

## Project Scope

As your group project, we ask you to contribute to one or more of the *17 Sustainable Development Goals* identified by the *United Nations*. A detailed description of goals can be found on the [UN website](#). The key topics are:

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Decent Work and Economic Growth
- Industry, Innovation and Infrastructure
- Reduced Inequality
- Sustainable Cities and Communities
- **Responsible Consumption and Production**
- Climate Action
- Life Below Water
- Life on Land
- Peace, Justice and Strong Institutions
- Partnerships for the Goals

You can align your project with one or more of the themes above, however, it should be scoped down to make it feasible within the semester. It should be a clearly defined project aimed at solving a problem under one of the themes using pervasive computing technology. Some examples of project ideas:

- Giving posture correction feedback to students in class using sensors. (*Good Health and Well-being*)
- Refrigerator monitor for awareness of food wastage. (*Responsible Consumption and Production*)
- Ambient interface for pollution awareness. (*Sustainable Cities and Communities / Climate Action*)
- Ambient sound interface based on physiological sensors to increase attention during learning. UN goal (*Quality Education*)

The project is divided into three (3) phases, and each phase has a specific assignment that you have to submit on canvas. Phases are designed so that you can chronologically follow them. However, please read all the phases before you start your project. They have overlaps and inter-dependencies. We highly encourage you to include a reasonable overlap between the execution of project phases (i.e. parts of project phase 2 should start during project phase 1). Every project member should contribute equally to the project and **individual contributions should be reflected using the diary section of the report (Page 6)**. Additionally, when you write code it should be managed through the [USyd Github](#).

## Report Template

You will be required to submit a report (in *pdf* format) at the end of each phase of the project. The template for the report should follow the [ACM CHI Publication Format](#) (use section per phase) available at:

- [Microsoft Word](#)
- [L<sup>A</sup>T<sub>E</sub>X](#) (Use [sample-manuscript.tex](#))
- [L<sup>A</sup>T<sub>E</sub>X in Overleaf](#)

## Phase 1 - Concept and Requirements (130 points [weight 13%])

In this phase, you are required to develop the concept for your group project, which involves several tasks as outlined below. Also include the diary for the period as outlined on page 6 at the end of the report.

### Tasks:

1. Identify the **project theme and scope** (60 points)
  - a. **Identify a problem space** related to one or more UN sustainability goals and clearly state why it needs a pervasive computing solution. Make sure to explain this in plain language so a reader without technical know-how can understand what you aim to do. (8 points / 200 words max)
  - b. **Conduct a short literature survey** on the selected problem space, and critically compare the limitations of existing approaches. You should find at least 6 existing solutions (including a minimum of 3 peer-reviewed and published scientific papers - use Google Scholar to find them and cite them). (12 points / 75 words max per item)
  - c. Follow the “10 plus 10 method” (check tutorial slides) to **generate at least 3 creative ideas** to solve the problem you identified using pervasive computing methods. Please explain your refined ideas (3) using sketches. (18 points / 300 words max)
  - d. Select one of the ideas for your group project and justify why you selected it. (6 points / 100 words max)
  - e. Explain how your project will follow at least 3 of the 6 *Characteristics of Pervasive Computing*. (6 points / 50 words max for each item)
  - f. Write a *user scenario* how your proposed project will be used. Please read these articles to learn about how to write a *user scenario*: [\[article 1\]](#), [\[article 2\]](#) (10 points / 200 words max)
2. Developing a design and technical concept (35 points)
  - a. Develop a conceptual diagram for the aimed project, similar to the one shown on Slide-14 of the Lecture 01 slide deck. It should depict what kind of sensors/actuators, embedded processing, networking methods, data storage and interfaces you would use in your project. It should be specific to your project and should include enough details for the reader to understand the technical operation of your project. We recommend using PowerPoint to draw the diagram. (10 points)
  - b. For each block in the diagram, add a short description of the functionality in an itemized list. You can label or number the blocks for reference. (15 points / 50 words max per item)
  - c. Identify 5 challenges that may pose a risk for the progress of this project. They can be technical or non-technical. They should be related to your project and cannot be a trivial statement (e.g. sensor can break). (10 points / 50 words max per item)
3. Synthesizing the requirements and planned activities (35 points)
  - a. Create a list of components you would need to implement the project. Please use components from your kits as much as possible. If you need additional components, find them and add links to the online store where you can buy them (e.g. [core-electronics](#), [little bird electronics](#), [element14](#), [mouser](#)). Clearly state costs. Please choose low cost components since your group may have to purchase them during the project. Include the answer in a table format. (10 points)

Item List				
Item	Unit cost	# of Units	Cost	URL Link
e.g. Model name/number	20	1	20	URL
...	...	...	...	...
<b>Total cost</b>	...	...	<b>AUD XX</b>	

- b. **Create a plan for evaluating** your project at the end, it **could be a technical evaluation** (e.g. accuracy of sensor data) **or a usability evaluation** (e.g. user feedback collection e.g. [Think Aloud](#)), **or a combination**. **Justify** your choice of evaluation approach for the project. (15 points / 150 words max)
- c. **Create a project plan** in a [Gantt chart](#), with time units in weeks till the end of the semester indicating all the major activities for the project. Something similar to [this](#). (10 points)

## Phase 2 - Progress Report (60 points [weight 6%])

In this phase, you will present the progress you made on your project, and details of the revised plans. Also include the diary for the period as outlined on page 6 at the end of the report.

### Tasks:

1. Progress Report (60 points)
  - a. Create an itemized list of activities (at least 5) you have conducted and their results. This could be technical implementations, tests, acquiring components, etc. State whether they were successful or not. (10 points / 50 words max for each item)
  - b. Identify and clearly indicate TO-DO items (at least 3). (3 points / 50 words max for each item)
  - c. State changes (at least 2) you made to the initial plan of your project with justifications. Changes could be conceptual, functional or implementation choices (e.g. type of sensors). Use bullet points. (4 points / 200 words max)
  - d. Revise your answers to project report *Phase 1-Task 1: a, b, e, and f* to reflect your changes. (6 points / 50 words max per item)
  - e. Revise your conceptual diagram to reflect the changes. (4 points)
  - f. Revise the Gantt chart, highlighting the changes. (3 points)
  - g. Develop a step-by-step evaluation plan for your project, which should include the measurements you are aiming to take, include details of comparisons you are going to make and indicate any ethical considerations you need to take into account. (10 points / 200 words max)
  - h. Demonstrate your progress at the tutorial to your tutor. Ideally, show a working demo (at least partly). Indicate parts that are yet to be completed. (20 points)

## Phase 3 - Final Report, Demo and Video (160 points [weight 16%])

In this phase, you will present the progress you made on your project. Also include the diary for the period as outlined on page 6 at the end of the report.

1. Progress Report (20 points)
  - a. Create an itemized list of activities (at least 5) you have conducted and their results. This could be technical implementations, tests, acquiring components, evaluation, etc. State whether they were successful or not. (10 points / 20 words max for each item)
  - b. Identify and clearly indicate things you could not complete as planned and why (at least 2). (4 points / 20 words max for each item)
  - c. Discuss at least two major challenges you faced in the project, and state how you overcame them or made alternative choices to avoid them. (6 points / 30 words max for each item)
2. Revise your answers to *Project Phase 1 and Phase 2* (30 points)
  - a. To reflect the changes you made to your project throughout the semester, revise your answers to *Project Phase 1 and Phase 2*. You can add new literature if your project has changed. (20 points - follow the number of words suggestions made in phase 1)
  - b. Revise the project conceptual diagram and Gantt chart. (10 points)
3. Outline the evaluation plan and results (50 points)
  - a. Revise the evaluation plan and procedure to reflect any changes. This should include the details of repetitions of measurements, how many instances, the number of users participated, the controls applied to the experiment, etc. (10 points / 200 words max)
  - b. Present the results (ideally using plots or diagrams) and outline the key findings. (15 points / 250 words max)
  - c. Discuss the implications of your results, for instance, where does your system excel and what are the weaknesses. (10 points / 200 words max)
  - d. Write a future perspective and impact of your project, for instance, some future work that will make your system better, application scenarios and how the concept can significantly address the UN challenges. (15 points / 250 words max)
4. Demonstrate your prototype at the tutorial to your tutor. Clearly show the working functions including sensing/actuation, software and networking aspects. Indicate parts that you did not manage to finish as planned. (40 points)
5. Make an introductory video, demonstrating the aims and function of your project. Think of it as a user guide to your users. The video should be a maximum of 5 mins long, however, should be no less than 2 mins. (20 points)

## Weekly Diary - All phases

You are required to **submit a diary at the end of each project phase** indicating the individual contributions you made to the project and the report. This **can be a summary of your activities for each week**. You should follow the following tabular format.

Group Name		
Week	Student Name	Activities
W03	Jane Doh	Join the meeting for discussing ideas and contributed to ideation
W03	John Doh	Join the meeting for discussing ideas and contributed to ideation
W04	Jane Doh	Drafted project scope
W04	John Doh	Made the listed of planned activities
W05	...	...