested Learning Hours					
Lecture:	Tutorial:	Seminar:	Tutor Supervision:	Private Study:	Total:
5	10	5	4	130	150

The teacher-led time for this module is comprised of lectures and seminars (‘project sessions’), with private study and tutorial supervision allowing students to complete their projects as required.

6.1 Project Sessions

Project sessions are a mixture of lectures and seminars. There are five project sessions, each of two hours in duration. These occur during the first five topics for the module and students should be encouraged to be active during this time and to practise the concepts covered.

Every project session will contain a lecture coupled with either a seminar-based discussion or an exercise. The PowerPoint slides are presented for use during this time. A key point to note is that the lectures are not designed to present new content to students beyond the structure and content of the project report, and an overview of the required depth of the project content. All other content is covered in the other modules on the Level 5 Diploma in Computing programme and is included here to highlight its relevance to the completion of a computing project.

6.2 Supervision

Students should have access to personal tutorial supervision every week for the full duration of the project (i.e. both during and beyond the taught element of the module). During this time they should meet with their supervisor to discuss their projects and seek support and guidance. Students should meet with their tutor individually for a **minimum** of 4 hours over the course of the project, it is expected that many students will require more supervision time than this.

The role of the project supervisor is to:

- Advise the student about the scope and viability of the work outlined in their project proposal;
- Direct the student to relevant books, papers and other sources of information that will support them in the development of their project;
- Advise the student on the Harvard style of referencing and the penalties associated with plagiarism;
- Maintain regular supervisory contact with the student throughout the whole duration of the computing project;
- Assist the student in managing the timetable of the project;
- Assist the student in identifying when problems are liable to be encountered and how they might be tackled;
- Ensure the student is made aware of inadequate progress or standards of work below the expected level;
- Read and comment on draft sections of the project report, where this is requested by the student, and return such work with constructive criticism and in reasonable time.

6.3 Private Study

In addition to the taught portion of the module, students will also be expected to undertake private study. This will consist of carrying out particular activities associated with their project and writing up various sections of the project within appropriate timescales. Details of the activities are provided in the Project Guidelines (see Appendix 1), which are also reproduced in the Student Guide.

7. Assessment

This module will be assessed by means of a project based assignment worth 100% of the total mark. The assessment will cover the learning outcomes and assessment criteria given above. For a complete assessment breakdown, see *Appendix 2*.

8. Further Reading List

There is no essential textbook for this module. The module material is intended to be sufficiently expansive to meet the learning outcomes. However, a selection of sources of further reading around the content of this module must be available in your Accredited Partner Centre's library. The following list provides suggestions of some suitable sources:

Dawson, C. (2009). *Projects in Computing and Information Systems: A Student's Guide*. Pearson Addison Wesley.
ISBN-10: 0273721313
ISBN-13: 978-0273721314

Weaver, P. (2003). *Success in Your Project: A Guide to Student System Development Projects*. Pearson Education.
ISBN-10: 0273678094
ISBN-13: 978-0273678090

Topic 1: Introduction

1.1 Learning Objectives

On completion of this topic, students will be able to:

- Project manage the analysis, design, development and deployment of a computing aretfact

1.2 Pedagogic Approach

This project session consists of a lecture and a seminar exercise. The lecture provides an overview of development methods, risk management and configuration management approriate to the computing project.

The seminar exercise provides the students with an oppurtunity to develop a template for a configuration management approach that can be enhanced to support the configuration management needs of their project.

1.3 Timings

Project Session:	2 hours
Tutorial:	2 hours
Private Study:	8.5 hours

1.4 Project Session

The Topic 1 Project Session includes a lecture and a seminar exercise.

1.4.1 Lecture Notes

Lecturers' Notes

The following notes are provided to serve as a guide to the material you should introduce to students during the lecture component of this project session.

The lecture is designed to provide an overview of how students should use concepts from other modules on the Level 5 Diploma in Computing in order to produce an appropriate computing project.

The structure of this topic is as follows:

- Appropriate artefacts
- Planning your project
- Appropriate development methods
- Appropriate risk management
- Appropriate configuration management

1.4.1.1 Guidance on the Use of the Slides

Slides 2-3: These slides cover the scope and learning outcomes of this lecture – you can read through them in order to explain the purpose of the lecture to the students.

Slide 4: Use this slide to make sure that the students understand that the lecture does not present a concrete set of rules that must be followed, but instead, provides rough guidelines of what should be included in a student project and the level of detail that should be presented. Future lectures and seminars will explain the level of detail required in more depth. Stress at this point that projects are individual and each student will decide on and produce their own piece of work.

Slide 5: 'Appropriate artefacts' section heading slide.

Slide 6: This slide explains what an artefact is. Make sure that the students understand that an artefact could be any of the things mentioned on the slide. You may find it helpful to expand the lower level bullet points with your own examples.

Slide 7: This slide drills down on models and code as artefacts. Make sure that the students understand that code and models other than those presented in the slide can be used for their projects. You may find it helpful to expand the lower level bullet points with your own examples.

Slide 8: This slide drills down on the working system and supporting documentation as artefacts. Make sure that the students understand that working systems and supporting documentation, other than those presented in the slide, can be

used for their projects. You may find it helpful to expand the lower level bullet points with your own examples. Also emphasis the point that more detail on supporting documentation will be delivered in future lectures and seminars.

Slide 9: Section heading slide for 'Planning your project' section. Point out that this includes two sets of tasks – defining your project and planning your project.

Slide 10: This slide signposts that defining the project is associated with producing the aims and objectives of your project. This is looked at in more detail in the following three slides.

Slide 11-12: These slides explain what aims are. You may find it helpful to expand the 'things that you are going to do' bullet points with your own examples. For the 'typical aims' bullet points, you may find it helpful to ask the students to suggest their own and provide them with feedback.

Slide 13-14: These slides explain what objectives are. You may find it helpful to talk through the objectives associated with some of the aims suggested by the students previously.

Slide 15-16: These slides present the concept of SMART objectives. Emphasise the point that all project objectives should be SMART objectives.

Slide 17-18: These slides explain the phases that you go through when planning a project. Make clear that this is a set of guidelines, not a set of rules. How the project plan should be presented and justified will be made clear in future lectures and seminars.

Slide 19: Section heading slide for the 'Appropriate development methods' section of the lecture.

Slide 20: This slide simply reminds students of the development methods that they have been introduced to throughout the course. Make clear that an appropriate method for a student project would be one taken from the list on this slide.

Slides 21-22: These slides provide a very brief overview of where and where not to use the methods listed in the previous slide. You may find it helpful to discuss with the students what they would use the particular methods for.

Slide 23: This slide shows the order in which the students should approach choosing a project, method and language. You may find it helpful to run through an example of your own.

Slide 24: This slide signposts that the next part of the lecture will be about appropriate risk management. Make clear that this part of the lectures is meant to give the students an idea of the level of detail at which they should address risk in their project – it is not a set of rules.

Slide 25: Use the diagram on this slide to emphasise how complex risk management can be.

Slide 26: This is a light hearted slide and is meant to make clear to the students the level of detail at which they should address in their projects. This point is included on Slide 24 as well.

Slide 27: This slide shows a basic risk management approach in the form of a bullet point list. The following four slides look at each bullet point in more detail.

Slide 28-31: These slides explain the risk management approach outlined in Slide 24. You may find it helpful to also present some examples of your own if required.

Slide 32: This slide explains the difference between containment and contingency. It is present here to provide supportive narrative for Slide 34 where risks are presented in tabular format along with actions (containment) and contingencies.

Slide 33: This slide presents four sources of project risk. The following four slides look at each type of risk more closely.

Slide 34: This slide presents the most relevant contractual/environmental risk to a student project. Students may ask what the other risks are. These are: defaulting subcontractors; late delivery of components; dependencies and/or demands from other projects; company operation; industrial action and disasters.

Slide 35: This slide presents the most relevant management/process risks to a student project. If the students ask what the other risks are, they are: undefined/ill-defined responsibilities and authorities; undefined procedures; unknown quality of development products; inadequate support facilities and services; lack of visibility.

Slide 36: This slide presents the personnel risks. Emphasise the point made in the slide that 'the above risks are not likely to occur on your project as YOU are the only team member and you have been educated on this NCC Education programme'.

Slide 37: This slide presents the technical risks. Get the students to reflect on which of them could affect a student project and why. For example, you would expect this type of project to suffer from requirements changes and failure to meet requirements rather than problem or error detected.

Slide 38: Use the diagram on the slide to explain to students a good way of presenting risks within a student project. Drive home the point that a table alone would not score very many marks. Supportive narrative should show the process carried out in order to be able to populate the table along with some reflection/justification regarding the approach used.

Slide 39: 'Appropriate configuration management' section heading slide.

Slides 40-41: These slides explain why configuration is required on large projects

Slide 42: A light hearted slide that explains a simple directory structure can be used for configuration management in a student project.

Slide 43: This slide points to an exercise that introduces an appropriate directory structure and supportive narrative. Be sure to emphasise the warning.

1.4.2 Seminar Exercises

Lecturers' Notes

The exercise below is included in the Student Guide. Rather than providing answers, pointers have been given as to what the students should be doing and how this relates to their project. The pointers are not provided in the Student Guide.

For this particular seminar students are asked to work through an exercise because they must adopt a directory structure approach for configuration management. What is being tested in the project report is if the student can tailor a particular approach for use in their project.

Read the scenario below and then use the content to produce a template for a configuration management approach that could be modified to work with your project. When producing the template you should also include:

- A justification for the configuration management approach
- An overview of what is considered as a configuration management item
- A directory structure to support the configuration management approach
- Details of the platform (hardware and software) that will be used to store the configuration management items

Work on this exercise individually but be prepared to discuss this later with the rest of your class.

Scenario

As DSDM (Dynamic Systems Development Method) is all about enabling change, the one area where more effort is required during the development of the project is configuration management. During the Functional Model Iteration phase and the Design and Build Iteration phase, new versions of software will be developed. It is entirely possible that the latest iteration is for some reason inferior to the previous version or that the development has taken a direction that the users of the system had not intended. For this reason it must be possible to revert back to a previous, acceptable state. This does not only include the prototype software but also any supporting documentation, test plans, test results, prototype feed back documents, and in fact anything that supports the project at a particular point in time.

The most convenient time to baseline the project in this way is at the end of the Feasibility and Business Study phases and after each of the iterations of the Functional Model Iteration phase and the Design and Build Iteration phase. This provides a stable base from which to develop the system further in the knowledge that it is always possible to return to that state.

This project uses a variety of tools to develop the report and the system to go with it:

- The documents, tables diagrams etc. are prepared using Microsoft Office and Visio
- The UML diagrams are prepared using Rational Rose
- Microsoft Project is the Project Management tool
- Borland Delphi is the development tool

These clearly do not represent an integrated software tool for agile systems development. For this reason and because DSDM does not recommend the implementation of new tools during a

project, my company uses a simple manual configuration management method which fulfils all of the above requirements. This method uses unique folders for each of the five phases of the project. It is a technique that has been in use within my company for some time and as such it is both proven and familiar to most development personal.

Everything is developed on a Dell Dimension 2400 PC running Windows XP so the folder structure will store all the products of the various phases of the project. The project itself has a folder called, in this case, PROJECT. Below this, there are a number of other folders which contain the various elements of the project. At the lowest level, there are individual folders for each of the four categories of software described above.

This simple structure has a number of features:

- The whole project may be backed up or restored via a single folder
- Each phase can be backed up or restored via a single folder
- All the various files created by some of the packages (notably Delphi, Microsoft Project and Rational Rose) are grouped into a single folder making it easy to track what has been done within the package
- The system is not efficient in terms of disk space since there can be a high degree of duplication. However the essence of DSDM is time and this system is simple to learn and operate. In the context of a modern PC which has perhaps 80 Gigabytes of disk space, duplication of a few documents is of little consequence.

Each of the five phases of the project has a folder. The folder for the Functional Model Iteration phase will contain three further folders, one for each of the iterations. In order to be able to backtrack to any stage in the prototype development cycle, the prototype iterations are baselined. This means having up to three more folders underneath each of the three partitioned Functional Prototype folders.

A partial folder structure is shown below.

C:\PROJECT	**(MAIN PROJECT FOLDER)**
PHASE1	**(Feasibility Phase)**
PROJECT	(Microsoft Project files)
RATIONAL-ROSE	(Rational Rose Case Tool files)
OFFICE	(Microsoft Office files)
DELPHI	(Delphi Development files)
PHASE2	**(Business Study Phase)**
PHASE3	**(Functional Model Iteration Phase)**
PHASE3_1	(Functional Prototype 1)

PTYPE1 (1st version of Functional Prototype 1)

PTYPE2 (2nd version of Functional Prototype 1)

PTYPE3 (3rd version of Functional Prototype 1)

PHASE3_2 (Functional Prototype 2)

PHASE3_3 (Functional Prototype 3)

PHASE4 (Design & Build Iteration Phase)

PHASE5 (Implementation Phase)

All files for the Feasibility Study are stored in their appropriate folders within the phase 1 folder. Any of the files that are used in the Business Study phase are first copied to the appropriate folder under the phase 2 folder before changes are made. In this way, all files within the phase 1 folder remain unchanged after the Business Study starts.

Good Configuration management software goes further than allowing developers to restore previous versions of software. It can provide security by allowing only one person to 'check out' a program to be changed. Access can also be controlled by project status thereby enforcing a degree of project control. Items such as source code, test scripts and general support documentation can individually be put under version control and these can be linked to create a complete release of the system. Changes can be tracked, in some cases from the initial change request through to the implemented system, and this can also be used for reporting purposes to identify why changes were made to individual programs and to monitor the overall progress of the change request or project.

Pointers for Lecturers

Encourage students to discuss their templates with the rest of the class and discuss the good and bad practices included in each template to come up with a set of best practice rules for the template.

Students should produce a generic configuration management approach that captures the following:

- Justification for the configuration management approach – this should eventually reflect their project rather than the one in the scenario.
- An overview of what is considered as a configuration management item – this should eventually reflect their project rather than the one in the scenario.
- A directory structure to support the configuration management approach – this should eventually capture the phase of their chosen methodology rather than the phases of DSDM version 4.2.

- The platform (hardware and software) that will be used to store the configuration management items – this should be a directory structure on the students' development machine. Note this directory structure should be backed up regularly.

1.5 Private Study

The time allocation for private study in this topic is expected to be 8.5 hours.

Lecturers' Notes

For private study refer students to the project guidelines in their Student Guide (Appendix 1) and explain that they should use this time to carry out the necessary activities (including writing up sections to show you) to keep progressing with their project. At this stage you should be encouraging students to prepare to discuss their project ideas with you and show you their written draft proposals.

Task 1

Refer to your project guidelines. You should use this private study time to think about the project you are going to develop and to write a project proposal, using a template or format that is acceptable to your tutor.

Be prepared to discuss your project ideas with your tutor and to show your work in progress. Your tutor will guide you on the scope of your project and whether the proposal is acceptable.

By the end of this topic, you should have completed the following:

- Thought of an initial project idea
- Found or developed a suitable project proposal template
- Discussed your initial project idea with your tutor

1.6 Tutorials (Supervision)

Lecturers' Notes

This time should be used for supervising the students' progress on their proposals. Each student should be allocated time for an individual meeting with you during which they will present their ideas so far for discussion and guidance. They may not proceed with the project until you have approved the draft proposal so there may be a need to hold a follow up meeting for guidance on the re-worked draft.

You should also encourage them to start to map out their plan for progression through the project and to come to the next meeting with a progress report which details:

- The work completed thus far
- A forecast of work to be completed
- An updated project plan

Topic 2: Analysis Specifications

2.1 Learning Objectives

On completion of this topic, students will be able to:

- Carry out the analysis of a computing aretefact.

2.2 Pedagogic Approach

This project session consists of a lecture and a seminar exercise. The lecture provides an overview of an anlaysis specification approriate for the computing project:

The seminar exercise provides students with an oppurtunity to discuss the analysis specification and gain a greater understanding of how it relates to their project.

2.3 Timings

Project Session:	2 hours
Tutorial:	2 hours
Private Study:	8.5 hours

2.4 Project Session

The Topic 2 Project Session includes a lecture and a seminar exercise.

2.4.1 Lecture Notes

Lecturers' Notes

The following notes are provided to serve as a guide to the material you should introduce to students during the lecture component of Project Session 2.

The lecture is designed to provide an overview of how students should use concepts from other modules on the Level 5 Diploma in Computing in order to produce an appropriate computing project.

The structure of this topic is as follows:

- Structure of an Analysis specification
- Content of an Analysis specification

2.4.1.1 Guidance on the Use of the Slides

Slides 2-3: These slides explain the purpose of the lecture to the students.

Slides 4-5: Use these slides to make sure that the students understand that the lecture presents a set of guidelines about the structure and content of the Analysis chapter of their report. Explain that students may find different structures and contents elsewhere, but this is the structure and content they MUST use for their project.

Slide 6: 'Structure of an Analysis Specification' section heading slide.

Remind students that purpose of an Analysis Specification is to provide a detailed overview of the requirements of a system and the architecture that is going to be used to realise those requirements.

Slide7. This slide provides the headings for the structure of the computing project analysis specification. Each header will be explained in more detail in the following slides.

Slide 8: Explain that the 'Requirements' heading is for the section that presents functional and non-functional requirements. State that the content of this section will be overviewed later in the lecture. Remind the students that functional and non-functional requirements are covered in other modules on the Level 4 and Level 5 programmes.

Note: This lecture should not be used to present concepts taught in other modules. You may wish to point the students towards the handbooks for the Level 4 and Level 5 diplomas in order to look up the appropriate modules. This will be an opportunity for students to learn where and how to find out information for themselves.

Slide 9: Explain that the ‘Use Cases’ heading is for the section that presents the system use case. State that the content of this section will be overviewed later in the lecture. Again, remind the students that they have looked at use cases in other modules on the programme.

Slide 10: Explain that the ‘Architecture’ heading is for the section that presents the system architecture and an initial class diagram for the system. The content of this section will be looked at in more detail later in the lecture. Again, elicit from students in which modules they have previously looked at class diagrams.

Slide 11: ‘Content of an Analysis Specification’ section heading slide.

Slide 12: Use this slide to explain that for the Analysis chapter in the student project, students must adhere to the headings and contents put forward in this lecture. Failure to do so will result in a loss of marks.

Slide 13: This slide outlines the contents of the of the ‘Requirements’ section. The contents are:

- *A list of functional requirements with supporting non-functional requirements where appropriate.* For example, for a functional requirement that asks for a report to be produced, a supporting non-functional requirement could be how long it takes for the report to be produced.

- *A list of system wide non-functional requirements*. For example, security requirements for the system.

Point out that the functional requirements should be prioritised using the MoSCoW prioritisation technique introduced in the ‘Agile Development’ module.

Also point out that a requirements catalogue is required to support the computing project, but it should be included in an appendix rather than in the main body of the report. Failure to do so will result in a loss of marks.

Slide 14: This slide outlines the contents of the ‘Use Cases’ section. Some students draw a use case for every requirement rather than producing one use case for the complete system. Emphasis that ONE use case for the complete system is required. Failure to do so will result in a loss of marks.

Also point out that use case descriptions are required to support the computing project, but they should be included in an appendix rather than in the main body of the report. Failure to do so will result in a loss of marks.

Slide 15: This slide reminds the students that the ‘Architecture’ section contains the system architecture and an initial class diagram, the contents of which will be outlined in the following slides.

Slide 16: This slide outlines the contents of the ‘System Architecture’ section.

- *Interfaces with other systems:* This section requires a diagram to show interfaces with other systems and relates to other systems that feed data into the system under development or other systems that take a data feed from the system under development. For example, if the system under

development was an online shopping site, it would take a data feed from a third party online payments system such as PayPal. The online shopping system would provide a data feed to an existing invoicing or order handling system. The diagram should show the system under development and the other systems that it interfaces with. Arrows should show the direction of the data flows and the supportive narrative should explain the contents of the data flows. The diagrams could use appropriate UML notation or could be produced in non UML format, using clip-art, Visio or some other drawing package.

- *An overview of the technical architectures to be used for development and implementation:* This section requires a diagram to show the technical architectures to be used for development and implementation, along with some supportive narrative. The diagrams could use appropriate UML notation or could be produced in non UML format, using clip-art, Visio or some other drawing package. By technical architecture, here we mean what hardware and software is being used. For development, the student may use a laptop but then transfer the developed system to a commercial web server as part of implementation. The diagram should show the hardware and the supportive narrative should provide an overview of the software used.

Slide 17-18: These slides outline the contents of the 'Initial Class Diagram' section. The initial class diagram should be derived from the use case diagram and any other information available at this stage of the project.

At this stage in the project, the class diagram will not be complete. It will only show classes and the relationships between them, but will not show attributes or methods. Some classes may be missing and some relationships may be unclear. The supportive narrative should relate to the above – which relationships are unclear and why, which classes may be missing and why, etc.

Slide 19: This slide recaps some of the important points raised in the lecture. Go through the points and make sure the students understand them.

2.4.2 Seminar Exercises

Lecturers' Notes

The aim of the seminar exercise is to provide the students with an opportunity to discuss the analysis specification and gain a greater understanding of how it relates to their project.

The tasks suggested below are for guidance only; you can run the seminar session in your own style as long as the above aim is met. This seminar does not have a particular practical exercise associated with it because what is important for this topic is that students understand the structure and content of an analysis specification rather than what an analysis specification looks like. What is being tested in the project report is the student's ability to produce appropriate artefacts for an analysis specification and present them in an appropriate manner based on the content of Topic 2. What is not being tested is the student's ability to complete a template.

One key point to make during the seminar is that an analysis specification is not just a collection of diagrams. It is a collection of diagrams coupled with supportive narrative. The point of this seminar is for the lecturer to ensure that the students follow the guidelines presented in the lecture for this topic to produce their own analysis specification for the project report.

Take 5 minutes to write down at least two things that you either did not understand from the lecture or that you feel you need further clarification on. Feed these back to your tutor.

Your tutor will then compile a list on the board and go through each one in turn to ensure that all students understand the main concepts delivered in the lecture.

2.5 Private Study

The time allocation for private study in this topic is expected to be 8.5 hours.

Lecturers' Notes

For private study refer students to the project guidelines in their Student Guide (Appendix 1) and explain that they should use this time to carry out the necessary activities (including writing up sections to show you) to keep progressing with their project.

Task 1

Refer to your project guidelines. At this stage, you should have developed a draft project proposal for discussion and review with your tutor. If you have not done this, make sure this is completed and shown to your tutor as soon as possible.

You should also use this private study time for planning to start the analysis of the project based on your draft proposal.

Task 2

Prepare a progress statement to discuss with your tutor during your supervision sesison. This should include:

- The work completed thus far
- A forecast of work to be completed
- An updated project plan

By the end of this topic, you should have done the following:

- Thought of an initial project idea (Topic1)
- Found or developed a suitable project proposal template (Topic1)
- Discussed your initial project idea with your tutor (Topic 1)
- Drafted a project proposal
- Discussed your draft project proposal with your tutor
- Begun the analysis of your project based on the final project proposal

2.6 Tutorial (Supervision)

Lecturers' Notes

This time should be used for supervising the students' progress on their proposals. Each student should be allocated time for an individual meeting with you. At this stage you should be encouraging those students who have not already shown you their draft proposals to do so, and reminding the group they should now be planning to start the analysis of their projects, based on their proposals. They may not proceed with the project until you have approved the draft proposal so there may be a need to hold a follow up meeting for guidance on the re-worked draft.

Students should also show you their progress statement. You should compare this to the actual work done and point out any issues.

Topic 3: Design Specifications

3.1 Learning Objectives

On completion of this topic, students will be able to:

- Carry out the design of a computing aretefact.

3.2 Pedagogic Approach

This project session consists of a lecture and a seminar exercise. The lecture provides an overview of an design specification approriate for the computing project.

The seminar exercise provides the students with an oppurtunity to discuss the design specification and gain a greater understanding of how it relates to their project.

3.3 Timings

Project Session:	2 hours
Tutorial:	2 hours
Private Study:	8.5 hours

3.4 Project Session

The Topic 3 Project Session includes a lecture and a seminar session.

3.4.1 Lecture Notes

Lecturers' Notes

The following notes are provided to serve as a guide to the material you should introduce to students during the lecture component of this project session.

The lecture is designed to provide an overview of how students should use concepts from other modules on the Level 5 Diploma in Computing in order to produce an appropriate computing project.

The structure of this topic is as follows:

- Structure of a Design specification
- Content of a Design specification

3.4.1.1 Guidance on the Use of the Slides

Slides 2-3: These slides explain the purpose of the lecture to the students.

Slides 4-5: Use these slides to make sure that the students understand that the lecture presents a set of guidelines about the structure and content of the Design chapter of their report. Explain that as with the analysis specification discussed in Topic 2, students may find different structures and contents elsewhere, but this is the structure and content they MUST use for their project.

Slide 6: 'Structure of a Design Specification' section heading slide.

Remind the students that a design specification provides an overview of the data and processes associated with a system, and how the users will interact with the system. It is the document that is referred to in order to code the system.

Slides 7: These slides provide the headings for the structure of the computing project design specification.

Slide 8: Explain that the 'Structural Model' model heading is for the section that presents a completed and detailed class diagram for the system under development. Remind the students that class diagrams are covered in other modules on the Level 4 and Level 5 programmes.

Note: This is not a revision lecture and should not be used to present concepts taught in other modules. You may wish to point the students towards the handbooks for the Level 4 and Level 5 diplomas in order to look up the appropriate modules. This will be an opportunity for students to learn where and how to find out information for themselves.

Slide 9: Explain that the ‘Behavioural Model’ model header is for the section that that describes the behaviour of the actors and classes in the system under development. State that the content of this section will be overviewed later in the lecture.

Slide 10: ‘Content of a Design Specification’ section heading slide.

Slide 11: Use this slide to explain that for the Design chapter in the student project, students must adhere to the headers and contents put forward in this lecture. Failure to do so will result in a loss of marks.

Slide 12-13: These slides outline the contents of the ‘Structural Model’ section. The completed class diagram should be presented in this section.

Point out that class definitions are required to support the computing project, but they should be included in an appendix rather than in the main body of the report. Failure to do so will result in a loss of marks

The supportive narrative for this section should include a brief discussion of how the design process for the structural model was carried out. In other words, a brief description of what the student did to move from the intial class diagram to the completed class diagram.

Slide 14: This slide outlines the contents of the ‘Behaviuoral Model’ section. Either sequence diagrams or collaboration diagrams should be included in this section. Remind the students that they have looked at sequence diagrams and collaboration diagrams in other modules on the programme.

The supportive narrative for this section should include a brief discussion of how the design process for the behavioural model was carried out. In other words, a brief description of what the student did to gain the information to produce the collaboration diagrams or sequence diagrams along with a brief overview of each diagram.

Slide 16: This slide overviews some of the important points raised in the lecture. Go through the points and ensure that students understand them.

3.4.2 Seminar Exercises

Lecturers' Notes

The aim of the seminar exercise is to provide the students with an opportunity to discuss the design specification and gain a greater understanding of how it relates to their project.

The task suggested below is for guidance only; you can run the seminar session in your own style as long as the above aim is met. When students have fed back their ideas, attempt to split students into small groups with a wide range of areas that they understand so that at least one group member can explain the concepts or theories to the others. If there are any areas that the majority of students do not understand, it may be worthwhile revisiting the relevant section of the lecture.

This seminar does not have a particular practical exercise associated with it because what is important for this topic is that students understand the structure and content of a design specification rather than what a design specification looks like. What is being tested in the project report is the student's ability to produce appropriate artefacts for a design specification and present them in an appropriate manner based on the content of Topic 3. What is not being tested is the student's ability to complete a template.

One key point to make during the seminar is that a design specification is not just a collection of diagrams. It is a collection of diagrams coupled with supportive narrative. The point of this seminar is for the lecturer to ensure that the students follow the guidelines presented in the lecture for this topic to produce their own design specification for the project report.

Take 5 minutes to write down at least two things that you either did not understand from the lecture or that you feel you need further clarification on. Also note at least two things that you are very clear on and understand fully from the lecture.You will feed this back to your tutor.

Your tutor will then split you into groups within which you should attempt to resolve all of the things that the group members did not understand.

3.5 Private Study

The time allocation for private study in this topic is expected to be 8.5 hours.

Lecturers' Notes

For private study refer students to the project guidelines in their Student Guide (Appendix 1) and explain that they should use this time to carry out the necessary activities (including writing up sections to show you) to keep progressing with their project.

Task 1

Refer to your project guidelines. At this stage, you should have a draft analysis of the system completed.

You should also use this private study time for planning the design phase of the project. Be prepared to discuss the progress of your project with your tutor and to show the written sections which should now be completed.

Task 2

Prepare a progress statement to discuss with your tutor during your supervision sesison. This should include:

- The work completed thus far
- A forecast of work to be completed
- An updated project plan

By the end of this topic, you should have done the following:

- Thought of an initial project idea (Topic1)
- Found or developed a suitable project proposal template (Topic1)
- Discussed your initial project idea with your tutor (Topic 1)
- Drafted a project proposal (Topic 2)
- Discussed your draft project proposal with your tutor (Topic 2)
- Begun the analysis of your project based on the final project proposal (Topic 2)
- Drafted an analysis of the system you are going to develop
- Discussed the draft analysis with your tutor

3.6 Tutorial (Supervision)

Lecturers' Notes

This time should be used for supervising the students' progress on their proposals. Each student should be allocated time for an individual meeting with you. At this stage, you should be encouraging students to have their draft analysis of the system completed and to be planning the design phase of the project.

Students should also show you their progress statement. You should compare this to the actual work done and point out any issues.

Topic 4: Test Scripts

4.1 Learning Objectives

On completion of this topic, students will be able to:

- Develop appropriate tests for a computing artefact.

4.2 Pedagogic Approach

This project session consists of a lecture and a seminar exercise. The lecture provides an overview of testing approriate for the computing project.

The seminar exercise provides the students with an oppurtunity to develop test scripts that can be enhanced to support the testing needs of their project.

4.3 Timings

Project Session:	2 hours
Tutorial:	2 hours
Private Study:	8.5 hours

4.4 Project Session

The Topic 4 Project Session includes a lecture and a seminar exercise.

4.4.1 Lecture Notes

Lecturers' Notes

The following notes are provided to serve as a guide to the material you should introduce to students during the lecture component of this project session.

The lecture is designed to provide an overview of how students should use concepts from other modules on the Level 5 Diploma in Computing in order to produce an appropriate computing project.

The structure of this topic is as follows:

- Types of testing (reminder)
- Appropriate types of testing
- Test scripts
- Documenting tests (in YOUR project)

4.4.1.1 Guidance on the Use of the Slides

Slides 2-3: These slides cover the scope and learning outcomes of this.

Slides 4-5: Use these slides to make sure that the students understand that the lecture presents a set of guidelines about the structure and content of the Testing section of their report. As with the previous topics, explain that students may find different structures and contents elsewhere, but this is the structure and content that is appropriate for their project.

Slide 6: 'Types of Testing' section heading slide.

Slide 7: This slide introduces the two types of test strategy. You may want to try to elicit these from students before showing the slide.

Slide 8: This slide provides a brief overview of Black Box Testing. Remind the students that Black Box Testing is covered in other modules on the Level 4 and Level 5 programmes.

Note: This is not a revision lecture and should not be used to present concepts taught in other modules. You may wish to point the students towards the handbooks for the Level 4 and Level 5 diplomas in order to look up the appropriate modules. This will be an opportunity for students to learn where and how to find out information for themselves.

Slide 9: This slide provides a brief overview of White Box Testing. Again, remind the students that they have looked at White Box Testing in other modules on the programme.

Slide 10: Make sure the students understand that they are only required to carry out Black Box Testing for the computing project.

Slide 11: 'Appropriate Types of Testing' section heading slide.

Slide 12: This slide introduces two types of test. You may want to elicit what students know about these types of test before showing the following slides.

Slides 13-14: These slides provide brief outlines of unit testing and integration testing. Remind the students that they have studies these types of test in other modules.

Slide 15: 'Documenting Tests' section heading slide.

Slide 16: Obviously the students are required to produce test scripts as part of the computing project. The format and content of the test scripts are introduced in the exercise which follows this lecture in the project session. Point out that the test scripts should be included in an appendix rather than the main body of the report.

Slide 17: This slide points out what should be included in the testing section of the Computing Project. Go through the points and make sure that the students understand them.

Slide 18: The lecture concludes with some of the important points raised in the lecture. Ensure that students understand these.

4.4.2 Seminar Exercises

Lecturers' Notes

The exercise below is included in the Student Guide. Answers are not provided in the Student Guide.

For this particular seminar, students are asked to work through an exercise because they must provide test scripts for their project that adhere to the format in this exercise. What is being tested in the project report is the ability of the student to use a specific template and use it to present data associated with their particular project.

Point out to the students that the content of the 'Description' column may not always be 'Test for basic functionality' and get them to think about what other content may go into the column. For example 'Print time of report'.

Point out to the students that the content of the 'Expected Result' column may not always be 'Record is added to the database' and get them to think about what other content may go in the column. For example 'Report should print within 10 seconds'

Also point out that each test should state if a functional requirement or a non-functional requirement is being tested. Suggest to the students that it may be an idea to change the detail in the 'Objective' field to state either 'Test Functional Requirement' or 'Test Non-functional Requirement' This would imply that there should be at least 2 integration test scripts – one for functional requirements and one for non-functional requirements.

Presented below are two unit test scripts in the format that you should use for the test scripts in your project. Read through the test scripts and then work through the tasks.

Unit Test 1		Tests Class: EmployeeDetails	Designed By: John Smith	
Data Source: User Entry		Objective: Test basic functionality	Tester: John Smith	
Test Case	Description	Tasks	Expected Result	Actual Result
1.1	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 FIRST NAME: Steve SECOND NAME: MOSS	Record is added to the database	

Unit Test 2		Tests Class: SalaryDetails	Designed By: John Smith	
Data Source: User Entry		Objective: Test basic functionality	Tester: John Smith	
Test Case	Description	Tasks	Expected Result	Actual Result
1.1	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 SALARY: $20,000	Record is added to the database	

1. Convert the unit test scripts into an integration test script.

2. Define a unit test script for the Class JobDetails the inputs are EMPLOYEE NUMBER and JOB TITLE

3. Add the unit test script that you produced in task 2 to the integration test script that you produced in task 1.

Suggested Solutions:

1.

Integration Test Suite 1.1		Tests Classes: EmployeeDetails and SalaryDetails	Designed By: <Student Name>	
Data Source: User Entry		Objective: Test basic functionality	Tester: <Student Name>	
Test Case	Description	Tasks	Expected Result	Actual Result
1.1.1	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 FIRST NAME: Steve SECOND NAME: MOSS	Record is added to the database	
1.1.2	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 SALARY: $20,000	Record is loaded to the database	

2.

Unit Test 3		Tests Class: JobDetails	Designed By: <Student Name>	
Data Source: User Entry		Objective: Test basic functionality	Tester: <Student Name>	
Test Case	Description	Tasks	Expected Result	Actual Result
1.1	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 JOB TITLE: Manager	Record is added to the database	

3.

Integration Test Suite 1.1		Tests Classes: EmployeeDetails and SalaryDetails	Designed By: <Student Name>	
Data Source: User Entry		Objective: Test basic functionality	Tester: <Student Name>	
Test Case	Description	Tasks	Expected Result	Actual Result
1.1.1	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 FIRST NAME: Steve SECOND NAME: MOSS	Record is added to the database	
1.1.2	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 SALARY: $20,000	Record is loaded to the database	
1.1.3	Test for basic functionality	Enter employee details: EMPLOYEE NUMBER: 123456 JOB TITLE: Manager	Record is loaded to the database	

4.5 Private Study

The time allocation for private study in this topic is expected to be 8.5 hours.

Lecturers' Notes

For private study refer students to the project guidelines in their Student Guide (Appendix 1) and explain that they should use this time to carry out the necessary activities (including writing up sections to show you) to keep progressing with their project.

Task 1

Refer to your project guidelines. At this stage, you should have completed a draft design.

You should also use this private study time for planning how you are going to test your system. Be prepared to discuss the progress of your project with your tutor and to show the written sections which should now be completed.

Task 2

Prepare a progress statement to discuss with your tutor during your supervision sesison. This should include:

- The work completed thus far
- A forecast of work to be completed
- An updated project plan

At the end of this topic you should have done the following:

- Thought of an initial project idea (Topic1)
- Found or developed a suitable project proposal template (Topic1)
- Discussed your initial project idea with your tutor (Topic 1)
- Drafted a project proposal (Topic 2)
- Discussed your draft project proposal with your tutor (Topic 2)
- Begun the analysis of your project based on the final project proposal (Topic 2)
- Drafted an analysis of the system you are going to develop (Topic 3)
- Discussed the draft analysis with your tutor (Topic 3)
- Drafted a design for the system you are going to develop
- Discussed the draft design with your tutor
- Drafted an initial plan for the testing of your system

4.6 Tutorial (Supervision)

Lecturers' Notes

This time should be used for supervising the students' progress on their proposals. Each student should be allocated time for an individual meeting with you. At this stage you should be encouraging students to make sure their draft designs are complete and to start planning how they are going to test their systems.

Students should also show you their progress statement. You should compare this to the actual work done and point out any issues.

Topic 5: Final Report

5.1 Learning Objectives

On completion of this topic, students will be able to:

- Start writing up their final report.

5.2 Pedagogic Approach

This project session consists of a lecture and a seminar exercise. The lecture provides an overview of the structure and content of the final report for the computing project.

The seminar exercise provides the students with an oppurtunity to discuss the structure and content of the final report and gain a greater understanding of how it relates to their project.

5.3 Timings

Project Session:	2 hours
Tutorial:	2 hours
Private Study:	8.5 hours

5.4 Project Session

The Topic 4 Project Session includes a lecture and a seminar discussion.

5.4.1 Lecture Notes

Lecturers' Notes

The following notes are provided to serve as a guide to the material you should introduce to students during the lecture component of this project session.

The lecture is designed to provide an overview of how students should use concepts from other modules on the Level 5 Diploma in Computing in order to produce an appropriate computing project.

The structure of this topic is as follows:

- Structure of the final report
- Content of the final report
- Citations and referencing (reminder)
- Appropriate appendices

5.4.1.1 Guidance on the Use of the Slides

Slides 2-3: These slides can be used to explain the purpose of the lecture to the students.

Slide 4-5: These slides introduce the structure of the final report. Each chapter will be explained in more detail in the following slides. You should also go through the 'Final Report' section of the Project Guidelines with students to ensure they understand all the requirements (see Appendix 1).

Slide 6: 'Contents of the Final Report' section heading slide.

Slide 7: This slide looks at the contents of the Introduction chapter. Go through the points and make sure the students understand them. You might like to ask them to give examples from their own projects of what should be included in order to check their understanding.

- *The system developed* – a brief overview of the system the student is going to develop.
- *Justification for the method or framework used* – the student must justify why they have chosen method or framework they are using for the development of the project and provide a brief overview of it.
- *The solution that emerged* – this should be a paragraph that outlines what was developed in term of hardware and software. For example, "the final system was developed using PHP and MySQL and implemented on the company web server."
- *The main aims and objectives of the project* – this should be presented in the form of two lists.

- *A short overview of the remaining chapters* – For example, “Chapter 2 introduces X, Chapter 3 explains Y,” etc.

Slide 8: This slide describes the contents of the Analysis chapter, which was the subject of Topic 2. Check students’ understanding of the points given on the slide and highlight that this chapter must have its own introduction and conclusion.

Slide 9: Before showing students this slide, you might like to try to elicit the content of the Design chapter from what students can remember from Topic 3. Emphasis that this chapter must also have its own introduction and conclusion.

Slide 10: This slide outlines the contents of the Implementation chapter. Again, remind students of the importance of including an introduction and conclusion for this chapter.

- *Choice of programming language* – this should state programming language used and justify its use for this particular student project.

- *System cutover from the development architecture to the implementation architecture* – this could be an extension of the technical architecture diagram introduced in Topic 2 Slide 16. The extension would be via the use of arrows that show what was moved from the development architecture to the implementation architecture in terms of code. The supporting narrative should explain why and how.

- *Data migration from the development architecture and/or existing systems to the implementation architecture* – this is simply an extension to the prevoius diagram coupled with additional supportive narrative.

- *Training – this involves the development of a user guide that should be placed in an appendix*. The user guide should consist of screen dumps of the system along with supportive narrative that explains how to use a particular screen. There should be a short section in the report that explains how, why and when particular groups of users will be trained.

Slide 11: Go through the content for the ‘Other Project Matters’ chapter and make sure that the students understand the points given on the slide.

- *Project Management* – this section should include a Gantt Chart and supportive narrative that explains how the project was managed.

- *Risk Management* – this section should overview the approach to risk management as outlined in Topic 1.

- *Configuration Management* – this section should overview the approach to configuration management as outlined in Topic 1.

- *Testing* – this section should overview the approach to testing as outlined in Topic 4.

Slide 12: This slide overviews the contents of the conclusion chapter. Go through the points and make sure the students understand them.

Slide 13: This slide overviews the contents and position of the Reference list. You may want to take the opportunity to recap the Harvard Referencing Style and elicit from students how this functions for different types of references (book, journal, internet source etc). You may also wish to discuss appropriate sources with students at this stage. Highlight that the list should only include those references mentioned in the other chapters of the report.

Slide 14: You may want to elicit possible contents for the appendices before showing students this slide. It contains a summary of the comments about appendices made in previous lectures.

Slide 15: This slide shows the breakdown of the final mark for the project. You should refer students to the assessment criteria in their Student Guide (see Appendix 2) and explain how these will be applied.

Slide 16: The final slides highlights some of the important points raised in the lecture with reference to the assessment of the student projects.

5.4.2 Seminar Exercises

Lecturers' Notes

The aim of the seminar session is to provide the students with an opportunity to discuss the structure and content of the final report and gain a greater understanding of how it relates to their project.

This seminar does not have a particular practical exercise associated with it because what is important for this topic is that students understand the structure and content of the project report. The structure of this discussion is left to the lecturer.

One key point to make during the seminar is the need for supportive narrative for every diagram presented in the project report. The point of this seminar is for the lecturer to ensure that the students follow the structure presented in Topic 5 for their project report and stress that marks will be lost if they do not.

This session provides an oppurtunity to discuss the structure and content of the project report.

5.5 Private Study

The time allocation for private study in this topic is expected to be 8.5 hours.

Lecturers' Notes

For private study refer students to the project guidelines in their Student Guide (Appendix 1) and explain that they should use this time to carry out the necessary activities (including writing up sections to show you) to keep progressing with their project.

Task 1

Refer to your project guidelines. At this stage you should have completed draft unit testing test scripts..

You should also use this private study time for planning what tasks you still need to carry out for your project and to keep writing up your project so that you are on target to meet the hand in deadline.

Be prepared to discuss the progress of your project with your tutor and to show the written sections which should now be completed.

Task 2

Prepare a progress statement to discuss with your tutor during your supervision sesison. This should include:

- The work completed thus far
- A forecast of work to be completed
- An updated project plan

At the end of this topic you should have done the following:

- Thought of an initial project idea (Topic1)
- Found or developed a suitable project proposal template (Topic1)
- Discussed your initial project idea with your tutor (Topic 1)
- Drafted a project proposal (Topic 2)
- Discussed your draft project proposal with your tutor (Topic 2)
- Begun the analysis of your project based on the final project proposal (Topic 2)
- Drafted an analysis of the system you are going to develop (Topic 3)
- Discussed the draft analysis with your tutor (Topic 3)
- Drafted a design for the system you are going to develop (Topic 4)
- Discussed the draft design with your tutor (Topic 4)
- Drafted an initial plan for the testing of your system (Topic 4)
- Discussed the intial testing plan with your tutor
- Finalised the testing plan for the project

At this point ensure that you are up to date and have completed all the tasks above and that everything has been fully documented so that you can easily write up each stage of the project in the final report.

5.6 Tutorial (Supervision)

Lecturers' Notes

This time should be used for supervising the students' progress on their proposals. Each student should be allocated time for an individual meeting with you. At this stage you should be encouraging students to have completed draft unit testing test scripts and to be planning what tasks they still need to carry out in order to complete their projects.

Students should also show you their progress statement. You should compare this to the actual work done and point out any issues.

Topic 6: Topics 6-12: Project and Report Completion

6.1 Private Study

The time allocation for private study is expected to be 71 hours plus time spent meeting with your tutor.

Lecturers' Notes

From this stage onwards it is the responsibility of the supervisor to guide the student through the remaining hours of private study. You should maintain weekly supervisory contact with all students in order to ensure that they are progressing satisfactorily. Students should have the opportunity to meet with you individually to ask questions, gain feedback on draft sections of their work and receive guidance. These supervisory meetings may be expected to last from 20-45 minutes for each student, depending on the nature of the project undertaken and the ability of the student.

Refer to your project guidelines. You should now complete your project and report, as well as prepare for your project demonstration and presentation.

Throughout this period you are expected to maintain contact with your tutor/supervisor and inform them of the progress you are making and any problems or questions you have. You should continue to prepare progress statements for each meeting with your tutor. You will also be expected to produce evidence of your work and demonstrate continually improving versions of your computing artefact in each meeting with your tutor.

You will need to manage your time carefully to ensure that you continue to work systematically through your project. It is now your responsibility to manage the project plan and ensure you keep making progress each week.

Appendix 1: Project Guidelines

1. Scope

This is an individual project that should cover, in detail, the analysis, design coding and testing of a computing project as outlined in the learning outcomes for the module. It should also give an overview of the approaches used for project management, configuration management and risk analysis.

2. The Project Proposal

The proposal is a blueprint for your project. The purpose of the proposal is to put forward your ideas about the project and allow your supervisor to judge whether the project is viable. The project proposal should be between 3 and 5 pages in length and include the following sections:

2.1 An overview of the computing artefact to be developed

What type of computing artefact you are going to develop? Why it is important to produce the computing artefact? What are the project aims and objectives?

For example: 'The computing artefact to be developed is an Information System because … A small firm currently maintains its records in paper based form. This is inefficient for the following reasons ... The solution will reduce overheads such as ... It will potentially allow savings of £xxx per year and open up the following business opportunities ... The aims of the project are … The objectives of the project are …')

2.2 The aims and objectives, scope and architecture

What are you going to develop? What features will and will not be developed? What architecture will you use to develop the system?

For example: 'The system will automate the following transactions ... It will provide an online Help system supporting the following features ... It will provide a user guide, focusing on the following ... It will not incorporate the following … because ... It will be developed in Java Version X and MySQL Version Y, to run on the following platforms ...'

2.3 Work Breakdown Structure and Gantt chart

This section needs to provide a breakdown of the main tasks and activities that you will need to undertake for the successful completion of your project. Indicate the key milestones with dates. *It is suggested that you use a tool such as Microsoft Project for producing this information.*

The project will not proceed until the plan is approved by your supervisor.

3. The Project Report

Your project report is an account of the work done in terms of the development of the computing artefact. It is important that you plan for the report to communicate with the people reading it. This means producing a report that your supervisor will enjoy reading. The project report should be a well-structured word processed document that is easy to read. The project report should be 6000 (+/- 500) words in length. The precise structure of the project report is presented below:

3.1 Title Page

This section should contain the following centred information:

- The full title of the project
- The full name of the author, followed by the student registration number in brackets
- The centre at which the author is studying

3.2 Abstract

This section should consist of a synopsis of the project (150-200 words) stating the nature and scope of the work undertaken, and a high level summary of the outcomes.

3.3 Contents Page

This section should show the page numbers of chapters, sections and sub-sections, a list of figures and tables, and a list of appendices.

3.4 Acknowledgements

This section is optional, but you may wish to pay tribute to particular people who have given you special assistance or support.

3.5 Introduction

This chapter provides the context of your work in terms of:

- The system developed
- Justification for the method or framework used
- The solution that emerged
- The main aims and objectives of the project
- A short overview of the remaining chapters

Further guidance with respect to the content of this chapter is provided in Topic 5.

3.6 Analysis

This chapter consists of the analysis specification of the proposed system in terms of:

- Requirements
- Use Cases
- Architecture

Further guidance with respect to the content of this chapter is provided in Topic 2.

3.7 Design

This chapter consists of the design specification for the proposed system in terms of:

- Structural Model
- Behavioural Model

Further guidance with respect to the content of this chapter is provided in Topic 3.

3.8 Implementation

This chapter describes your approach to implementation in terms of:

- Choice of programming language
- System cutover from the development architecture to the implementation architecture
- Data migration from the development architecture and/or existing systems to the implementation architecture
- Training

Further guidance with respect to the content of this chapter is provided in Topic 5.

3.9 Other Project Issues

This chapter provides an account of your approach to project management, risk management, configuration management and testing. You need to describe what particular techniques you have used, why you have used these rather than others, and present a summary of your main results.

Further guidance with respect to project management, risk management and configuration managed is provided in Topic 1, whilst Topic 4 provides further guidance with respect to testing.

3.10 Conclusion

This chapter evaluates the substantive aspects of your work, within the context you have established in the Introduction. It also comments on the extent to which the original aims and objectives have been met. In addition, you might wish to comment on any envisaged future development of the system.

Further guidance with respect to the content of this chapter is provided in Topic 5.

3.11 References

All references you cite within the body of your report should be fully referenced in this section, using the Harvard Style. No reference should appear here unless it has been cited in the body of the report.

3.12 Appendices

Appendices may include any supporting material to which a reader might wish to refer, but which is not essential for the main body of the report. Appendices for the computing project may include some, or all, of the following:

- Requirements Catalogue
- Use Case Descriptions
- Detailed Class Definitions
- Test Scripts
- User Guide
- System Code
- External Client Documents where applicable (see Section 4 below)

4. The Project Presentation and Demonstration

Following completion of your project report, you will have 30 minutes to demonstrate the system developed and give a presentation about the content of the computing project. The demonstration and presentation will be assessed and contribute to your final mark.

The 30 minutes will be structured as follows:

- Demonstration (10 minutes)
- Questions related to the demonstration (5 minutes)
- Presentation (10 minutes)
- Questions related to the presentation (5 minutes)

The presentation should contain between 10 and 15 slides and should be structured as follows:

- An overview of the context/background of the project
- An overview of the analysis and design activities (high level model of the system, techniques used, key design decisions)
- An overview of the testing (techniques, a summary results, conclusions)
- A critique of the process (what went well, what didn't, what you have learned, what you would do differently next time)

PC and projection equipment will be available, so it is expected that you will give a PowerPoint presentation. The audience for the session will be your supervisor plus one other tutor.

5. Notes on Working with External Clients

You are not required to work with an external client to develop your project. However, if you are working with an external client the following must be included in an appendix:

- A letter of introduction from the Accredited Partner Centre to support the student.
- A memorandum of understanding (MOU) between the student and client. This document is typically prepared soon after a client has been chosen. Its purpose is to formally establish the specific details of the project work with the intention of protecting both the client and the student. It should cover:

- A specification of the system project, including expected functionality, timeline, and resources to be committed.
- Confidentiality of documents which may be passed from client to student.
- Liabilities of student to client in case of failure to deliver a working product.
- Financial compensation or remuneration. The MOU should make clear that the student is not to be paid for any project work undertaken.

Appendix 2: Project Assessment

There are four assessment components for the computing project:

- The Project Proposal: 10%
- The Project Report: 70%
- The Project Demonstration: 10%
- The Project Presentation: 10%

Each component will be marked out of 100 according to the following criteria.

The Project Proposal

Mark Range	Descriptor	Criteria
0-29	Poor Failure	• The overview of the computing artefact to be developed is either unclear or missing • The aims and objectives, scope and architecture are either unclear or missining • The work breakdown structure and Gantt chart are either unclear or missing
30-39	Marginal Failure	• The overview of the computing artefact to be developed is either unclear or missing • The aims and objectives, scope and architecture are either unclear or missining • The work breakdown structure and Gantt chart are either unclear or missing
40-49	Marginal Pass	• The overview of the computing artefact to be developed is vague, but appropriate • The aims and objectives, scope and architecture are vague, but appropriate • The work breakdown structure and Gantt chart are vaque, but appropriate
50-59	Average Pass	• The overview of the computing artefact to be developed is partially clear, but appropriate • The aims and objectives, scope and architecture are partially, but appropriate • The work breakdown structure and Gantt chart are partially, but appropriate
60-69	Merit	• The overview of the computing artefact to be developed is generally clear and appropriate • The aims and objectives, scope and architecture are generally clear and appropriate • The work breakdown structure and Gantt chart are generally clear and appropriate

70+	Distinction	• The overview of the computing artefact to be developed is very clear and appropriate • The aims and objectives, scope and architecture are very clear and appropriate • The work breakdown structure and Gantt chart are very clear and appropriate

The Project Report

Mark Range	Descriptor	Criteria
0-29	Poor Failure	• The Introduction is unclear and too short • The Analysis is unclear and uses inappropriate models • The Design is unclear and uses inappropriate models • The Implementation of the system is unclear • Other Project Issues are unclear and inappropriate • The Conclusion unclear and too short • References are missing
30-39	Marginal Failure	• The Introduction is either unclear or too short • The Analysis is either unclear or uses inappropriate models • The Design is either unclear or uses inappropriate models • The Implementation of the ssystem is unclear • Other Project Issues are either unclear or inappropriate • The Conclusion is either unclear or too short • References are missing
40-49	Marginal Pass	• The Introduction is vague, but appropriate • The Analysis is vague, but uses appropriate models • The Design is vague, but uses appropriate models • The Implementation of the system is vague • Other Project Issues are vague, but appropriate • The Conclusion vague, but appropriate • References are used poorly and are not in the Harvard style
50-59	Average Pass	• The Introduction is partially clear, but appropriate • The Analysis is partially clear, but uses appropriate models • The Design is partially clear, but uses appropriate models • The Implementation of the system is partially clear • Other Project Issues are partially clear, but appropriate • The Conclusion partially clear, but appropriate • References are used adequately and are not in the Harvard style

60-69	Merit	• The Introduction is generally clear and appropriate • The Analysis is generally clear and uses appropriate models • The Design is generally clear and uses appropriate models • The Implementation of the system is generally clear • Other Project Issues are generally clear and appropriate • The Conclusion generally clear and appropriate • References are used well and are in the Harvard style
70+	Distinction	• The Introduction is very clear and appropriate • The Analysis is very clear and uses appropriate models • The Design is very clear and uses appropriate models • The Implementation of the system is very clear • Other Project Issues are very clear and appropriate • The Conclusion generally clear and appropriate • References are used well and are in the Harvard style

The Project Demonstration

Mark Range	Descriptor	Criteria
0-29	Poor Failure	• System is unusable. • System does not have a help subsystem. • System uses interfacing that is inconsistent. • System is unstable and constantly runs into errors.
30-39	Marginal Failure	• System is nearly unusable. • System does not have a help subsystem. • System uses interfacing that is inconsistent. • System is unstable and constantly runs into errors.
40-49	Marginal Pass	• System barely meets expectations. • System does not have a help subsystem. • System uses interfacing that is inconsistent. • System is nominally stable and runs into frequent errors.
50-59	Average Pass	• System somewhat meets expectations. • System has a simplistic help subsystem. • System uses interfacing that is usable but lacks general consistency. • System is somewhat stable but has some noticeable errors.
60-69	Merit	• System meets expectations. • System has a usable help subsystem. • System uses consistent interfacing. • System is generally stable and has just some minor software errors.
70+	Distinction	• System meets or exceeds functional expectations. • System has comprehensive help subsystems • System uses consistent interfacing. • System is stable and generally error-free. • System is of unusual scope or type.

The Project Presentation

Mark Range	Descriptor	Criteria
0-29	Poor Failure	• Unclear overview of the context/background of the project • Inappropriate and incomplete models used to overview the the analysis and design activities • Unclear and incomplete overview of testing • Unclear and incomplete critique of the process • Poor and inadequate presentation with unacceptably low use of visual materials • Failure in answering any questions
30-39	Marginal Failure	• Unclear overview of the context/background of the project • Inappropriate or incomplete models used to overview the the analysis and design activities • Unclear or incomplete overview of testing • Unclear or incomplete critique of the process • Presentation is not sufficient in content and little use of visual materials • Poor performance in answering questions
40-49	Marginal Pass	• Vague overview of the context/background of the project • Appropriate, but incomplete models used to overview the the analysis and design activities • Vague overview of testing • Vague critique of the process • Presentation is adequate in content, but makes little use of visual materials • Adequate performance in answering questions
50-59	Average Pass	• Partially clear overview of the context/background of the project • Appropriate, but incomplete models used to overview the the analysis and design activities • Partially clear overview of testing • Partially clear critique of the process • Presentation is of an acceptable standard and logically structured, with good use of visual materials • Fair performance in answering questions

60-69	Merit	• Generally clear overview of the context/background of the project • Appropriate and complete models used to overview the the analysis and design activities • Generally clear overview of testing • Generally clear critique of the process • Presentation is generally well organised with very good use of visual materials • Competent in answering questions
70+	Distinction	• Very clear overview of the context/background of the project • Appropriate and complete models used to overview the the analysis and design activities • Very clear overview of testing • Very clear critique of the process • Presentation is very well-organised and structured with excellent use of visual materials • Very competent in answering questions