SOLENT
UNIVERSITY

SCHOOL OF MEDIA, ARTS AND TECHNOLOGY

PROJECT HANDBOOK

FOR UNITS:

Game Development Project – CGP601

Indie Game Project - CGP602

Version 9.4
2018-2019

CONTENTS

1. Introduction

The undergraduate Final Major Project represents the comprehensive culmination of the undergraduate degree and forms the cornerstone of a graduate's portfolio. The project unit is a double-value unit, worth 40 CATS point, and therefore warrants significant investment and effort to achieve the most impressive results possible.

The Final Major Project requires the student to conduct a significant body of independent work, consisting of both research and development, which draws from and extending the taught elements of the degree programme.

The content of the project should reflect your particular interests, but must also reflect the emphasis of the course and named award (i.e. Computer Games Indie or Computer Games Software Development). Section 3.2 goes into detail on the choice of project topic; this crucial step is explored further in Appendices D and E.

The completed project will demonstrate your ability to research, plan and execute the project such that the project aims and objectives are achieved. Artefacts in the form of reports serve as milestones to track progress and build toward the completed project. A final report which documents the development process and decisions made throughout accompanies the resulting software product.

You should expect to spend at least 400 hours working on the project; the reports, log book, software product and any other products should provide evidence for this.

The project is assessed at multiple points. There are 4 written hand-ins over the course of the project:

1. **Project Proposal** – this is a **formative/unmarked** assessment and an initial indicator of the direction of the project. The proposal is submitted to your supervisor for approval by week 1.

2. **Project Definition** – this is also **formative/unmarked** and is simply a more complete description of the project after some initial research, including scope and an initial but thorough project plan. It is normally due by week 3.

3. **Progress Report** – This report is a **summative/marked** assessment, usually due in week 6. It details all progress to-date on research, implementation and any conclusions reached. It builds on the Definition and further specifies plan and all work remaining.

4. **Final Project Report** – This **summative/marked** assessment concludes implementation of the project, including a critical analysis of your project management, a reflective conclusion on all aspects of the project, and a short video demonstration. The Final Project Report and Product are presented to both supervisors on Demonstration Day.

Refer to the **Assessment Briefs** and Solent Online Learning for the official due dates.

2.   Conduct of the Project

Conduct refers to the manner in which the Project and all related activities are planned and managed over its entire duration. Applying the knowledge and skills gained on your course will enable you to properly and effectively initiate a project of your choosing, and see it through completion.

2.1   Areas of Conduct

There are two distinct areas within the project's conduct:

There is the "**PROCESS**" that you use to research, plan and monitor the creation of a "product", including the selection of appropriate methods, tools and techniques, and how guidance from your supervisor is adopted and influences your thinking.

The "**PRODUCT**" is what you create by following the process. It might be a software system and associated documentation, a game mechanic prototype, or the results of an investigation and primary research.

In your final report, you will be expected to evaluate your "product" in terms of how well it satisfies your objectives, and also to review the tools, techniques and approaches used during the "process".

2.2   Skills Demonstrated

Over the course of the Project, you are expected to:

- Relate to the solution of a non-trivial and normally real-world problem through the development of a software system.

- Synthesize theory and practice in providing interesting and novel solutions.

- Justify the choice of any adopted approach and/or methods, tools and techniques applied using criteria.

- Evaluate the fitness for purpose of the chosen solution.

- Demonstrate the meaningful application of project management using appropriate metrics.

- Evaluate appropriateness of tools and methods used.

- Reflect on all aspects of the development process.

All of the above skills are assessed at various points during the unit. Refer to the Learning Outcomes in Appendix A for more information regarding how they relate to assessment of skills.

2.3   Assessment

Your grade on the Final Major Project is determined by two summative assessments, each of which is built up from smaller formative assessments.

The process you use to conduct your project is **more** important than the product you create. It is therefore <u>extremely important</u> that you maintain careful records in your logbook and project library throughout the project to assist you when discussing and writing up the project process.

Note that the product itself will be evaluated based on the success criteria defined by **you**. It will be critiqued based on demonstrating quality workmanship, application of theory and principles learned in your course, and whether it reflects the effort expected from 400 hours of work.

The product is developed primarily as a tool by which you demonstrate the skills and knowledge gained during your degree program. It highly valuable to you as the cornerstone of your portfolio, and should receive the majority of your attention throughout your final year.

2.4   Project Phases

A typical, well-managed project has several distinct phases:

- **Identification** of a problem to be solved followed by formal definition in terms of aims and measurable objectives.

- **Research** into potential solutions to the given problem, and criteria-based selection of potential solution(s).

- **Selection** of suitable tools/methods to be used in the process of solving the problem.

- **Planning** the process of solving the problem, including contingency and risk analysis.

- **Determination** of methods whereby the success or otherwise of all aspects of the project can be assessed.

- **Implementation** of a product or primary research results and analysis.

- **Review** and reporting on the product and the process.

The cadence of project phases is approximately tied to the summative assessments:

- The **Progress Report** is due approximately when the Determination phase should be completed.

- The **Final Project Report** concludes the Review Phase and the overall project.

3. What every student needs to do for their Final Major Project

In addition to building an impressive product, students must produce several assessed documents and follow a process. There is a temptation for students to over-focus on the product, which usually ends in poor results.

Following the entire process will ensure students perform to their potential on the project and are eligible for the highest grade.

3.1 Start a Logbook

You **must** maintain a logbook in support of your conduct of the project. The logbook is used to record and retain all project-related thoughts and notes, and is invaluable when reviewing previous decisions and writing assessment reports.

The logbook should be a properly bound A4 notebook suitable for keeping notes, ideas, diagrams, etc. Pages should be dated to show regular progress on the project and to help you to stay organized.

It is also important to keep track of all meetings with your supervisors, as all such meetings reflect the professionalism of your conduct, which is included in the assessment criteria.

Any loose papers or irregular shaped items should be placed in the **Project Library** (Appendix I) and cross-referenced in the logbook. Refer to Appendix C for more details regarding the **Logbook**.

3.2 Meet with Your Supervisor

Project students are expected to meet regularly with their supervisor and act on the advice and guidance provided. Most students meet with their primary supervisor on a weekly basis for 30 minutes and occasionally as needed for urgent questions or problems.

Students who meet regularly with supervisors and are able to benefit from frequent guidance tend to perform best. Each meeting should be recorded in the project logbook so nothing is forgotten; this may be included as evidence in report appendices.

Assessment marking considers how each students records and acts on guidance from supervisors; failing to meet with your supervisor will limit your potential marks. Refer to Appendix B for more information.

3.2 Select a Topic

The project process commences with the selection of a topic. You should select a topic are at the start of the academic year to give yourself sufficient time to consider all aspects of the topic and how you want to approach it.

Projects should be based in one of two categories:

- The design and build of a technical product or game.

- The testing and proving/disproving of a theory or concept.

To make a start on the process of choosing a topic you will want to build to completion, the following questions may be of help:

- What aspects of the course would I like to pursue further in a practical way?

- How will my project topic selection relate to my degree pathway?

- Will my project satisfy the unit outcomes?

- Will the project help me to get a job or start my own business?

- Is there an appropriate amount of primary or secondary research potential?

- What industry-related technical skills do I consider as interesting or important for investigation?

- What practical outcome can be achieved as the result of a study and investigation?

Be aware that your project supervisor **must** approve your project type and topic – not all project types or topics may be available for your course.

Other project categories may be acceptable, but will have to be approved by the Course Leader. Please consult Appendix D for guidance on choosing a project idea, and refer to Appendix E for the table of project types available for each course.

Once the project idea has been identified and approved, you will prepare a more detailed Project Proposal.

3.3   Submit the Project Proposal

For your **Project Proposal**, you will need to build upon the approved project idea.

The proposal is designed to ensure that the project is completed according to plan, and will meet the criteria for level six of an undergraduate course.

The proposal document should be 2 – 5 pages in length, and contain an overview of the project you wish to undertake. This should contain a discussion of the background of the project idea, what you intend to research, what the measurable outputs are you intend to build, and how you intend to approach the project.

All of the work put into the Proposal is carried forward into the Project Definition and built up further for the Progress Report - it is not wasted effort!

The Project Proposal must be agreed by both supervisors! The supervisors' primary concern is that the scope of the project is appropriate for the course/degree and feasible given the time and resource constraints. It may be necessary to modify a proposal multiple times to gain approval so it should not be delayed.

See Section 4.1 for more on the Project Proposal.

3.4   Complete the Project Definition

The **Project Definition** should demonstrate that you have already done a reasonable amount of research, planning and justified decision making. By this point in the project students should understand, in detail, what the project is expected to achieve, and identify the options (or possible solutions) that may lead to the desired outcomes.

Essentially it can be expressed as the questions "What am I going to do?" and "How am I going to do it?"

It will be formatively assessed by your project supervisor. The Definition can be seen as an outline - building up the project proposal to include all necessary sections, and as an interim step towards the Progress Report – the first assessment. See Section 4.2 for specific elements the Definition Report should contain.

If your research will include human participants, it is essential that your research is performed ethically according to university policy and with consent of the participants. See Appendix K for more information.

The Project Definition also includes an important new concept: Project Management. Based on the characteristics of your project, you need to decide how you will manage it and which development methodology you will use: Adaptive or Predictive. This decision also influences the best tracking and communication tools to use, which from this point are an essential part of the project. Refer to the Use Project Management in section 3.5 and Appendix G for more details.

A specific format is required for each report. Refer to Appendix J on Report Formatting for guidance, which should be followed for each report starting with the Definition.

3.5   Use Project Management

Project management is a large component of the Final Major Project – more important that the actual product in terms of your grade. **Starting with the Definition Report**, it is necessary to start formally managing the project. Each student is responsible for producing a "product" as well as managing the "project" that proactively seeks to deliver the project. All time spent on the product should be planned, tracked and managed at hourly granularity.

Some aspects of the project will change over time – plans do change. Underestimation and scope change are common problems that many students face. "Change management" refers to the process by which changes are controlled to ensure the best possible final results are achieved, and it is critical for successful project management.

When (not if!) a change is necessary, the student must review the situation and all reasonable options, choosing the best. The Progress Report and the Final Report must show active project management throughout the project. It is necessary to use project management artefacts as evidence to support your decision making process and explain when and why changes were decided upon.

Refer to Appendix G for guidance and recommendations on how to manage your project.

3.6   Build Your Product

This should be self-explanatory!

3.7   Write the Progress Report

The Progress Report is the first summative/marked assessment of the project. It should be the culmination of incremental improvements and additions to the definition report based on student work guided by project supervisor feedback at project meetings. The progress report is essentially a continuation of the development of the definition report to the point where the initial research is complete and a viable project plan has been finalized.

Every project is different and places different emphasis on research vs development. Projects that intend to produce a game product will likely have concluded research and be well into development; research-driven projects may have little development output yet. Regardless of your project type, the Progress Report must contain several sections which are appropriately complete and detailed. Your supervisor will help clarify the depth and level of detail expected.

The Progress Report sets the tone and direction for the Final Project Report and comprises 40% of the project grade. It is therefore important to start early on the report by completing the formative assessments, rather than focussing only on the product you are building.

3.8   Submit the Final Project Report

At the end of the project, the Final Project Report collects all of evidence of the conduct of the project into a single document. This document is submitted along with the actual Product, any additional artefacts created during the project, and a 1-minute video demonstration of the product.

The report is comprised of several sections, including the body of the Progress Report, which serves as an introduction to the project and documents the first phases of development. All evidence of project management, which should have been diligently produced and collected throughout, is included in appendices along with any other supporting documentation.

The report must follow structure and formatting guidelines as specified in Appendix J.

The report is a substantial piece of work and should not be underestimated or procrastinated.

3.9   Present your Project at Demonstration Day

Each student will have a 30-minute time slot to discuss their project with both supervisors in person and demonstrate their product. This is a great opportunity for students to show their software in action, answer any questions the supervisors may have, and ensure that all the hard work put in is fully realized and appreciated.

Sometimes a report cannot capture everything, and the demonstration is the final chance to for students to earn the highest grade possible.

Be aware that marks are awarded at Demonstration Day! Failure to attend the scheduled time slot will result in lower grade.

Demonstrations with the primary supervisor and secondary supervisors are normally scheduled for week 16. Specific times and locations will be determined by early May and published to SOL.

Please discuss any hardware/software/facilities requirements with your supervisor in advance of your demonstration time to ensure all requirements are met.

3.10   Show off your Project at the Grad Show

The Grad Show is an opportunity for final year Games course students to exhibit their work and before students, staff, and potential employers. It is a compulsory event and represents the final day students are expected to attend university. It is a professional occasion and students should dress (smart casual) and act accordingly.

The Grad Show website will provide public access to view profiles and work from all final year students. To be included on the site, students will need to provide a Word document with the some relevant information, information about the Final Project and other projects to be shown (such as a written synopsis, images, videos), and a professional photo.

Solent Futures provides a free professional photo service. More details will be announced closer to the time, but students are encouraged to plan this in advance.

4. Assessments

Assessments are a necessary part of the project to ensure students focus on the skills and outcomes most important for their course. The first documents are due shortly into the project semester to encourage a fast start, as it is imperative that you do not fall behind. The formative assessments also serve to guide students through the necessary project documentation, building up over time into the two summative assessments.

The Project is a **double** (40 CATS) unit and you CANNOT be compensated for a marginal fail.

4.1   Project Proposal

A project proposal must contain:

- Project Title

- Background

  An overview of context and scope of the proposed project, explaining broadly the subject area of the project, as well as what you want to achieve by carrying out the project and how the project 'fits' into the course.

- The overall **aim**(s)

  Aim(s) should summarize the description of the project in the overview in one or two sentences; these are the overall goal(s) that you will be working towards during the project.

- Some initial **objectives**

  Project objectives describe the steps you plan to follow in order to fulfil the aim(s) of the project. At this stage the objectives do not need to be final nor fully detailed; a broad overview of five or more objectives is sufficient - they will be refined later. Refer to Appendix F for more information on project aim(s) and objectives.

- An initial **plan** for how you will develop the project

  Project planning and management forms a large part of your work on the project. At this time, the initial plan should consider the scope of work involved and how the known elements can be broken down into estimable pieces and sequenced.

- A review of relevant **literature**

  A Literature Review identifies key sources that you plan to use later for research and decision making. This is a referenced listing of books, journals, scholarly articles, documentation and other sources relevant to your project, with a short overview for each source briefly summarizing the content and how it might inform your project. The needs of this section may vary depending on your project - refer to Appendix H.

The proposal must be agreed by the supervisor to confirm that these criteria have been met before moving on to the Project Definition Report.

4.2   Definition Report

The Definition Report can be seen as building out the Project Proposal into a full report structured into specific sections. This structure matches that of the Progress Report making the Definition an important interim step.

It should include the following sections, several of which are updated and refined from the Project Proposal:

- **Background** [updated]

- Project **aim**(s) and **objectives** [updated]

- Description of **research/prototyping completed**

  A section on the research you have so far conducted should be added to this report. You should cite literature using Harvard referencing, and begin to build your references list and reading list from these sources. Any prototyping so far conducted should also be included here, with some form of evidence of results and what has been learned from it.

- Project Specification

  The specification is a fully detailed description of your "product", i.e. what you plan to hand in, based on the objectives that have been defined. Use short, clear descriptions, and try to use readily measurable values wherever you can. The specification can be used for guidance in determining potential solutions, as well as a basis for the planning and breaking down tasks.
  For primary research projects, specification should be a statement of research questions instead.

- Discussion of **potential solutions** and justified choices

  Once a specification has been created you should then consider several potential solutions, consisting of a set of methods or algorithms, which could get the project completed to the given specification, based on your research. Simply selecting a single method with no justification is a poor way of doing this, there should be several possibilities with justified rationale as to which one is eventually chosen. You should try to generate as many ideas as possible - proceeding with the first one you think of will inevitably lead to long delays when difficulties arise later in the project. The proposed solutions should then be evaluated by measuring how well each one will satisfy the project objectives, by using a set of criteria relating to your specification, in order to find the best one. You should use references to help justify your selection of criteria.

- Discussion of choice of **tools and technologies** required, with justified decisions

  This report should also look at some issues of enabling technology and systems. In other words it answers the questions; "Are there methods, technologies and systems that can be used to solve this problem?", and if so, "What is my strategy for using them?" These activities require background research to determine the nature of the problem. You must show that you are using literature references to inform your decision making and to establish what work has already been carried out in your chosen subject area. In many cases this may also involve further experimentation to ensure that proposed tools, methods and techniques are capable of doing the job

required. This sort of work must be done in a structured way and the results need to be carefully recorded to provide justification for any choices made.

- Discussion of Software Development **Methodology**

  If your project will follow the Prescriptive Framework as suggested, this section should simply contain a brief description of your approach in applying it. Questions to be answered include:

  o How to do you plan to begin the project?

  o How will you organize the plan and weekly workload?

  o How frequently will you re-evaluate progress compared to the plan?

  o How will risks be managed?

  If you intent to use a different and specific methodology, this section must go into detail explaining your rationale for choosing the methodology, including references to research that supports your decision and the benefits to your project.

- Discussion of Project Management **Tools** and **Metrics**

  Project Management consists of the chosen methodology to organising and sequencing tasks, and the process by which progress is measured. The Tools and Metrics section contains a brief description of how the project will be kept on track, including the artefacts regularly produced and how these will be used to adjust plans.

  This section concludes with an initial plan for the project through completion, and tracking data from inception to date. The chosen methodology and artefacts should be applied, showing the current state of the project and known work remaining.

  Refer to Appendix G for guidance on project management.

- **Resource implications**

  Resources include any software, hardware, people or other sources of information or development outside your immediate control or not provided to you by the university. Some projects do not require any additional resources; however some might be compromised without access to specialist resources. Examples might include:

  o Virtual Reality hardware and environment

  o Cloud computing or storage

  o Test subjects for a focus test or survey

  Any such resources should be listed here, along with the implications of their availability and any costs associated with their use.

- **Reference List** and **Reading List**

  Information sources that informed project, whether general and unreferenced which go into the Reading List, or specific and referenced sources which go into the Reference List.

- **Literature review** [updated and moved to an appendix]

  The literature review should have expanded in scope since the proposal, so add any new sources along with descriptions. This section should be moved to an appendix; it will continue to help fill out the Reference and Reading lists.

This report should begin with your project background, aim(s) and objectives. These may have been changed since the proposal, so include any updates here and in good detail.

Once the preceding stages have been completed you need to confirm with your supervisor that your project is viable and that you have the ability to complete it successfully. As this report is formatively assessed you will have the opportunity to improve it iteratively with feedback from your supervisor until it is agreed that it is of a sufficient standard to move on to the **Progress Report**.

4.3   Progress Report

The progress report is the first summative/marked assessment of the project. It represents all the incremental improvements and additions to the Definition Report based on student work, guided by project supervisor feedback. The Progress report is essentially the development of the Definition report to the point at which all or most of the initial research is complete and project planning has been finalized.

The progress report should contain all of the content of the Definition report as discussed with your project supervisor, and should contain at the very least the following sections (please note the highlighted new sections):

- **Background** [updated]

- Project **aim**(s) and **objectives** [updated]

- Description of research/prototyping completed [updated]

- Project Specification [updated]

- Discussion of **potential solutions** [updated]

- Discussion of **tools and technologies** [updated]

- Discussion of Software Development Methodology [updated]

- Discussion of Project Management Tools and Metrics [updated]

- Resource implications [updated]

- [NEW] **High level overview** of classes that may be required

  (or equivalent components for research projects)

  The first of the two new sections should show broadly what classes the project may require and their relationships, including inheritance, composition and aggregation. Fully detailed class diagrams are not needed at this time, the detailed design will precede each implementation phase you go through in the final report. For research projects this section might instead be a description of resources required.

- [NEW] High level flow diagrams and pseudocode

  (or equivalent processes for research projects)

  This section should show the proposed main operations of the application. Again this does not need any particular detail at this stage, there just needs to be an approximate indication of the ordering of operations in the final product, this will be refined in the final report. For research projects this section might instead be research tasks that need to be performed.

- **Reference List** and **Reading List** (in Appendices)

- **Literature review** (in an Appendix)

- Other Appendices

Progress Report Writing Guidance

Some of the above sections will have been part of the definition report and are labelled as needing to be updated. For the Progress report please ensure you review the requirements laid out in the definition report section of this document, and consult the assessment criteria to ensure you have covered all the areas required.

This assessment has a word count that you can find in the assessment brief. If the word count of your project exceeds this limit you should first of all ensure that you have not included any words in appendices, tables, pseudocode, code snippets, flow diagrams, class diagrams, etc. If word count is still a problem you should look at whether your text is too verbose, and consider how you might explain things more succinctly. Finally, astute use of appendices can help reduce the word count in the main body of the text – move detailed discussions to appendices, and use a summary in the main text referencing the detail in the appendices. One good way to think of the main body of the report is as an 'executive overview' of the process and results of the project, with the relevant details in appendices if the reader of the report wants it.

Remember, the main body of the text still needs to be coherent and make sense - don't fall into the trap of putting so much content into appendices that the main report contains little or no information, and never end up with text along the lines of 'Section 1.3 – Planning Methodologies – see Appendix C', there should always be some form of overview of the text referenced in the appendices.

Some of your work may need to reference information in your logbook and/or project library. If this is the case then you need to reproduce that information in your report in some fashion, as neither the logbook nor project library is handed in and therefore cannot be used for marking. Usually this will be in the form of a properly summarized and referenced appendix. If you use scans or photos then ensure any text is legible, if it is not you should consider reproducing it as text.

Please ensure that, as well as following the guidelines in this document, you consult the assessment criteria as you produce and finalize your report.

4.4   Final Project Report

Overview

The Final Project Report is a combination of everything that has been achieved during the Final Major Project in one nice neat package. It contains three distinct elements, and is to be accompanied by the completed Product and a Demonstration Video. Below is a brief description of the areas that are to be covered within each element.

Progress Report

This is the main body of the Progress Report assignment, as originally submitted. This section will not be marked again, but it is included for completeness and to introduce the project.

Implementation

A description of the implementation of final project as the development cycle progressed, using the planning and tracking methodologies identified in the Project Definition.

Reflections and Conclusion

A post-mortem discussion of the project development cycle and results of the project as a whole, evaluating the resulting product and key lessons learned.

Note the word count limit is used to provide a guideline, whilst also enforced to limit excessive documentation. Conciseness is a professional skill and thus is part of the assessment.

Additionally, your submission must contain:

Product

The finished software product, submitted on appropriate electronic storage medium, preferably Solent Online Learning. If your project is too large to fit on SOL even when compressed, two physical copies must be handed in before the submission deadline to the project supervisor or to Assessments.

Demonstration Video

A video recording of your product demonstrating its functionality and key features (aims and objectives). The video should be between 60 and 90 seconds in length, and contain either captions or narration as necessary to explain.

Videos must use a codec that allows for playback on Solent PCs.

Document Structure and Format

The document **must** be formatted in the style specified in Appendix J with the following structure and section headings:

- Cover page

- Abstract

- Table of Contents and Figures

- Progress Report

- Implementation

- Evaluations, Reflections and Future Development

- References

- Bibliography

- Appendices

Breakdown of Sections

Cover page

The cover page must use the Solent Dissertation Template.

Abstract

The Abstract is a description of the entire project summed in one or two paragraphs. This section should be written last, when the entire Project Report has been completed.

Table of Contents

A list of section headings, tables and figures and their associated page numbers.

Progress Report

The Progress Report is assignment AE1, exactly as it was submitted with no changes, modifications or updates but *with the original abstract/Background removed*.

- The headings in this section will be dependent upon the contents of the progress Report as originally submitted.

- Appendices from the Progress Report should be combined with the Final Project Report appendices as needed, created a single set of appendices that support the entire report.

NOTE: The Progress Report (AE1) is included here only for completeness of the project and will not be marked again.

Implementation

Headings in this section will be dependent upon the project definition. It should be a formalized and professional version of the logbook created during development. A discussion of implementation chronologically by timebox would be a logical approach, referring to project management data and artefacts as needed.

An introductory page should begin the implementation section, helping to bridge the time gap since the Progress Report.

This section *may* contain the following discussions:

- How the project progressed: Did it stay on track?

- Changes made (if any) to the schedule, why and when did they happen?

- What was learned from each milestone?

- Feedback from end-users and/or questionnaires.

- Difficulties encountered during the implementation stage.

- Implementations of backup plans.

- Any interesting implementations of tasks.

- Any other events of note that occurred during the development cycle of the project.

Any diagrams, burn-down charts or tables used in this section are not included in the word count.

Evaluations, Reflections and Future Development

Evaluation - A critical discussion of the project:

- Does it meet the desired aims and objects defined in the project definition?

- What processes have been performed to verify this?

- Were certain objectives not met? If so, discuss why.

Reflections - A post-mortem discussion of the project as a whole:

- What went right?

- What went wrong?

- What was learned?

- What could have been done differently?

- If the project were to be repeated, what changes would be made to improve the project?

Future Development - A discussion of the potential continuation of the project:

- What questions has the project raised?

- How could the project be used as a foundation for future development?

References

The reference list at the end of the document which demonstrates the depth of the research carried out in the project. It also acknowledges sources of information and protects against the serious charge of plagiarism (passing off others' ideas as one's own).

Any reference to sources used in this document must be covered in this Harvard-referenced list.

Bibliography

This is a Harvard-referenced list of all sources that were researched during the development of the project. This also include any citations required for the libraries, software and resources used during the development of the project.

Appendices

Any material relating to research that does not fit easily or suitably in the body of the paper may be presented as an appendix. Examples are:

- Survey questionnaires

- Observation sheets

- Interview transcripts

- Supplementary data that, while not essential to the understanding of the paper, does add useful information or insight.

Each individual appendix must be numbered and titled and must start on a new page. The Appendices should use a different page-numbering system.

For example:

Report numbering: '1', '2', '3' … '57', '58', etc.

Appendix A numbering: 'A-1', 'A-2', 'A-3' … 'A-7', 'A-8', etc.

Appendix B numbering: 'B-1', 'B-2', 'B-3' … 'B-11', 'B-12', etc.

For information on the marking criteria specific to your project type, please consult the individual Project Types in Appendix E.

Appendix A - Learning Outcomes

In order to complete the unit successfully, you must demonstrate that you are able to:

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Cognitive Skills
C1   Critically evaluate the suitability of methods, tools and technologies in an independent development context.

Practical and Professional Skills
P1   Undertake a significant self-managed project in a planned and systematic fashion.
P2   Identify, interpret and integrate technical theory drawn from a range of business and independent development sources.

Transferable and Key Skills
T1   Communicate clearly and concisely using a variety of media.

SOFTWARE DEVELOPMENT CGP601

Cognitive Skills
C1   Critically evaluate the suitability of methods, tools and technologies for achieving project outcomes that are meaningful in the context of current professional practice.

Practical and Professional Skills
P1   Undertake a significant self-managed project in a planned and systematic fashion.
P2   Identify, interpret and integrate technical theory drawn from a range of appropriate sources.

Transferable and Key Skills
T1   Communicate clearly and concisely using a variety of media to professional standards.

Appendix B - Project Supervision

Each project student **must** meet regularly with their nominated supervisor. <u>**Failing to do so always results in poor performance.**</u>

Individual meetings are used to discuss specific project progress and outcomes. Each meeting should be recorded in the project logbook. Your supervisor will expect to review the project logbook and the project library at each meeting.

Careful planning of the project is essential and after discussion with your supervisor you should produce an initial plan of methods, activities and timings, following the recommended methodologies.

Once the project proposal has been accepted it is your responsibility to continue and carry out the project - but you are not on your own!

Your initial plan may change with further research and investigation – or even the focus of your project. But the initial plan has value and will help as a project management tool, and therefore should be included in the project library to discuss with your supervisor. Project tracking documents should be included in all reports and the details of methods and activities documented in your logbook.

The relationship between you and your supervisor is founded in certain basic expectations placed on both parties. The role of the project supervisor is **NOT**, in any way, to carry out any part of your project. Your supervisor is there to help you make the most of the opportunity.

The project student will be expected to:

- Attend weekly scheduled meetings with the supervisor

- Provide regular updates on relevant progress.

- Communicate proactively, either in person or by e-mail.

- Inform the supervisor of any problems that may arise that may have an effect on performance.

- Listen to and act upon advice.

Even if you have not done any work since your last meeting, you should still attend the weekly meeting!

The project supervisor will be expected to:

- Provide academic advice as and when required.

- Review progress and try to ensure you are setting and meeting appropriate objectives.

- Help you to develop the skills of research and reporting appropriate to level 6 of an undergraduate programme.

Appendix C - The Logbook

You <u>must</u> maintain a logbook in support of the project. It should be hard bound and A4 in size. It would be prudent to periodically scan the contents of the logbook to maintain an independent backup in case physical book is lost or destroyed.

The logbook is used to record project-related information, and will save time at the write- up stage because you should have recorded the thinking and evidence behind the decisions made at each stage. In other words it helps in the development of the rationale for any choices made.

The logbook should reflect the on-going evolution of the project. It should be used to record the following sorts of information:

- All formal and informal meetings with your supervisor (or secondary supervisor), clearly documenting:

- Date and time

- Topics discussed

- Decisions made

- Follow-up actions assigned (to any participant)

- Any discussions with other parties involved in the project.

- Key references to sources of information, journals, books, technical documentation and URLs consulted.

- Key ideas drawn from these sources which have helped shape the thinking behind the project.

- Technical and design information, recorded while working on aspects of the project.

- Preliminary thoughts and ideas, lists of work to do and plans.

- Development of criteria for choices to be made, and metrics for project tasks.

- Results of technical proving exercises, experiments or technical/product evaluations.

This is not an exhaustive list, and other things may occur as the project evolves. As a general principle the log book should be used as the project's 'memory'.

Logbooks are not necessarily designed to be neat and tidy, but they should be well organized and the information in them should be **readily accessible**. **DO NOT** stick things in the logbook, anything loose should be placed in the **project library** and cross-referenced in the logbook.

Pages should be dated to show regular progress in the work of the project. Your supervisor will want to see your logbook at every meeting to monitor what you have been doing, and to check your progress.

Appendix D - Additional Notes on Topic Selection

Your choice of project topic should "develop and extend" the material studied elsewhere on the course, should lead to a "significant" piece of work, and should be approached in a "structured" and "systematic" way.

The process for developing your Project idea is as follows:

1. Decide, in broad terms, what you want to do.

2. Submit a brief but informative Project Idea (up to 1 page) to your supervisor for discussion and gain approval to continue.

3. Create a formal **Project Proposal**, based on your Project Idea as detailed in Section 3.2.

4. Present the Project Proposal to your supervisors for approval with the project. This is the first assessment, due very early in the semester.

Inspiration for a project Topic can come from a variety our sources including:

- Favourite Games or Genres

- Previous Uni projects

- A question – such as how or if something could be done

- A technical concept, such as Procedural generation or AI Pathfinding

- Extending or understanding the functionality of a Game Engine, Middleware or tool

- Interesting game mechanics or concepts

You may also browse through previous years' projects for inspiration and to better understand the range of suitable topics to choose from:

http://ssudl.solent.ac.uk/cgi/search/archive/advanced?screen=Search&dataset=archive&documents_merge=ALL&documents=&title_merge=ALL&title=&creators_name_merge=ALL&creators_name=&abstract_merge=ALL&abstract=&date=&datestamp=&keywords_merge=ALL&keywords=&subjects=sub_avg&subjects_merge=ANY&type=fyproject&department_merge=ALL&department=&editors_name_merge=ALL&editors_name=&refereed=EITHER&publication_merge=ALL&publication=&note_merge=ALL&note=&satisfyall=ALL&order=-date%2Fcreators_name%2Ftitle&_action_search=Search

Appendix E - Project Types

Students can choose from a range of project types which are relevant to their course's specialisms and learning outcomes. A project type should be decided upon early to maximise the time available and opportunity to earn the highest grade – as well as most impressive results for your portfolio.

The choice of project type will impact the required end-products and conduct of the project. A project type and topic must be selected and approved by the project supervisor before any assessed work is submitted and any required artefacts are produced.

There are some restrictions placed on project types to ensure that students are eligible for the highest marks possible. There are also some restrictions on how the project is conducted and the types of support and resources you may use.

- The outputs of your final project must be of the highest quality to maximize their value to your portfolio. A supervisor may require changes to propped topic or project type to ensure the goals are within scope and the student's capabilities.

- Your supervisor must approve the inclusion of any non-original work. Prior using work from any other source, seek confirmation from your supervisor that the resource is appropriate for your project and will not impact your grade. Students are encouraged to collaborate with other students, especially across courses, to achieve the best possible results provided that academic and ethical guidelines are followed.

- Use of a 3rd Party Plugin or middleware in a project is allowed, but it must **not** form a part of the specific solution or proposed implementation. Such products or services may only be used to speed up development or provide supporting functionality.

- Students may not change an approved project type without supervisor consultation.

Project Type	Description	Required End-Products
Game Project Indie only	Build a fully working and polished game, and publish it to a digital store. Game assets <u>must</u> be outsourced.	• Published Game • Marketing plan • Business plan • Consumer feedback
Tool Project Indie & SD	Develop a tool that supports other game development roles, either as a standalone product or plugin/add-on to existing software. Resulting work must be well-tested and production-ready.	• Production-ready software • User manual • Video tutorial
Technical Game Aspect Project SD only	Develop a prototype or demo, focusing on a specific technical aspect. This aspect must be readily demonstrable and reusable in other games or products. Possible aspects include: AI, Audio, Graphics, Procedural Generation, Networking, Physics, Gameplay, VR/AR, Mobile, and Sensors/Robotics.	• Tech Demo
General Game Aspect Project Indie & SD	Build a game prototype focusing on a specific creative aspect. This aspect must be readily demonstrable and reusable in other games or products.	Game Prototype demonstrating either: • Implementation of a specific game design technique • a specific gameplay mechanic
Social Impact Game Indie only	Create a game that focuses on a specific concept with broad social or public impact. The potential impact must be readily demonstrable and usable to make the world a better place. Social and Mental Health aspects of games are particularly appropriate.	• Game Prototype • Publishing Plan
Other Gamified Media Indie & SD	Develop a web-app or Windows application that is relevant to the goals of the course.	• Gamified Web-App • Gamified Windows Application • Mod for a Game
Business Case Indie only	Conduct thorough research on business and write a business model/plan as well as a marketing and funding model for an indie start-up.	Business Case for start-up including: • Business Plan / Model • Marketing Plan • Financial Documentation
Directed Research With Supervisor Approval Only	Under the direction of your supervisor, conduct research and development on a specific topic and produce an artefact that supports the research.	Determined by supervisor, possibly: • Game showcasing research results • Technical demo • White Paper

Appendix F - Aims and Objectives

Aims are the primary goals for the project as a whole, a focussed "wish list", and may be concerned with either your learning experience, or the functionality of your product. For example:

"I want to investigate 3D shader programming techniques for post processing effects"

"I want to create a game prototype that demonstrates AI pathfinding"

"I want create a demo that procedurally creates small planets"

"I want to create a point-and-click application to help train paramedics how to assess the scene of an accident"

"I want to create a mobile application that uses navigation data to influence gameplay"

"I want to create a game framework with massive online multiplayer capabilities"

Objectives must be carefully considered as they are the stepping-stones to achieving project aims. They must be concise, easily understood and contribute toward the project aims.

Project objectives must meet [SMART](#) criteria:

Specific – precisely what is the objective?

Measurable – how will you assess the objective's progress and completion?

Achievable – is it within your capabilities to complete?

Relevant – does it support the project aim(s)?

Timely – it will be completed by when?

Objectives that are not SMART will add less value to your project and be more difficult to achieve, and are therefore marked down.

When setting your objectives (most projects have roughly five to eight) you should ask yourself:

How much time will I have to spend learning topics I have not done before?

What potential for research does this objective have?

At the end, how can I demonstrate that I have achieved this objective?

Is this feasible given the time I have available?

Will these outcomes allow me to satisfy ALL of the requirements for ALL of the submissions at the level I am hoping to achieve (2:1, 1st, etc.)?

Take care that the scope of your project is not too big or too small when choosing the objectives; this should be discussed with your project supervisor. A good approach would be to have a core set of objectives that have a reasonable chance of being fulfilled, and then have additional stretch goals that will allow you to increase the scope of your project if required.

You are expected to conduct secondary research as part of your project, so ensure some or all of your objectives allow for this. Please ensure you understand the difference between research and learning, "I want to research Unity" is not research, it is learning.

Secondary research is the process of investigating a topic or problem, using books, academic papers and other sources. The investigation should look at various approaches to the topic or problem, and a there should be a comparison between them to determine which are appropriate.

Suitable objectives might be:

"Determine the suitability of AI methods for improving interaction with NPCs."

"Implement a 2D physics engine to simulate collisions affected by acceleration, mass, friction, coefficient of restitution and spin."

"Create a tool to simplify the process of adding, and controlling the drift of smoke in 3dsMax."

"Create a series of sliding block puzzles that can be controlled by a game avatar interacting with in-game items."

"Access mobile location services to determine player position."

"Procedurally generate the terrain that AI NPCs will navigate around."

Appendix G - Project Management

Project management can be a time consuming and challenging part of the project, and many students struggle to follow a single approach which leads to successful results. Rather than a specific methodology, or an ad hoc approach of your own choosing, we recommend that projects follow a "Prescriptive Framework" which utilizes elements of both Predictive and Adaptive approaches.

The framework calls for the project to be developed in weekly "timeboxes". Each timebox ends with one or more pre-defined outputs, including a plan for the following timebox. Timeboxes may contain work of any type (research, writing, coding, etc.) provided they contribute toward completing the goals of the current project phase and overall project aims and objectives. By definition, a timebox is a single mini-project of limited scope that must be completed within the allocated time, with the results assessed and guiding plans for the next timebox.

Project Phases (Inception, Definition, etc.) align with formal project milestones, unit assessments, and the natural cadence of most projects. If followed correctly, the combination of phases with the weekly timeboxes provides the project with a solid framework to help organize and track your project with sufficient granularity, flexibility and structure.

Planning a Timebox

At the start of a timebox, students are expected to identify and estimate the main tasks to be completed within the timebox. These tasks must all contribute toward achieving your phase goals, and overall project objectives.

The work conducted during each timebox should be organized and documented using two primary tools:

1. A **Work Breakdown Structure (WBS)** describing all tasks as they contribute to the goals and outcomes of the timebox. Specifically,

    a. Tasks in the current timebox should be broken down into estimated durations of 1 day maximum. Tasks larger than 1 day should be split into sub-tasks.

    b. 1 hour is the minimum for most tasks, but it's better to maintain a complete list of all work to be done rather than let something slip.

    c. Tasks information should include estimated time (of effort rather than elapsed time), the goal or objective that requires the task, any tasks dependent upon it, and the actual time spent when completed.

2. A **Gantt chart** which captures the sequence in which tasks are expected to be completed during the current timebox, and presents them in an easily understood format. The Gantt should also:

    a. Highlight dependencies between tasks.

    b. Indicate task progress or completion status.

    c. Indicate those tasks which are critical to the phase outputs.

    d. Indicate those tasks which were carried forward from the previous timebox.

Notes:
- A WBS in diagram format may be acceptable up to Definition Report, but for the Progress Report and onwards the WBS should be in a text or outline format to ensure that sufficient detail is present.

- A Product Backlog may be used as an alternative to the WBS, consisting instead of a prioritized listing of all tasks on record, with those in the current timebox prioritized at the top.

- Large tasks and features for future timeboxes may be up to 5 days in duration, and roughly planned in advance.

- Ideally, any tasks started within a timebox are also completed within that timebox. However, larger tasks (broken down into subtasks) may span two timeboxes, which must be clearly documented.

A plan for the timebox must be in place before work begins, against which the actual results of your efforts are to be compared. Every task **should** have metrics for assessing its successful completion and value to the project. The highest grades are only achievable if these are in place before work within a timebox has commenced.

Students should start using project management methods as early as possible in the project. All effort following the Definition Report must be planned and tracked with appropriate documentation produced and included in the summative reports.

Running a Timebox

Once a WBS and Gantt are created, timebox execution can proceed. This consists simply of following the plan by working through the tasks in sequential order identified in the Gantt. As each task is started and completed, the times and dates should be recorded in the task information – both for your benefit in future planning and for proper documentation.

A timebox end does not move once it has started! It is important to **achieve the intent** of the timebox, even if some tasks remain. If one or more tasks cannot be completed for any reason, this must also be recorded in task information and the WBS and/or Gantt must be updated to reflect the change of plans.

At least one new WBS and Gantt should be produced weekly with each timebox showing progress against the phase plan, indicating any necessary adjustments and completed goals and objectives.

 In particular, plan modifications should be noted:

- Added tasks (especially due to splitting larger tasks)

- Removed tasks

- Changes to task dates, durations or sequence

It is perfectly normal and expected that circumstances and estimates will change; it is therefore essential that each student is diligent in project management and updates their project documentation on a weekly basis. This will facilitate effective management, reduce the overall time required to manage the project, and contribute directly to the assessment requirements.

Additional Project Management Tools

Supplemental management, planning and communication tools such as User Stories, Burndown charts, Velocity charts, Kanban boards, retrospectives etc., can be valuable and may improve your ability to manage your time and maximize project achievement. An overall Product Backlog or task list may be useful for organization and planning. These tools and/or others may be used within the framework to form a comprehensive approach that works for each student.

The results of each project phase are to be compiled in chronological showing how the project progressed, and referred to in Project Management section of the report. The report should document the expected 400 hours of effort.

Appendix H - Literature Review

The Literature Review allows a researcher to critically evaluate information sources to demonstrate how research fits within a larger field of study. It allows discovery and organization of current ideas, practice and processes in support of a project's Aim, Objectives, and Specification/Requirements.

You will need to show that you have conducted thorough and proper research to inform your project and various decisions. A Literature Review is a survey of the previously published materials available to you which may be relevant for your project. Materials can be either physical or electronic, so your search approaches must take into account all possible sources to ensure the best results.

The Literature Review should provide a short overview of each source, summarising the content and how it might inform the project.

Numerous resources are available to help you conduct research, including:

- Solent University Library

- Electronic journals in the library

- Bibliographies in books or other articles discussing your topic

- Internet search engines

- RefWorks

- Google Scholar (http://scholar.google.com/)

A Solent Librarian is a valuable resource and will be able to advise you on research and how to manage research results. More information is also available online through the Library pages on the Portal (https://libguides.solent.ac.uk/researchers).

Reading research materials can be very time consuming so it is important to be efficient with your research time. Some references will be more useful to you than others, so start off by choosing sources which are:

- Less than five years old, unless known to be still relevant and up-to-date

- Cited in other references

- Found to contain a large number of keywords

- Recommended by a supervisor or tutor

Start reading each potential academic reference by scanning its abstract to determine if the reference may be of value. Checking the conclusion will also help to ensure the reference retained its initial direction and relevance.

A summary of the key points should appear in your literature review, along with note regarding the potential value and future use of the source. More useful sources should be written up thoroughly so your notes (including page numbers) contain all the information needed later.

RefWorks (https://learn.solent.ac.uk/course/view.php?id=18861) is a very helpful tool to help you to manage your references.

Appendix I - The Project Library

A Project Library is another useful tool that helps with organising and storing research and should be maintained throughout the duration of the project. The project library is a record of material that comes from research and other activities to gather data that informs your project. The information held in it should be cross-referenced in your logbook in order to ensure you record the context of each document. The library will provide evidence that you can include in your reports for any claims or statements that you make.

It should contain any copied or original material pertinent to the project. For example, it may hold:

- Journal articles.

- Reference material.

- Information obtained from websites.

- Technical literature.

- Specifications and other documents developed during the project (under revision control).

The library may be part electronic and part physical, depending on the source of the material. It is worthwhile periodically scanning the physical material for backup in case the library is lost or destroyed.

Take particular care when referencing online resources in your project, as these sources may not be permanent. Any online material that is crucial to your project should be saved in your electronic library, as it is not necessarily permanent.

As much of the physical library material will be loose it would be appropriate to use a ring binder to store it. Ensure you separate individual contributions, e.g. using dividers, and that you keep an index at the start of what has been added.

Your supervisor will also want to see the project library regularly to ensure that background study is taking place in support of other project activities.

Appendix J – Report Formatting

Project Reports are expected to consistent use a format consistent with academic writing and in comparable to other university documents.

TITLE PAGE

All Project Reports submitted at Solent University must use the official university dissertation Title page format. This and additional dissertation format guidance is available here: https://learn.solent.ac.uk/mod/book/view.php?id=2744&chapterid=1273

When formally printed and bound, a dissertation **cover** page has a 'window' in it (a rectangular hole). Make sure that the title page has the required information positioned correctly so that it will display clearly through the window if printed.

The title page should contain the following information, easily readable through the cover page window:

- The award for which the project is submitted

- The academic year of submission

- The name of the author

- The title of the work

FONT

Trebuchet, 12 point for text body.

MARGINS

Paper must have the margins set as below

Left: 3.2cm (1.25inch)

Right: 2.5cm (1 inch)

Top: 3.8cm (1.5inch)

Bottom: 3.8cm (1.5inch)

LINE SPACING

Set the line spacing to 1.5 lines.

ALIGNMENT

The document text body should use Left Justify for alignment. Section headings should be left-aligned.

INDENTS OR BREAKS

Leave a space of one line between paragraphs. Do not indent the first line of each paragraph.

SECTION HEADINGS

Each new section must be started on a new page.

Sections headings should be left-aligned, bold and numbered, matching that of the contents page.

Subheadings should be sub-numbered dependant on their parent. For example:

1.   Heading 1

1.2   Subheading 2

1.2.1   Sub Sub Heading 1

1.2.2   Sub Sub Heading 2

APPENDICES

Each individual appendix must be numbered and titled and must start on a new page. The Appendices should use a different page-numbering system.

For example:

Report numbering: '1', '2', '3' … '57', '58', etc.
Appendix A numbering: 'A-1', 'A-2', 'A-3' … 'A-7', 'A-8', etc.
Appendix B numbering: 'B-1', 'B-2', 'B-3' … 'B-11', 'B-12', etc.

Appendix K - Ethics Policy

All projects must be carried out within the framework of the University's Ethics Policy, as detailed in section 2S of the Academic Handbook (available via the portal: http://portal.solent.ac.uk/documents/academic-services/academic-handbook/section-2/2s-university-ethics-policy.pdf)

As stated under General Responsibilities,

> All staff and students have a responsibility to ensure, as far as possible, the physical, social and psychological well-being of those involved in any teaching, research, and innovation they carry out. In doing so, they should aim to anticipate and guard against potential harmful consequences wherever possible.

To ensure that students are aware of university policy and that projects are conducted within guidelines, all students conducting research using human participants must complete the online Ethics Release Checklist. The completed form must be included as evidence of Professional Conduct in an appendix of the final report. The online form can be found here: http://portal.solent.ac.uk/portal-apps/ethics/ethics-form.aspx.

In most cases a project supervisor will be able to approve and sign off the Ethics Release. If additional consideration or clearance is required, the proposed project must be reviewed by the university Ethical Review Panel.

More information regarding Ethics as related to research projects can be found here: http://portal.solent.ac.uk/research-and-innovation/ethics/student.aspx