Mechanical Engineering Undergraduate Options

BIOMEDICAL | MECHATRONICS | THERMOFLUIDS

Our Options

The UBCV Mechanical Engineering undergraduate program engages you in an education with breadth and depth, giving you the teamwork, leadership, design and technical skills you need to work across a wide variety of sectors. This flexibility gives you the opportunity to explore different areas of interest, and the mobility to adapt when the industry changes. For many students, our general program is exactly what they want.

Some students, however, have a narrower focus.

They know where their passion lies, and they want to customize their degree to uniquely suit their career goals. The UBC Mechanical Engineering Options in **Biomedical Engineering, Mechatronics,** and **Thermofluids** allow you to pursue specialized coursework with professors who are leaders in their field, while still maintaining a solid core competency in mechanical engineering. Whether your goal is grad school, a second professional school, building your own business, or that perfect job in industry, pursuing a Mechanical Engineering Option allows you to demonstrate your passion, commitment, dedication, and abilities in the field you love.

Admissions

THERE ARE TWO INTAKES INTO THE OPTIONS:

Early Admission - apply by February 28 of your first year

- Minimum overall average of 80% for all first-year courses
- Acceptance to an Option is conditional upon being placed in Mech and successfully completing Mech 2

Regular Admission - apply by March 31 of your second year

- Must have completed Mech 2 (including 224/225) and have a minimum average of 65%

TO APPLY

Submit an application package, including the application form (available online), a cover letter, resume, unofficial transcript, and up to 5 pages of supplemental material. See our website for full details.

IMPORTANT TO KNOW

- Acceptance into Mech is a separate process than acceptance into an Option, and your acceptance into any of the Options will be conditional upon you being placed in Mech
- Because the cohort sizes for the Options are so small, most classes are only offered once per year. As most students in Mech are enrolled in Co-op, the class schedule for the Options follows the Co-op schedule. This means it will require a minimum of 2.5 years after Mech 2 to complete an Option, regardless of whether or not you enroll in Co-op.

Learn More

MECH.UBC.CA/UNDERGRADUATE

Student Services Office

P: 604-822-6584
E: students@mech.ubc.ca

Biomedical Option

In a world where the need for innovative medical solutions is rapidly growing, it's not surprising that Biomedical Engineering is one of the fastest growing fields.

From designing hip implants to heart valves, conducting research in academic and government institutions, and testing medical products, biomedical engineers are at the front line of life-changing innovation in the medical field.

The Biomedical Option in Mechanical Engineering gives students the knowledge and skills necessary for a future in biomedical engineering. With exposure to a range of courses from biofluids to orthopedics, access to highly reputed professors in the field and the opportunity to gain hands on experience at some of the best biomedical facilities in Western Canada, the Biomedical Option opens doors for those wishing to work in industry, pursue a graduate research degree or even head off to medical school.

HOW DOES THIS OPTION CUSTOMIZE YOUR DEGREE?

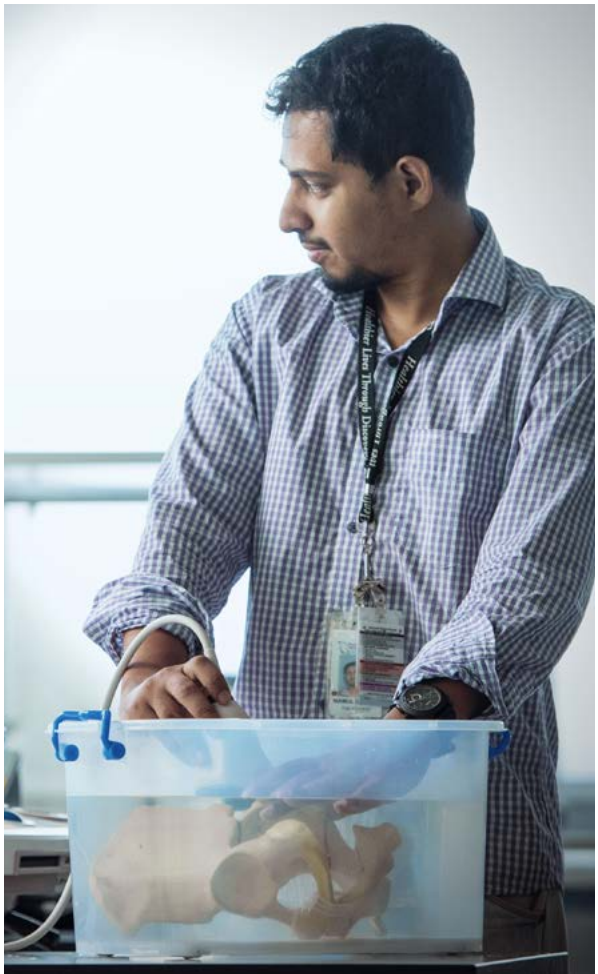
Courses in the Biomedical Option are highly specialized to medical applications, providing students with first-hand exposure to medical technologies and applications.

Remove these courses		Add these courses	
MECH 327	Thermal System Design	BMEG 410	Biomedical Equipment, Physiology and Anatomy
MECH 329	Materials for Mechanical Design	BMEG 456	Clinical and Industrial Biomedical Engineering
MECH 392	Manufacturing Processes	MTRL 495	Biomaterials
MECH 457	Mechanical Engineering Design Project	MECH 439	Biomechanics Research Seminar
		MECH 459	Biomedical Design Project
		+	Specialized technical electives

WHAT DOES THIS MEAN FOR YOU?

The Biomedical Option allows graduates to develop technical, communication and problem solving skills, as well as an in-depth understanding of medical technologies. As such, graduates are well-equipped to go out and work in industry, government institutions, or research facilities, or to pursue post-graduate education.

In industry, biomedical engineers can work in a variety of settings, from hospitals and pharmaceuticals to medical imaging and bioinstrumentation companies. Prosthesis development is a major biomedical specialization involving the design and optimization of knees, hips, shoulders and heart valves. Sports medicine is now tending to rely more on biomedical engineers to design devices and approaches to injury recovery, and tailor solutions for rehabilitation patients.



Mechatronics Option

With the growing capabilities of electronics, many mechanical systems are now either controlled by computers or enhanced by embedded sensors and circuits. This is Mechatronics, and it is one of modern society's most critical fields.

Mechatronics combines the principles of mechanical, computer, electrical, and controls engineering into a unified whole. Mechatronics engineers design everything from smartphones and kitchen appliances to CNC Machines, medical devices, and robots.

Students in the Mechatronics Option have access to one of the most well-equipped laboratories in North America, giving them the unique opportunity to gain hands-on experience in the integrated design of mechanical, electrical, and software systems. Students leave with the necessary background to pursue interesting and relevant projects, either in industry or graduate studies.

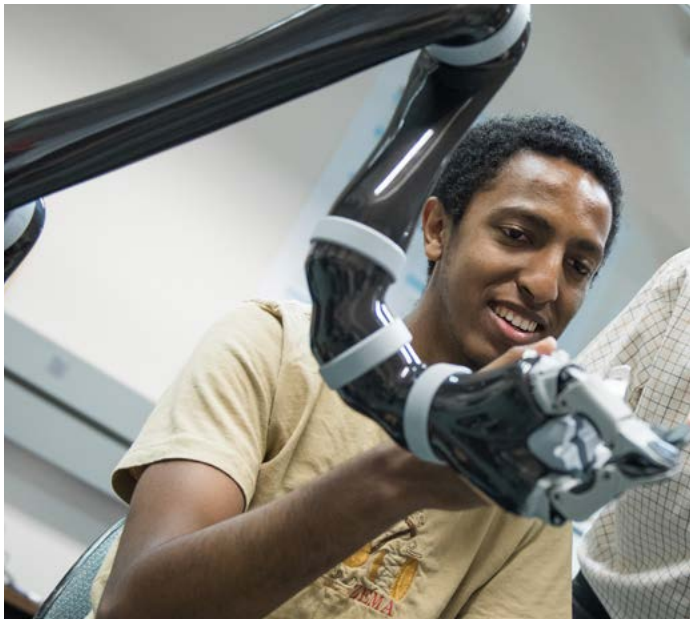
HOW DOES THIS OPTION CUSTOMIZE YOUR DEGREE?

Many of the mechatronics courses contain a lab component to bolster students' hands-on experience and teamwork skills. With small class sizes and supportive professors, students get a robust education in this cross-disciplinary field.

Remove these courses		Add these courses	
ELEC 344	Applied Electronics and Electromechanics	CPSC 259	Data Structures and Algorithms for Electrical Engineers
MECH 305	Data Analysis and Mechanical Engineering Laboratories	CPEN 333	System Software Engineering
MECH 326	Mechanical Design II	CPEN 312	Digital Systems and Microcomputers
MECH 327	Thermal System Design	ELEC 302	Electronic Circuits for Electromechanical Design
MECH 329	Materials for Mechanical Design	ELEC 343	Electromechanics
MECH 358	Engineering Analysis	MECH 306	Data analysis and Mechatronics Laboratories
MECH 368	Engineering Measurements and Instrumentation	MECH 366	Modeling of Mechatronic Systems
MECH 380	Fluid Dynamics	MECH 420	Sensors and Actuators
MECH 457	Mechanical Engineering Design Project	MECH 421	Mechatronics System Instrumentation
MECH 466	Automatic Control	MECH 423	Biomechatronics
+	1 Technical Elective	MECH 458	Electromechanical Design Project
		MECH 467	Computer Control of Mechatronics Systems

WHAT DOES THIS MEAN FOR YOU?

The Mechatronics Option provides students with technical, teamwork, and communication skills. Students leave the program well-positioned to pursue graduate studies in mechatronics, mechanical, electrical, or computer engineering, or to work in a wide range of industries, from consumer goods or industrial applications, such as CNC machine tools and biomedical instrumentation.



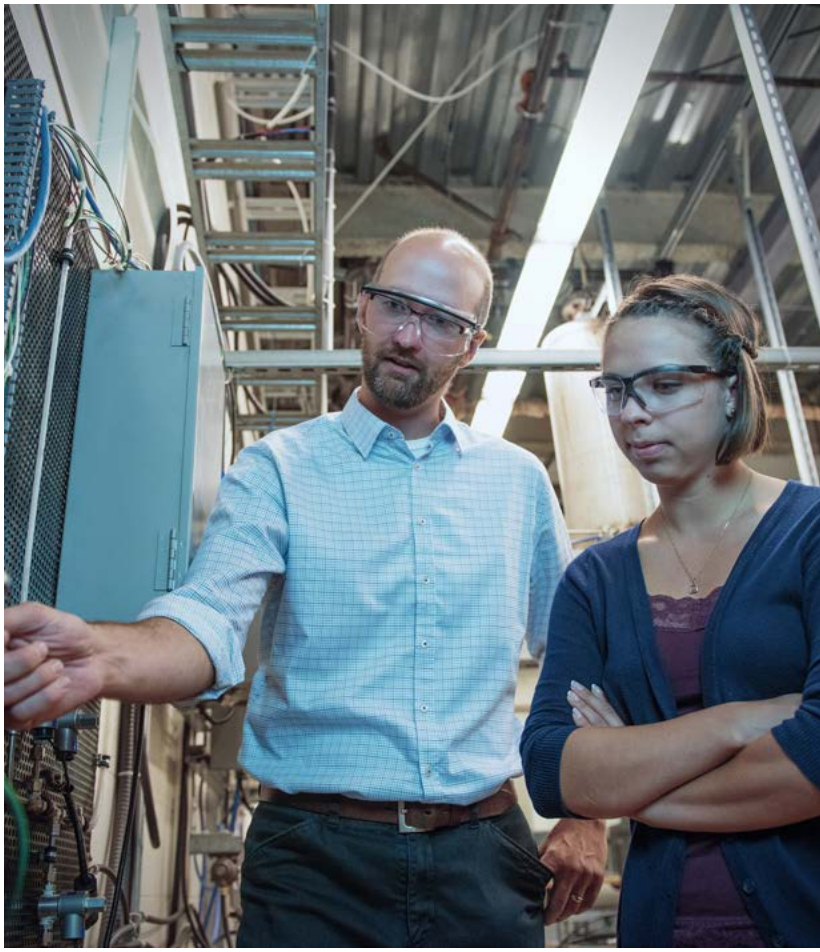
Thermofluids Option

The most customizable of the Options, Thermofluids allows you to focus on what you're truly passionate about. Aircraft design, naval architecture, power generation, heating and air conditioning – it's all here and it's your ticket to an exciting industry full of opportunities.

Thermofluids is the combined study of heat transfer, fluid dynamics, thermodynamics, and combustion. The applications of thermofluids range from efficient engine design to heating, ventilation, and air-conditioning (HVAC). Engineers in the field of thermofluids will find themselves well prepared for almost any challenge in a variety of industries.

Student involvement is one of the major focuses of this Option, and student teams are a great way to get involved. Students in the Thermofluids Option will find themselves comfortable in teams like UBC Supermileage, Formula UBC, SailBot, and UBC Aerodesign.

Though students accepted into the Thermofluids Option are not required to complete co-op work experience, it is very strongly encouraged, and the course schedule is built with the expectation that students will be completing five co-op work terms.



HOW DOES THIS OPTION CUSTOMIZE YOUR DEGREE?

The Thermofluids curriculum replaces some of the general mechanical engineering courses with courses in fluid dynamics, computational fluid dynamics, and a plethora of thermofluids technical electives. The Option itself is heavily customizable and allows each student to refine their degree to suit their needs, while enriching them with a sound base of both general mechanical engineering and thermofluids knowledge.

Remove these courses		Add these courses	
MECH 326	Mechanical Design II	MECH 386	Industrial Fluid Mechanics
MECH 329	Materials for Mechanical Design	MECH 479	Compuational Fluid Dynamics
MECH 368	Engineering Measurement and Instrumentation	MECH 489	Experimental Thermofluids
MECH 457	Mechanical Engineering Design Project	MECH 454	Thermofluids Capstone Design Project
MECH 392	Manufacturing Processes	+	Specialized technical electives

WHAT DOES THIS MEAN FOR YOU?

Expect to take on some of the most challenging and applicable courses in your undergraduate degree. This Option will prepare you to tackle our generation's growing energy demand, and give you a new perspective to solve engineering problems using applied thermofluids.