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| School of Mechanical Engineering |  |

MECH3895 Individual Engineering Project

Scoping and Planning Document

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| **Student Name:** | |
| **Programme of Study:** | |
| **Provisional Title of Project:** | |
| **Name of External Company** (if any)**:** | |
| **Supervisor Name:** | |
| **Type of Project:** (numerical simulation, experimental, design, analysis, software development, analytical derivation, etc.) | |
| ***NOTES TO STUDENT****:*   1. *The font used should be no smaller than Arial 11pt or equivalent, with 1.5 line spacing and margins no smaller than 25 mm (top, bottom, left, and right)* 2. *Ensure you have discussed the content with your supervisor well in advance of the deadline for submission.* 3. *An* ***electronic version*** *of this report in pdf format must be submitted via Minerva* | |
| STUDENT DECLARATION (from the “LU Declaration of Academic Integrity”)  I am aware that the University defines plagiarism as presenting someone else’s work, in whole or in part, as your own. Work means any intellectual output, and typically includes text, data, images, sound or performance. I promise that in the attached submission I have not presented anyone else’s work, in whole or in part, as my own and I have not colluded with others in the preparation of this work. Where I have taken advantage of the work of others, I have given full acknowledgement. I have not resubmitted my own work or part thereof without specific written permission to do so from the University staff concerned when any of this work has been or is being submitted for marks or credits even if in a different module or for a different qualification or completed prior to entry to the University. I have read and understood the University’s published rules on plagiarism and also any more detailed rules specified at School or module level. I know that if I commit plagiarism I can be expelled from the University and that it is my responsibility to be aware of the University’s regulations on plagiarism and their importance. I re-confirm my consent to the University copying and distributing any or all of my work in any form and using third parties (who may be based outside the EU/EEA) to monitor breaches of regulations, to verify whether my work contains plagiarised material, and for quality assurance purposes. I confirm that I have declared all mitigating circumstances that may be relevant to the assessment of this piece of work and that I wish to have taken into account. I am aware of the University’s policy on mitigation and the School’s procedures for the submission of statements and evidence of mitigation. I am aware of the penalties imposed for the late submission of coursework. | |
| **Signature of Student:** (add scanned copy of your signature) | **Date:** |

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## 1. Scope of the project [600 words maximum]

This section specifies what the project is and what it will deliver. It should be written in a concise manner.

### 1.1 Background

First, using only **two** or **three** paragraphs, write an introduction to the project as background, setting the scene and explaining why it needs to be done. It should provide information about the importance of the work and its connection to a wider area, including how the wider area, or the project in itself, integrates knowledge of other disciplines.

### 1.2 Project Aim and Objectives

### 1.2.1 Aim

The aim of the project is the overall top-level goal, it should be concise. It might be helpful to consider this in conjunction with the project title.

### 1.2.2 Objectiv**e**s

List several objectives which need to be successfully completed in order to achieve the aim of the project. When you phrase an objective, think about how you can demonstrate its achievement.

Suitable characteristics of objectives are “SMART”:

* **S**pecific: you need specific deliverables.
* **M**easurable: someone need to be able to judge/quantify if they are achieved.
* **A**chievable and appropriate: They should solve a sufficiently difficult problem but not out of scope of the module.

**A**greed: By your supervisor and other members of the School (where appropriate).

* **R**ealistic: you need to define them knowing your background and your knowledge, need to be ambitious but not unachievable.
* **T**imebound: you need to have clear deadlines and timing set for each objective.

The scoping document, and hence the list of objectives, is about the work that needs to be done to complete the project and not about your personal development.

### 1.3 Project Deliverables

These are items for assessment under ‘achievements’. These should be written up as the ‘achievements’ sections in the final project report or in some instances they may be handed in separately (e.g. CFD or FEA model of analysed component, code, design specification, user manual or installation guide etc.). It is important to have the agreement from the supervisor at this stage that these deliverables are suitable as achievable for your type of project. To ensure that these deliverables are within the scope of the project, you will need to cross-reference them to the project objectives. You do not need to submit any of these for your project, but you can discuss with your supervisor what data or procedure would be useful to hand over to your supervisor.

## 2. Literature Review [2500 words maximum]

### What is a literature review?

A literature review is a critical and evaluative account of what has been published on a chosen topic. Its purpose is to summarise, synthesise, and analyse the arguments of others. It should clarify the relationship between your own project and the work that has previously been done. It should reveal similarities and differences, consistencies and inconsistencies, strengths and weaknesses, and controversies in previous research. It should provide an overview for the reader to appreciate the level of challenge posed by the project. It should reflect a systematic and critical approach to reading and reviewing the literature.

### What skills do you gain from doing a literature review?

Reviewing the literature is an opportunity for you to gain the necessary knowledge in the area of your project. Writing a literature review serves to demonstrate that you have explored the problem space for the project and have acquired an understanding of the project requirements.

Writing about the material you have read, in your own words, will show that you have the ability to understand academic papers in your field of study and summarise what you have read. It demonstrates your ability to source and synthesise information, which is a skill that will be of benefit to you in the workplace.

### How do you write a literature review?

A literature review is not primarily an argument for the importance of your project aim (which is mostly covered in the first section of the scoping and planning document). While it is necessary to explain what the primary purpose of your project is, the reader of a literature review will assume that the need for undertaking the work has already been established. You can use a short part of the literature review to expand on this need, but it is not the primary purpose of this section.

A literature review is organised around ideas, not the sources themselves (it is not a descriptive list of papers or summaries; you must not just list your sources and describe them in detail one at a time – that would be the role of an annotated bibliography). It should identify themes and areas that are related to your project and determine what other researchers/companies/people have done related to your project. It should also present underlying concepts which are deemed too specialised to assume that the reader knows these in advance, but which they must be aware of in order to understand the work that will be carried out as part of the project.

The type of information that the literature review section should aim to address is:

* Existing work related to the subject area of your project, with emphasis on what is directly relevant to your specific project.
* Work related to the subject area of your project but for which there is no or little literature directly relevant to your specific project.
* Underlying concepts that will be used in this project.
* Social and/or technical context for this project.
* Stakeholders involved.

These aspects are not exhaustive and may not be relevant to your specific type of project, so please discuss with your supervisor what needs to go in this section. Look for review papers in your topic area and read them to get an idea of the types of themes you might want to include in your research or ways in which you could organise your literature review. In most research papers that are not review papers, the introduction of the paper will contain a short literature review; you should aim for this type of critical analysis.

After searching for articles, you should read, re-read and assimilate complex ideas so that you can write about them in a review of the literature. You must develop a good understanding of the research literature to be able to write a critical review. You should think about the themes and issues that your sources have in common, and their relevance and applicability to your project.

### Technical and critical writing

Consult chapter 5 of the “Technical Writing for Project Report” document for information about critical vs descriptive writing, and grammar and writing style in a technical report.

### Writing conduct and plagiarism

Please make sure that you follow all the relevant rules on how to use the third party work and how to reference the resources that you use. Plagiarism is a very serious charge, which can include penalties and could stop your progress. If in doubt, please ask your supervisor.

When writing, remember that we want to know your understanding and analysis of your work or what others have done. [Summarise and synthesise](https://library.leeds.ac.uk/info/14011/writing/106/academic_writing/4) the information rather than paraphrase other's writing. Quoting other's work should only be done sparsely, for famous quotes or agreed-upon definitions. Remember that we cannot assess your critical writing and your understanding of the literature if most of it is made of quotes!! Go back to [Recognising Plagiarism](https://library.leeds.ac.uk/info/1401/academic_skills/46/academic_integrity_and_plagiarism/2) information if you are unsure of what malpractice is and to the school lecture on [academic integrity](https://minerva.leeds.ac.uk/webapps/blackboard/content/listContent.jsp?course_id=_423009_1&content_id=_5988835_1&mode=reset).

**Remember, you can borrow ideas from others, not their words!** A reference acknowledges the idea, not the wording or the structure of the argument.

### How do you structure a literature review?

The literature review should be well structured to include an introduction, relevant sub-headings, and a summary at the end.

There are many different ways to structure your literature review, for example:

* By topics of interest.
* As a chronological review of the work of others.
* By the order in which you tracked down information, in particular if one thing led to another.
* According to the opinions of others, for or against a particular issue.

Organising your literature review by topics with headings and sub-headings is the most common way to proceed in technical work. Your survey of relevant material, and discussions with your supervisor, will help you identifying appropriate headings and sub-headings. However, writing a good literature review or background to your project is not easy and may involve you deleting what you have written and starting again - this may happen more than once. Your literature review section should be structured as below:

### 2.1 Introduction

A succinct introduction should inform the reader what the literature review covers and why, or why some relevant aspects are not covered. A brief outline of the structure can also be included.

### 2.2. Sub-headings (as many as necessary)

A number of sections with sub-headings should be included as appropriate for the structure of the literature review. Use as many sub-headings as necessary.

You should use paragraphs conveying different information within the topic of the section.

**Harvard** or **Numeric** citation style should be used, see the **References** section for more information.

### 2.x Conclusion and relationship to current project

The last sub-heading (here “x” but you should number your subheadings) in this section should be a critical conclusion of the literature review highlighting how it informs the project.

This section should include specific explanation of how the literature review has informed the current project plan or its methodology, and how you are going to use or have already used the knowledge acquired from the literature to conduct your project (e.g. define a set of design requirements, inform the experimental design, choose parameters of computational model …). It should not simply be a summary of what you read.

You could consider about one sixth of the literature review (400-500 words) for this summary and how the findings from the literature review link to your project.

## 3. Project Work Plan and Ethical Considerations [600 words maximum]

This section identifies a project plan and a risk assessment for the project, including identifying possible ethical considerations.

### 3.1 Tasks, milestones and timeline

The project work plan should relate the activities (or tasks) to the objectives or deliverables. A few milestones should be identified in order for you and your supervisor to monitor the progress. It should include a written description of the tasks to be performed, referencing a Gantt chart.

The Gantt chart should be used to visually show the full list of tasks milestones and deliverables. It may take several iterations after discussion with your supervisor to arrive at a workable timeline of all tasks.

### 3.2 Project Risk assessment

All projects require that a risk assessment be carried out to identify all possible risks which may prevent the project from completing (e.g. availability of stakeholders, technical issues, availability and/or knowledge of specialist software, suitable test data, manufacture of components, lab availability, high performance computing , etc.). Possible mitigating strategies to reduce the risks need to be discussed.

### 3.3 Ethical Considerations

After you have carefully looked and used the ethics chart (available in appendix A, you do not need to include it in your document) to determine if there is a need for ethical approval, you will need to

(1) fill in a form ([MECH3895 ethical approval form](https://forms.office.com/Pages/ResponsePage.aspx?id=qO3qvR3IzkWGPlIypTW3y3qC66CyabxBjITuKmEclgZUMFVZRlVWUEFTOU5CWVMxSU5HOVE2QURMUyQlQCN0PWcu)) to inform the module leader of your ethical requirement (you need to fill the form even if you concluded that your project does not require ethical approval). You need to add your answers as appendix of your scoping and planning document; you can save a pdf once you have completed the form. Your scoping and planning document will not be marked without completing the form. This needs to be done by **Thursday 10/11,** wellahead of the submission deadline for the scoping document. If you misidentify your ethical approval requirements, you will be asked to re-scope your project (see module handbook).

(2) write a short paragraph on the ethical considerations of your project. This needs to be at minimum stating why ethical approval is required, or not. **All other ethical implications of your project should be considered and mentioned in this paragraph. Go beyond what is necessary in terms of ethical approvals. Be specific and complete in your explanations.**

## References [no length limit]

A list of all the references used in this report should be included here. The Harvard or Numeric reference styles should be used. Please speak with your supervisor as to which of these two styles is most appropriate for the type of project that you are carrying out.

Further guidance on both styles can be found from Skills@Library here:

**Harvard style references:** <https://library.leeds.ac.uk/skills-referencing-harvard>

**Numeric style references:** <https://library.leeds.ac.uk/skills-referencing-numeric>

## Appendix A. Ethical Review Guidance

This is a University requirement.

For guidance, please see the process for research ethics document in Minerva, Figure A1 next page, and discuss it with your supervisor.

You should not include this appendix in your submission. The only appendix required for your scoping and planning document is your answers to the ethics form. No other information in appendix is authorised in the scoping and planning document.

Qr code

Description automatically generated**Figure A1:** Research Ethics Flow Chart