
Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

# HIGHER DIPLOMA IN SCIENCE IN COMPUTER SCIENCE (NFQ – LEVEL 8)

## Project Handbook 2020-21

**Department of Computing & Mathematics**
**WIT**

# Table of Contents

## 1. Project Proposals

The purpose of the project is:

- To provide a Capstone for learning from the course
- Integrate knowledge from multiple modules
- Investigate new domains, technologies or procedures
- Document and record your work experience
- Formally research a new technical domain
- Showcase skills and achievements

You are invited to make project proposals on an individual basis. The proposal may reflect a deep personal interest, the interest of your supervisor or aspects of the technology and business processes of your work placement. It may be useful to conceive a project as a solution to a problem. Representative examples include:

- **Work Package**
  A project allocated by your work experience supervisor, representing a reasonably independent piece of work you have been implementing on your placement:
  - A standalone **application** (e.g. web app, native mobile app)
  - A **component** of a larger system
  - A new or improved **workflow / business process** serving some need in the workplace (e.g. CI/CD continuous integration / continuous deployment)

- **Personal Project**
  unrelated to work experience, consisting of an implemented software system designed to explore or consolidate knowledge in a specific domain

- **Research Paper**
  exploring a specific topic or set of topics and developed to *conference paper standard*. May or may not be related to work experience.

The problem may be directly aligned with your work placement opportunity, or it may be independent of it. This may depend on the disposition of the industry providing the placement, your personal goals and interests and the advice of you project supervisor.

## 2. Project Timelines

The body of work constituting "the project" will commence in Semester 4, the bulk of the work will be done in Semester 5. “The Project” can be divided into three phases:

**Inception Phase:**
including formation of the project concept,
initial meeting with supervisor,
draft and final proposals + (optionally) interaction with workplace mentor.

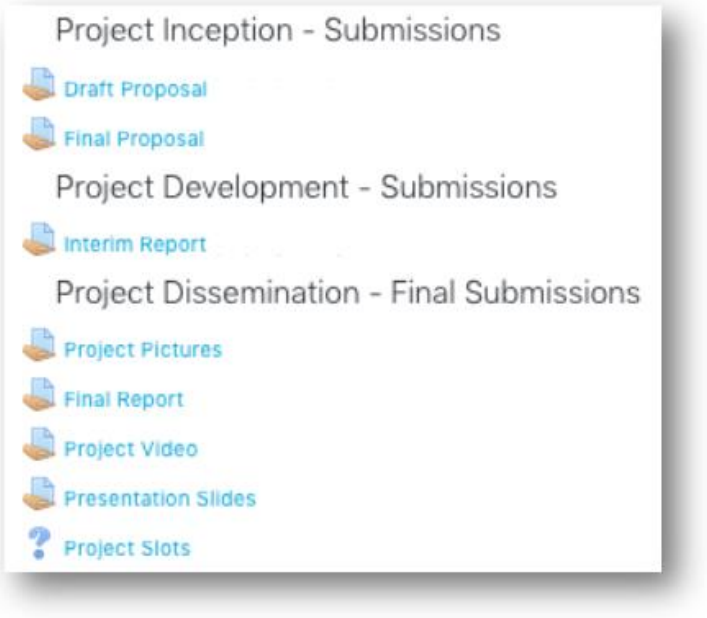
**Development Phase**:
Realisation of the project as proposed or amended in agreement with your supervisor.

**Dissemination Phase**:
Preparation of final report.
Creation and publishing of a demonstration video.
Presentation of project demonstration/presentation.
Delivery of final documentation.

It is envisaged that most of the time will be spent in the Development Phase. In order to help you plan your project, these milestones will serve as a useful guide:

| Semester | Milestone | Description | When? |
|---|---|---|---|
| 4 | 1 | **Initial Meeting** with Supervisor | Start of semester<br>(Week of 7th September 2020) |
| 4 | 2 | **Draft Proposal** | by Sunday 29nd November 2020 |
| 4 | 3 | **Final Proposal** | by Sunday 10th January 2021<br>cut off **14th Feb 2021** |
| | | | |
| 5 | 4 | **Interim Report** | by Sunday 28th March 2021 |
| 5 | 5 | **Handbook** | by Sunday 16th May 2021 |
| 5 | 5 | **Final Project Submission**<br>(**code** and **final report**) | by Sunday 23rd May 2021 |
| 5 | 6 | **Video** demo of project | Sunday 30th May 2021 |
| 5 | 7 | **Presentation** of Final Project | during the week beginning<br>Monday 7th June 2021 |

## 3. Project Submissions




During the project's development and realisation, a number of artefacts are created:

### Proposal

This will articulate the project concept and nature and will serve to scope the work of realising the project. It may typically be less than <**2 pages**

### Interim Report

This will be a substantial update on the progress of the project – and can be regarded as an early draft of the final report. It may be **10-15 pages**, depending on the project type. Completing it highlights the work required in completing the Final Report. This report is not marked.

### Final Report

The final report typically about **40 pages.** Your final report should have most of the following features: a cover page, declaration of authenticity, acknowledgements, titles, preface, abstract, keywords, glossary, list of abbreviations, TOC, TOF, TOT, appendices and a bibliography. The TOC will vary depending on the project, write to the assessment criteria, and the development of the project. Make sure to include models, analysis, design, iteration plans, implementation details, reflection (what you achieved, learned, future development, problems encountered and solutions).

Use numbered headings and styles, page numbers, and Harvard referencing. Use numbered captions on tables and figures. Appendix 4 shows some samples of final report elements.

After the final report deadline, the upload facility will be closed (cut-off) and the reports downloaded and distributed to the panel for review.

Typically, the final report will be accompanied by associated codebase, which can be submitted as a **zipped archive** or other repository format.

After completing and submitting the project (code and final report), there will be time to complete a demo **video**, and **presentation** before presenting in person.

### Video

The **video** should be hosted (e.g. YouTube). A link to the video will be submitted to Moodle. The video file will also be submitted to Moodle. See Appendix 2 for more details on the video.

### Presentation

When presenting the final project in person, you will prepare a presentation e.g. Powerpoint. This **presentation** will be submitted just before or straight after your presentation.

### Handbook

A showcase handbook/is produced each year. Look at last year's book, to better understand its purpose. In order to automate its compilation, we will require several small details.

- An up to date personal digital **portrait photograph, square 300*300 in jpeg or .png** format is required.
- a **project image** to represent your project (e.g. 1920*1080). This could be a screenshot or a composition of many (Quick TIP: capture some screens, crop and paste onto a Powerpoint slide and export as .png).
- **Titles** of the project for use in showcase handbook. A **professional/academic title** of the project e.g. "distributed library book retrieval system". In addition, an optional **"commercial" title** should be chosen e.g. “FindThatBook.com”.
- **Abstract**/Summary text **100 words max**, for use in showcase handbook
- **URL** of Project Landing page (preferably shortened). You should ideally have a web page which should act as a home/landing page. It will have links to your documentation, hosted video, presentation slides, link to site or app download, Slack, Trello, github repos, link to application, etc.

### Artefact Usage

**Artefacts** produced and submitted as part of the project (including reports, images, video, code, and slides) may be used for future quality, training, and promotion purposes. Final projects may be archived, as part of the Institute's efforts to provide a repository of the interesting and valuable work carried out by its members and to help future students. Sensitive work can be excluded by way of NDA if needs be.

## 4. Submitting

You will be required to adhere to the milestones outlined in section 2. Also, you will need to submit 1 hard copy of each proposal/report to your supervisor and upload a further copy to Moodle.

## 5. Declaration of Authenticity

On the first inside page of any report, you should have printed out the declaration shown in Appendix 5, and, in the case of any hard copy, this is to be signed and dated by the project participant and work place mentor if sensitive company information is being used for project purposes.

## 6. Assessment

Each project will be assessed based on the following criteria:

### Core Criteria (85%)

- **Model (15%)**
  lightweight, relevant modelling, generally in accordance with a recognised process. For a software project this is most commonly expressed in a subset of UML or a set of appropriate diagrams. For other types of project, a different formalism may be more appropriate. Architectural Model.

- **Documentation (15%)**
  project-related communication including, but not limited to:
  - keeping appropriate logs,
  - writing well-constructed formal reports,
  - maintaining sketches of ideas in diagrammatic/written form in UML or otherwise.
  - Submitting all requirements.

  In keeping with the ethos of the programme, all project communication should be through **#Slack**. Announcements will be made on the Slack Project channel. Communications, interim submissions, documentation, etc. should be exchanged with your advisor in a private channel. Initially, these may be informal photos of notes/diagrams, and may evolve into more formalised minutes as the project progresses. **Trello** would be a good choice for planning.

- **Implementation (30%)**
  based on the modelling and the content of the reports.

- **Level (25%)**
  appropriate mix of (a) originality, (b) innovation and (c) complexity

### Critical Self-Review (15%)

- what you **learned (5%)**

- what you **achieved (5%)**,
  and in what direction the project might be taken if more time was available (**future development**)

- **problems** encountered **(5%)**
  how they were addressed and solved

In addition, you must attend all meetings with your supervisor. There are no marks allocated for these, but failure to attend, without good cause, will disrupt the assessment procedure.

## Assessment Process

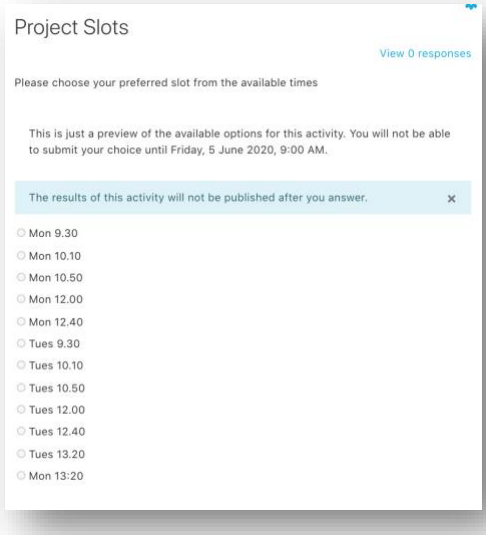
Marking is done at the end of the project. Before presentations are made:

- A panel of 3+ lecturers will be tasked with reviewing all projects. The panel makeup will be communicated to all in the week before presentations.
- Your supervisor will provide marks to the panel. These are for indicative purposes only.
- All panel members will have viewed your demo video.
- At least 1 member will have read your report.
- All panel members will be present for your presentation. Your supervisor may attend also.
- After each presentation, the panel will score the student on each of the headings.
- After all presentations have been completed, projects and marks will be compared and ranked against each other and normalised.
- The panel will revisit again the day after to finalise the marks.

Assessment takes place at project demos. This is a **typical** timetable:

| Monday | June 8th | | Tuesday | June 9th |
|---|---|---|---|---|
| Project Demo | Start Time | | Project Demo | Start Time |
| 1 | 9.30 | | 6 | 9.30 |
| 2 | 10.10 | | 7 | 10.10 |
| 3 | 10.50 | | 8 | 10.50 |
| Break | 11.30 | | Break | 11.30 |
| 4 | 12.00 | | 9 | 12.00 |
| 5 | 12.40 | | 10 | 12.40 |
| 6 | 13.20 | | 11 | 13.20 |
| Finish | 14.00 | | Finish | 14.00 |

You will be able to book your project slot on Moodle on a first come first served basis (providing you have uploaded your pictures).




## Assessment Examiners

There will be three examiner categories:

(a) The Supervisor
(b) Project Panel
(c) the External Examiners

## 7. Project Supervision

Each student will be appointed an academic supervisor to provide supervision and advice. The norm will be that you will have the same supervisor for both semesters, however it is not unusual to have a different advisor in each semester. It is recommended you discuss the project progress at regular intervals with your supervisor, usually face to face (e.g. Slack/Zoom call)

### Project Meetings

Typically, there may be just 1 or 2 * half hour meetings in the inception phase with your supervisor.

Most meetings will occur in semester 5 during the development and dissemination phases. Usually each project student will have a weekly meeting with their supervisor consisting of (10 half hour meetings or 5 one-hour meetings) at the discretion of the supervisor and workplace mentor. He or she will show his/her progress, emphasis being placed on risk-reduction from week to week as issues associated with (a) project requirements gathering, (b) technologies and (c) skills building are addressed.

For each meeting, brief **minutes** and **action points** should be taken by the student and posted to Slack / Trello either during the meeting or immediately afterwards. This post should outline what was agreed and what is to be done for the next meeting. Follow-on meetings can start by reviewing these minutes and action points.

If either the supervisor or the student is unable to keep a project-related appointment, the other party will be informed as soon as possible. Naturally it will be rare for such cancellation to take place.

## 8. Project Finishing Date

The module will have an oral examination/demonstration on the week of the 5th **June 2021.**

# Appendices

## APPENDIX 1: Project Proposal Outline

Project proposals are now invited from all members of the Higher Diploma in Science in Computer Science class.

For the hand-up procedure and any additional information and advice, please check with the course leader for your programme, or use information on Moodle that he/she may have provided.

- Your project proposal must have a **title** (see below).
- Your project proposal will be about **four or five hundred words long**.
- Please re-read your proposal when written, and amend it if necessary, to ensure that it is easy to read and makes sense to another person.
- You may wish to include a diagram or two.
- You should provide a list (with a title) of **technologies** that your project will employ, both software (including programming languages) and hardware.
- You should provide a list (with a title) of **tools** and frameworks that you intend to use.
- You should indicate the project **process** you intend to use: for example: whether you intend to implement your software all at once or as a series of production quality releases where more functionality is added as you go along.
- You should indicate other parties with whom you are collaborating or parties for whom the software is being written. These are sometimes collectively referred to as **stakeholders**.
- A title page is important to ensure that we can easily file and retrieve your report. Please provide a page at the front carrying the following information:
    - A title of your proposed project, for example: *Distributed Book Retrieval System* or whatever is appropriate.
    - The words *Project Proposal* below that in a smaller font.
    - Your name and student number
    - Your programme: Higher Diploma in Science in Computer Science.

A submission box has been provided on Moodle; please submit on or before the date that has been set.

## APPENDIX 2: Video Guide

This is a simple video ideally 3-7 mins in duration, but we will allow up to a maximum of 10 minutes. It is a demonstration of the key features of your project. It acts as a backup in case you can't get the live demo working on presentation day. It also provides a convenient way to see the project working. It helps focus the mind on the creating a good presentation.

It is not expected to be a Hollywood production. Depending on the project you might:

- use a screen recording to do a walkthrough of the software implemented
- use a phone (in landscape mode) to record a video of some hardware you are controlling with software.
- Do a video recording highlighting the key elements of a research project

The video must have voice commentary (your voice) explaining what's happening. It must use your voice explaining what is happening. Typically, I would suggest start by introducing yourself "Hi my name is X" and my final project is called Y. One sentence description of the system. Then demo.

Most systems have registrations & logins, we take it for granted that this functionality is working at this stage. By all means, login/register if you wish (quickly) but don't labour the point and don't waste too much time in demonstrating how great your login/registration is. We are more interested in what makes your system different. Focus on the key aspects of your project.

If recording mobile, ideally check if your software has a trails feature, which makes it much easier to see the user interaction.

### Video Software Recommendations:

Desktop:
You've already used OBS to record videos, so this is a fine way of recording the desktop.
Camtasia is the best screen recorder/editor on PC.
ScreenFlow is the best screen recorder/editor on Mac.
Demos are available (don't worry about watermarks)
Jing is free.
Loom is free.
There are others.

Mobile:
Built in screen recorders.
Camtasia & ScreenFlow record from your mobile device too.

*Android:*
DU Recorder Screen Recorder

*iOS:*
RecordIt!::Screen Capture

## Submitting

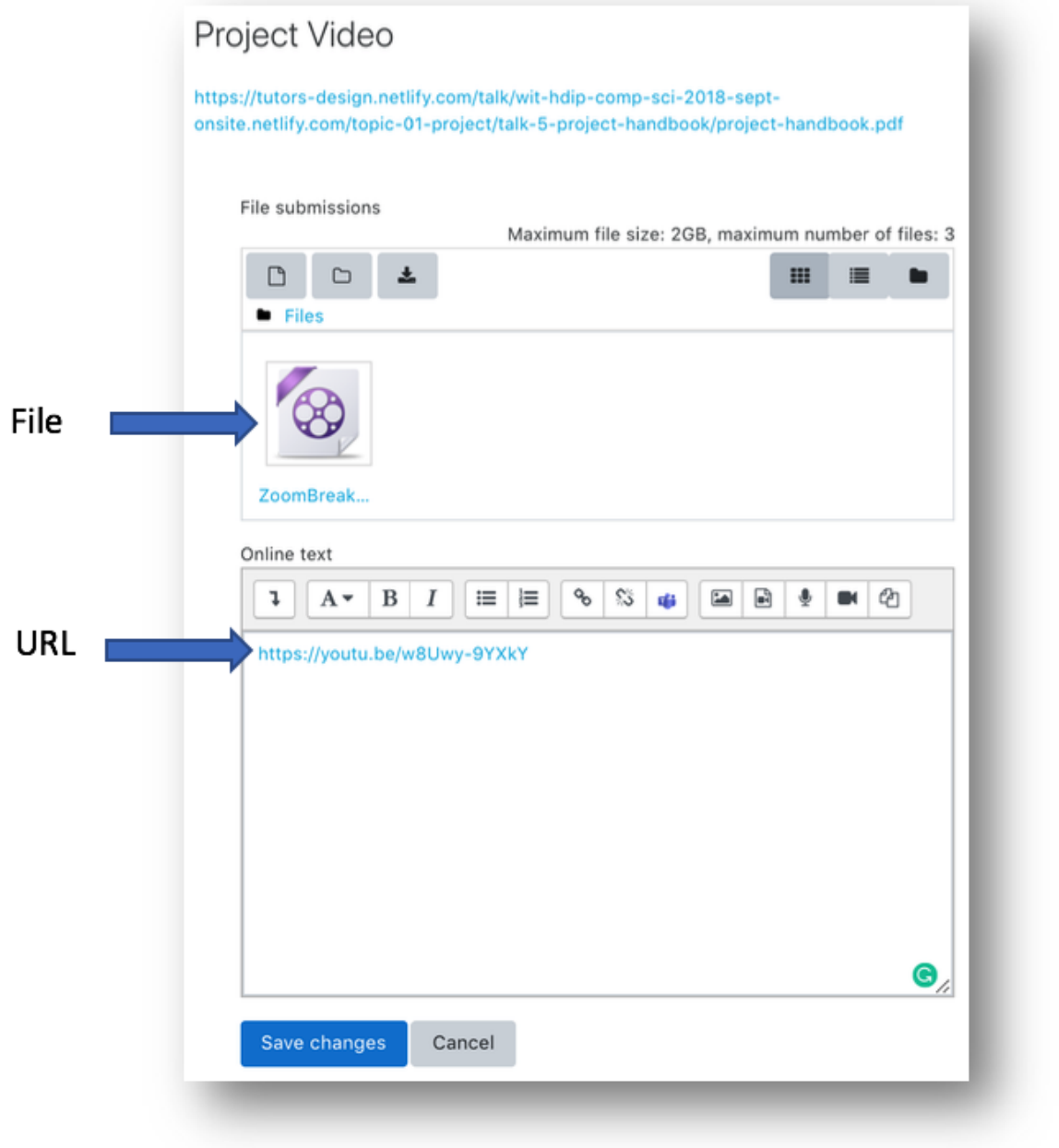
There are **two parts** to submitting:

**URL**

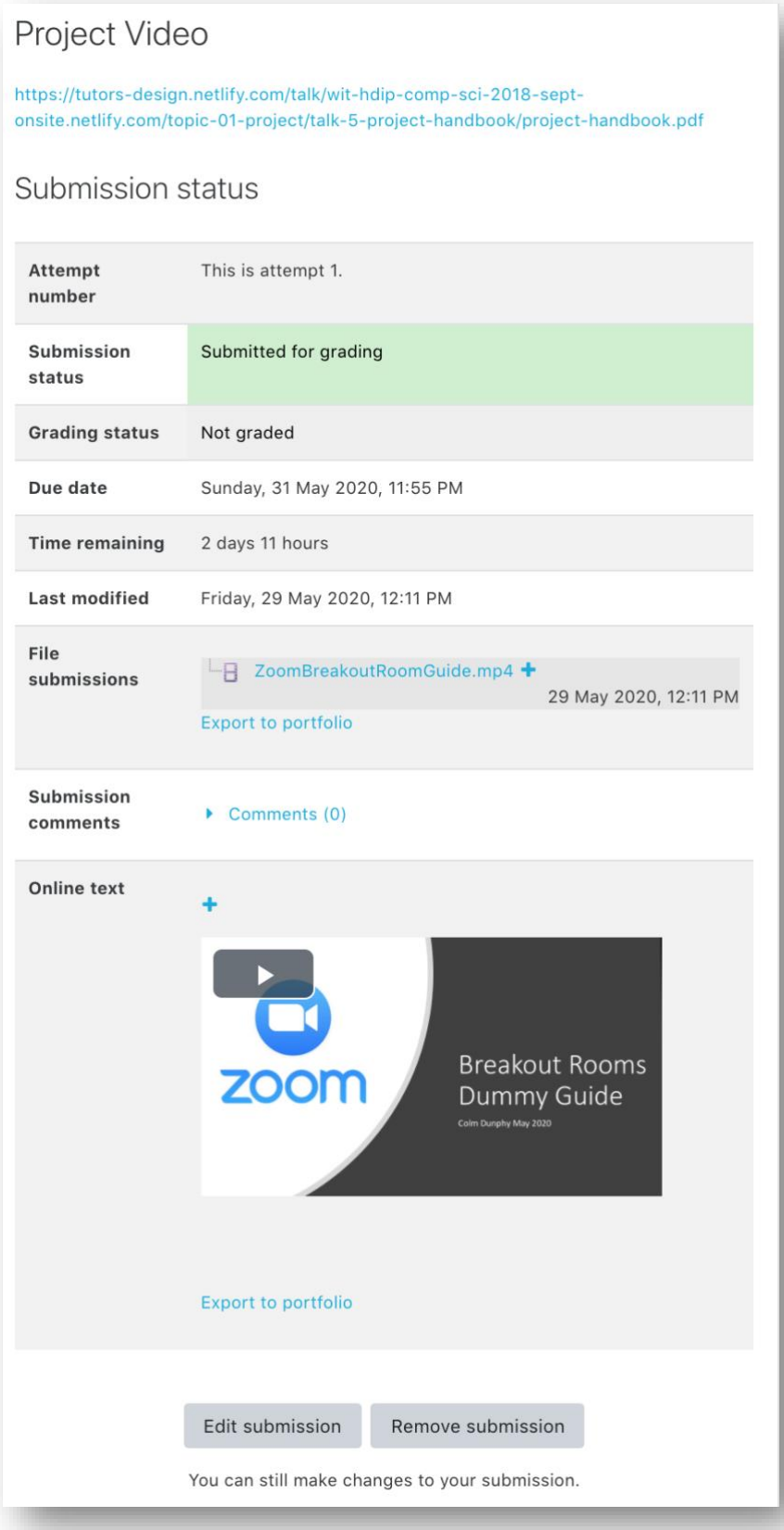
Upload your video to YouTube or similar (make it unlisted or public). Copy the URL. Paste it in the 'Online text' textbox. Highlight it and make it a hyperlink by clicking the link button and pasting the URL again.

**FILE**

Upload your video file to Moodle also in the File submission box - you can just drag and drop. It will most like be an mpeg4 encoded video (.mp4, .mkv)



When you click Save, your Moodle submission it will look something like this.



## Additional:


Tip for recording in OBS
Output
Generate File Name without Space
1
Recording Format
mkv
Advanced
Recording
Filename Formatting
%CCYY-%MM-%DD-%hh-%mm-%ss
Overwrite if file exists
2
Automatically remux to mp4 (record as mkv)
.mkv & .mp4 about 10 seconds after you press stop

## APPENDIX 3: Presentation Guide

The week before your presentation, create your slides. These will be submitted to Moodle.
It's a good idea to arrange & rehearse presentations a few days before with each other. Honest critiquing will help everyone improve.

You have **15 minutes to present**, followed by **5-10 minutes of Q&A**. So, this time will need to be managed well.

### Planning your Presentations:

**Part 1 – Introduction**

1. Introduce yourself.
2. Give the name of the project and your short abstract (1 or sentences)

**Part 2 - Sales Pitch (everything is great)**

1. Demo what you've got
(This is ideally a live demo, but just in case it's good to have a recorded backup)

It's a good idea to use **real data** to help with understanding the system (i.e. don't use "test")

**Part 3 - Academic Explanation (SUMMARY OF KEY POINTS OF YOUR REPORT)**

1. i.e. how did you built it from start to finish? Analysis, design, plans, methodology, artefacts created along the way.
2. Summarise sections of your final report. What you learned. Key milestones. (demo videos). Problems encountered & solutions. Future development

**Part 4. Wrap up**
Any Questions + ask if anyone wants to try it out (live demo again)

### Typical Timing
Part 1 & 2 will take 5 mins.
Part 3 & 4 will take 10 mins.
Q&A will take 5-10 mins

### Tips
- Split up what you want to say and allocate a time budget to achieve it.
- Summarize and Visualize
- Use images instead of text where possible
- Short videos can also help
- A good yardstick is have no more than 7 points on the screen at any given time
- Max of 25 words on screen (there are exceptions)

## APPENDIX 4: Sample Final report elements

Cover Page

JUNE 2020

# "RUNNING SOCIAL"

# Cloud Native App Development Pipeline

FINAL REPORT

**NAME:** [redacted]

**STUDENT ID:** [redacted]

**LECTURER:** COLM DUNPHY

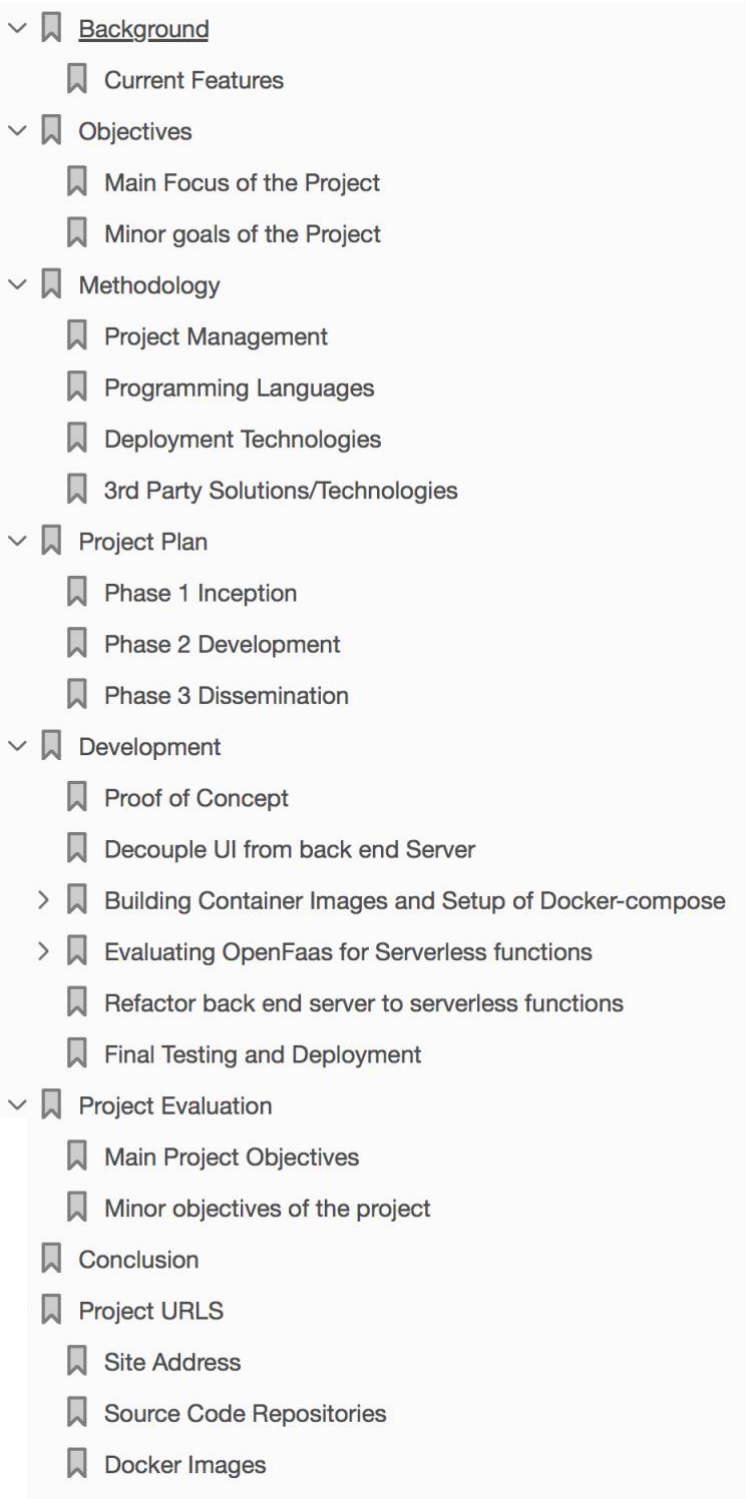
**MODULE:** PROJECT

**COURSE:** Higher Diploma in Computer Science

TOC

## Table of Contents





## APPENDIX 5: Declaration

I declare that the work which follows is my own, and that any quotations from any sources (e.g. books, journals, the internet) are clearly identified as such by the use of 'single quotation marks', for shorter excerpt and identified italics for longer quotations. All quotations and paraphrases are accompanied by (date, author) in the text and a fuller citation is the bibliography. I have not submitted the work represented in this report in any other course of study leading to an academic award.

Student…….....  Date …….....

Work Place Mentor……  Date …….