UNSW Course Outline

BIOM9551 Rehabilitation Engineering and Assistive Technology - 2024

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General Course Information

Course Code : BIOM9551
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : Graduate School of Biomedical Engineering
Delivery Mode : Multimodal
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate, Postgraduate
Units of Credit : 6

Useful Links

[Handbook](#) [Class Timetable](#)

Course Details & Outcomes

Course Description

"With the right technology, we will have a world where 'I can't' becomes 'I can'… but

that **technology you can only get if someone makes it**." (Jeff Paradee, Disability Advocate). That someone can be you!

Are you interested in engineering and technology, and passionate about improving people's lives? If so, BIOM9551 Rehabilitation Engineering and Assistive Technology is the perfect course for you!

This practice-based course provides you with the practical skills and essential knowledge necessary to actively contribute to the field of rehabilitation engineering and assistive technology. You will immerse yourself in hands-on learning experiences aimed at designing and developing solutions to real-world challenges faced by individuals with disabilities.

During the course, you will also have the opportunity to develop your skills in collaborating with end-users. Through case studies, you will gain insights into the experiences of individuals with disabilities, allowing you to design and develop technology that meets their unique needs and requirements. This collaborative approach will help you to develop your communication and teamwork skills, which are essential for success in any field.

If you're looking for an engaging and challenging learning experience that will equip you with the skills and knowledge to make a real difference in people's lives, then BIOM9551 Rehabilitation Engineering and Assistive Technology is the course for you. Sign up now to begin your journey towards a rewarding career in this exciting field!

Course Aims

This course aims to provide students with a comprehensive learning experience that equips them with the skills, knowledge, and ethical considerations needed to make a meaningful impact in the field of rehabilitation engineering and assistive technology.

Specifically, this course aims to:

1. Provide students with a comprehensive understanding of current topics and issues underpinning rehabilitation engineering and assistive technology.
2. Equip students with the knowledge and skills to design and develop assistive technology devices that meet the unique needs and requirements of end-users of assistive technology.
3. Enhance students' skills in collaborating with end-users, including effective communication and teamwork.

Relationship to Other Courses

This course is part of the Bionics, Biomechanics, and Biomechatronics theme within the Graduate School of Biomedical Engineering. It aligns with **BIOM9541 Mechanics of the Human Body** and has connections to **BIOM9561 Mechanical Properties of Biomaterials**. Complementary courses include **BIOM9640 Biomedical Instrumentation, BIOM9650 Biosensors and Transducers**, and **BIOM9660 Bionics and Neuromodulation**. While not a prerequisite, **ANAT2511 Fundamentals of Anatomy** can enhance understanding for this course.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Critically assess the impact of rehabilitation engineering and assistive technology on the lives of individuals with disabilities.
CLO2 : Analyze and evaluate current issues, challenges, and trends in rehabilitation engineering and assistive technology.
CLO3 : Discuss, apply, and appraise the value of the principles of co-creation in developing user-centred assistive technologies
CLO4 : Seek, evaluate, and use numerous types of feedback, including self-reflection, to guide an iterative design process
CLO5 : Develop an effective detailed design, precisely specify the design in written and oral form, and critically evaluate its merits

Course Learning Outcomes	Assessment Item
CLO1 : Critically assess the impact of rehabilitation engineering and assistive technology on the lives of individuals with disabilities.	• Case Studies • Reflective Journal • Design Project
CLO2 : Analyze and evaluate current issues, challenges, and trends in rehabilitation engineering and assistive technology.	• Case Studies • Reflective Journal • Design Project
CLO3 : Discuss, apply, and appraise the value of the principles of co-creation in developing user-centred assistive technologies	• Participation • Case Studies • Reflective Journal • Design Project
CLO4 : Seek, evaluate, and use numerous types of feedback, including self-reflection, to guide an iterative design process	• Participation • Reflective Journal • Design Project
CLO5 : Develop an effective detailed design, precisely specify the design in written and oral form, and critically evaluate its merits	• Participation • Design Project

Learning and Teaching Technologies

Microsoft Teams

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Participation Assessment Format: Individual	10%	Start Date: Not Applicable Due Date: Not Applicable
Case Studies Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Not Applicable
Reflective Journal Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Not Applicable
Design Project Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Week 10: 29 July - 04 August

Assessment Details
Participation

Assessment Overview

For the participation assessment, you will be evaluated on your active participation in class discussions, group activities, and workshops. Active participation means contributing to class discussions and group activities, asking questions, providing feedback to peers, and engaging in reflective thinking.

The participation assessment will be graded based on the following criteria:

1. Frequency and quality of participation: You will be evaluated on the frequency and quality of your contributions to class discussions and group activities. Your contributions should demonstrate an understanding of the course concepts and principles and show evidence of critical thinking.

2. Preparation and engagement: You will be evaluated on your preparation and engagement in class activities and workshops. This includes completing assigned readings, preparing for group activities, and engaging in discussions and activities with your peers.

3. Respectful and inclusive behavior: You will be evaluated on your ability to engage in

discussions and group activities in a respectful and inclusive manner. This includes being open-minded, respectful of diverse perspectives, and avoiding behaviors that are disruptive or disrespectful to others.

This assessment provides an opportunity for you to engage with course content and concepts and to learn from your peers through active discussion and collaboration. By actively participating in class activities and discussions, you will be able to deepen your understanding of course concepts and develop your critical thinking and communication skills.

<u>Course Learning Outcomes</u>

- CLO3 : Discuss, apply, and appraise the value of the principles of co-creation in developing user-centred assistive technologies
- CLO4 : Seek, evaluate, and use numerous types of feedback, including self-reflection, to guide an iterative design process
- CLO5 : Develop an effective detailed design, precisely specify the design in written and oral form, and critically evaluate its merits

<u>Assignment submission Turnitin type</u>

This is not a Turnitin assignment

Case Studies

<u>Assessment Overview</u>

For the case studies assessment, you will be required to analyze and evaluate case studies related to rehabilitation engineering and assistive technology. You will be provided with a set of case studies to review, and will be asked to apply the course concepts and principles to analyse the case studies.

The case studies assessment will be graded based on the following criteria:

1. Analysis and evaluation: You should demonstrate an ability to apply course concepts and principles to analyze and evaluate the case studies.

2. Depth of analysis: The analysis should demonstrate a deep level of understanding of the course material, showing the students' ability to critically analyze and evaluate the case studies.

3. Evidence of learning: The analysis should provide evidence of your learning, including insights

gained from the course, and new perspectives on rehabilitation engineering and assistive technology.

4. Quality of writing: The analysis should be well-written, clear, and concise, with appropriate grammar and spelling.

5. Completion and consistency: The analysis should be completed on time and consistently, with a complete and thorough analysis of each case study.

This assessment provides an opportunity for you to apply the course concepts and principles to real-world situations. The assessment also allows for the evaluation of the your writing skills, critical thinking abilities, and ability to apply course material to real-world situations. By providing regular feedback and grading on the case study analysis, you will be able to monitor your progress and make improvements as needed.

Course Learning Outcomes

- CLO1 : Critically assess the impact of rehabilitation engineering and assistive technology on the lives of individuals with disabilities.
- CLO2 : Analyze and evaluate current issues, challenges, and trends in rehabilitation engineering and assistive technology.
- CLO3 : Discuss, apply, and appraise the value of the principles of co-creation in developing user-centred assistive technologies

Submission notes

via Teams

Assignment submission Turnitin type

This is not a Turnitin assignment

Reflective Journal

Assessment Overview

For the reflective journal assessment, you will be required to keep a journal throughout the course to document their learning experiences and insights gained from the course. The journal can include personal reflections on the discussions, projects, and interactions with end-users, as well as thoughts on the course readings and guest speakers.

The journal will be graded based on the following criteria:

1. Reflection and analysis: You should demonstrate an ability to reflect on your learning experiences and analyze the key concepts and principles learned in the course.

2. Depth of reflection: The journal entries should demonstrate a deep level of reflection, showing the your ability to critically analyze and evaluate their learning experiences.

3. Evidence of learning: The journal entries should provide evidence of the students' learning, including insights gained from the course, and new perspectives on rehabilitation engineering and assistive technology.

4. Quality of writing: The journal entries should be well-written, clear, and concise, with appropriate grammar and spelling.

5. Completion and consistency: The journal should be completed regularly and consistently, with entries documenting the your progress throughout the course.

This assessment provides an opportunity for you to reflect on their learning experiences and demonstrate their understanding of the course content. The assessment also allows for the evaluation of the your writing skills, critical thinking abilities, and self-reflection skills. By providing regular feedback and grading on the reflective journal entries, you will be able to monitor your progress and make improvements as needed.

Course Learning Outcomes

- CLO1 : Critically assess the impact of rehabilitation engineering and assistive technology on the lives of individuals with disabilities.
- CLO2 : Analyze and evaluate current issues, challenges, and trends in rehabilitation engineering and assistive technology.
- CLO3 : Discuss, apply, and appraise the value of the principles of co-creation in developing user-centred assistive technologies
- CLO4 : Seek, evaluate, and use numerous types of feedback, including self-reflection, to guide an iterative design process

Submission notes

via Teams

Assignment submission Turnitin type

This is not a Turnitin assignment

Design Project

<u>Assessment Overview</u>

For the design project assessment, you will be required to develop and present a design proposal for an assistive technology solution that addresses a specific problem or challenge faced by individuals with disabilities. The design project will incorporate three assessable activities: the design proposal, poster, and demonstration.

The design proposal will be graded based on the following criteria:

1. Clarity and creativity: Your proposal should be clear, concise, and demonstrate creativity in your approach to the design.

2. Feasibility and functionality: Your proposal should demonstrate an understanding of the feasibility and functionality of your design solution.

3. User-centered design: Your proposal should demonstrate a user-centered design approach, showing an understanding of the needs and requirements of the end-users.

4. Evidence of research: Your proposal should include evidence of research, including relevant literature and other sources of information.

The poster presentation will be graded based on the following criteria:

1. Clarity and organization: Your poster should be well-organized and clearly communicate the key features of your design.

2. Creativity and visual appeal: Your poster should demonstrate creativity and visual appeal.

3. Integration of feedback: Your poster should integrate feedback received during the design proposal phase.

The demonstration of the design will be graded based on the following criteria:

1. Functionality and usability: Your demonstration should demonstrate the functionality and usability of your design.

2. User-centered design: Your demonstration should show that your design is user-centered and meets the needs and requirements of the end-users.

3. Integration of feedback: Your demonstration should integrate feedback received during the design proposal phase.

This assessment provides an opportunity for you to apply the course concepts and principles to a real-world design challenge. The assessment also allows for the evaluation of your creativity, research skills, design thinking, and ability to communicate and present your ideas effectively. By providing regular feedback and grading on each phase of the design project, you will be able to monitor your progress and make improvements as needed.

Course Learning Outcomes

- CLO1 : Critically assess the impact of rehabilitation engineering and assistive technology on the lives of individuals with disabilities.
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- CLO3 : Discuss, apply, and appraise the value of the principles of co-creation in developing user-centred assistive technologies
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- CLO5 : Develop an effective detailed design, precisely specify the design in written and oral form, and critically evaluate its merits

Assignment submission Turnitin type

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General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Welcome and Introduction
	Workshop	Disability Awareness
Week 2 : 3 June - 9 June	Lecture	Lived Experience Panel
	Workshop	International Classification of Functioning
Week 3 : 10 June - 16 June	Topic	Ethics
Week 4 : 17 June - 23 June	Fieldwork	Site Visits (in Lecture Slot)
	Workshop	Design Principles
Week 5 : 24 June - 30 June	Topic	Seating
Week 7 : 8 July - 14 July	Topic	Mobility
Week 8 : 15 July - 21 July	Topic	Postural Control
Week 9 : 22 July - 28 July	Topic	Alternative Controls
Week 10 : 29 July - 4 August	Lecture	Presentations

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 Resources

Prescribed Resources

None

Recommended Resources

Cook, Albert M, Jan Miller Polgar and Pedro Encarnac ão, *Assistive Technologies Principles & Practice* (Elsevier, 5th edition., 2020) (available via: https://primoa.library.unsw.edu.au/permalink/61UNSW_INST/1m02euc/alma9951396940801731)

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Lauren Kark		SAM509	(02) 9385 0560	Please check my calendar	Yes	Yes
Demonstrator	Lauren Wood					No	No

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit / Submit rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

III. Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

Note: This course outline sets out the description of classes at the date the Course Outline is

published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/ Moodle/LMS applies.

Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

School Contact Information

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