BIOM1010

Engineering in Medicine and Biology

Term Two // 2021

Graduate School of Biomedical Engineering // UNSW Engineering

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Dorna Esrafilzadeh	d.esrafilzadeh@unsw.edu.au	Via email and for face-to-face consultation with pre-arrangement	Room 1005, Level 1, Biological Sciences Building (E26), UNSW Sydney	

School Contact Information

Student Services can be contacted via unsw.to/webforms.

Course Details

Credit Points 6

Summary of the Course

Welcome to Engineering in Biology and Medicine (BIOM1010)!

Are you interested to know the process of medical devices design, manufacturing and regulations? Have you thought about elements to improve medical devices? Imagine making an impact on healthcare equipment by modifying its design or improving its efficiency!

Course Aims

BIOM1010 will introduce you to the various aspects of design and developing a medical device. You will learn introduction to design, device manufacturing, evaluation and basic information on IP commercialization of medical devices and work collaboratively with your mentors to improve medical equipment. BIOM1010 is an introductory course, preparing students in the dual degree for subsequent biomedical engineering courses. As an introductory course, it is also a suitable first-year elective for all engineering students and for interested non-engineering students with some technical background (mathematics and physics).

Course Learning Outcomes

1. Students will be able to identify and describe several applications of engineering and technology to medicine/biology.
2. Students will be able to apply basic mathematics, physics and engineering methods to solve biomedical problems.
3. Students will be able to find information on and evaluate specific applications of technology to medicine/biology.
4. Students will be able to write a concise and professional report detailing a specific application of technology in medicine/biology using the languages of engineering and medicine/biology
5. Students will be able to modify a healthcare device in a collaborative teamwork environment
6. Students will learn how to present for your audience with engineering and/or medicine/biology background

Teaching Strategies

Suggested strategy for learning:

For each hour of contact, it is expected that students will put in at least 1.5 hours of private study. Students will need to spend substantial time each week before and after class to work through the various online resources in Moodle, prepare for their tutorial classes and work on their project and reports.

Private Study	Review online lessons and textbook Complete online quizzes Join Moodle discussions

	• Reflect on class content • Keep up with notices and find out marks via Moodle
Tutorials	• Guided study • Practice solving problems • Ask questions • Hands-on work, to set studies in the context • Work on your group project and reports and presentation
Assessments	• Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving

Additional Course Information

Lectures are included short online lessons and face-to-face sessions over the first hour of each tutorial. They include concept development, problem-solving and discussion sessions. These will cover the theory supporting experimental methods and the practical research problems. Tutorials are designed to explain the concepts introduced in the lectures using practical approaches. These strategies are intended to support you in attaining the learning outcomes. Content, including notes and videos, will be available via Moodle and in the class. Assessments and feedback will be provided to you regularly.

Assessment

Further information related to the assessment will be provided in the Moodle and face-to-face classes.

Assessment Tasks

Assessment task	Weight	Due Date	Student Learning Outcomes Assessed
Final report	50%	Not Applicable	1, 2, 3, 4, 5
Individual Report	10%	Not Applicable	1, 2, 3, 4, 6
Weekly Quizzes	10%	Not Applicable	1, 2, 3, 4
Tutorial/Online Activity Participation	10%	Not Applicable	1, 2, 3, 4
3min Video Presentation	15%	Not Applicable	1, 2, 3, 6
Mentor Mark	5%	Not Applicable	1, 2, 3, 5, 6

Assessment Details

Assessment 1: Final report

Start date: Not Applicable

Details:

This is a group activity (typically 5 or 6 students per group), consisting of a major group report that will be submitted at end of term.

Turnitin setting: This is not a Turnitin assignment

Assessment 2: Individual Report

Start date: Not Applicable

Details: This is a brief individual report, consisting of the future perspective of the project that expect to be submitted at the end of the term.

Assessment 3: Weekly Quizzes

Start date: Not Applicable

Details:

Weekly 10 minute quizzes at the end of each online lesson. There is no limitation of the the number of attempt.

Assessment 4: Tutorial/Online Activity Participation

Start date: Not Applicable

Details:

This will assess participation in the various tutorial and online activities throughout the course.

Assessment 5: 3min Video Presentation

Start date: Not Applicable

Details: This is an individual component consisting of a recorded video in the format of 3 min presentation pitch related to the outcomes of the group project. It is expected to submit the video at the end of the term

Assessment 6: Mentor Mark

Start date: Not Applicable

Details: Each mentor will give the students a score out of five based on their observations of students' motivation and attempt on their design/build project.

Attendance Requirements

Please note that lecture recordings are not available for this course. Students are strongly encouraged to attend all classes and contact the Course Authority to make alternative arrangements for classes missed.

Course Schedule

View class timetable

Timetable

Date	Type	Content
O Week: 25 May - 28 May		
Week 1: 31 May - 4 June	Tutorial	Week 1: Welcome to BIOM1010, course introduction, team building, meet the mentors, intro to Fusion 360
Week 2: 7 June - 11 June	Tutorial	Week 2: Medical technology, information finding and resources, literature review, project selection and design & build
Week 3: 14 June - 18 June	Tutorial	Week 3: Clinical needs, brainstorming Ideas and reporting, referencing style, design & build project
Week 4: 21 June - 25 June	Tutorial	Week 4: Device assessment, data presentation and evaluation, group project proposal with feedback including peers evaluation
Week 5: 28 June - 2 July	Tutorial	Week 5: Ethics: just because we can..., introduction to medical device ethics, discussions on some medical scenarios, design and build project
Week 6: 5 July - 9 July	Group Work	Week 6: Flexible Week, no official teaching, Q&A sessions
Week 7: 12 July - 16 July	Tutorial	Week 7: Clinical trials: Trial stages of medical devices, report writing, design and build project
Week 8: 19 July - 23 July	Tutorial	Week 8: Regulatory requirements, practice on oral presentation, design and build project
Week 9: 26 July - 30 July	Tutorial	Week 9: Intellectual properties: IP strategy and patent search, class activity, design & build project
Week 10: 2 August - 6 August	Tutorial	Week 10: Health technology assessment, class activity, design and build project

Resources

Prescribed Resources

No specific textbooks are required for this course. Useful references will be listed on Moodle when required. Students seeking additional resources can also obtain assistance from the UNSW Library.

Recommended Resources

Medical Device Innovation Handbook by Durfee et al. Bakken Medical Devices Center, University of Minnesota, Minneapolis, USA

Course Evaluation and Development

Student feedback has helped to shape and develop this course, including feedback obtained from online evaluations as part of UNSW's myExperience process and UNSW Course Design Institute. Your feedback is much appreciated and taken very seriously. Continual improvements are made to the course based in part on such feedback and this helps us to improve the course for future students. Informal student feedback is also sought frequently throughout the semester and used to assist in the progression of the course.

Laboratory Workshop Information

Students will work with Makerspace to receive badges for 3D printing/laser cutting and digital fabrication. They also will work with CREATE UNSW team to provide the required components for their group project.

Submission of Assessment Tasks

Laboratory reports and major assignments will require a Non Plagiarism Declaration Cover Sheet.

Late submissions will be penalised 10% of the mark for each calendar day late. If you foresee a problem in meeting the nominated submission date please contact the Course Convenor to make an appointment to discuss your situation as soon as possible.

Academic Honesty and Plagiarism

PLAGIARISM

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise will have their names entered on a plagiarism register and will be liable to disciplinary action, including exclusion from enrolment.

It is expected that all students must at all times submit their own work for assessment. Submitting the work or ideas of someone else without clearly acknowledging the source of borrowed material or ideas is plagiarism.

All assessments which you hand in must have a Non Plagiarism Declaration Cover Sheet. This is for both individual and group work. Attach it to your assignment before submitting it to the Course Coordinator or at the School Office.

Plagiarism is the use of another person's work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:
https://student.unsw.edu.au/plagiarism

Academic Information

COURSE EVALUATION AND DEVELOPMENT

Student feedback has helped to shape and develop this course, including feedback obtained from on-line evaluations as part of UNSW's as part of UNSW's myExperience process. You are highly encouraged to complete such an on-line evaluation toward the end of Term. Feedback and suggestions provided will be important in improving the course for future students.

DATES TO NOTE

Refer to MyUNSW for Important Dates, available at:
https://my.unsw.edu.au/student/resources/KeyDates.html

ACADEMIC ADVICE

For information about:

- Notes on assessments and plagiarism,
- Special Considerations,
- School Student Ethics Officer, and
- BESS

refer to the School website available at
http://www.engineering.unsw.edu.au/biomedical-engineering/

Supplementary Examinations:

Supplementary Examinations for Term 2 2021 will be held on Monday 6th September – Friday 10th September (inclusive) should you be required to sit one.

Image Credit

Synergies in Sound 2016

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.