Faculty of Engineering
Final Year Project

Writing the Progress Report

These items form a general guide based on guidelines produced by various departments. While the information contained is generally applicable to all progress reports, the emphasis placed on each item varies between departments, and some have further or slightly different requirements. Students should refer to their own department’s current guidelines, or ask their supervisors, for more specific information.

Your supervisor is your primary authority in all matters related to the project and the report.

Purposes of the Progress Report
- To summarise the work you have completed so far
- To clarify and record any changes to the aim or scope of your project
- To plan your work for next semester

The Progress Report is an opportunity to take stock of where you stand at the end of the first semester. You may have encountered unforeseen obstacles which caused you to revise your plan, or your preliminary work may have taken you in an unexpected direction. Whatever the reason, you may well have modified your aim, scope, approach or expected outcomes since writing your Research Proposal.

This is your opportunity to clarify such changes in direction, as well as to present and review your achievements to date.

Getting Started
If the problem you are investigating or your project aims, scope or approach have changed, your Introduction will need to reflect this. You may also need to change your project title. Begin by reviewing your original problem statement, aims and title.

Is your overall aim the same? Has your scope narrowed or widened as a result of your outcomes to date? Does your title still accurately reflect your project?
Research Problem:
Households in remote areas are dependent on expensive, environmentally unsound fuel-burning generators. Wind and solar power could provide a cleaner and less expensive solution; however, the cost of the necessary installation is currently prohibitive.

Aim:
To design a cost-effective installation that will enable a residence to be almost completely self powered using solar and wind energy.

Title:
Design of a wind and solar power installation for a remote domestic residence.

Structuring the report
Some departmental guidelines include a ‘template’ of section headings. Where no template is provided, you are expected to structure the report as you see fit. The sample Contents pages below show typical sections. However, keep in mind that these are highly generic so you may need to adapt them to your own needs. Remember, the main point is to organize your report so that it develops logically from the reader’s point of view.

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Note that some departmental guidelines provide a list of ‘required content’. These items refer to the type of information you should include in the report; they are not necessarily suggested as section headings. It is up to you to decide on section headings and include the content in the appropriate section.
For many projects, a substantial proportion of the first semester will have been devoted to reading the literature. However, in some design or industry projects, there may be little literature available. In such cases, the related contextual information should appear in the Introduction.

**Industrial process project sample**

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**Design project sample**

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<tr>
<td>(define problem)</td>
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<tr>
<td>(describe existing solution)</td>
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<td>(explain limitations of existing solution)</td>
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<td>(describe project aims)</td>
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<td>2. Completed project work</td>
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Sections in the Progress Report:

**Summary**
The Summary gives an overview of the contents of the whole report. It:
- states the topic of the project
- summarises the work already completed – and its outcomes
- outlines the plan for the following semester

**Compare the two Summaries below:** What is the major difference between the work already completed in each?

**Summary 1**

**Compressive strength of fly ash based geopolymer concrete exposed to elevated temperatures**

In this project the effects of elevated temperature on the compressive strength of Geopolymer Concrete are compared with that of High Strength Concrete made using Ordinary Portland Cement. A review of the literature on the two types of concrete, completed in the first stage of the project, shows that the production of Ordinary Portland Cement contributes up to 7% of Australia’s greenhouse gas emissions. Geopolymer Concrete is becoming a popular alternative as it offers greater durability and fire resistance. It is suitable for applications where a fast curing time and high strength are required; however, it is not clear whether its strength may be compromised at extremely high temperatures.

In the next stage of the project, the fire resistance of fly ash based Geopolymer Concrete will be compared with that of High Strength Concrete by testing the compressive strength of each under a variety of temperatures.
Summary

The objective of this project is to indirectly attract small particles toward the trapping point of a laser tweezer and to model the force of the attraction.

Preliminary experimental work has explored the effects of inter-particle forces between a small particle trapped in a laser tweezer and small particles in its immediate vicinity. Evidence has been recorded of the surrounding particles being attracted to, and gravitating towards, the trapped particle; the project has also established that this phenomenon can be reliably replicated.

The next part of the project will address the following objectives: collection and analysis of data; determination of the relationships between key variables of the laser tweezers and the attraction force; development of a quasi-empirical model to describe the relationships; translation of model from small dielectric particles to living cells.

Language Focus: Tenses

In most reports the Summary is written largely in the past tense (eg; The aim of the project was to…). However, in the Progress Report, the project is still in progress, not completed, so the aims should be expressed in the present tense as in the samples above (ie; “The aim of this project is to cut…”; “…the effects of …are compared…”).

Summary

The objective of this project is to assess the viability of the stress wave method for structural health monitoring.

In the first stage of the research, experiments were carried out on a simple plate structure…. It was established that the presence of mechanical connectors can affect the effectiveness of … and that stress wave distribution decreases with the increase in damage…

In the next stage, similar experiments will be performed on more complex plate structures…. The tests will consist of two different …

Paragraph 1. The project is ongoing so it is referred to in the present tense

Paragraph 2.

a. The first stage is finished, so the steps completed are referred to in the past tense

b. The findings are assumed to be established facts or general principles, so are referred to in the present tense

Paragraph 3. The next stage is in the future, so will is used

Introduction

The Introduction will be similar to that in your Project Proposal. It should perform the following functions:

- Set the context for your project: the problem, its importance, aims and scope
- Clearly state the purpose of the Progress Report
- Briefly outline the structure of the report

Note: The last two functions are often performed in the same sentence or paragraph.
If you have made any changes to your project in terms of the problem to be investigated, aims, scope or methodological approach, you will need to revise your Introduction. It is not essential to explain the reasons for such changes, unless lack of explanation would leave your project open to question (eg: if preliminary results indicated that your original approach was ineffective). This can be done either here or in the body of the report, whichever is most appropriate.

Introduction from a project on the future potential of groundwater resources in urban Melbourne: Can you identify the function/s of each paragraph? How many of the functions listed above are performed in the first paragraph?

Introduction
Melbourne’s water supply is derived primarily from forested catchments in the hills to the east of the city. Historically, groundwater has never been more than a minor contributor to the total supply. Now, with the growth in population and economy, along with changing climatic conditions, finding a more sustainable alternative to the current system is imperative.

The aim of this study is to analyse the groundwater systems in the urban area in order to determine their utilization potential, evaluate the likely impact of any development on groundwater resources, and develop system management options for future application.

This report presents an overview of groundwater systems and a detailed description of the characteristics of Melbourne’s groundwater systems, including geology, soils, climate and land use. The research proposed for semester two is then outlined in terms of approach, project stages, and timeline.

Note how the final paragraph performs the functions of both indicating the purpose of the report and outlining the structure.

Language focus: Precise expression
Beware of weak terms such as ‘focus on’ and ‘look at’. The former means merely that you will direct most, though not all, of your attention on the object, while the latter conveys very little at all. Compare the two versions of an aims statement below:

❌ Version 1
This study will focus on groundwater systems in the urban area, and look at their utilization potential, likely impact of any development on groundwater resources, and system management options for future application.

✅ Version 2
The aim of this study is to analyse groundwater systems in the urban area in order to determine their utilization potential, evaluate the likely impact of any development on groundwater resources, and develop system management options for future application.
Reviewing the literature
Your literature review will incorporate new information you have found since writing your Project Proposal. Depending on length, or the requirements specified by each department, the literature review can be either presented in its own section after the Introduction or incorporated into the section on completed project work. Whatever you decide, make sure to give it a heading which reflects the topic – don’t just call it “Literature Review”. Compare the samples below; which is neater?

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Remember, the main functions of the literature review are to give readers the background information necessary to understand your report by:

- describing the current state of knowledge and/or technology in the field
- introducing the theory, techniques, approaches, models, hypotheses or processes which will form the basis of your work
- highlighting the ‘gap’ in knowledge or technology, or the limitation in existing studies, which your project aims to fill

If your research problem, aims, scope or approach have changed, the focus of your literature review will need to be changed to reflect your new direction. Some of the previous content may need to be discarded, and new content added.

Excerpt from a review of the literature on the characteristics of vortex breakdown

**Definitions**
Spohn (1998) et al. compared flow and breakdown conditions with rigid cover and free surface in a confined flow generated by a rotating disc. They claim that asymmetric separation occurs on the cylinder wall, and that the bubble is an open structure, axisymmetric on the upstream side and asymmetric on the…

In contrast, Hourigan and Thompson (2001) argue that the breakdown bubble is in fact axisymmetric throughout. They claim that Spohn et al’s findings are due to inaccuracies in their visualization technique… Thus, flow visualization techniques such as dye and electrostatic precipitation can be misleading….

**Experimental methods**
The other method under consideration for this investigation is vortex breakdown in swirling jets using a setup similar to that used by Billant et al. (1998), who …

Note how, in the first two paragraphs, the writer shows the relationship between the different researchers’ studies. In the final paragraph, the writer makes clear how the technique described relates to the current study.
Citation types
When writing up the literature review, pay attention to where you place the focus of your citations. The two main types of citation are:

*Information prominent*
A cylinder with a rotating plate is commonly used to investigate vortex breakdown due to the simplifications that can be made in this configuration. The four main parameters that can be altered in this setup are: cylinder height (H), cylinder radius (R), swirl number and Reynolds number (Lugt 1983).

*Author prominent*
The definition of vortex breakdown is central to the current study and various criteria have been proposed. In its most general definition, Hall (1972) stated that the term … . More specifically, Benjamin (1962) and Sarpkaya (1971) defined the phenomenon as … . Leibovich (1978) developed the definition further with … .

Note that information prominent citations are most commonly used in most literature reviews. However, it is often more natural to use author prominent citations when describing chronological developments or pointing out the relationship between studies.

Work completed in the first semester:
This section presents your progress to date. It describes the work you have carried out and discusses the outcomes of that work. Even if the results of this work are limited or inconclusive, present what you have and discuss what it indicates. Remember, a null result is still a result.

A common mistake made by students writing this section is to make it too personal, or subjective. This section should be an objective presentation of work you have completed, whether limited to the findings of your literature review or including the results of preliminary experimental work.

Language Focus: Objective, impersonal writing

✘ Sample 1. From the Progress Report of a project investigating the use of pumped hydro storage in Portland, Victoria

3.1 Site selection
Selecting the most appropriate site for the plant was much more time-consuming than I had expected as I needed to review topographic maps and local planning regulations in each area I investigated. Given that a pumped hydro storage facility would require a large volume of water, and that in Australia we have a limited supply of water, I realised that sea water would be the only viable water source. Therefore, I limited the search to wind farms located near the sea. I made a list of the wind farms in Victoria and put a great deal of effort into analysing them, coming to the conclusion that the Portland wind project appears to be the most viable site.

Note how the writer describes his reactions to the experience of completing the work, and focuses attention on himself. This is not appropriate in academic or technical writing. Compare the above sample with the more objective reporting below.


✓ Sample 2.

3.1 Site selection
A pumped hydro storage facility requires a large volume of water. Given that water is a limited resource in Australia, it was concluded that the sea was the most viable water source. Therefore, the search was limited to wind farms located near the coast, with priority given to those in close proximity to the sea, in order to minimise the cost of pumping sea water to the plant. A list of the coastal wind farms in Victoria was compiled and analysed in terms of topography and local planning regulations. It was concluded that the Portland wind project would be the most suitable site for the plant.

Note that it is acceptable to use terms such as ‘our approach’ in this type of report. The occasional ‘I’ or ‘we’ is also acceptable if necessary to avoid using convoluted sentence structure.

Research plan for the next semester
In this section you should state your aim/s for the second semester and describe in detail the steps or stages needed to complete your project. Let us refer back to this example of the Methodology section of a Project Proposal:

Sample Methodology from a Project Proposal. The project investigated laser trapping as a means of manipulating small particles

Methodology
The project will conducted through experimentation in two parts, testing using polystyrene spheres, and application to cells.

Part 1. Testing using polystyrene spheres
The goal of this part is to indirectly manipulate a small polystyrene (PS) sphere via:

i. Laser trapping a proxy particle to manipulate another small PS sphere in close proximity

ii. Using photo-acoustic tweezers (laser) to manipulate a PS sphere by locally heating a medium in close proximity to the sphere

The equipment used for the laser trapping will be an Olympus IX81 spinning disc confocal microscope with laser tweezers and the equipment used for the photo-acoustic tweezers will be a PALM MicroBeam. The polystyrene sphere samples will be immersed in distilled water at a ratio of 10μL of spheres to 1mL of distilled water (i.e.: a ratio of 1:100); this ratio ensures that the polystyrene spheres are easily found under a microscope, whilst also avoiding an overcrowding of the sample….

Part 2. Application to cells
The objective of this part is to apply the model from micron-sized spheres to cells. The same equipment used in Part 1 will be used for the testing on cells. The outcome of this part will be used to validate the model proposed through the testing on PS spheres.
In the second semester, the Research Plan might look like this:

**Research Plan**
The outstanding objectives to be fulfilled in order to achieve the aim of this project are: data collection, which will continue from the progress made in the first semester; data analysis; development of an empirical model that describes the net force felt by the manipulated particle; and a translation of the model from small dielectric particles in distilled water to living cells in aqueous solution.

1. **Data collection**...

2. **Data analysis**
Video processing software (e.g.: Adobe Premiere) will be used to analyse the data recorded from the Debut Video Capture software. The position change over a time increment will be measured from the recorded data in order to ascertain the velocity of the particle; this will then be related back to the net force acting on the particle.

**Equipment:** PC with video processing software and Microsoft Excel

**Potential delays:** PC may not be available or experiencing equipment failure

**Outcome:** Clear trends in the data indicating the effect of changing experimental variables on the net force felt by the manipulated particle

3. **Development of empirical model**...

This would be followed by timetable usually, though not necessarily, in the form of a Gantt chart, and Resources statement, similar to the Project Proposal.

**Research plan:**
- provide a detailed plan of the stages involved
- outline tasks within each stage, in detail
- identify concrete outcomes for each stage
- list resources required

**Timetable:**
- indicate clear start and finish dates for each stage or step
- show interrelationships between tasks (i.e.; how subsequent steps are affected if an earlier step runs overtime)
- list the expected outcome of each stage or step

**Language Focus: Precise vocabulary and concise expression**

**Research Approach**
The method by which a recommendation can be reached is by reading, researching and evaluating a number of research papers and other sources of information. With this information reviewed, an environmental risk matrix can be assembled. Each step in the matrix will have an in-depth explanation and a rating on how important it is to the process….

1. **Words which do not go together:**
   a. **reaching a recommendation:** The writer is confusing ‘reach a conclusion’ and ‘make a recommendation’.
   b. **reading, researching and evaluating a number of research papers:** It is possible to ‘read a research paper’ and ‘evaluate a research paper’, but not to ‘research a research paper’. The verb ‘research’ should be followed by the **topic**. Example: ‘research desalination techniques’.

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2. Redundant words:
**reading, researching and evaluating:** Too many verbs. ‘Reading and evaluating’ would be sufficient, while ‘reviewing’ expresses both meanings in just one word.

3. Vague words:
   a. a number of: This expression contains no useful information. It would be better to omit it or replace it with a more useful descriptor. Example: ‘evaluating recent research papers…’
   b. other sources of information: This also contains no actual information. It would be better to list one or two examples. Example: ‘research papers, books and journals.’

4. Inappropriate mode:
   **can:** This means only that it **is possible.** In the Methodology section it is more appropriate to state what you actually intend to do. Example: ‘…an environmental risk matrix **will** be assembled’.

5. Inefficient word forms:
   a. have an in-depth explanation and a rating on…: These words do not read smoothly. ‘Have a rating on…’ is especially awkward. Both ‘explanation’ and ‘rating’ have verb forms which would be effective here. Example: ‘Each step… will **be explained** in depth and **rated** on its importance…’
   b. how important it is to the process: Too many unnecessary words. Instead of the adjective, ‘important’, use the noun form, ‘importance’. Example: ‘…rated on its importance to the project’.

6. Incorrect word choice:
   **With this information reviewed:** The **sources of information** were reviewed, not the information itself. The information was **obtained** or **acquired**. Example: ‘Using the information obtained, an environmental matrix will be assembled.’

Citing and Referencing
You will be expected to cite and reference your source material correctly. See:

Resources
**Reporting the 4th Year Project**
Engineering Online Resources

**Writing the literature review**
Language and Learning Online

**Writing the thesis**
Michaelson, HB 1990, How to write and publish engineering papers and reports, 3rd ed., Oryx Press, Phoenix AZ.