UNSW SYDNEY | Australia's Global University

Graduate School of Biomedical Engineering

BIOM1010 Major Assignment

In teams of 5, students will research and write a report on one specific application of engineering technology in medicine. Topics covered by the report will include the following:

Background

- What is the problem that the device is meant to fix?
- Does it address any significant local/global health issues?
- What are the relevant anatomy and physiology?

The design of the device or system

- How does it work?
- What is it made of?
- What design features distinguish it from other systems or devices that address the same problem?

Benefits

- How well does it work?
- How widely used is it?
- What are the limitations?

Future developments

- What are the design specifications for an ideal device or system?
- How might this be achieved in the future? (Speculate).

It is expected that the submitted work will be an integrated report, properly referenced and without plagiarism. If we detect plagiarism, you will be penalised.

You are expected to organise your references using bibliographic software.

The assignment is designed to achieve several of the aims of BIOM1010:

- to introduce you to applications of engineering technology to problems in medicine.
- to develop your information literacy skills.
- to develop your written and oral communications skills.
- to develop your skills in collaborative work.

You are referred to The Learning Centre for helpful advice on writing a report in science and engineering https://student.unsw.edu.au/writing-skills-support.

Assessment weight: 35% of the final mark (5% for interim reports, 20% for the written report, 10% for the video presentation).

The written report should be no longer than 2500 words plus figures and tables.

The video presentation must be no longer than 8 minutes, with an additional 2 minutes allotted to answering any questions arising from your presentation from your peers. Each group will present their video during their tutorial class.

The major assignment will be submitted in stages. These will be:

Week 6 (2.5%)

A draft report that defines the problem that your device solves and describes any relevant anatomy and physiology. This will eventually form the backbone of the introduction and background section of the final report.

Week 9 (2.5%)

A detailed outline of the report (table of contents) and a draft of the section describing the design of the device.

An annotated bibliography listing the sources that you are consulting for your paper. In addition to the citation, give the nature of the source (encyclopaedia, company web site, journal article, etc.), a short description of the information it provides and how it will fit into the report. It is recommended that you read the Learning Centre's guide on preparing an annotated bibliography. This can be found on https://student.unsw.edu.au/annotated-bibliography.

Week 12 (10%)

Video presentations (8 min plus 2 min questions) by all group members. All students are expected to participate in the video and peer evaluate other videos throughout this week.

Week 12 (20%)

The final written report, submitted via Turnitin via Moodle. (Due by Midnight, Friday 19 October).

All work is to be submitted in electronic form via a Turnitin submission folder in Moodle. One member of each group will submit the document.

A hard copy will be submitted in the tutorial class of the work-breakdown form (indicating who did what) and signed non-plagiarism declarations.

Assessment Criteria

The following assessment criteria will be applied to the Major Assessment:

Background (20%) – A comprehensive overview of the state-of-the-art of the therapy. Specify the problem the device is meant to fix. Does it address any significant local or global health issues? Identify the relevant anatomy and physiology.

Design (30%) - The design of the device or system. A clear and concise description of the therapy (how it works, materials used, unique features, etc).

Benefits (15%) – A description (supported by facts and citations) of the benefits the recipients receive from the therapy. Consider “how well it works”, how widely it is use and the limitations.

Future developments (15%) – An identification of the major players in research of this therapy and their activities. What have they done in the past five years that appears destined to influence future developments of the therapy? What would the ideal system be, and how could this be achieved?

Report formatting (10%) - Does the format of the report make it easy to read, easy to locate sections and references, and easy to identify key points?

Appropriate referencing (10%) – Has the report been appropriately referenced throughout, including all text, facts and figures not generated by the authors themselves?

Peer assessment

Among the graduate attributes that UNSW wishes to develop in its students is the ability to function well in collaborative work. It is recognized, however, that working in groups can lead to complaints

about unequal contributions of group members to the overall project. To some extent, it is up to team members to organise and share the workload, but we recognise that this is difficult. For this reason, the program WebPA (in Moodle) will be used to assess relative contributions of group members to the overall project. Results derived from these evaluations may be used to moderate the marks for the group work (to the range 80% to 105% of the group mark).

Dos and don'ts

Make the effort to edit the report so that differences in style are smoothed out. The report should read as "one voice" – that is, as if it were written by one person.

Do give some thought when you copy/paste tables and figures from online sources. It is easy to do but rare that these are adequately cited and explained in the text. Every table and figure must be appropriately cited and referenced in the body of the report – e.g. "The data in Table 2 show that ...".

Do contribute to your group. If you are unclear how to contribute, ask your team members and don't take no for an answer if they refuse your input.

Possible Topics

- Implantable cardioverter defibrillator
- External defibrillator
- Artificial liver
- Blood vessel prosthesis
- Cochlear implant
- Mechanical heart valve
- Left Ventricular Assist Device
- Spinal cord stimulator
- Deep brain stimulator
- Implantable drug delivery device
- Drug-eluting stent
- Insulin pump
- Artificial skin
- Visual prosthesis
- Exoskeleton device
- Prosthetic hand
- Positive pressure respirator
- Surgical robotic system
- Others by permission