Master of Engineering (Biomedical)

Year and Campus:	2016
Coordinator:	Prof David Ackland Email: dackland@unimelb.edu.au
Contact:	Melbourne School of Engineering Current students: # General information: **https://ask.unimelb.edu.au (https://ask.unimelb.edu.au/)** # **Contact Stop 1 (http://students.unimelb.edu.au/stop1)** Future Students: # Further Information: **Master of Engineering (Biomedical) (http://www.eng.unimelb.edu.au/study/graduate/master-eng-biomedical.html)** # Email: **Enquiry (http://www.eng.unimelb.edu.au/study/degrees/master-engineering-biomedical/overview)**
Overview:	Biomedical engineers bridge the gap between technology, medicine and biology. Within this specialisation, students choose to focus on areas including biomechanical engineering, bioengineering, bioinformatics, biocellular engineering, biosignals, neuroengineering and clinical engineering. Students also benefit from the high standing of services provided by the University and the School of Engineering for biomedical innovation.
Learning Outcomes:	To produce graduates who are both skilled in biomedical engineering principles and have the ability to apply them to complex, open-ended engineering tasks and problems.
Structure & Available Subjects:	The Master of Engineering (Biomedical) consists of 300 points of study - 212.5 points core including Biomedical Engineering Capstone Project plus 87.5 points elective subjects as listed below (at least 50 points must be taken from Biomedical Engineering Electives). Advanced standing will be awarded for equivalent subjects taken in prior study to applicants on the following basis: # A maximum of 100 points for applicants with a 4 year Bachelor of Engineering or equivalent. # A maximum of 100 points for applicants with a 3 year undergraduate degree. Students entering with a three year bachelor degree must complete at least 200 points of study within the Masters of Engineering. In cases where applicants have completed the equivalent of more than 100 points of core masters subjects, discipline specific electives must be taken to fulfil the 200 minimum masters study requirement. Note: applicants from the University of Melbourne with: # An appropriate “Engineering System” major will receive 100 points of advanced standing. Applicants who have completed more than 100 points of core subjects in their undergraduate degree will obtain exemption for the cores taken but will need to replace the points in excess of 100 points with elective subjects. # Engineering breadth sequences (including those in the Bachelor of Commerce) will receive advanced standing to a maximum of 100 points.
Subject Options:	Total 300 point - 212.5 points core (compulsory) plus 87.5 points elective subjects from the list below. Students must complete all 300 points of subjects, including all core subjects, or have advanced standing or exemption. The core and elective subjects are those listed below. The order of subjects below is one way of progressing through the course - students who meet subject requisites may tailor their individual study plan to take into account advanced standing and their study load. Students plan their study on-line; however, Melbourne School of Engineering course advisors are available to assist students with individual study plans. **Suggested first 100 points:** Suggested study plan for first 100 points:

87.5 points Core
12.5 points Biomedical Science elective from the list below

Core (87.5 points)

Subject	Study Period Commencement:	Credit Points:
MAST20029 Engineering Mathematics	Summer Term, Semester 1, Semester 2	12.50
BMEN20001 Biomechanical Physics & Computation	Semester 1	12.50
ENGR90021 Engineering Practice and Communication	Semester 1, Semester 2	12.50
BMEN30005 Introduction to Biomechanics	Semester 1	12.50
BMEN30006 Circuits and Systems	Semester 1	12.50
BMEN30008 Biosystems Design	Semester 2	12.50
BMEN30007 Biotransport Processes	Semester 2	12.50

Suggested second 100 points:

Suggested study plan for the second 100 points:

50 points Core
50 points Bioengineering Electives

Core (Total 50 points)

Subject	Study Period Commencement:	Credit Points:
ELEN30009 Electrical Network Analysis and Design	Semester 1	12.50
BMEN90023 Biomaterials	Semester 2	12.50
BMEN90026 Clinical Trials and Regulations	Semester 1	12.50
BMEN90028 Anatomy and Physiology for Engineers	Semester 2	12.50

Suggested third 100 points:

Suggested study plan for the third 100 points:

Core (25 points) including **BMEN90027 Biosystems Modelling (../../view/current/BMEN90027)** (students, who commenced before 2015, may replace this subject with an approved elective)
Biomedical Engineering Research and Design Project Electives (50 points)
Approved Electives (25 points)

Core (Total 25 points)

Subject	Study Period Commencement:	Credit Points:
BMEN90019 Biomedical Engineering Management	Semester 1	12.50
BMEN90027 Biosystems Modelling	Semester 1	12.5

Biomedical Engineering Research and Design Project Electives (50 points)

Students must complete 50 points from the following capstone subjects:

Subject	Study Period Commencement:	Credit Points:
BMEN90030 BioDesign Innovation	Year Long	50

BMEN90017 Biomedical Engineering Design Project	Semester 2	25
BMEN90018 Biomedical Engineering Capstone Project	Year Long, Semester 1, Semester 2	25
BMEN90025 Biomedical Eng Capstone Project A	Semester 1, Semester 2	12.50

NOTE: BMEN90025 Biomedical Eng Capstone Project A is of year-long duration (continuing subject over two semesters). Students commence this subject in Semester 2 and continue in the consecutive semester (semester 1 in the following year). Upon successful completion of this project, students will receive 25 points credit.

Bioengineering Electives

Total 50 points

Students are encouraged to take two pairs of subjects in the same study area:

- Tissue Engineering & Stem Cells and Soft Matter Engineering
- Computational Genomics and Algorithms for Functional Genomics
- Human Impact & Forensic Biomechanics and Computational Biomechanics
- Medical Imaging and Neural Information Processing

Subject	Study Period Commencement:	Credit Points:
BMEN90011 Tissue Engineering & Stem Cells	Semester 2	12.50
COMP90016 Computational Genomics	Semester 1	12.50
BMEN90021 Medical Imaging	Semester 1	12.50
COMP90014 Algorithms for Functional Genomics	Semester 2	12.50
BMEN90002 Neural Information Processing	Semester 2	12.50
BMEN90022 Computational Biomechanics	Semester 2	12.50
BMEN90012 Soft Matter Engineering	Semester 1	12.50
BMEN90029 Soft Tissue and Cellular Biomechanics	Semester 1	12.5

Biomedical Science Elective

Total 12.5 points

Students with a background in Chemistry must take the **BIOL10004 (../../view/current/BIOL10004)** elective. Students with a background in Biology must take the **CHEM10003 (../../view/current/CHEM10003)** elective.

Subject	Study Period Commencement:	Credit Points:
CHEM10003 Chemistry 1	Semester 1, Semester 2	12.50
BIOL10004 Biology of Cells and Organisms	Semester 1	12.50

Approved Electives

Total 25 points

An approved elective is any postgraduate level subject or third-year undergraduate subject.

Students anticipated to graduate in 2015 can have up to 37.5 points approved electives (**BMEN90027 Biosystems Modelling (../../view/current/BMEN90027)** can be replaced with an approved elective).

Student may take the following subjects as approved electives:

	<table><tr><th>Subject</th><th>Study Period Commencement:</th><th>Credit Points:</th></tr><tr><td>BMEN90003 Clinical Engineering</td><td>Semester 2</td><td>12.50</td></tr><tr><td>ENGR90033 Internship</td><td>January, Semester 1, Semester 2</td><td>25</td></tr></table> Note : 1) All students must meet any requisite prior to enrolling in a subject; 2) Students may need written permission from other faculties to enrol in some subjects; please check with the course coordinator of the subject.
Links to further information:	http://www.eng.unimelb.edu.au/study/degrees/master-engineering-biomedical/overview
Related Course(s):	Master of Engineering