THE UNIVERSITY OF BRITISH COLUMBIA

School of Biomedical Engineering

COURSE PLANNING AND REGISTRATION GUIDE 2020W

THE UNIVERSITY OF BRITISH COLUMBIA
School of Biomedical Engineering

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

TABLE OF CONTENTS

Updated June 2020

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

Intentionally left blank for pagination purposes.

THE UNIVERSITY OF BRITISH COLUMBIA
School of Biomedical Engineering

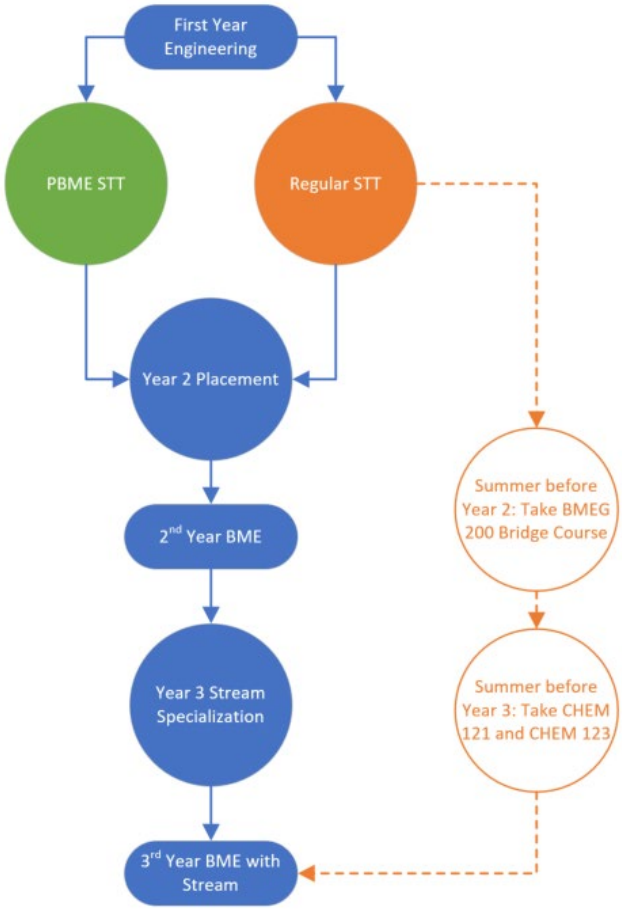
School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

STANDARD DEGREE PATHS

Students do not specialize until their second year. First year students can submit a supplementary form for the PBME STT – a modified first year timetable with courses meant to prepare students for a specialization in Biomedical Engineering. Students who do not complete in the PBME STT in their first year can still choose to pursue Biomedical Engineering. However, these students are required to take a bridge course (BMEG 200) in the summer before their second year, and take CHEM 121 and CHEM 123 (generally taken in the summer before their 3rd year).

In their third year, Biomedical Engineering students will choose one of four streams – Bioinformatics, Biomedical Systems and Signals, Biomaterials and Biomechanics, or Cellular Bioengineering. Each stream has a specific set of core and technical electives course requirements.

Courses are scheduled in such a way that, if students follow the course schedule, they will graduate on time, without course conflicts, provided they pass all of their courses. If students take courses off-cycle, they are responsible for ensuring they have the necessary pre-requisites and may end up with a course conflict.



School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

DEGREE NAVIGATOR – REVIEW YOUR GRADUATION REQUIREMENTS

The easiest way to review what courses you need to graduate it to log in to Degree Navigator and use the default session selection (directions are at http://students.engineering.ubc.ca/how-use-degree-navigator).

If the curriculum you see doesn't look quite right, please contact undergrad@bme.ubc.ca and we will verify that your default session is correct.

Once you know what courses you are required to take, it is important to realize you won't necessarily take them in the order presented in the calendar.

Because we can only offer most courses once a year, and due to the complexity of pre-requisites, you usually have to mix up the third and fourth year courses to make your schedule work. The School creates recommended course order schedules for the streams.

If you deviate from the scheduled program, you are responsible for ensuring you meet p-requisite requirements and we can't guarantee that your courses won't conflict with each other

NOTE: We are still in the process of building the Degree Navigator. We anticipate it will be live in September 2020.

Degree Navigator should only be used as a tool to help you plan your courses and view your degree progress. It should not be used as a formal way to verify that you have met your degree requirements, and students are strongly encouraged to contact the School of Biomedical Engineering Student Services Office for a graduation check if they want to confirm that they have completed what is needed to graduate.

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

CO-OP

Students have the option of participating in the co-op program. Students must apply through the Co-op office. Participating in Co-op extends the duration of a student's engineering study by one year. Co-op students normally take eight academic semesters and five work semesters over a five year period.

Co-op Schedule

	Fall	Winter	Summer
Year 1	Study 1	Study 2	Off
Year 2	Study 3	Study 4	Co-op (4 months)
Year 3	Study 5	Study 6	Co-op (4 months)
Year 4	Co-op (4 months)	Co-op (4 months)	Co-op (4 months)
Year 5	Study 7	Study 8	

Visit https://coop.engineering.ubc.ca/ for more information.

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

REGISTRATION

How to Register for Courses

1. Register online via the SSC.
2. Problems registering? Try the Troubleshooting section below.
3. Continued issues with BMEG-coded courses? Email undergrad@bme.ubc.ca with your name, student number and the problem you are having.
4. Continued issues with non-BMEG coded courses? We cannot help with courses outside of the BMEG department. Please contact the department offering the course directly. A list of departmental contacts can be found online here: https://academicservices.engineering.ubc.ca/registration/registration-requests/

Registration Troubleshooting

Before contacting SBME Student Services for assistance, please check that you have:

- Paid your registration deposit
- Ensured you have met the LPI/English requirements
    - You must complete the LPI prior to promotion to second year, your first year English requirement prior to promotion to third year, and BMEG 201 prior to promotion to fourth year.
- Have met the pre-requisites for the course you are trying to register.
    - If you do not meet the pre-requisites, do you have permission from the instructor to enroll?
- Registered in a Standard Timetable (STT)
    - You can't register in individual courses without registering in a STT first
- Ensured you do not have any conflicts with other courses
- Tried registering for the course on your own
    - Do you meet the restrictions?
    - We use "Restricted" seats rather than general seats for our courses, but seeing the word "restricted" does not necessarily mean you can't take the course. Always attempt to register prior to requesting assistance.

Due to rules about classroom assignment and minimum course sizes, students are required to complete their registration for both academic terms by August 1st.

After August 1st:

- **Courses with low enrollment may be cancelled**
- **It may not be possible for us to accommodate registration requests.**

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

Pre-requisites and Co-requisites

Pre-requisites and co-requisites are strongly enforced in our BMEG courses to ensure consistency and fairness to all students. Students must be enrolled in the following co-reqs concurrently otherwise they will be dropped without notice if they do not meet the conditions:

1. BMEG 101 and BMEG 102
2. BMEG 220 and MATH 264*

For all other pre-requisite issues, you must contact the instructor of the course (please cc undergrad@bme.ubc.ca). The instructor will consider requests on a case-by-case basis and may contact you if they have questions about your preparation. Once they have considered your request, they will inform you and the department via email. If your request is approved, the departmental will register you in the course. Students are responsible for ensuring they have the pre-requisite knowledge to pass a class.

An instructor/department has no obligation to accept a pre-requisite waiver. There is no appeal against their decision

You are advised to make requests as early as possible. It may take a week or more to process your request. You may make requests prior to your registration opening, although you will not be registered until after that date has passed. Please state your registration opening date in your email when making an early request.

Course Conflicts

Occasionally courses will overlap. Students can ask for permission from instructors to approve a course conflict. Please ensure before you ask for an exception that you have thought about how you will manage the conflict. For example, what will you do to make up the missed lecture time? Are there participation marks you may be missing out on? Instructors are not obligated to approve course conflicts.

Course conflict forms must be submitted to SBME instructors by August 1st and must be submitted to ESS online. You can find the form here: https://academicservices.engineering.ubc.ca/form-course-conflict/.

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

REGISTRATION GUIDES

The term courses are offered and when they are offered are subject to change each year.

How to use these guides:

Find the correct stream, and the correct year level.

Your stream

BIOMEDICAL INFORMATICS

The Bioinformatics stream explores the use of patient health care information to understand disease and pathophysiology, and to improve outcomes.

Your year

2020W Third Year

2020W Third Year				
TERM 1			TERM 2	
BMEG 310	4		BIOC 202	3
BMEG 371	3		BMEG 321	3
CHEM 233	3		BMEG 350	4
CHEM 235**	1		BMEG 357	3
MATH 220	3		CPSC 221	3
STAT 251*	3		C.STUD*	3
T.ELEC*	3			
	20			19

How to register for the courses

What courses you will take
*highlighted courses are NOT in the STT.

Registration Instructions

1. Register in an STT: BEAR
2. Register in labs/studios/tutorials associated with STT courses:
   - BMEG 310
   - BMEG 371
   - BMEG 321
   - BMEG 357
3. Register in highlighted courses

*Can be taken in term 1 or 2
**CHEM 235 may not be available in term 1. Please check with CHEM for the latest updates.

ANTICIPATED 2021W Fourth Year *SUBJECT TO CHANGE*				
TERM 1			TERM 2	
BIOC 302*	3		BMEG 455	3
BMEG 401	3		BMEG 457	3
BMEG 457	3		STAT 300*	3
CPSC 340*	3		C.STUD*	3
C.STUD*	3		T.ELEC*	5
T.ELEC*	6			
	18			17

Registration Instructions

1. Register in an STT: BOLD
2. Register in courses
   - BIOC 302
   - CPSC 340
   - STAT 300
   - Two C.STUDs
   - 11 credits T.ELEC

*Can be taken in term 1 or 2

What you will take the next year **anticipated**

Brief course descriptions are available in the official UBC Calendar.

Registration Guide Abbreviations

STT – Standard Timetable
C.STUD – Complementary Studies (additional information on page 21)
T.ELEC – Technical Elective (additional information on page 25)

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

STREAMS

There are four streams students can choose from: Biomedical Informatics, Biomedical Systems and Signals, Cellular Bioengineering, and Biomaterials and Biomechanics. At the end of your second year, you will be asked to apply for your preferred stream. There is no guarantee that students will get their first choice. We need to ensure there is reasonable distribution between the four streams to run our courses.

Due to the volume of technical elective options, we are unable to guarantee that there will be no course conflicts between core courses and stream technical electives.

Requests to change streams will be reviewed on a case by case basis. There is no guarantee we can approve stream choices so please think carefully before submitting your stream placement form.

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

YEAR 2 REGISTRATION

2020W Second Year				
TERM 1			**TERM 2**	
BMEG 210	4		BMEG 201	3
BMEG 230	3		BMEG 220	4
BMEG 245	4		BMEG 250	4
CPEN 221 OR 223	4		BMEG 257	4
MATH 253	3		CHBE 251	3
MATH 256	3		MATH 264	1
	20			**20**

Registration Instructions

1. Register in an STT: BALL
2. Register in labs/tutorials associated with STT courses
    - BMEG 230
    - BMEG 245
    - BMEG 250
3. Register in highlighted courses:
    - BMEG 201
    - CPEN 221 OR CPEN 223
        - Students interested in Biomedical Informatics or Biomedical Systems & Signals Streams must register for CPEN 221
        - If you are undecided as to which stream you want to prefer, register for CPEN 221
    - MATH 253
    - MATH 256

THE UNIVERSITY OF BRITISH COLUMBIA
School of Biomedical Engineering

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMEDICAL INFORMATICS

The Bioinformatics stream explores the use of patient health care information to understand disease and pathophysiology, and to improve outcomes.

2020W Third Year

2020W Third Year				
TERM 1			**TERM 2**	
BMEG 310	4		BIOC 202	3
BMEG 371	3		BMEG 321	3
CHEM 233	3		BMEG 350	4
CHEM 235**	1		BMEG 357	3
MATH 220	3		CPSC 221	3
STAT 251*	3		C.STUD*	3
T.ELEC*	3			
	20			**19**

Registration Instructions

1. Register in an STT: BEAR
2. Register in labs/studios/tutorials associated with STT courses:
   - BMEG 310
   - BMEG 371
   - BMEG 321
   - BMEG 357
3. Register in highlighted courses

*Can be taken in term 1 or 2
**CHEM 235 may not be available in term 1. Please check with CHEM for the latest updates (https://chem.ubc.ca/undergraduates-covid-impact-chem-courses)

ANTICIPATED 2021W Fourth Year *SUBJECT TO CHANGE*				
TERM 1			**TERM 2**	
BIOC 302*	3		BMEG 455	3
BMEG 401	3		BMEG 457	3
BMEG 457	3		STAT 300*	3
CPSC 340*	3		C.STUD*	3
C.STUD*	3		T.ELEC*	5
T.ELEC*	6			
	18			**17**

Registration Instructions

1. Register in an STT: BOLD
2. Register in courses
   - BIOC 302
   - CPSC 340
   - STAT 300
   - Two C.STUDs
   - 11 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMEDICAL INFORMATICS

2020W Fourth Year

2020W Fourth Year				
TERM 1			**TERM 2**	
BIOC 302*	3		BMEG 455	3
BMEG 401	3		BMEG 457	3
BMEG 457	3		STAT 300*	3
CPSC 340*	3		C.STUD*	3
C.STUD*	3		T.ELEC*	5
T.ELEC*	6			
	18			**17**

Registration Instructions

1. Register in an STT: BOLD
2. Register in highlighted courses
    - BIOC 302
    - CPSC 340
    - STAT 300
    - Two C.STUD courses
    - 11 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMEDICAL INFORMATICS

Technical Elective List

Students must take 14 credits of stream technical electives in order to fulfil program requirements. Of these 14 credits, a minimum of 7 credits must be taken from BMEG 400C; BMEG 400D; BMEG 400E; BMEG 420; CHBE 381; CPEN 321; CPEN 421; CPEN 441; ELEC 221; ELEC 331; ELEC 462 (highlighted below).

Choose 14 Credits			
Course	**Title**	**Term**	**Credits**
BMEG 400C	Modern Biomedical Optical Imaging	1	3
BMEG 400D	Clinical Informatics	1	3
BMEG 400E	Genome Informatics	2	3
BMEG 420	Medical Imaging	1	3
CHBE 381	Bioprocess Engineering I	2	3
CPEN 321	Software Engineering	1	3
CPEN 421	Software Project Management	2	3
CPEN 441	Human Computer Interfaces in Engineering Design	2	3
CPSC 302	Scientific Computing	1	3
CPSC 303	Numerical Computation for Algebraic Problems	2	3
CPSC 304	introduction to relational databases	1 or 2	3
CPSC 320	Intermediate Algorithm Design and Analysis	1 or 2	3
CPSC 322	Introduction to Artificial intelligence	1 or 2	3
CPSC 344	Introduction to Human Computer Interaction Methods	1	3
CPSC 425	Computer Vision	1 or 2	3
CPSC 445	Algorithms for Bioinformatics	2	3
ELEC 221	Signals and Systems	1 or 2	4
ELEC 331	Computer Communications	1 or 2	4
ELEC 462	Sensors and Actuators in Microsystems	1	3
STAT 406	Methods for Statistical Learning	1	3

THE UNIVERSITY OF BRITISH COLUMBIA
School of Biomedical Engineering

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMATERIALS & BIOMECHANICS

The Biomaterials & Biomechanics stream focuses on the application of principles of classical mechanics to problems in biological systems and views the body as an engineered structure.

2020W Third Year

2020W Third Year				
TERM 1			**TERM 2**	
APSC 278*	3		BIOC 202	3
APSC 279* ɬ	1		BMEG 321	3
BMEG 310	4		BMEG 350	4
BMEG 371	3		BMEG 357	3
CHEM 233	3		BMEG 330	3
CHEM 235**	1		C.STUD*	3
MECH 260	3			
STAT 251*	3			
	21			**19**

Registration Instructions

1. Register in STT: BEAR
2. Register in labs/tutorials associated with STT courses
   - BMEG 310
   - BMEG 371
   - BMEG 321
   - BMEG 357
3. Register in highlighted courses

*Can be taken in term 1 or 2
**CHEM 235 may not be available in term 1. Please check with CHEM for the latest updates. (https://chem.ubc.ca/undergraduates-covid-impact-chem-courses)
ɬ Can be taken in Fourth Year. For students who started their stream in 2020W or later.

s*ANTICIPATED* 2021W Fourth Year *SUBJECT TO CHANGE*				
TERM 1			**TERM 2**	
BMEG 401	3		BMEG 455	3
BMEG 457	3		BMEG 457	3
C.STUD*	3		STAT 300*	3
T.ELEC*	10		C.STUD*	3
			T.ELEC*ɬ	7
	19			**19**

Registration Instructions

1. Register in an STT: BOLD
2. Register in courses
   - STAT 300
   - Two C.STUD
   - 17 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMATERIALS & BIOMECHANICS

2020W Fourth Year

2020W Fourth Year				
TERM 1			**TERM 2**	
BMEG 401	3		BMEG 455	3
BMEG 457	3		BMEG 457	3
C.STUD*	3		STAT 300*	3
T.ELEC*	10		C.STUD*	3
			T.ELEC*	7
	19			**19**

Registration Instructions

1. Register in an STT: BOLD
2. Register in highlighted courses
    - STAT 300
    - Two C.STUD
    - 17 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMATERIALS & BIOMECHANICS

Technical Electives

Choose 16 credits**			
Course	**Title**	**Term**	**Credits**
BIOC 302	General Chemistry	1 or 2	3
BMEG 372	Biomedical Materials and Drug Delivery	1	3
BMEG 373	Microfluidics	1	3
BMEG 400C	Modern Biomedical Optical Imaging	1	3
BMEG 470	Cellular Responses to Forces and Biomaterials	1	3
CPEN 312	Digital Systems and Microcomputers	2	3
MECH 360	Solid Mechanics	1	3
MECH 410D	Special Topics in Mechanical Engineering - ENGINERNG DYNMC	1	3
MECH 433	Biofluids	2	3
MECH 436	Fundamentals of Injury Biomechanics	1	3
MECH 462	Finite Element Analysis	2	3
MECH 463	Mechanical Vibrations	1	4
MECH 469	Dynamic System Modeling	2	3
MTRL 495	Biomaterials	2	3

THE UNIVERSITY OF BRITISH COLUMBIA
School of Biomedical Engineering

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMEDICAL SYSTEMS & SIGNALS

Biomedical System and Signals stream provides an understanding of the fundamental processes that produce and transform signals in biological systems, and the method by which these signals are transformed to general information.

2020W Third Year

2020W Third Year				
TERM 1			**TERM 2**	
BMEG 310	4		BIOC 202	3
BMEG 371	3		BMEG 321	3
CHEM 233	3		BMEG 350	4
CHEM 235**	1		BMEG 357	3
BMEG 320	3		ELEC 221*	4
STAT 251*	3		C.STUD	3
T.ELEC*	3			
	20			**20**

Registration Instructions

1. Register in an STT: BEAR
2. Register in highlighted courses

*Can be taken in term 1 or 2
**CHEM 235 may not be available in term 1. Please check with CHEM for the latest updates. (https://chem.ubc.ca/undergraduates-covid-impact-chem-courses)

ANTICIPATED 2021W Fourth Year *SUBJECT TO CHANGE*				
TERM 1			**TERM 2**	
BMEG 430	3		BMEG 455	3
BMEG 457	3		BMEG 457	3
C.STUD	3		STAT 300*	3
T.ELEC*	9		C.STUD*	3
			T.ELEC*	8
	18			**20**

1. Register in an STT: BOLD
2. Register in courses
   - STAT 300
   - Two C.STUD
   - 17 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMEDICAL SYSTEMS & SIGNALS

2020W Fourth Year

2020W Fourth Year				
TERM 1			**TERM 2**	
BMEG 430	3		BMEG 455	3
BMEG 457	3		BMEG 457	3
C.STUD	3		STAT 300*	3
T.ELEC*	9		C.STUD*	3
			T.ELEC*	8
	18			**20**

Registration Instructions

1. Register in an STT: BOLD
2. Register in highlighted courses
    - STAT 300
    - One C.STUD
    - 17 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

BIOMEDICAL SYSTEMS & SIGNALS

Technical Elective List

Students must complete 20 credits of stream technical electives in order to fulfil program requirements. Of these 20 credits, a minimum of 13 credits must be taken from BMEG 420; BMEG 400C; CHBE 381; CPEN 312; ELEC 321; ELEC 331; ELEC 421; ELEC 422; ELEC 442; ELEC 462; ELEC 463; ELEC 464; ELEC 465; ELEC 473; MECH 464 (highlighted below).

Choose 20 Credits			
Course	**Title**	**Term**	**Credits**
BIOC 302	General Biochemistry	1 or 2	3
BMEG 400C	Modern Biomedical Optical Imaging	1	3
BMEG 420	Medical Imaging	1	3
CHBE 381	Bioprocess Engineering I	2	3
CPEN 312	Digital Systems and Microcomputers	2	3
CPSC 121	Models of Computation	1 or 2	4
CPSC 221	Basic Algorithms and Data Structures	1 or 2	4
CPSC 330	Applied Machine Learning	1	3
CPSC 340	Machine Learning and Data Mining	1 or 2	3
ELEC 321	Stochastic Signals and Systems	2	4
ELEC 331	Computer Communications	1 or 2	4
ELEC 421	Digital Systems and Image Processing	1	3
ELEC 422	Biosignals and Systems	2	3
ELEC 442	Introduction to Robotics	1	3
ELEC 462	Sensors and Actuators in Microsystems	1	3
ELEC 463	Micro/Nanofabrication and Instrumentation Laboratory	1	3
ELEC 464	Nanotechnology and Nature	N/A	3
ELEC 465	Microsystems Design	1	3
ELEC 473	Biological Micro-Electro-Mechanical Systems	1	3
MATH 220	Mathematical Proof	1 or 2	3
MECH 464	Industrial Robotics	2	3

THE UNIVERSITY OF BRITISH COLUMBIA
School of Biomedical Engineering

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

CELLULAR BIOENGINEERING

The Cellular Bioengineering stream applies the engineering principles of design, analysis, and methodology to cellular and molecular biology for the development cell-based therapeutics in regenerative medicine and drug delivery.

2020W Third Year

2020W Third Year			
TERM 1		**TERM 2**	
BMEG 310	4	BIOC 202	3
BMEG 371	3	BMEG 321	3
CHEM 233	3	BMEG 350	4
CHEM 235**	1	BMEG 357	3
STAT 251*	3	BMEG 374	3
T.ELEC*	3	CHBE 381	3
C.STUD*	3		
	20		**19**

Registration Instructions

1. Register in an STT: BEAR
2. Register in highlighted courses:

*Can be taken in term 1 or 2
**CHEM 235 may not be available in term 1. Please check with CHEM for the latest updates. (https://chem.ubc.ca/undergraduates-covid-impact-chem-courses)

ANTICIPATED* 2021W Fourth Year *SUBJECT TO CHANGE			
TERM 1		**TERM 2**	
BMEG 430	3	BMEG 455	3
BMEG 457	3	BMEG 457	3
BMEG 470**	3	STAT 300*	3
BIOC 302*	3	C.STUD*	3
C.STUD*	3	T.ELEC*	9
T.ELEC*	3		
	18		**21**

*Can be taken in term 1 or 2
**Previously BMEG 370

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

CELLULAR BIOENGINEERING

2020W Fourth Year

2020W Fourth Year				
TERM 1			**TERM 2**	
BMEG 430	3		BMEG 455	3
BMEG 457	3		BMEG 457	3
BMEG 374	3		STAT 300*	3
BIOC 302*	3		C.STUD*	3
C.STUD*	3		T.ELEC*	9
T.ELEC*	3			
	18			**21**

Registration Instructions

1. Register in an STT: BOLD
2. Register in highlighted courses
    - BMEG 374
    - One C.STUD
    - 12 credits T.ELEC

*Can be taken in term 1 or 2

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

CELLULAR BIOENGINEERING

Technical Elective List

A minimum of 9 credits must be taken from BMEG 372; BMEG 373; BMEG 400C; BMEG 400D; BMEG 400E; BMEG 474; CHBE 481 (highlighted below).

Choose 15 Credits			
Course	**Title**	**Term**	**Credits**
BMEG 372	Biomedical Materials and Drug Delivery	TBD	3
BMEG 373	Microfluids	2	3
BMEG 400C	Modern Biomedical Optical Imaging	1	3
BMEG 400D	Clinical Informatics	1	3
BMEG 400E	Genome Informatics	2	3
BMEG 474	Stem Cells and Regenerative Medicine	TBD	3
CAPS 421	Advanced Cellular & Molecular Physiology	1	3
CHBE 481	Bioprocess Engineering II	1	3
CHEM 211	Introduction to Chemical Analysis	1 or 2	4
MICB 202	Introductory Medical Microbiology and Immunology	1 or 2	3
MICB 302	Immunology	1	3
MICB 306	Molecular Virology	1	3

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

COMPLEMENTARY STUDIES ELECTIVES

The following sections provide information on complementary studies electives.

Complementary Studies Elective Requirements *Note: Complementary studies requirements are governed by Engineering Student Services. This page is for your general information, and to help you interpret the Calendar listing (*http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,272,30*In case of discrepancies, the Calendar listing takes precedence.*

Students require a total of 20 complementary credits to graduate. 3 courses (9 credits) are built into your core curriculum (BMEG 201, BMEG 401, BMEG 455). The remaining 12 credits are taken as follows:

1. APSC 176, WRDS 150, or another first-year English course (typically taken in your first year)
2. **An Impact of Technology on Society course (3 credits).**
   Acceptable courses can be found on the following link:
   http://students.engineering.ubc.ca/degree-requirements Note that not all courses are offered all years, and we have no control over what courses will be offered. Students may seek approval from the Engineering Student Services Office for other courses that address the impact of technology on society as the central course theme.
3. **A humanities or social sciences elective (3 credits).**
   This elective must deal with central issues, methodologies, and thought processes of the humanities and social sciences. Most courses from the Faculty of Arts are acceptable apart from courses that are scientific or performance based (ex. dramatic arts). To see if your course is eligible, please visit:
   https://academicservices.engineering.ubc.ca/registration/humanities/ or contact ESS.
   Students thinking of pursuing UBC Medical School should register for an additional 3 credits of 1st Year English.
4. **A second humanities or social sciences elective** OR a language skills course **(3 credits)**.
   If you took a six credit Impact of Technology on Society or humanities course, you do not need to take this fourth course.

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

STREAM TECHNICAL ELECTIVES

Electives Outside of your Stream

At this time, students cannot take technical electives outside of their stream for credits towards their program. If there is a course you are interested in taking, please email undergrad@bme.ubc.ca.

The lists below and to the left represent our best guess at what may be offered this year – read the titles carefully. Please register by August 1 or classes with low registration may be canceled. The courses on the SSC will represent the most up-to-date course listing. Availability of electives is subject to securing a qualified instructor.

These tables cover the Technical Electives we anticipate offering for 2020W, and are subject to change based on the availability of professors and other factors. Different courses that qualify as technical electives may be offered in different years. Any course that appears on the approved list in the year it was taken will count.

** Note that any course that is core for your program cannot be double-counted as a technical elective.*

2020W Term 1 Technical Elective List

Course Number	Course Name	Biomedical Informatics	Biomaterials & Biomechanics	Biomedical Systems & Signals	Cellular Bioengineering
BMEG 372	Biomedical Materials and Drug Delivery		✓		✓
BMEG 373	Microfluidics		✓		✓
BMEG 400C	Modern Biomedical Optical Imaging	✓	✓	✓	✓
BMEG 400D	Clinical Informatics	✓			✓
BMEG 420	Medical Imaging	✓		✓	

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

2020W Term 2 Technical Elective List

Course Number	Course Name	Biomedical Informatics	Biomaterials & Biomechanics	Biomedical Systems & Signals	Cellular Bioengineering
BMEG 400E	Genome Informatics	✓			✓
BMEG 474	Stem Cells and Regenerative Medicine				✓

May or May not be Offered in Either Term – Outside Electives

Course Number	Course Name	Biomedical Informatics	Biomaterials & Biomechanics	Biomedical Systems & Signals	Cellular Bioengineering
BIOC 302	General Biochemistry		✓	✓	
CAPS 421	Advanced Cellular & Molecular Physiology				✓
CHBE 381	Bioprocess Engineering I	✓		✓	
CHBE 481	Bioprocess Engineering II				✓
CHEM 211	Introduction to Chemical Analysis				✓
CPEN 312	Digital Systems and Microcomputers		✓	✓	
CPEN 321	Software Engineering	✓			
CPEN 421	Software Project Mangement	✓			
CPEN 441	Human Computer Interfaces in Engineering Design	✓			
CPSC 121	Models of Computation			✓	
CPSC 221	Basic Algorithms and Data Structures			✓	
CPSC 302	Numerical Computations for Algebraic Problems	✓			
CPSC 304	Introduction to Relational Databases	✓			
CPSC 320	Intermediate Algorithm Design and Analysis	✓			
CPSC 322	Introduction to Artificial Intelligence	✓			
CPSC 330	Applied Machine Learning			✓	
CPSC 340	Machine Learning and Data Mining			✓	
CPSC 344	Introduction to Human Computer Interaction Methods	✓			
CPSC 425	Computer Vision	✓			
ELEC 221	Signals and Systems	✓			

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

ELEC 321	Stochastic Signals and Systems			✓	
ELEC 331	Computer Communications	✓		✓	
ELEC 421	Digital Signal and Image Processing			✓	
ELEC 422	Biosignals and Systems			✓	
ELEC 442	Introduction to Robotics			✓	
ELEC 462	Sensors and Actuators in Microsystems	✓			
ELEC 463	Micro/Nanofabrication and Instrumentation Lab			✓	
ELEC 464	Nanotechnology and Nature			✓	
ELEC 465	Microsystems Design			✓	
ELEC 473	Biological Micro-Electro-Mechanical Systems			✓	
MATH 220	Mathematical Proof			✓	
MATH 464	Industrial Robotics			✓	
MECH 360	Mechanics of Materials		✓		
MECH 380	Fluid Dynamics		✓		
MECH 410D	Engineering Dynamics		✓		
MECH 433	Biofluids		✓		
MECH 436	Fundamentals of Injury Biomechanics		✓		
MECH 462	Finite Element Analysis		✓		
MECH 463	Mechanical Vibrations		✓		
MECH 469	Dynamic System Modeling		✓		
MICB 202	Introductory Medical Microbiology and Immunology				✓
MICB 302	Immunology				✓
MICB 306	Molecular Virology				✓
MTRL 495	Biomaterials		✓		
STAT 406	Methods for Statistical Learning	✓			

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

REGISTRATION EXTERNAL TO BMEG

Engineering Student Services:
First year curriculum, transfer credits, Complementary Studies courses, minors:
KAIS 1100
604-822-6556
Via the "Contact Us" webform on www.engineering.ubc.ca
Book an appointment time in person or via phone.

ELEC/CPEN Courses:
Please submit a request here: https://ubc.ca1.qualtrics.com/jfe/form/SV_8ctQzXHSpEed63r (available starting June 23)

MATH Courses:
Math asks that you continue to try registering online, or email ugradchair@math.ubc.ca.

MECH Courses:
Josy Austin, Program and Advising Coordinator
students@mech.ubc.ca

Other out-of-department courses
Contact the Department offering the course for instructions.

CONTACT US

Michelle Lee, Academic Program Assistant
undergrad@bme.ubc.ca

School of Biomedical Engineering
Faculty of Applied Science and Faculty of Medicine
The University of British Columbia
2222 Health Sciences Mall
Vancouver, BC Canada V6T 1Z3
www.bme.ubc.ca

APPENDIX

Appendix A: Bioinformatics Program Checklist

Appendix B: Biomaterials & Biomechanics Program Checklist

Appendix C: Biomedical Systems and Signals Program Checklist

Appendix D: Cellular Bioengineering Program Checklist