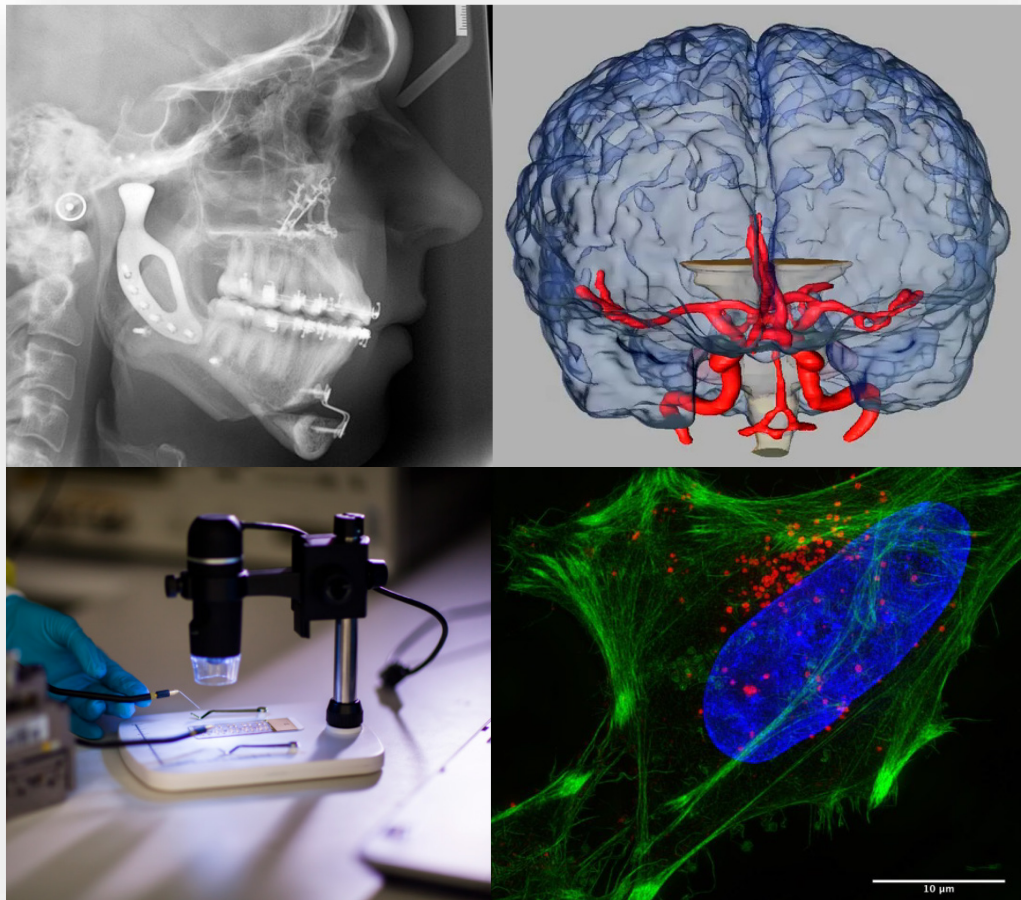




THE UNIVERSITY OF  
MELBOURNE

# DEPARTMENT OF BIOMEDICAL ENGINEERING

## STUDY GUIDE 2022



## DISCLAIMER

The Department of Biomedical Engineering has endeavored to ensure that the material contained in this study guide was correct at the time of publication. However,

1. The department gives no warranty and accepts no responsibility for the accuracy or the completeness of the material.
2. No reliance should be made by any user on the material, but instead, the user should check for confirmation with the originating or authorizing faculty, department or another body.
3. The Department reserves the right at any time to make changes as it deems appropriate.

This handbook is to be used only as a guide and all current information can be obtained via the University of Melbourne website: <https://handbook.unimelb.edu.au/search>

This handbook has been produced by the Department of Biomedical Engineering. If any incorrect information is found within this guide, please email our Academic Support Coordinator: Peter Mason ([peter.mason@unimelb.edu.au](mailto:peter.mason@unimelb.edu.au)) after January 31<sup>st</sup>, 2022.

# TABLE OF CONTENTS

<b>DISCLAIMER .....</b>	<b>2</b>
<b>WELCOME TO THE DEPARTMENT OF BIOMEDICAL ENGINEERING .....</b>	<b>4</b>
<b>BIOMEDICAL ENGINEERING COURSE INFORMATION .....</b>	<b>5</b>
<b>ENGR90033 INTERNSHIP .....</b>	<b>11</b>
<b>EXCHANGE AND STUDY ABROAD .....</b>	<b>12</b>
<b>VACATION WORK .....</b>	<b>13</b>
<b>ENGINEERING PRACTICE HURDLE .....</b>	<b>14</b>
<b>STUDENT SERVICES .....</b>	<b>15</b>
<b>STOP 1 .....</b>	<b>18</b>
<b>ADVANCED STANDING.....</b>	<b>20</b>
<b>SPECIAL CONSIDERATION .....</b>	<b>20</b>
<b>ACADEMIC INTEGRITY.....</b>	<b>20</b>
<b>EXAMINATIONS.....</b>	<b>21</b>
<b>LECTURE THEATRE LOCATIONS.....</b>	<b>21</b>
<b>SAFETY.....</b>	<b>22</b>
<b>RESEARCH HIGHER DEGREES.....</b>	<b>23</b>
<b>THE MELBOURNE UNIVERSITY BIOMEDICAL ENGINEERING SOCIETY .....</b>	<b>24</b>
<b>DEPARTMENT OF BIOMEDICAL ENGINEERING STAFF.....</b>	<b>25</b>
<b>MEET THE STAFF IN THE DEPARTMENT OF BIOMEDICAL ENGINEERING .....</b>	<b>26</b>
<b>WHERE TO GO FOR HELP.....</b>	<b>33</b>

## WELCOME TO THE DEPARTMENT OF BIOMEDICAL ENGINEERING

It is my pleasure to welcome all students to the Department of Biomedical Engineering, including Bachelor of Science and Bachelor of Biomedicine students in the Bioengineering Systems major, and our students in the Master of Biomedical Engineering and Master of Biomedical Engineering (Business). I would especially like to welcome students from abroad that are new to Australia and those who may be studying remotely due to COVID-19.

This guidebook provides essential information for all new and current students, including sample course structures, subject information, teaching responsibilities, assessment, study abroad applications, special consideration information, and lecture locations. It is designed to supplement specific course information provided in the official University Handbook <https://handbook.unimelb.edu.au>.

Please be advised that there are many student services available at the University of Melbourne, including admissions, skills and development services, health and disability services, counseling services, financial services, administrative and information services, as well as course planning services.

Please see Stop 1 for further information via this link: <http://students.unimelb.edu.au/stop1> or visit at 757 Swanston Street, Parkville or call 13 MELB (13 6352).

I encourage you to provide feedback on your teaching and learning experiences so that we can continue to improve our courses. This can be achieved by providing comments directly to each subject's Staff-Student Liaison Committee representative. The Committee meets twice each semester to provide feedback to the Department on our subjects. Towards the end of each semester, you will be provided with a teaching evaluation survey called the End of Subject Survey (ESS), which gives you an opportunity to provide specific comments and feedback on each subject in which you are enrolled. You are also welcome to email or meet with the Course Coordinator, Dr Kathryn Stok, or myself.

On behalf of the Department of Biomedical Engineering, I wish you all the best during your studies here at the Faculty of Engineering and Information Technology.

Leigh Johnston, Professor and Head of Department  
**Department of Biomedical Engineering**



## BIOMEDICAL ENGINEERING COURSE INFORMATION

Biomedical Engineers address healthcare problems from a unique perspective, blending an understanding of biomedical science with specialist knowledge of engineering techniques and problem-solving skills.

### Courses in Biomedical Engineering

- Master of Biomedical Engineering
- Master of Biomedical Engineering (Business)

You will focus on human systems, the design and operation of devices and processes, and the application of engineering skills to new medical treatments, instruments, and machines. Our reputation for biomedical innovation in areas such as medical bionics, prostheses, and tissue engineering, ensures you are learning from leaders in the field, who are working on exciting projects. These professional-entry-level courses will lead to a formal qualification in biomedical engineering.

### Career Outcomes

The acquisition of the master degree will enable you to become biomedical engineers to:

- Develop new drug therapies
- Study the electrical and/or mechanical activity of organs such as the brain, heart, muscle, and bone
- Build artificial organs, limbs, heart valves, and bionic implants to replace lost function
- Develop orthopedic devices to treat bone and joint conditions
- Grow living tissues to replace failing organs.

Employment opportunities exist in a range of areas including biotechnology, biomedical, pharmaceutical, medical device and equipment industries, research and innovation, health services and hospitals, government and consulting, and companies such as Cochlear, Sanofi, Cell Therapies, Compumedics, GlaxoSmithKline and Zimmer Biomet.

### Course Entry

Master of Biomedical Engineering and Master of Biomedical Engineering (Business) are accredited by EUR-ACE and Engineers Australia. To gain entry into the 2-year Master of Biomedical Engineering pathway from the BSc or B-BMed programs, students must complete the Bioengineering Systems Major, which includes: Circuits and Systems BMEN30006), Biosystems Design (BMEN30008), Introduction to Biomaterials (BMEN30009), and Mechanics for Bioengineering (BMEN30010). Students in earlier versions of the Bioengineering Systems Major may have completed BMEN30005 (Introduction to Biomechanics) or Biotransport Processes (BMEN30007). These are still accepted for entry to the Masters.

Students seeking to gain entry into the 3-year Master of Biomedical Engineering programs must have successfully completed a three-year or more undergraduate degree at a tertiary institution. Students must have completed mathematics subjects equivalent to MAST10006 Calculus 2 and MAST10007 Linear Algebra, as well as 25 points (2 subjects) of appropriate tertiary-level Biology OR appropriate tertiary-level Chemistry OR Engineering Mathematics, equivalent to MAST20029

Engineering Mathematics. Students must also have completed their undergraduate program with an average grade equivalent to a Melbourne score of 65%.

Full course information about all our undergraduate study options can be found on the following link: <http://www.bme.unimelb.edu.au/study/undergraduate/>.

### Course Structure and Sample Course Plans

Details of subjects offered in the Master of Biomedical Engineering and specialisation “Business”, may be found in the Handbook: <https://handbook.unimelb.edu.au/2022/courses/mc-biomeng>

Individual course plans will vary according to each student’s background, year of entry, and previous degree(s).

### Department of Biomedical Engineering subjects

Semester 1		
Subject Code	Subject Title	Teaching Staff
BMEN20003	Applied Computation in Bioengineering	Lionel Lam
BMEN30005	Introduction to Biomechanics	Kathryn Stok
BMEN30006	Circuits and Systems	Katie Davey
BMEN30010	Mechanics for Bioengineering	Vijay Rajagopal
BMEN90027	Systems and Synthetic Biology	<i>not offered in 2022</i>
BMEN90039	Biomedical Eng Management & Regulations	Brooke Farrugia
BMEN90021	Medical Imaging	Leigh Johnston, Kathryn Stok
BMEN90037	Bioengineering Data Analytics	Katie Davey, Matt Faria
BMEN90032	Biomed Eng Capstone Prog Part 2	Anthony Burkitt
BMEN90033	Bioinstrumentation	Sam John
BMEN90038	Biomechanics	Kathryn Stok
Semester 2		
Subject Code	Subject Title	Teaching Staff
BMEN20002	Anatomy and Physiology for Bioengineering	Hamish Meffin
BMEN30008	Biosystems Design	Sam John
BMEN30009	Introduction to Biomaterials	Brooke Farrugia
BMEN90035	Biosignal Processing	Hamish Meffin
BMEN90036	Biofluid Mechanics	David Collins
BMEN90011	Tissue Engineering & Stem Cells	Andrea O'Connor
BMEN90002	Neural Information Processing	Anthony Burkitt
BMEN90031	Biomedical Engineering Capstone Project Part 1	Anthony Burkitt
Summer Semester		
Subject Code	Subject Title	Subject Coordinator
BMEN90041	Biomedical Eng Summer Research Subject	Kathryn Stok
Year Long		
Subject Code	Subject Title	Subject Coordinator
BMEN90030	BioDesign Innovation	David Grayden
BMEN90018	Biomedical Engineering Capstone Project	Anthony Burkitt

The following course plans are **examples only** for students entering the degrees in 2022 and are provided as a suggestion only. Up-to-date information can always be found in the handbook at

### Master of Biomedical Engineering – Semester 1 entry in 2022

Year 1	Sem 1	<b>Foundation Selective (See Note 1)</b>	<b>BMEN20003</b> Applied Computation in Bioengineering	<b>BMEN30010</b> Mechanics for Bioengineering	<b>BMEN30006</b> Circuits and Systems
	Sem 2	<b>Foundation Selective (See Note 1)</b>	<b>BMEN20002</b> Anatomy and Physiology for Bioengineering	<b>BMEN30009</b> Introduction to Biomaterials	<b>BMEN30008</b> Biosystems Design
Year 2	Sem 1	<b>BMEN90038</b> Biomechanics	<b>BMEN90037</b> Bioengineering Data Analytics	<b>BMEN90033</b> Bioinstrumentation	<b>BMEN90039</b> Biomedical Eng Management & Regulations
	Sem 2	<b>BMEN90036</b> Biofluid Mechanics	<b>BMEN90035</b> Biosignal Processing	<b>Selective subject (See Note 2)</b>	<b>Bioengineering Elective</b>
Year 3	Sem 1	<b>BMEN90018</b> Biomedical Engineering	<b>Bioengineering Elective</b>	<b>Bioengineering Elective</b>	<b>Approved Elective (see Note 4)</b>
	Sem 2	<b>Capstone Project (see Note 3)</b>	<b>Bioengineering Elective</b>	<b>Bioengineering Elective</b>	<b>Approved Elective (see Note 4)</b>

### Master of Biomedical Engineering - Semester 2 entry in 2022

Year 1	Sem 1	<b>Foundation Selective (See Note 1)</b>	<b>Foundation Selective (See Note 1)</b>	<b>BMEN30009</b> Introduction to Biomaterials	<b>BMEN20002</b> Anatomy and Physiology for Bioengineering
	Sem 2	<b>Selective subject (See Note 2)</b>	<b>BMEN20003</b> Applied Computation in Bioengineering	<b>BMEN30010</b> Mechanics for Bioengineering	<b>BMEN30006</b> Circuits and Systems
Year 2	Sem 1	<b>BMEN30008</b> Biosystems Design	<b>Bioengineering Elective</b>	<b>BMEN90035</b> Biosignal Processing	<b>BMEN90036</b> Biofluid Mechanics
	Sem 2	<b>BMEN90038</b> Biomechanics	<b>BMEN90033</b> Bioinstrumentation	<b>BMEN90039</b> Biomedical Eng Management & Regulations	<b>BMEN90037</b> Bioengineering Data Analytics
Year 3	Sem 1	<b>BMEN90018</b> Biomedical Engineering	<b>Bioengineering Elective</b>	<b>Bioengineering Elective</b>	<b>Approved Elective (see Note 4)</b>
	Sem 2	<b>Capstone Project (see Note 3)</b>	<b>Bioengineering Elective</b>	<b>Bioengineering Elective</b>	<b>Approved Elective (see Note 4)</b>

## Master of Biomedical Engineering (Business) – Semester 1 entry in 2022

Year 1	Sem 1	<b>Foundation Selective (See Note 1)</b>	<b>BMEN20003</b> Applied Computation in Bioengineering	<b>BMEN30010</b> Mechanics for Bioengineering	<b>BMEN30006</b> Circuits and Systems
	Sem 2	<b>Foundation Selective (See Note 1)</b>	<b>BMEN20002</b> Anatomy and Physiology for Bioengineering	<b>BMEN30009</b> Introduction to Biomaterials	<b>BMEN30008</b> Biosystems Design
Year 2	Sem 1	<b>BMEN90038</b> Biomechanics	<b>BMEN90037</b> Bioengineering Data Analytics	<b>BMEN90033</b> Bioinstrumentation	<b>BMEN90039</b> Biomedical Eng Management & Regulations
	Sem 2	<b>BMEN90036</b> Biofluid Mechanics	<b>BMEN90035</b> Biosignal Processing	<b>ENGM90006</b> Engineering Contracts and Procurement	<b>Bioengineering Elective</b>
Year 3	Sem 1	<b>BMEN90018</b> Biomedical Engineering Capstone Project (see Note 3)	<b>ENGM90013</b> Strategy Execution for Engineers	<b>ENGM90011</b> Economic Analysis for Engineers	<b>Approved Elective (see Note 4)</b>
	Sem 2		<b>ENGM90012</b> Marketing Management for Engineers	<b>Bioengineering Elective</b>	<b>Approved Elective (see Note 4)</b>

## Master of Biomedical Engineering (Business) - Semester 2 entry in 2022

Year 1	Sem 1	<b>Foundation Selective (See Note 1)</b>	<b>Foundation Selective (See Note 1)</b>	<b>BMEN30009</b> Introduction to Biomaterials	<b>BMEN20002</b> Anatomy and Physiology for Bioengineering
	Sem 2	<b>ENGM90011</b> Economic Analysis for Engineers	<b>BMEN20003</b> Applied Computation in Bioengineering	<b>BMEN30010</b> Mechanics for Bioengineering	<b>BMEN30006</b> Circuits and Systems
Year 2	Sem 1	<b>BMEN30008</b> Biosystems Design	<b>ENGM90013</b> Strategy Execution for Engineers	<b>BMEN90035</b> Biosignal Processing	<b>BMEN90036</b> Biofluid Mechanics
	Sem 2	<b>BMEN90038</b> Biomechanics	<b>BMEN90033</b> Bioinstrumentation	<b>BMEN90039</b> Biomedical Eng Management & Regulations	<b>BMEN90037</b> Bioengineering Data Analytics
Year 3	Sem 1	<b>BMEN90018</b> Biomedical Engineering Capstone Project (see Note 3)	<b>ENGM90012</b> Marketing Management for Engineers	<b>ENGM90006</b> Engineering Contracts and Procurement	<b>Approved Elective (see Note 4)</b>
	Sem 2		<b>Bioengineering Elective</b>	<b>Bioengineering Elective</b>	<b>Approved Elective (see Note 4)</b>



**Note 1: Foundation Selective**

1. BIOL10002 Biomolecules and Cells for Bachelor of Biomedicine students OR BIOL10009 Biology: Life's Machinery OR BIOL10008 Introductory Biology: Life's Machinery for Bachelor of Science students (Students who do not have a study score of 25 or above in VCE Biology units 3 and 4, or equivalent, should take BIOL10008 Introductory Biology: Life's Machinery).
2. CHEM10003 Chemistry 1
3. MAST20029 Engineering Mathematics

**Note 2: Selective Subject**

Students must complete one of -

1. ENGR90034 Creating Innovative Engineering
2. ENGR90039 Creating Innovative Professionals
3. ENGR90021 Critical Communication for Engineers

**Note 3: Capstone and Biodesign Innovation**

Students may replace BMEN90018 and two Bioengineering Electives with BMEN90030 Biodesign Innovation, a 50-point year-long subject. An application and approval process is required for enrolment in BMEN90030 BioDesign Innovation.

**Note 4: Approved Electives**

An Approved Elective is any Masters-level subject. Students must meet requisite subjects to enrol in an Approved Elective. For enrolment in subjects outside of the Engineering faculty, permission must be obtained from the Subject Coordinator and the Course Coordinator Dr Kathryn Stok via [kathryn.stok@unimelb.edu.au](mailto:kathryn.stok@unimelb.edu.au).

**Bioengineering Electives**

Subject Code	Subject Name	Semester
BMEN90002	Neural Information Processing	2
BMEN90011	Tissue Engineering and Stem Cells	2
BMEN90021	Medical Imaging	1
BMEN90022	Computational Biomechanics	2
BMEN90027	Systems and Synthetic Biology (Available in alternate years from 2021; not available in 2022)	1
BMEN90029	Soft Tissue & Cellular Biomechanics (Available in alternate years from 2021; available in 2022)	1
BMEN90040	Biotransport Processes	1
CHEN90039	Pharmaceutical & Biochemical Production	2
COMP90014	Algorithms for Bioinformatics	2
COMP90016	Computational Genomics	1

## Recommended Approved Electives

Subject Code	Subject Name	Semester
BMEN90041	Biomedical Eng Summer Research Project	S
CHEN90038	Product Design and Analysis	1
COMP90007	Internet Technologies	1,2
COMP90038	Algorithms and Complexity	1,2
COMP90041	Programming and Software Development	1,2
ELEN90054	Probability and Random Models	1,2
ELEN90055	Control Systems	1,2
ENGR90024	Computational Fluid Dynamics	1
ENGR90033	Internship	1, 2, S
MAST90007	Statistics for Research Workers	W
MCEN90015	Thermodynamics	1
MCEN90048	Artificial Intelligence for Engineers	1
MKTG90022	Commercialisation of Science	2
SCIE90011	From Lab to Life	1
SKIL90004	Project Management in Science	1

## ENGR90033 INTERNSHIP

ENGR90033 Internship is a 25-point subject that gives students the opportunity to undertake an internship of 10-15 weeks (a minimum 350 hours) for academic credit toward their degree.

ENGR90033 requires two Approved Electives and there is an application process.

Due to the workload, students are advised not to take a standard 50-point load during semester while simultaneously taking this subject. In Semesters 1 and 2, ENGR90033 Internship can be taken along with one additional 12.5-point subject. Summer enrolment is restricted to 25 points so students can only take the ENGR90033 Internship.

### Am I eligible?

Students require an average grade of H2B (70%) or above and there are minimum coursework completion requirements to be eligible for a University-sourced internship.

### How do I apply?

Students may apply for university-sourced internships through a competitive process, or source their own internships.

Students intending on using a self-sourced internship must apply to have it approved by the ENGR90033 subject coordinator by contacting [engit-placements@unimelb.edu.au](mailto:engit-placements@unimelb.edu.au)

**Note:** Students will not be able to enrol into ENGR90033 Internship through the Student Portal until their internship has been approved and signed off.

Further information is available in the Handbook: [ENGR90033 Internship](#).

## EXCHANGE AND STUDY ABROAD

The Faculty of Engineering and Information Technology Exchange and Study Abroad programs facilitate immersion in a different social, cultural and intellectual settings, with the chance to add an international perspective to study.

This can be done as an exchange or study abroad program: With an approved study plan, this can provide credit or fulfill academic requirements. There are also opportunities to complete a research project or industry project overseas in a full-time placement over the summer break.

Please note that due to current travel restrictions around the world, exchange and study abroad options may also be limited.

### Why study overseas?

There are many reasons why you may wish to consider study abroad or exchange. Your reasons can be based on academic, personal, career aspirations or those below:

- **Gain a global perspective on your studies:** Study at an international university and gain a different perspective on your studies.
- **Challenge yourself:** Gain independence and build your self-confidence.
- **Make some international connections:** Build links by meeting new people.
- **Improve your language skills:** Immerse yourself in another culture and either refine your foreign language skills or learn a new language.

### Student exchange information sessions

Information sessions for students are run throughout the year by the Global Mobility team.

General information sessions are the first step to hear more about the varied opportunities available around the world. They are intended to provide a general overview of how to undertake part of your studies overseas and get you thinking about where you would like to go.

#### Further information:

Please contact the Global Mobility Coordinator for Engineering & IT:

[eng-exchange@unimelb.edu.au](mailto:eng-exchange@unimelb.edu.au)

For subject/course-specific information, you can contact Biomedical Engineering Exchange Coordinator:

**Dr Kathryn Stok** [kathryn.stok@unimelb.edu.au](mailto:kathryn.stok@unimelb.edu.au).

## VACATION WORK

The Department strongly recommends that you obtain vacation work with an engineering employer during your university studies. This work is of the greatest value at the end of your penultimate year and is highly valuable at any stage of your degree program.

Vacation work is advertised by major companies within Australia from March to July. These positions are highly competitive. Other companies may offer vacation work and you will need to approach these companies yourself. If you are an overseas student, you may find it easier to gain an internship in your home country. Please contact the Academic Support Coordinator for advice on companies in your country who you could approach.

Please ensure that your cover letter and resume are checked by others before you use them. You will not get past the first selection round if these documents are poorly formatted, contain spelling mistakes or incorrect grammar.

In some cases, you may be able to use your vacation work as credit towards ENGR90033 (see page 11). However, to do so, the university must first sign an agreement with your intended employer. This means that **you need to notify the Engineering Placements team ([eng-placements@unimelb.edu.au](mailto:eng-placements@unimelb.edu.au)) at least one month in advance** of the intended work to determine whether this is possible.

Upon completion of vacation work or relevant work experience, please complete a 'Vacation Work Record', and ask your company supervisor to also comment and sign. This document can then be kept by both the Department and you as a permanent record of your experience.

**Further advice on vacation work and careers can be obtained from:**

<https://students.unimelb.edu.au/careers/discover-your-career-options>

## ENGINEERING PRACTICE HURDLE

The Engineering Practice Hurdle is the submission of an ePortfolio demonstrating your capabilities in these Professional Skills for internal assessment within the School of Engineering. The primary goal of these applications is to demonstrate that you have achieved good levels of competency in skills required by practicing engineers with a focus on those that are not technical by nature such as communications and teamwork.

You will need to complete the Engineering Practice Hurdle before you can graduate with a Master of Engineering.

Your primary resource for information about the Engineering Practice Hurdle is the dedicated community on the LMS.

Specific to the engineering practice hurdle, this community contains:

- Engineering practice hurdle requirements
- Assessment criteria for the engineering practice hurdle
- A discussion board for seeking assistance
- The link for submitting your applications.

Engineering Practice Hurdle (EPH) can be met with one of the following options:

- **CHEN90028 Chemical Engineering Internship**
- **ENGR90033 Internship**
- **Leaders in Communities Award**
  - 3 components:
    - Volunteer ventures (40 hours min)
    - Uni action (20 hours min)
    - Professional skills (4 sessions, internal/external)
  - <https://eng.unimelb.edu.au/students/coursework/study-resources/practice-hurdle/leaders-in-communities>
- **Not-for-Credit Internship**
  - 350 hours of self-sourced paid work experience relevant to degree
  - Within 12 months, max 3 opportunities
  - Prior approval from FEIT Student Enrichment Team (no backdating)
  - <https://eng.unimelb.edu.au/students/coursework/study-resources/practice-hurdle/internship-no-credit>
- **Skills Towards Employment Program (STEP)**
  - ePortfolio demonstrating written & verbal communication skills
    - Written piece
    - Technical presentation
    - Prep pieces
    - Improvement plans
  - May be from studies or extracurricular activities – may be submitted during any semester of study
    - Biosystems Design final presentation, Endeavour presentation, etc.
  - Run as a subject on Canvas
  - <https://eng.unimelb.edu.au/students/coursework/study-resources/practice-hurdle/step>

**For more Information contact:** [eph-info@unimelb.edu.au](mailto:eph-info@unimelb.edu.au).

## STUDENT SERVICES

The following services are available to all University of Melbourne students:

### Academic Skills

Academic Skills can help students with academic writing, time and task management, oral presentations, exam preparation, and English language development.

### Counseling and Psychological Services

Counselling and Psychological Services provides you with free individual appointments, and workshops during the semester.

### Library

The University Library holds large collections of printed books, e-books, journals, databases, reference materials, audio-visual and other items available for loan to students.

### Melbourne Scholarships

Melbourne Scholarships is responsible for the administration and promotion of major scholarship programs for undergraduate, graduate coursework and research students.

### Safer Community Program

The Safer Community Program (SCP) aims to promote an environment that fosters safe learning, working and living at the University of Melbourne, and provides the opportunity to pass on the behavior of concern before it develops into something serious.

### Student Union Legal Service

The Student Union Legal Service can provide you with legal advice, support and referral service on an initial consultation basis.

### AIRport

The Academic Interactive Resources portal (AIRport) can help you make a smooth transition to the University and improve your academic writing and study skills.

### Disability Liaison

The Disability Liaison team provides a range of advice and services for students who experience disability as a result of health conditions or impairment.

### Health Service

The Health Service provides confidential medical care, at no direct cost to students with Medicare or OSHC World care insurance.

### Melbourne Centre for the Study of Higher Education

The Melbourne Centre for the Study of Higher Education offers programs to support quality, innovation, and careers in teaching, research, engagement, and leadership and management for graduate researchers and academic staff.

### [Student IT](#)

The Student IT team supports you with setting up your login account, connecting to UniWireless, using the University's learning tools and systems, printing and document scanning.

### [ask.unimelb](#)

ask.unimelb is the University's comprehensive FAQ database for students and staff. Looking for info? Start here!

### [Children's Services](#)

Two Children's Centres provide quality early childhood care and education for your child or children.

### [Graduate Student Association](#)

The University of Melbourne Graduate Student Association (GSA) is the student representative body for graduates at the University of Melbourne.

### [Melbourne Careers Centre](#)

Melbourne Careers Centre provides a range of career programs, services, and resources for students to assist with their career development.

### [Melbourne University Sport](#)

Melbourne University Sport offers a range of resources including a great variety of sporting clubs, fitness facilities, and services.

### [Student Housing](#)

Find out about your housing options and how to manage your tenancy (e.g. lease agreements, bonds, repairs, rent, eviction) through Student Housing.

### [Student Union Advocacy Service](#)

The Student Union Advocacy Service (SUAS) provides independent advocacy services to undergraduate and graduate students.

### [Chaplaincy](#)

Perhaps you are thinking about the meaning of life, wondering where your studies lead, or you are experiencing grief or loss. Chaplains are here to support you.

### [Financial Aid](#)

If you find yourself in financial difficulty, not sure how to fill out a tax return, got a question on government subsidies, then visit Financial Aid.

### [International Student Services](#)

International Student Services support all international students and their families during their time at the University.



### **Melbourne Global Mobility**

Melbourne Global Mobility offers you a range of exciting overseas experiences as part of your degree.

### **Murrup Barak**

The Murrup Barak Melbourne Institute for Indigenous Development provides Aboriginal and Torres Strait Islander students both undergraduate and graduate with a range of support services.

### **Student Union**

The Student Union promotes student welfare and culture on campus.

### **UMeyecare Clinic**

The University of Melbourne Eye Care (UMeyecare) clinic offers patient care primarily for University staff and students but is also open to the general public and for specialist referral by other practitioners.

For more information, please visit: <https://services.unimelb.edu.au/finder>

## STOP 1

### STOP

Offers a range of services to help you succeed

#### ADMISSIONS INFORMATION

- Our courses
- Entry requirements
- Single subject studies
- Extension program

#### ADMINISTRATIVE AND INFORMATION SERVICES

- Fees
- Transcripts and academic statements
- Scholarships and graduations

#### ENROLMENT SERVICES

- Course planning
- Enrolment assistance
- Special consideration
- Student equity

#### SKILLS AND DEVELOPMENT SERVICES

- Careers
- Academic skills
- Student connect
- Study abroad and exchange

#### SUPPORT SERVICES

- Disability
- Elite athletes and international student support
- Housing
- Financial aid
- Safer Community Program

### STOP

Student Equity and Disability Support

If you need ongoing assistance due to long-term circumstances, you can register with Student Equity and Disability Support.

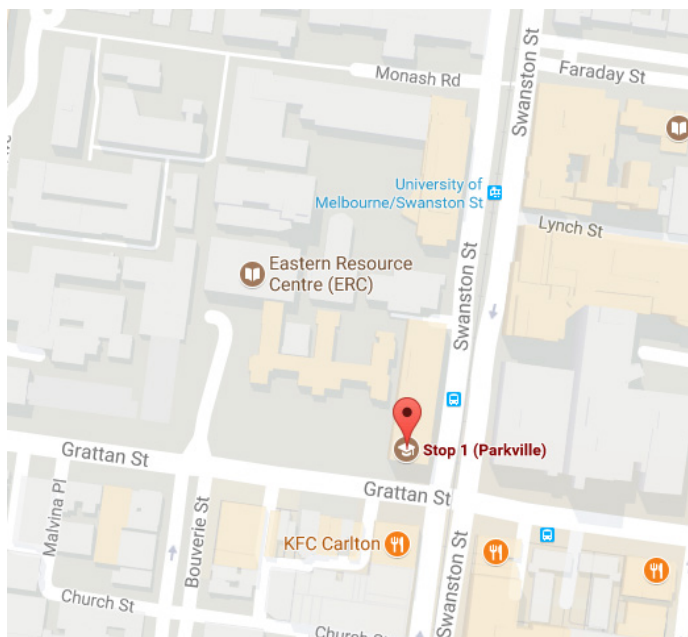
We offer a range of support services:

- Alternative formats for written materials
- Support workers, such as note-takers
- Specialist equipment
- Assistive technology
- Accessible teaching spaces

Visit [services.unimelb.edu.au/disability/students](https://services.unimelb.edu.au/disability/students)

## How do I contact STOP 1?

STOP 1 is located at 757 Swanston St, near the corner of Grattan and Swanston Streets (see Map below)



## STOP 1

Your student services  
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Current opening hours: [students.unimelb.edu.au/stop1](https://students.unimelb.edu.au/stop1)

## ADVANCED STANDING

### What is Advanced Standing

Advanced standing (sometimes known as credit or recognition of prior learning) is an acknowledgement of prior study granted towards your current degree, based on prior study or work experience. If advanced standing is awarded the length of your degree may be reduced. You can find more information about applying for Advanced Standing at: <https://study.unimelb.edu.au/how-to-apply/advanced-standing>

### Credit policies

Credit decisions are subject to the University's [Advanced Standing and Accelerated Entry Policy](#). The University is also a signatory to the [Go8 Credit Transfer Agreement](#) to help facilitate the transfer of credit earned by students if they move from one Group of Eight university to another.

## SPECIAL CONSIDERATION

Special Consideration is available to students who have had their studies significantly impacted by short-term circumstances reasonably beyond their control such as acute illness.

For more information please visit: <http://ask.unimelb.edu.au/>. Alternatively, speak to a staff member at Stop1 (<http://students.unimelb.edu.au/stop1>)

P: 13 MELB (13 6352)

E: Submit an enquiry (<https://ask.unimelb.edu.au/app/ask>)

## ACADEMIC INTEGRITY

### Introduction

All University of Melbourne students are expected to uphold academic integrity in all aspects of every piece of work that they submit for assessment.

### Resources

Please see the University of Melbourne Academic Integrity website for further information: <http://academicintegrity.unimelb.edu.au/>

## EXAMINATIONS

### Examination Rules

There are several important rules to follow during a University examination. For more information, you should always refer to the [Assessments and Results Policy \(MPF1326\)](#) (item 5.23 onwards).

Note that you must bring an [acceptable form of photo ID](#) to all your examinations.

Other general information in relation to exams is provided below:

- [Exam Start and Arrival Times](#) (Item 5.27)
- [What you can bring into an Exam](#) (Item 5.60-70)
- [Storing your personal possessions at an Exam](#)
- [Attendance at Exams](#) (most crucially, your availability during the Exam Period).

## LECTURE THEATRE LOCATIONS

A map of the buildings at the University of Melbourne Parkville campus may be found here: <https://maps.unimelb.edu.au/parkville/building>.

Lecture venues according to Building may be found here: <http://learningspaces.unimelb.edu.au/room-search>.

## SAFETY

The Faculty of Engineering and Information Technology is committed to providing and maintaining a workplace that is safe and without risk to the health of our staff, students, and visitors to our facilities.

The management of the Faculty will take all measures necessary to ensure adherence to safe work practices and conditions and these will be given priority in the Faculty 's planning, procedures and work instructions.

The creation and maintenance of a safe and healthy working environment is an integral part of our operation and we actively pursue the goals of this policy. The University follows the National Assessment Tool (NAT) program to ensure that these goals are achieved, and the Faculty of Engineering and Information Technology is committed to maintaining its accreditation under this program.

It is expected that, through consultation and co-operation, all staff, students, contractors, and visitors will observe OHS rules and safe working practices and make every effort to reduce the risk of injury to themselves, their fellow workers and others. A Task Risk Assessment form will need to be completed for some laboratory classes.

The management of the Faculty of Engineering and Information Technology is committed to the provision of appropriate resources and training in order to assist all staff and students to fulfill their responsibilities and maintain a safe working environment.

### **Emergency Contact Information**

#### **The University of Melbourne Security**

Emergency phone number: +61 3 8344 6666 (internal extension 46666)

Enquiry phone number: +61 3 8344 4674

**Note:** University of Melbourne security guards are trained first aiders and can be called upon to supply first aid in an after-hours emergency situation.

#### **FEIT Occupational Health and Safety Unit**

Emergency phone number: +61 3 8344 2400 (internal extension 42400) and business hours only

#### **Ambulance, Police or Fire Brigade**

From a university phone: 0-000

From a mobile phone: 000 or 112

## RESEARCH HIGHER DEGREES

The Department of Biomedical Engineering drives research and education in medical technologies, health informatics, and healthcare delivery. Combining the expertise of engineers, biomedical researchers, clinical practitioners, and industry partners, we create innovative medical solutions that have a societal and economic impact.

The Department offers PhD and MPhil research programs in several themes, including:

- Biomaterials and tissue engineering
- Biomechanics and mechanobiology
- Neural engineering
- Biomedical imaging
- Systems and synthetic biology
- Biomicrosystems

More information about research projects may be found on the Department Website:

[http://www.bme.unimelb.edu.au/research/.](http://www.bme.unimelb.edu.au/research/)

### Interested in Further Study by Research?

#### Who should apply?

Successful applicants for admission to research and scholarships with Engineering & IT will typically:

- Have secured strong support from their nominated supervisor
- Be placed in the top 5% of their graduating class
- Have evidence of research potential by having completed a major research project worth 25% or more of a full year, as part of their final year of their Bachelor or Master degree.

#### Before you apply, find a supervisor

As a research student, you will work under the guidance of an academic supervisor. Your supervisor will provide advice and direction throughout your research project. Your PhD project is often part of a larger project run by your supervisor. It is your responsibility to identify a supervisor you would like to work with, prior to making an application. You must supply documented evidence that you have secured a supervisor, who has agreed to work with you on your research proposal.

**Further details on the application process and Research Scholarships can be found at:**

<https://eng.unimelb.edu.au/research/graduate-research>

## THE MELBOURNE UNIVERSITY BIOMEDICAL ENGINEERING SOCIETY

The Melbourne University Biomedical Engineering Society (MUBES) is the faculty-based student-run body for biomedical engineering students at the University of Melbourne. MUBES are affiliated with the University of Melbourne Student Union (UMSU) and serve as a professional and social body for anyone studying or interested in biomedical engineering.

MUBES runs events throughout the year to update students with upcoming learning and job opportunities. MUBES offer academic services with frequent software workshops (MATLAB and Solidworks). They host an Industry Night once per year, which attracts prospective employers and provides invaluable networking opportunities. MUBES also organizes frequent social events including barbeques (free food and drinks) and Trivia Night events.

Follow MUBES using the Facebook group (<https://www.facebook.com/groups/mubes.unimelb>) and Facebook page (<https://www.facebook.com/officialmubepage>) where all events are advertised. You may find MUBES during Orientation Week or at any of our events to sign up!

If you have any questions please feel free to get in touch with any of the committee members via email, on the Facebook page, or at [mubes.unimelb@gmail.com](mailto:mubes.unimelb@gmail.com).

### Committee Members 2022

Role	Incumbent
President	Cindy Millenia Hidajat
Vice President	Shavin Fernando
Treasurer	Anton Kogios
Secretary	Julian Bianco
Education Officer	Sabrina Wang
Publicity Officer	Aaron Khoo
Outreach Officer	Auwen Xia
Social Coordinator	Jessica Ngan
International Representative	Christopher Ong
Undergraduate Representative	Yeely Khoh



## DEPARTMENT OF BIOMEDICAL ENGINEERING STAFF

Name	Position	Email
<b>Academic Staff</b>		
<b>David Ackland</b>	Associate Professor	<a href="mailto:dackland@unimelb.edu.au">dackland@unimelb.edu.au</a>
<b>Anthony Burkitt</b>	Professor	<a href="mailto:aburkitt@unimelb.edu.au">aburkitt@unimelb.edu.au</a>
<b>David Collins</b>	Senior Lecturer	<a href="mailto:david.collins@unimelb.edu.au">david.collins@unimelb.edu.au</a>
<b>Katie Davey</b>	Lecturer	<a href="mailto:catherine.davey@unimelb.edu.au">catherine.davey@unimelb.edu.au</a>
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<b>Vini Gautam</b>	Lecturer	<a href="mailto:vini.gautam@unimelb.edu.au">vini.gautam@unimelb.edu.au</a>
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<b>Vijay Rajagopal</b>	Senior Lecturer	<a href="mailto:vijay.rajagopal@unimelb.edu.au">vijay.rajagopal@unimelb.edu.au</a>
<b>Kathryn Stok</b>	Associate Professor and BME Course Coordinator	<a href="mailto:kathryn.stok@unimelb.edu.au">kathryn.stok@unimelb.edu.au</a>
<b>Andrew Zalesky</b>	Associate Professor	<a href="mailto:azalesky@unimelb.edu.au">azalesky@unimelb.edu.au</a>
<b>Professional Staff</b>		
<b>Natasha Baxter</b>	Department Administrator	
<b>Peter Mason (from 31-01-2022)</b>	Academic Support Coordinator	<a href="mailto:peter.mason@unimelb.edu.au">peter.mason@unimelb.edu.au</a>
<b>School of Chemical and Biomedical Engineering Leadership</b>		
<b>Sandra Kentish</b>	Head of Chemical and Biomedical Engineering	<a href="mailto:sandraek@unimelb.edu.au">sandraek@unimelb.edu.au</a>

## MEET THE STAFF IN THE DEPARTMENT OF BIOMEDICAL ENGINEERING

**Associate Professor David Ackland**



Associate Professor Ackland is an ARC Future Fellow, and Deputy Director of the ARC Training Centre for Medical Implant Technologies. His research focuses on computational modelling and simulation of human movement, with a particular emphasis on upper limb and maxillofacial surgery and biomechanics. He employs medical imaging, human motion experiments, musculoskeletal modelling, and in vitro biomechanical experiments as his primary research techniques. A/Prof Ackland has close ties to the orthopaedics industry and has a particular interest in the design and evaluation of joint replacements and other implantable devices for the treatment of end-stage bone and joint conditions.

**Professor Anthony Burkitt**



Professor Anthony Burkitt holds the Chair in Bio-Signals and Bio-Systems in the Department of Biomedical Engineering. He was the Director of Bionic Vision Australia (2010-2016) - a special research initiative in bionic vision science and technology of the Australian Research Council (ARC). He successfully led the project through all of its phases: project conception, securing \$50 million in ARC funding, the research and development programs that led to the development of a prototype bionic eye (suprachoroidal retinal implant), the successful implantation in three patients, and the establishment of the company Bionic Vision Technologies (BVT) with US\$18M of venture capital for the ongoing commercial and clinical development of the technology. In addition to his work on the bionic eye, Professor Burkitt's research encompasses a number of areas of neuroscience and medical bionics, including computational neuroscience, neuro-engineering, cochlear-implant speech processing and bio-signal processing for epilepsy. His research has been instrumental in the development of visual stimulation paradigms for retinal implants, new cochlear implant speech processing strategies, methods for detecting and predicting seizures, and the use of electrical stimulation for seizure abatement in epilepsy.

**Dr David Collins**



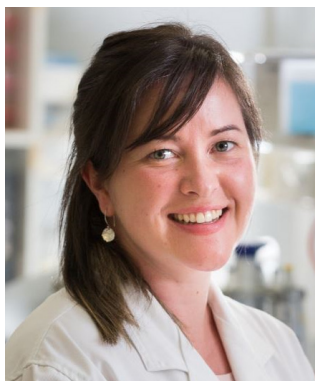
Dr David Collins is a DECRA fellow, Head of the Collins Bio-Microsystems Laboratory (CBML) and Senior Lecturer in the Biomedical Engineering Department. David's main research interests are in micromanipulation of cells and tissues for biosensing, advanced tissue engineering and diagnostic applications. High frequency acoustic fields are particularly suitable for cell manipulation due to their biocompatibility and ability to generate force gradients with micron-scale dimensions. Ongoing projects include those on 3D bioprinting, flow cytometry and organ-on-a-chip systems at the nexus of microsystems and biology. Prior to his role at the University of Melbourne David was a postdoc at MIT and in Singapore. David maintains research linkages with groups across Melbourne as well as Germany, the US and Singapore.

**Dr Katie Davey**



Dr Katie Davey is a Lecturer in the Department of Biomedical Engineering. Katie's current research uses advanced statistical signal processing, in conjunction with simulation and modelling techniques, to mathematically and programmatically model cortical processes and gain insight into how we perceive and process sensory information. Her primary research areas are spike timing dependent synaptic plasticity (STDP) - the process by which neurons adapt connection strengths to other neurons during learning, and functional MRI - the acquisition and analysis of a series of low-resolution magnetic resonance images. Katie has additional collaborations, including with Imperial College of London investigating the encoding and storage of location information by place cells using calcium imaging, and the Florey in modelling neural pathways for bowel disease. Katie completed her doctoral research in functional MRI connectivity, which is a field of research that analyses a series of MRI images to identify how brain regions cooperate to achieve sensory and perception tasks. After completing her PhD, Katie worked at the Defence Science Technology Group, modelling pilot cognition and aircraft control. She then worked in finance, modelling and predicting the movement of stock prices on the S&P500.

**Dr Brooke Farrugia**



Dr Brooke Farrugia is a Senior Lecturer in the Department of Biomedical Engineering. Dr Farrugia has a multifaceted research background including biomaterial development and characterisation, wound healing, including *in vitro* models, molecular biology and glycobiology. Dr Farrugia received her PhD from UNSW Sydney investigating polyurethane nanocomposites for blood contacting applications and held post-doctoral positions at the Institute of Health and Biomedical Innovation, Queensland University of Technology (2010-2012) and the Graduate School of Biomedical Engineering, UNSW Sydney (2013 – 2018). Specifically, her research activities and interests lie in the fields of wound healing and tissue regeneration; the molecular mechanisms behind their occurrence, and the development of new therapies.

**Dr Vini Gautam**



Dr Vini Gautam is a lecturer and ARC DECRA fellow in the department of Biomedical Engineering at the University of Melbourne. Dr Gautam's main research interests are in developing devices and technologies to address some of the key challenges in biomedicine. Her research spans the areas of bionic vision (e.g. developing artificial photoreceptors for stimulating blind retinal tissues); brain-machine interfaces (e.g. developing flexible electrodes for stimulating brain cells); and neural tissue engineering (e.g. creating scaffolds to understand how brain circuits form and connect). She is also involved in developing new tools to better understand Alzheimer's Disease.

**Professor David Grayden**



Professor David Grayden is the Clifford Chair in Neural Engineering. Professor Grayden's main research interests are in understanding how the brain processes information, how best to present information to the brain using medical bionics, such as the bionic ear and bionic eye, and how to record information from the brain, such as for brain-machine interfaces. He is also conducting research in epileptic seizure prediction and electrical stimulation to prevent or stop epileptic seizures, and in electrical stimulation of the vagus nerve to control inflammatory bowel disease.

**Associate Professor Daniel Heath**



Dr Daniel Heath is an Associate Professor in the Department of Biomedical Engineering. His research focuses on developing next-generation biomaterials. He has a specific interest in blood-material interactions, as poor interactions between blood and biomaterials lead to the failure of many medical devices including vascular grafts and stents. His lab hopes to address these challenges by developing new biomaterials with improved blood-material interactions. In many ways, cells are the best producers of biomaterials. Therefore, the Heath Lab also looks at extracellular matrix materials and their applications as biomaterials. Core to this technology is the decellularization of tissue or cell cultures in order to produce extracellular matrix materials that can be used for a variety of applications.

**Dr Sam John**



Dr Sam John is a Senior Lecturer in Neural Engineering, in the Department of Biomedical Engineering. Dr John's research interests are in neural prosthetics. He is specifically interested in understanding long range interactions in the brain such as how the deep brain regions and the cerebral cortex interact. He will use this information to develop Neural Prosthetics that can help people with motor or sensory loss. Some common application of his work is in the development of the Bionic Ear, the Bionic Eye, Brain Machine Interfaces and Closed Loop Neuromodulation. He has research linkages with The Royal Melbourne Hospital, Florey Institute for Neuroscience and Mental Health, and the Osaka University, Osaka Japan.

**Professor Leigh Johnston**



Professor Leigh Johnston is the Head of the Department of Biomedical Engineering, and the Director of the Melbourne Brain Centre Imaging Unit in the Department of Radiology. Her research focus is the development of medical imaging acquisition and analysis techniques, with a speciality in ultra-high field Magnetic Resonance Imaging. Leigh has background expertise in statistical signal processing and image processing. Prior to her current appointment, she was a postdoctoral researcher at the Howard Florey Institute (Melbourne), York University (Canada), and the Université Catholique de Louvain (Belgium).

**Professor Sandra Kentish**



Professor Kentish holds a Bachelors, Masters and PhD from the University of Melbourne. Before she became an academic, she worked at Qenos, Kodak Australia and Kimberly Clark Australia for a total of nine years. Her research interests lie in membrane technology for gas and liquid separations. She was the Head of Department of Chemical Engineering from October 2012. In early 2017 she moved to a broader role as the Head of the School of Chemical and Biomedical Engineering.

**Dr Lionel Lam**



Dr Lionel Lam is a Lecturer (Teaching Fellow) within the Department of Biomedical Engineering. He obtained his Bachelor of Engineering in Chemical/Process Engineering (2011) from the University of Western Australia. He then completed his Master of Science in Chemical Engineering Practice (2013) and his PhD in Chemical Engineering (minoring in Biology, 2017) at the Massachusetts Institute of Technology. Dr Lam's doctoral research focused on the development and application of ex vivo single-cell phenotypic, transcriptomic, and functional assays on tumour-infiltrating immune cells to better understand differential responses to anti-PD-1 immunotherapy in mice.

**Professor Peter Vee Sin Lee**



Peter (Vee Sin) Lee is Professor and Deputy Head of the Department of Biomedical Engineering. He obtained his BEng in Mechanical Engineering (1st Class Hons., 1991) and PhD (1996) in Bioengineering from the University of Strathclyde, UK, and continued his post-doc in the same university from 1996 to 1998. He was a Research Fellow with the Biomaterials Group at the Institute of Materials Research and Engineering, Singapore, from 1998 to 2001. In 2001, he joined Defence Medical and Environmental Research Institute, DSO National Laboratories, Singapore, as the Head of the Bioengineering Laboratory. He was appointed as an Adjunct Associate Professor from 2002 to 2008 in the Division of Bioengineering at the National University of Singapore. He joined The University of Melbourne as a Senior Lecturer in 2008.

**Associate Professor  
Hamish Meffin**



Dr Hamish Meffin is an Associate Professor in the Department of Biomedical Engineering at The University of Melbourne and an Honorary Fellow at the National Vision Research Institute of Australia.

His research interests lie in two main fields: (1) medical bionics for the treatment of neural disorders and (2) systems neuroscience that seeks to understand the processing performed by the brain. He combines mathematical modelling and experimental electrophysiology with expertise in device development to progress these fields. He is particularly interested in vision. His work has contributed to the development of a retinal implant for the restoration of vision to people with degenerative retinal diseases. His research also explains how the visual areas of the brain interprets raw sensory input from the retina to allow perception of the world. He has linkages with the National Vision Research Institute and The Bionic Institute

**Professor Andrea O'Connor**



Professor O'Connor is the Shanahan Chair in Frontier Medical Solutions in the Department of Biomedical Engineering. Her expertise is in chemical and biomedical engineering with particular focus areas including biomaterials, tissue engineering, porous materials, and 3D printing. She leads the Tissue Engineering Research Group. She has active collaborations with several medical research institutes and medical device companies in Australia and has worked in the chemical industry in Australia and overseas.

**Dr Vijay Rajagopal**



Dr Vijay Rajagopal is a Senior Lecturer at the Department of Biomedical Engineering. Dr Rajagopal leads the Cell Structure and Mechanobiology Group and is a co-founder of the Faculty of Engineering and Information Technology Mechanobiology Lab in the Parkville Biomedical Precinct. Cells harness the interplay between electrical, chemical and mechanical signals as well as their own shape to perform a variety of functions in our bodies. This interplay is what makes the heart beat and also enables cancer cells to dynamically change shape and migrate from a tumor to new regions of the body. By making new experimental measurements and developing innovative computational models, Dr Rajagopal primarily focuses on discovering ways to manipulate or engineer this interplay to effect positive treatments for diseases of the heart, cancer metastasis and red blood cell diseases.

**Associate Professor  
Kathryn Stok**



Kathryn Stok (FIEAust) is Associate Professor of Mechanobiology in the Department of Biomedical Engineering, and an innovative biomedical engineer in quantitative microstructural imaging (micro-computed tomography) and biomechanics of cartilage and joint structures. She uses a variety of experimental and computational approaches. Her research work merges solid engineering approaches with biomedical advancement. She aims to improve mechanobiological measurement and control methods using novel imaging, mechanics and computational modelling. This involves the development of novel, in vivo, imaging-based measurement technologies for hard and soft biological tissues in 3D at different length scales. It will further enable investigation of joint health, with commercial potential in imaging, mechanobiology and biofabrication, and translation into Medtech patents and spinoffs. She is the Head of the Integrative Cartilage Research Group and a co-founder of the Melbourne Mechanobiology Lab in the Parkville Biomedical Precinct.

**Associate Professor  
Andrew Zalesky**



Associate Professor Andrew Zalesky is a Senior Researcher, holding a joint appointment in the School of Medicine and Faculty of Engineering and Information Technology. He completed his PhD in electrical engineering in 2006. He is internationally recognized for developing the network-based statistics, one of the most widely used methods for performing statistical inference on brain networks. His contributions to neuropsychiatry include mapping of the schizophrenia connectome and development of advanced methods for analyzing patient neuroimaging data. He co-authored *Fundamentals of Brain Network Analysis*, one of the best-selling Elsevier neuroscience titles published in 2016 and commended by the British Medical Association. His 2010 nodes paper has become a classic in the field of imaging connectomics. He holds the NHMRC Senior Research Fellowship and leads the Systems Neuropsychiatry Group. His primary research interests are in systems neuroscience, neuroimaging, psychiatry, and networks.



## WHERE TO GO FOR HELP

Try the following:

**Ask Unimelb:** <http://ask.unimelb.edu.au/>

**Stop 1:** <http://students.unimelb.edu.au/stop1>

For matters relating to the Master of Biomedical Engineering, Master of Biomedical Engineering (Business) or the Biomedical Engineering Systems major in the Bachelor of Science and Bachelor of Biomedicine, please contact Course Coordinator Dr Kathryn Stok of the Department of Biomedical Engineering, via [kathryn.stok@unimelb.edu.au](mailto:kathryn.stok@unimelb.edu.au).

## You are also welcome to come and visit us at:

203 Bouverie Street

Department of Biomedical Engineering

