

# UVIC

BIOMEDICAL ENGINEERING  
MENG BIOMEDICAL SYSTEMS

MAY 13, 2024



# AGENDA

1. PROGRAM INFORMATION
2. CO-OPERATIVE EDUCATION
3. PROFESSIONALISM
4. COMMUNITY & CULTURE
5. CAPSTONE PROJECT
6. KEY CONTACTS AND ASSISTANCE
7. QUESTION/ANSWER

# 1. PROGRAM INFORMATION

# MENG IN BIOMEDICAL SYSTEMS

## 1. TECHNICAL COURSES

1. 5 CORE COURSES

2. 4 ELECTIVES

## 2. PROJECT (BME598)

The screenshot shows the University of Victoria Biomedical Engineering website. The header includes the university logo, the text 'University of Victoria | Biomedical Engineering', and navigation links for 'Faculty of Engineering and Computer Science', 'Academic calendar', 'A-Z', 'Directories', and 'Maps'. A search bar is located on the right. The main navigation menu includes 'Home', 'Future students', 'Current students', 'Careers & co-op', 'Faculty & research', 'Services', and 'BMEHT Showcase 2021'. The main content area is titled 'Master of Engineering in Biomedical Systems' and includes a breadcrumb trail 'home » future students » graduate'. The page describes the program, admission requirements, and application process. A sidebar on the left contains a navigation menu with items like 'Careers', 'Co-op success stories', 'Pathways to medicine', 'Student life', 'Finance your education', 'Apply for admission', 'Graduate', 'News', and 'Contact us'. A right sidebar features a 'CAREERS IN BIOMEDICAL ENGINEERING' logo, 'NEWS & EVENTS' with a list of announcements, and 'LABS & LINKS' with a link to 'Labs and teams'.

University of Victoria | Biomedical Engineering

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Home | Future students | Current students | Careers & co-op | Faculty & research | Services | BMEHT Showcase 2021

home » future students » graduate

### Master of Engineering in Biomedical Systems

Gain knowledge and experience in biomedical systems and biomedical devices with the Master of Engineering Biomedical Systems program at UVic. Learn to apply human physiology on scales from cells to organ systems to medical device design.

You must meet the minimum [admissions requirements](#) of the Faculty of Graduate Studies. An undergraduate degree in Engineering or Applied Science is preferred. We may consider relevant industrial experience combined with other types of degrees, diplomas or certifications.

If your first language is not English, you must provide proof of language proficiency. Learn more about [language requirements](#), including allowable exemptions and tests.

Review our [general admission requirements](#) for more information.

Even if you meet the language requirements, you may be required to take English language courses in addition to your other course work.

The admissions selection process is competitive. Typically, between 14 and 20 students are admitted to the program each year. Not all students who meet the minimum requirements will be admitted.

Please apply for admission to the [Faculty of Graduate Studies](#).

Your application must include:

- Online application
- Two assessment letters from professional or academic contacts

CAREERS IN BIOMEDICAL ENGINEERING

#### NEWS & EVENTS

Announcements

- 5th Biomedical Engineering and Health Technology Showcase
- Project funded to print "mini-brains" for drug screening
- UVic welcomes new biomedical director
- BME Experimental Learning Partnership with StarFish Medical

[More news & announcements](#)

+ News

#### LABS & LINKS

Labs and teams

# MENG

- Electives can be augmented\*

- Check website regularly for updates and changes

Up to date info:

<https://www.uvic.ca/calendar/>

## Program requirements

The MENG Biomedical Systems program provides students with knowledge and experience in biomedical systems and biomedical devices. Human physiology on scales from cells to organ systems will be applied to medical device design. All MEng students will be under the supervision of the program director.

### Compulsory core courses

- Complete all of:
  - BME500 - Medical Device and System Design for Clinical Engineers (1.5)
  - BME501 - Biosensors and Imaging for Medical Device Design (1.5)
  - BME505 - Quantitative Human Physiology (1.5)
  - BME520 - Human Factors and Usability Engineering for Medical Devices (1.5)
  - BME598 - MEng Technical Project (3.0)

### Note

- Students can register in the Technical Project in any term.

### Elective courses

- Complete all of the following
  - Complete 6 units from:
    - BME510 - Bioprinting and 3D Printing Human Body Parts (1.5)
    - BME515 - Biomaterials and Tissue Engineering (1.5)
    - BME525 - Mechanics and Energy Conversion in Living Cells (1.5)
    - BME548 - Introduction to Musculoskeletal Mechanics (1.5)
    - BME552 - Microfluidics for Biomedical and Energy Applications (1.5)
    - BME580 - Special Topics in Biomedical Engineering (1.5)
    - ECE545 - Nanoelectronics (1.5)
    - ECE547 - Electronic Devices (1.5)
    - ECE591 - Professional Foundation (1.0)
    - MECH576 - Introduction to Electron Microscopy (1.5)
    - MECH580 - Selected Topics in Mechanical Engineering (1.5)
  - Credit for MECH580 will only be granted when taken in pre-approved topics. Registration in MECH 580 requires the approval of the program director.

### Note

- Not all elective courses are necessarily offered in each academic year. The student should contact the department that offers a particular elective course for scheduling information.

# BIOMECHANICS, MEDICAL ROBOTS, PROSTHETICS

Relevant skills and prerequisite areas: Control, digital control, embedded systems, robotics, electrical motors, kinematics, dynamics, mechanics, advanced manufacturing, additive manufacturing, biomechanics, material selection.



# BIOMEDICAL SIGNAL PROCESSING, INSTRUMENTATION, BIOSENSING

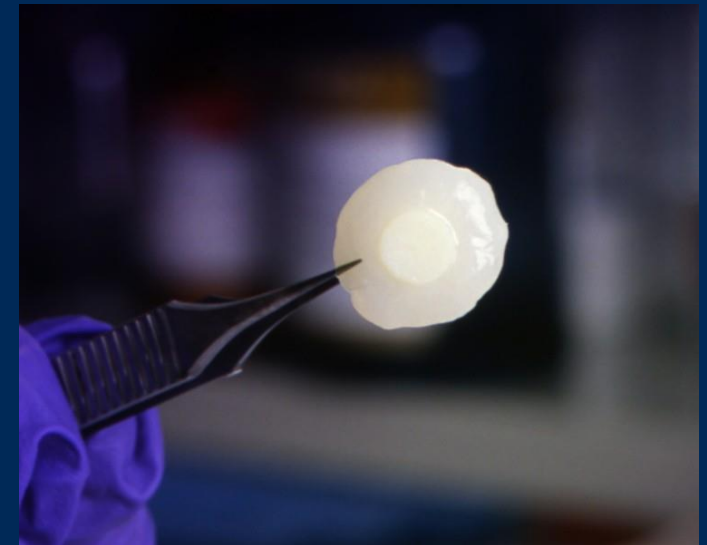
Relevant skills and prerequisite areas: Electronics (digital, analog), Amplification, denoising, digitization, sampling, microfluidics, real-time systems, embedded systems, programming, Signal processing, software development.





# BIOMATERIALS, TISSUE ENGINEERING, THERAPIES

Relevant skills and prerequisite areas: Biomaterials, 3D-printing, microfluidics, nanomaterials, programming, electromagnetics, photonics, nuclear medicine, propagation, absorption, scattering, mass transfer, fluid mechanics, heat transfer.





# CO-OP

BME co-op:  
Ash Senini  
asenini@uvic.ca

Inquire with co-op for  
eligibility, key-dates,  
and procedures

## Final Project

The topic of the project (BME 598) for the MEng program is subject to approval of the department.

The work leading to the project must be performed under the direction of an academic supervisor who is a member of the department's graduate faculty. A detailed description of the project will be presented in a formal report written by the student.

Each student's program is subject to the approval of the department.

## Oral Examination

MEng students will be required to defend their completed project in a final oral examination which is open to the public.

## Program Length

The program length for MEng is guided by time limits established by the Faculty of Graduate Studies. Typically, the Department of Mechanical Engineering MEng students are expected to complete program requirements within 24 months as it should take between 12 and 16 months to complete the program, which may be extended due to co-op.

## Co-operative education

Participation in the optional Co-operative Education program, which enables students to acquire knowledge, practical skills and workplace experience, is optional for full-time Master's students. Students require permission from their academic supervisor and the Co-op coordinator to participate in the Co-op program. Permission may be granted for additional work terms typically to a maximum of four. Interested students should contact the Engineering and Computer Science Co-op office during their first year. Students should also consult [Co-operative Education](#).

Up to date info:

<https://www.uvic.ca/calendar/>

# 2. NEXT: CO-OP INFORMATION



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## Co-op program

[Co-op program](#)

[How to apply](#)

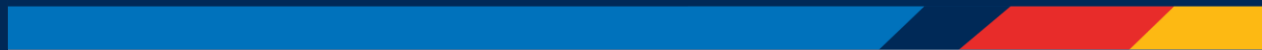
[Video](#)



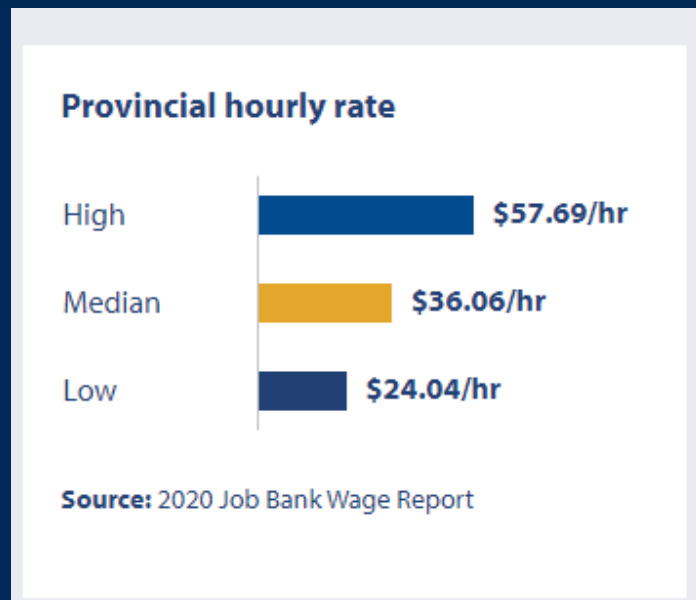
**BME co-op:**  
Ash Senini  
[asenini@uvic.ca](mailto:asenini@uvic.ca)

# CAREERS IN MASTERS OF ENGINEERING BIOMEDICAL SYSTEMS

Ash Senini  
Co-op Coordinator, Biomedical Engineering Undergrad



# JOB PROSPECTS FOR GRADUATE BIOMEDICAL ENGINEERS IN BC



The average salary for those with a Biomedical Systems or BME graduate degree is quite high

A graduate degree in this field will greatly prepare you for work in the private or public sector.

## JOBS INCLUDE...

- Medical instrumentation,
- Pharmaceutical,
- Hospitals/Hospital Administration,
- Medical/Scientific research facilities,
- Educational institutions (such as Uvic)

## IN CANADA...

- BC,
- Saskatchewan,
- Manitoba,
- Ontario and Quebec,
- Nova Scotia and New Brunswick

# WHAT IS CO-OPERATIVE EDUCATION

## Graduate programs

As a graduate student, you can take part in the optional co-op or work experience program.

## Program facts

Master's students: complete 2 work terms (8 months of work) to receive a co-op designation, or 1 work term to receive a "work experience" endorsement on your degree

# CO-OPERATIVE EDUCATION PROGRAM

## How to apply

Submit the [graduate co-op application form](#), by May 24<sup>th</sup>

<https://www.uvic.ca/coop/explore-programs/engineering/graduate-application-form/index.php>

International students should apply at least 2 semesters before the intended work term to ensure that there is enough time to receive a co-op work permit.



# CO-OP APPLICATION CTND.

## Application requirements

- Grad supervisor's permission to participate in the co-op program and each specific work term
- You must complete your first co-op work term before the academic term in which you complete your academic requirements (defend your thesis or equivalent)
- You must complete regular work term requirements (including Introduction to Professional Practice, competency assessments and all work term assignments)

# CO-OPERATIVE EDUCATION PROGRAM

Limited enrollment (for now)

Applications due May 24<sup>th</sup>

All applicants will be reviewed

- Resume
- Application Questionnaire Completed

Decision reached by Friday, May 31st

Co-op training/IPP begins shortly, successful completion leads to co-op access.

# 3. PROFESSIONALISM

▼ ————— Wikipedia —————

## Professionalism

*Not to be confused with [Professionalization](#).*

**Professionalism** is a set of standards that an individual is expected to adhere to in a [workplace](#), usually in order to appear serious, uniform, or respectful. What constitutes professionalism is hotly debated and varies from workplace to workplace and between [cultures](#).

# Standards for Professional Behaviour

What you can expect from us  
(and your peers)

What we expect from you



University of Victoria  
Faculty of Engineering and Computer Science

## Standards for Professional Behaviour

*It is the responsibility of all members of the Faculty of Engineering and Computer Science, students, staff and faculty, to model and promote standards of professional behaviour that support an effective learning environment and prepare graduates for careers as professionals.*

### Professional Behaviour

Professionalism is a way of conducting oneself that includes:

**Respect for others:** Respect for others is fundamental to professional behaviour. A professional strives to appreciate the differences among classmates and colleagues, provides fair constructive feedback when asked to evaluate others, contributes equitably in group work, and is punctual and avoids disrupting the learning and work environment. Professionals consider the effect of their words and actions on others and respect others' expectations of confidentiality and privacy.

**Commitment to quality:** A professional aims for the highest possible standards and endeavours to produce work in which they can take true pride. Professionals respect themselves and others, and demonstrate this through their work, words, actions and appearances.

**Responsibility:** A professional takes responsibility for their own progress by being prepared for all activities, including classes, labs, deadlines, meetings, etc. A professional also takes responsibility for their actions and respects the work of others. A professional considers consequences and is aware of how their actions will affect others.

**Personal integrity:** Professionalism is reflected by the extent to which others can rely upon you. A professional can be counted on to follow through on commitments, avoid conflicts of interest and bias, show respect and adhere to the rules of society or organizations with which they are involved.

*Adopted by the Faculty of Engineering and Computer Science, April 4, 2000 and by the Senate of the University on October 4, 2000.*

*Aspects of Faculty of Business "Standards for Professional Behaviour" document included. In the event that these standards contradict University policy, the University policy will take precedence.*

*Approved by Faculty Council May 5, 2021, approved by Senate August 2021; edits made March 31, 2023 to reflect updated Faculty name*

Professionals in the workplace are governed by codes of conduct/ethics. Knowing, understanding and adhering to those codes is a significant part of preparing to enter a profession. Examples of codes of conduct/ethics that are used in areas related to the engineering and/or computer science disciplines include those listed below. Students should be familiar with the core principles that are common to all such codes of conduct/ethics, many of which are also common to the rules for student conduct in the University Calendar.

- Engineers & Geoscientists BC [Code of Ethics](#)
- Canadian Information Processing Society [Code of Ethics and Standards of Conduct](#)
- Institute of Electrical and Electronics Engineers [IEEE Code of Ethics](#)
- Association for Computing Machinery [Code of Ethics and Professional Conduct](#)

In addition to the guidance in this standard, students are subject to all University policies and procedures relative to the matters of:

- Equity, Diversity and Inclusion
- Academic Integrity
- Non-Academic Misconduct
- Use of facilities
- Confidentiality
- Conflict of interest and bias

This document specifically addresses student expectations, enrolled in courses offered through the Faculty, regardless of whether the student is declared in a degree program, or if the student is representing the Faculty or University off-campus. Employees of the Faculty, who model and promote professional behaviour, as described in this document, are subject to policies and agreements related to their employment.

# Respect



**THE GOLDEN RULE**

vs



**THE PLATINUM RULE**

treat others how  
~~you~~ they want to  
be treated

# Commitment to Quality

We endeavor to produce work we can take pride in

# Responsibility

We are prepared for all activities and we are responsible for our progress

# Integrity

We follow a code of ethics and avoid biases and conflicts of interest.

Academic Integrity is taken very seriously. It is also often subject to misunderstandings. **Communication between students and instructors is key!**

## 4. COMMUNITY & CULTURE

Click [here](#) to view the video.



# 5. CAPSTONE PROJECT

## BME 598

# BME 598

- Application of course theory in engineering project
- Partnership with Faculty mentor
- Onus on student to find project and mentor

## Recommendations:

- Contact Program Director for assistance in identifying project/mentor
- Begin process one academic semester before starting BME 598
- Registration questions? Ms. Katharine Waring: [bme.coord@uvic.ca](mailto:bme.coord@uvic.ca)
- Project requirements? Dr. Christopher Dennison: [bmedirector@uvic.ca](mailto:bmedirector@uvic.ca)

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# 6. KEY CONTACTS & ASSISTANCE

# CONTACTS & ASSISTANCE

Program Director: Dr. Christopher Dennison (bmedirector@uvic.ca)

Program Co-Ordinator: Ms. Katharine Waring (bme.coord@uvic.ca)

MECH Grad Secretary: Ms. Keri Kingsley (mech.grad@uvic.ca)

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University of Victoria | Biomedical Engineering

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home » future students » graduate

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**CAREERS IN BIOMEDICAL ENGINEERING**

### NEWS & EVENTS

- **Announcements**

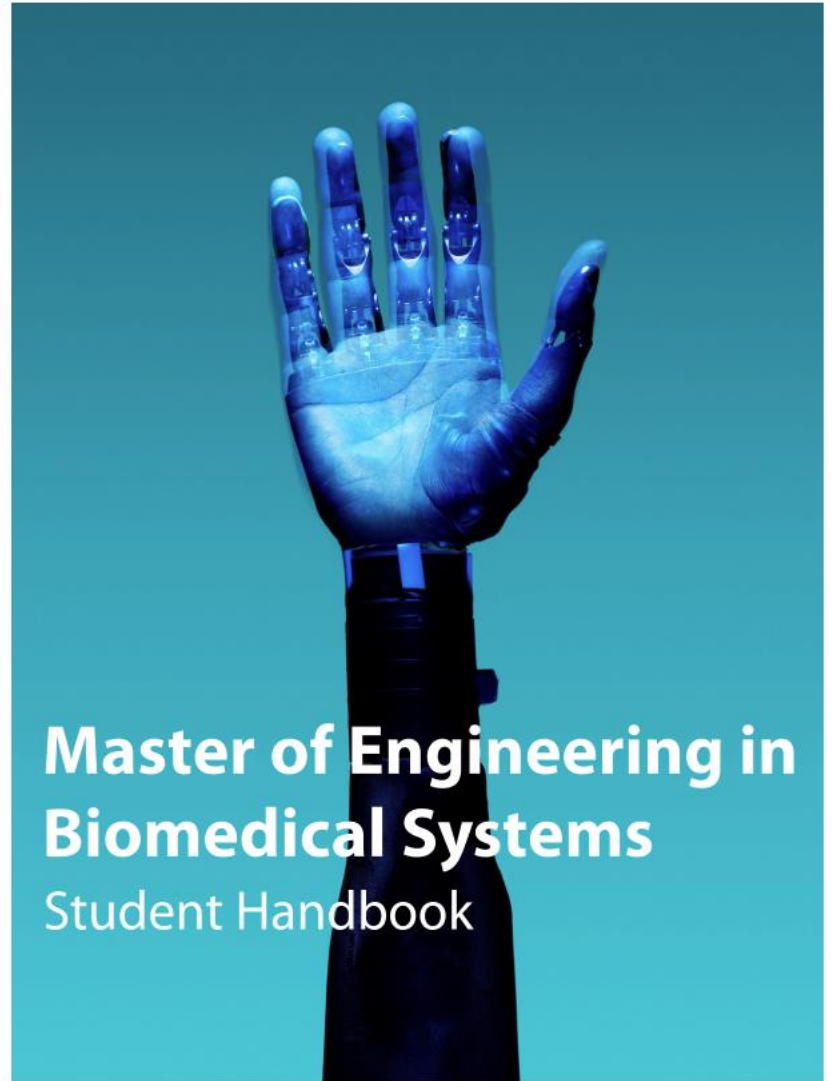
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[More news & announcements](#)

+ **News**

LABS & LINKS

# STUDENT HANDBOOK



**Master of Engineering in  
Biomedical Systems**  
Student Handbook

# QUESTIONS?

Follow up questions:

[bme.coord@uvic.ca](mailto:bme.coord@uvic.ca)

[bmedirector@uvic.ca](mailto:bmedirector@uvic.ca)