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THE UNIVERSITY OF BRITISH COLUMBIA
Chemical & Biological Engineering
Faculty of Applied Science

STUDENT INFORMATION HANDBOOK

2014 - 2015

You are advised to consult the current UBC calendar, the official source of information concerning courses and regulations.
http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,272,35

Contents in this handbook are subject to change in future years.

Dear Undergraduate Students,

Welcome to the Department of Chemical and Biological Engineering, Faculty of Applied Science at the University of British Columbia. You join one of the world's finest Chem Bio Departments with a proud tradition of research and teaching and community service accomplishments.

Chemical Engineering was established at UBC in 1915, as the first Canadian chemical engineering program west of Ontario, and a separate Department of Chemical Engineering was established in1954. In the Department merged with Bio-Resource Engineering to form the Department of Chemical and Bio-Resource Engineering. In 1999, Department name was changed to the Department of Chemical and Biological Engineering reflecting the growing need for engineers in the fields of biotechnology, biomedical as well as bioresource engineering.

The handbook is provided as a:

- Companion reference for important information about the departments' two undergraduate degree programs (chemical engineering & chemical and biological engineering)
- Repository of information for a particular academic year
- Starting point to engage in conversations with our faculty and staff about planning your academic and professional future

It is our hope that your stay with the Department is fulfilling and we wish you the best of success.

Best regards

Peter Englezos

Dr. Peter Englezos
Professor and Head
Department of Chemical & Biological Engineering
Faculty of Applied Science
University of British Columba
www.chbe.ubc.ca

Vision and Mission of the Chemical and Biological Engineering Department

Our Vision is to be a globally renowned department advancing contribution of chemical and biological engineering to society through excellence in education, research, and social responsibility.

The Department of Chemical and Biological Engineering is committed to:

- Provide outstanding undergraduate and graduate degree programs, educating engineers empowered with excellent technical and leadership skills, integrity, and social responsibility.
- Be recognized internationally as a leader in research and engineering science, creating novel and sustainable solutions to serve public interests and to address global challenges in areas such as health, energy, and environment.
- Promote an inclusive, safe, collaborative, and respectful community for learning and work.

Our Department's Values

As members of the Department, we are committed to our core values:

- *Excellence*
  We strive to achieve excellence in teaching, to carry out leading-edge research and to provide an outstanding workplace environment.
- *Innovation*
  Innovation is at the core of our vision. We instill an innovative spirit in our students to drive the future of our profession.
- I*ntegrity*
  We support UBC Values by acting with integrity, fulfilling promises, and ensuring open, respectful relationships.
- *Mutual respect and equity*
  We commit to include, respect, and value the diverse perspectives that comprise Canadian society.
  We create an equitable environment for all our members.
- *Sustainability*
  We embrace and practice the concept of sustainability, and exemplify economic, environmental and social responsibility
- *Accountability and responsibility*
  We honor obligations and take social, environmental, and economical responsibility for actions and outcomes.
- *Collegiality*
  We promote an equitable, transparent, intellectual, respectful and collaborative working environment.

TABLE OF CONTENTS

I. RESPECTFUL ENVIRONMENT AND STUDENT CONDUCT

Respectful Environment
http://www.hr.ubc.ca/respectful-environment/

a. Building an Environment of Respect, Diversity, Opportunity & Inclusion

In late September 2008, President Toope introduced the UBC Respectful Environment Statement for Students, Faculty and Staff. The Statement speaks to our freedoms and our responsibilities, and provides the guiding principles to support us in building an environment in which respect, civility, diversity, opportunity and inclusion are valued. The statement was revised in May, 2014. Read the revised UBC Respectful Environment Statement (PDF).

b. The Golden Rule & the Platinum Rule

Many of us live by the Golden Rule or the Ethic of Reciprocity:
"Treat others the way **you** would like to be treated."
But have you heard about the Platinum Rule?
"Treat others the way **they** want to be treated."
This rule means that you recognize that service is not about what you want to give; it's about what others want to receive. Ask people what they want. Listen to their answers.
Apply the Golden Rule to avoid harming others, and apply the Platinum Rule to provide people with the things that they value or that are important to them.

Student Conduct
(http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,0)

1. Academic Honesty and Standards
(http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,286,0,0#15620)

Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action.

It is the student's obligation to inform himself or herself of the applicable standards for academic honesty. Students must be aware that standards at the University of British Columbia may be different from those in secondary schools or at other institutions. If a student is in any doubt as to the standard of academic honesty in a particular course or assignment, then the student must consult with the instructor as soon as possible, and in no case should a student submit an assignment if the student is not clear on the relevant standard of academic honesty.

If an allegation is made against a student, the Registrar may place the student on academic hold until the President has made his or her final decision. When a student is placed on academic hold, the student is blocked from all activity in the Student Service Centre.

2. Academic Misconduct
(http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959)

Students are responsible for informing themselves of the guidelines of acceptable and non-acceptable conduct for graded assignments established by their instructors for specific courses and of the examples of academic misconduct set out below. Academic misconduct that is subject to disciplinary measures includes, but is not limited to, engaging in, attempting to engage in, or assisting others to engage, in any of the actions described below.

1. Cheating, which may include, but is not limited to:
   i. falsification of any material subject to academic evaluation, including research data;
   ii. use of or participation in unauthorized collaborative work;
   iii. use or possession in an examination of any materials (including devices) other than those permitted by the examiner;
   iv. use, possession, or facilitation of unauthorized means to complete an examination (e.g., receiving unauthorized assistance from another person, or providing that assistance); and
   v. dishonest practices that breach rules governing examinations or submissions for academic evaluation (see the Student Conduct during Examinations).
2. Plagiarism, which is intellectual theft, occurs where an individual submits or presents the oral or written work of another person as his or her own. Scholarship quite properly rests upon examining and referring to the thoughts and writings of others. However, when another person's words (i.e. phrases, sentences, or paragraphs), ideas, or entire works are used, the author must be acknowledged in the text, in footnotes, in endnotes, or in another accepted form of academic citation. Where direct quotations are made, they must be clearly delineated (for example, within quotation marks or separately indented). Failure to provide proper attribution is plagiarism because it represents someone else's work as one's own. Plagiarism should not occur in submitted drafts or final works. A student who seeks assistance from a tutor or other scholastic aids must ensure that the work submitted is the student's own. Students are responsible for ensuring that any work submitted does not constitute plagiarism. Students who are in any doubt as to what constitutes plagiarism should consult their instructor before handing in any assignments.
3. Submitting the same, or substantially the same, essay, presentation, or assignment more than once (whether the earlier submission was at this or another institution) unless prior approval has been obtained from the instructor(s) to whom the assignment is to be submitted.

4. Impersonating a candidate at an examination or other evaluation, facilitating the impersonation of a candidate, or availing oneself of the results of an impersonation.
5. Submitting false records or information, orally or in writing, or failing to provide relevant information when requested.
6. Falsifying or submitting false documents, transcripts, or other academic credentials.
7. Failing to comply with any disciplinary measure imposed for academic misconduct.

II. FACULTY AND OFFICE STAFF

Faculty				
Name	**Bldg**	**Room**	**Phone**	**Email**
Dr. S. Baldwin	CHBE	217	2.1973	sbaldwin@mail.ubc.ca
Dr. C. Berlinguette	CHBE	233	7.5192	cberling@ ubc.ca
Dr. X.Bi	CHBE	411	2.4408	xbi@chbe.ubc.ca
Dr. L. Creagh	CHBE	403	7.521	alcreagh@chbe.ubc.ca
Dr. N. Ellis	CHBE	227	2.1243	nellis@chbe.ubc.ca
Dr. P. Englezos	CHBE	261	2.6184	peter.englezos@ubc.ca
Dr. J.Feng	CHBE	209	2.8875	jfeng@ ubc.ca
Dr. B. Gopaluni	CHBE	407	7.5668	gopaluni@chbe.ubc.ca
Dr. E. Gyenge	CHBE	201	2.3217	egyenge@chbe.ubc.ca
Dr. S. Hatzikiriakos	CHBE	243	2.3107	hatzikir@chbe.ubc.ca
Dr. C. Haynes	MSL	231	2.5136	israels@chbe.ubc.ca
Dr. D. Kannangara	CHBE	401	2.0084	kannanga@chbe.ubc.ca
Dr. E. Kwok	CHBE	237	2.1346	ezra@chbe.ubc.ca
Dr. A Lau	CHBE	247	2.3476	aklau@chbe.ubc.ca
Dr. C.J. Lim	CHBE	413	2.4871	cjlim@ubc.ca
Dr. M. Martinez	CHBE	231	2.2693	martinez@chbe.ubc.ca
Dr. M. Mohseni	CHBE	221	2.0047	mmohseni@ubc.ca
Dr. J. Piret	MSL	207	2.5835	james.piret@ubc.ca
Dr. D. Posarac	CHBE	409	2.2599	posarac@.ubc.ca
Mr. M. Schoen	CHBE	213	7.4708	michael.schoen@ubc.ca
Dr. K Smith	CHBE	223	2.3601	kjs@chbe.ubc.ca
Dr. F. Taghipour	CHBE	219	2.1902	fariborz@ubc.ca
Dr. H, Trajano	CHBE	203	7.1823	heather.trajano@ubc.ca
Dr. D. Wilkinson	CHBE	239	2.4888	dwilkinson@ ubc.ca
Dr. V. Yadav	CHBE	207	7.2706	vikramaditya.yadav@ubc.ca

Office				
Name	**Position**	**CHBE Room**	**Phone**	**Email**
Marlene Chow	Manager, Technical Resources	173	7.3537	marlene.chow@ubc.ca
Joanne Dean	Manager, Administration	259	2.5548	jdean@ ubc.ca
Ivan Leversage	Safety Officer		2.3857	ileversage@ ubc.ca
Magnolia Flores	Admin. Assistant	218	7.4758	floresm@mail.ubc.ca
Jane McCarthy	Exec. Assistant to Head	218	2.2565	jane.mccarthy@ubc.ca
Lori Tanaka	Undergraduate Student Support	218	2.3238	undergrad@chbe.ubc.ca
Ken Wong	Research Assistant/Tech	439	7.4833	kenwong@ ubc.ca
Amber Lee	Financial Clerk - Photocopy Credits	218	2.6029	alee@chbe.ubc.ca

III. DEPARTMENTAL ASSISTANCE TO STUDENTS

a. Undergraduate Student Advisors

Students	Advisors (student year)	Role
Chemical Engineering Degree (Chem Eng)	• Dr. Dhanesh Kannangara (year 2) • Dr. Jim Lim (year 3) Dr. Dusko Posarac (year 4)	Advisors are the first point of contact for students for any of a wide range of issues, including recommending course substitutions or equivalent credits to the Department. If issues are not resolved, students are referred by their advisor to the Associate Head (Undergraduate) -Dr. Gopaluni and/or Department Head Dr. Englezos
Chemical & Biological Engineering Degree (ChemBio)	• Dr. Louise Creagh (years 3&4) • Dr. Heather Trajano (year 2)	
Exchange, Transfer and Visiting	• Dr. Ezra Kwok (year 2) • Dr. Kevin Smith (Chem Eng years 3&4) • Louise Creagh (ChemBio Eng years 3&4)	
Student Club (CSChE, AIChE)	Dr. Fariborz Taghipour	Faculty advisor for the Undergraduate Student Club: assists students with conferences and competitions including AIChE and CSChE (more information in Section VII).
Chem E Reaction Car Team	Dr. Elod Gyenge	Faculty advisor for Chem E Reaction car team (for safety issues consult with Marlene Chow). More information in section VI)
Premedical	Dr. Ezra Kwok	Dr. Kwok is a P.Eng. and a practicing medical doctor: provides advice to student who wish to prepare for application to Medical School.

b. Curriculum Committee

This committee serves to propose curriculum changes driven by the Canadian Engineering Accreditation Board (CEAB) requirements as well as various other program needs. The committee consists of:

- Dr. James Piret (Chair)
- Dr. Bhushan Gopaluni
- Dr. Madjid Mohseni (Term 1)
- Dr. Susan Baldwin (Term 2)

c. Scholarships, Research Awards, and Financial Aid

- CHBE Scholarships are granted annually in May for graduating students and in the fall for other years. Department scholarships are awarded based on merit and no application is required. Students are encouraged to use the ESS and UBC sites for additional financial assistance opportunities:
  http://engineering.ubc.ca/eng/students/student-resources/awards-scholarships
  http://students.ubc.ca/enrolment/finances/awards/current
- NSERC (Natural Sciences and Engineering Research Council of Canada) Undergraduate Students Research Awards (USRA). Students can apply for these awards with NSERC-funded professors to pay for part of the student salary, usually during the summer. http://students.ubc.ca/career/campus-experiences/undergraduate-research/NSERC-USRA
- UBC Bursaries - http://students.ubc.ca/enrolment/finances/awards/ubc-bursary
- Student Loans and Financial Assistance – http://students.ubc.ca/enrolment/finances/loans and StudentAid BC https://studentaidbc.ca/plan

IV. FACILITIES AND RESOURCES

a. CHBE Home Building

The CHBE Building is located at 2360 East Mall, Vancouver BC, V6T 1Z3.
Tel: 604.822.3238, Fax: 604.822.6003
Building hours are 7 AM – 7:30 PM for main floor, 7 AM – 5PM for 3rd floor. Students have access to the first and third floors 24/7 by using their UBCcard. The main office is located in room 218 on the second floor. The office hours are 8:30 AM to noon and 1:00 to 3:30 PM (subject to change).

b. Assignment Hand In

Assignment hand-in boxers are located outside of the office, Room 218. Assignments are due at 4:30 PM unless otherwise specified by the course instructor. Note: all assignments are time stamped and therefore any tardiness will be documented.

c. Computers

Computers are located in CHBE 314 and 316. Your account username is your first and last name initials followed by the last 4 digits of your student number. The password will be the same as your username the first time you access the account and you must change it during your first access. The CHBE 314/316 computers are used for instruction purposes during some lecture hours. You

can check the availability of these rooms on the weekly schedule posted outside the doors. The computers should be equipped with all necessary software.
As CHBE is moving towards replacing computer terminals with a "2X Client" application which provides students with access to software using their personal laptops and notebooks. Course instructors will provide further instruction regarding access to 2X Client. Students in CHBE are strongly encouraged to acquire a personal laptop or notebook.
The minimum recommended specifications for personal computers are as follows:

- Operating System: Windows 7 or 8, MAC or Linux
- Processor: Any Intel (or Equivalent AMD) processor such as the i3, i5 or i7
- Memory: Minimum 2 GB
- Network: Wireless
- Disk Drive: 500 GB
- Screen Resolution: 1280 by 800
- Connectivity: Minimum 1 UBC-2 or UBC-3
- Screen Connection: VGA or HDMI connection

d. Printing

Printing, copying and scanning is available on the third floor photocopier. To obtain printing credits on your student computer account, you must fill out a printing credit form at the main office and submit the form along with payment to Amber Lee. The minimum credit purchase is $5.00. Unused credit will remain until your graduation. Please allow 24 hours for the credit to be transferred to your account. To avoid last minute rushes, consider making larger credit purchases. Students can view their account balance at http://10.89.2.232/balance. Printing is 10 cents/page for black and white and 25 cents/page for color printing. You may print from the departmental computers or directly from your personal laptop or notebook. For wireless printing, sign in at https://137.82.115.193:8443/login. Alternately, printing services are available at most campus libraries as well as the printing center in the University Village.
For any issues regarding IT, printing or accounts, please contact help@chbe.ubc.ca

e. Student Mailboxes

Shared student mailboxes are provided on the third floor. Notices and forms are placed in the boxes.

V. UNDERGRADUATE COUNCIL

The Chemical and Biological Engineering Undergraduate Council aims to enhance the students' experience during their time in the department. The council addresses academic issues through academic feedback sessions; coordinates graduation photos, packages and iron rings; organizes various social events such as the grad cruise, monthly socials, biweekly barbeques and Engineering Week events; coordinates with industry partners in organizing the industry nights and Design Banquet; and represents Chemical and Biological Engineering Undergraduate students to the Engineering Undergraduate Society (EUS), Alma Mater Society (AMS), the departments and the faculty of Applied Science. For more information, please refer to their website at: www.chbecouncil.com

VI. STUDENT TEAMS AND AFFILIATED GROUPS

a. Teams in Chemical and Biological Engineering and Affiliations

- Chem-E-Car: http://ubccheme.wordpress.com/
- Oil and Gas Initiative: oginitiative.ca
- International Genetically Engineered Machine: http://www.ubcigem.com/
- Engineers for a Sustainable World: http://blogs.ubc.ca/sustainabilityclub/
- Engineers Without Borders: ubc.ewb.ca/
- Women in Engineering: wie.engineering.ubc.ca

b. Engineering Design Teams Council

For a list of all Engineering Teams at UBC, please refer to: http://teams.engineering.ubc.ca/the-teams/

c. Other Competitions

Students can also compete at various competitions including:

- UBC Engineering Competitions (UBC EC): Qualifier for Western Engineering Competitions
- BC Water and Waste Association (BCWWA) Student Design Competition (SDC)
- AIChE and CSChE Conferences including research competition, poster competition, paper competition, Chem-E Jeopardy and many more
- Minerva Safety Engineering Design Awards Competition http://www.safetymanagementeducation.com/en/?sv=&category=safety+awards&title=index

VII. PROFESSIONAL AFFILIATIONS

a. Canadian Society for Chemical Engineering (CSChE)*

The CSChE is a national, not-for-profit, professional association that unites chemical engineering students and professionals working in the industry, academia and government.
For information on membership** and benefits, please refer to:
http://www.cheminst.ca/about/membership

b. American Institute of Chemical Engineers (AIChE)*

The AIChE is a nonprofit professional organization for chemical engineers providing leadership to the chemical engineering profession and representing 45,000 members in industry, academia, and government.

For information on membership** and benefits, please refer to:
http://www.aiche.org/community/membership

c. Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)*

APEGBC is a licensing and regulatory body responsible for BC professional engineers and geoscientists. The association is charged with protecting public safety in BC by setting and maintaining high standards of professional practice and ethical conduct for its members and licensees.

For information on membership** and benefits, please refer to:
https://www.apeg.bc.ca/Become-a-Member

d. Canadian Institute of Mining, Metallurgy, and Petroleum (CIM)*

Founded in 1898, the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) is the leading technical society of professionals in the Canadian Minerals, Metals, Materials and Energy Industries. CIM aims to facilitate the exchange of knowledge and technology, foster networking, professional development and fraternity, and to recognize excellence and outstanding achievements in the minerals industry.

For information on membership** and benefits, please refer to:
https://www.cim.org/en/Students.aspx

*All the above professional affiliations host seminars, competitions, conferences and various networking events in Vancouver, Canada or the United States.

**Membership fees for the organizations listed above are partially or in some cases fully subsidized by CHBE and APSC or the organization itself.

VIII. ACADEMIC REGULATIONS AND GUIDELINES

a. Course Loads and Length of Program

The average course load per session is ~38 credits. A normal completion time is four to five years. In order to enroll in more than the full-time credit load, academic advisor approval is required. In order to be considered full-time, a student must carry a credit load equal to at least 80% of the standard credit load for the year and program. Check with your Academic Advisor and Enrollment Services Professional (ESP) for more information prior to decreasing your course load to part-time, as certain bursaries, loans or scholarships require for students to maintain full-time status. Note that Provincial and Federal Student Loans often qualify a student as full-time only if the student is registered in 60% of the program course load (40% for students with permanent disabilities).

b. Standard Time Tables (STT)

STTs are designed for students in each program to ease registration. However, the STTs do not include electives or required courses such as general English or Mathematics. Students must register in those courses separately after they have registered in their STT. Please use the curriculum in section IX as a guide while registering.

c. Course Change Deadlines

(http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,45,99,0)

	Last day to drop courses without a W standing through Student Service Centre	Student Service Center course withdrawals with a W standing	CHBE Faculty approval required for withdrawals with a W standing
Full-Year course (Term 1 and 2) or Distance Education Term B	September 19, 2014	September 20 - November 21, 2014	After November 21, 2014
Term 1 Course or Distance Education Term A	September 16, 2014	September 17 - October 10, 2014	After October 10, 2014
Term 2 Course or Distance Education Term C	January 19, 2015	January 20 - February 13, 2015	After February 13, 2015
Distance Education Term D	January 23, 2015	January 24 - March 27, 2015	After March 27, 2015

d. Grading

(http://www.calendar.ubc.ca/Vancouver/pdf/UBC_Vancouver_Calendar_Faculty_Applied_Science.pdf)

Students in the Bachelor of Applied Science program are not eligible to take courses on a Credit/D/Fail basis. General UBC grading guidelines are as follows:

Percentage (%)	Letter Grade
90-100	A+
85-89	A
80-84	A-
76-79	B+
72-75	B
68-71	B-
64-67	C+
60-63	C
55-59	C-
50-54	D
0-49	F (Fail)

e. Standings

Students in any Winter Session with a sessional average of at least 80% while taking 30 or more credits will receive the notation 'Dean's Honour List' on their record. A student will be granted a degree with distinction upon graduation if he or she achieves an overall average of at least 80% on all 200-level and higher courses while registered in the B.A.Sc. program.

Applied Science Specific Academic Standings are as follows:

Year Level	Sessional Average	Conditions	Academic Standing	Promotion Status
1	60% or more	N/A	Good Standing	Eligible to continue; eligible for Year 2[(1)]
1	50% - 59.9%	Previous standing was not Probation	Academic Probation	Eligible to continue; not eligible for Year 2
1	50% - 59.9%	Previous standing was Probation	Failed Year	Required to discontinue
1	Less than 50%	N/A	Failed Year	Required to discontinue
2-5	55% or more	N/A	Good Standing	Eligible to continue[(2,3,4)]
2-5	50% - 54.9%	Previous standing was not Probation	Academic Probation	Eligible to continue[(2,3,4)]
2-5	50% - 54.9%	Previous standing was Probation	Failed Year	Required to discontinue
2-5	Less than 50%	N/A	Failed Year	Required to discontinue
(1) Students must successfully complete a minimum of 27 credits of the first year program and satisfy the Language Proficiency Index (LPI) requirement before proceeding to Year 2.				
(2) Students must successfully complete a minimum of 80% of the credits required for year levels 2 and higher before proceeding to the next year level.				
(3) Students must successfully complete ENGL 112 or equivalent before proceeding to the third year of their programs.				
(4) Students must successfully complete their 200-level technical communication requirement before proceeding to the fourth year of their programs.				

f. Appeal and Supplemental Examinations

Current students may appeal year standing decisions to the Faculty of Applied Science Committee on Admissions, Standings, and Courses.

There are no supplemental examinations for any courses offered within the Faculty of Applied Science with the exception of some 400-level courses, with supplemental examinations only available to students who have passed their year and failed the course with a grade of at least 40%. Supplemental examinations are only offered during the deferred/supplemental examination period in July and August even for courses that end in December.

g. Exam Hardship, Clashes and Deferral

An examination hardship is defined as the occurrence of an examination candidate being faced with three (3) or more formal examinations scheduled within a 24-hour. An examination candidate facing an examination hardship shall be given a new examination date and time for the second formal examination by the respective instructor or department/faculty. The student must notify the instructor of the second formal examination no later than one month prior to the

examination date for courses in the Winter Session (whether in December for Term 1 or April for Term 2), and no later than two weeks prior to the examination date for courses in the Summer Session. If the examination hardship concerns more than three (3) formal examinations, this process is to be repeated.

An examination clash is when a student has multiple formal examinations scheduled on the same day and at the same time, or where the allotted times for scheduled formal examinations overlap. In these cases, alternate arrangements should be made as soon as possible. The student should first contact his or her instructor(s) to determine if an alternate time to write the exam is available; if the instructor(s) is unable to resolve the examination clash, then the department head or dean/director is to be consulted. If an alternate writing time is not available at the faculty level, examination candidates must contact Enrolment Services, to make alternate arrangements.

h. Missed Examinations

If a student has missed a final exam due to medical illness or any other extenuating circumstances, he or she may ask for Academic Concession by submitting the request form found at http://students.engineering.ubc.ca/forms within 72 hours of the missed exam. Official documentation to support these requests is required.

i. Observing Religious Rites

In a situation where religious observance precludes attending classes or examinations, in accordance with the UBC Policy on Religious Holidays, students may request alternate arrangements. Students must notify their instructor in writing at least two weeks in advance, and preferably earlier.

IX. CURRICULUM AND REGISTRATION

To ensure an up-to-date curriculum, please consult the University Calendar http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,272,35

Second Year (2014/15)				
Course Number	Course Name	Prerequisites/Co-requisites	Term	Credits
CHBE 262	Chemical Engineering and Applied Chemistry Laboratory	C - CHBE 241, 251 C - CHEM 250, 251, 260	1&2	**4**
APSC 201	Technical Communication	P - One of APSC 176, ENGL 110, 111, 112, 120 or 121	1[(6)]	**3**
BIOL 112	Biology of the Cell	P - One of CHEM 12, 111 P - One of BIOL 11, 12, 111	1[(6)]	**3**
CHBE 241	Material and Energy Balances	-	1	**3**
CHBE 243	Introduction to Chemical and Biological Engineering Process and Technology	P - CHBE 241	1	**1**
CHEM 251	Physical Chemistry for Engineers	P - CHEM 154[(1)]	1	**3**
CHEM 260	Organic Chemistry for Engineers	P - CHEM 154[(1)]	1	**3**
MATH 253	Multivariable Calculus	P - MATH 101[(2)]	1[(6)]	**3**
CHBE 230	Computational Methods	P - APSC 160 / C - MATH 256	2	**3**
CHBE 244	Chemical and Biological Engineering Thermodynamics I	P - CHBE 241	2	**3**
CHBE 251	Transport Phenomena I	P - PHYS 170 / C - Math 256	2	**3**
CHEM 250	Inorganic Chemistry	P - CHEM 154[(1)]	2	**2**
MATH 256	Differential Equations	P - MATH 101[(2)] / C - MATH 253[(3)]	2[(6)]	**3**
Total Credits				**37**
Third Year (2014/15)				
CHBE 344	Unit Operations I	P - CHBE 241, 244	1	**3**
CHBE 346	Chemical and Biological Engineering Thermodynamics II	P - CHBE 241, 244, CHEM 251	1	**3**
CHBE 351	Transport Phenomena II	P - CHBE 251	1	**3**
CHBE 362	Chemical Engineering Laboratory	P - CHBE 241, 251 C - CHBE 344, 351	1	**2**
CHBE 345	Unit Operations II	P - CHBE 244, 251	2	**4**
CHBE 356	Process Dynamics and Control	P - One of MATH 255, 256	2	**3**
CHBE 376	Computer Flowsheeting and Fluid Properties Estimation	P - CHBE 241	2	**3**
STAT 251	Elementary Statistics	P - MATH 253[(4)]	1/2	**3**
Complementary Studies elective*			1/2	**3**

Two of the three courses listed below				**6**
CHBE 373	Water Pollution Control	P - CHBE 251[(5)]	1	(3)
CHBE 485	Air Pollution Prevention and Control	-	1	(3)
CHBE 484	Green Engineering Principles and Applications for Process Industries	P - CHBE 241, and One of CHBE 242 or 244	2	(3)
Plus one of the programs listed below:				**5**
Chemical Engineering				
APSC 278	Engineering Materials	-	1	(3)
CHBE 366	Process and Environmental Engineering Laboratory	P - CHBE 241, 251 C - CHBE 345, 356	2	(2)
Chemical and Biological Engineering				
CHBE 365	Biotechnology Laboratory	P - CHBE 241, BIOL 112 C - CHBE 381	2	(2)
CHBE 381	Bioprocess Engineering I (Third or Fourth Year Standing Required)	P - BIOL 112 and One of MATH 103, 105 or CHBE 241, 251	2	(3)
Total Credits				**38**
Fourth Year (2014/15)				
CHBE 464	Chemical and Biological Engineering Laboratory	P - CHBE 345, 356, 362 and One of CHBE 365, 366 C - CHBE 455	1&2	**4**
APSC 450	Professional Engineering Practice	-	1	**2**
CHBE 455	Kinetics and Reactor Design	P - CHEM 251	1	**3**
CHBE 457	Process Synthesis	P - CHBE 241, 346, 376, 344	1	**3**
CHBE 456	Heterogeneous Catalysis and Advanced Reactor Design	P - CHBE 351, 455	2	**3**
CHBE 459	Chemical and Biological Engineering Economics	-	2	**3**
Technical Electives*			1/2	**9**
Complementary Studies electives*			1/2	**3**
Plus one of the programs listed below:				**9**
Chemical Engineering				
CHBE 454	Chemical Process and Product Design	P - CHBE 346, 351, 356 C - CHBE 457, 459	1&2	(6)
CHBE 474	Process Control Engineering	P - CHBE 356, 376	1	(3)
Chemical and Biological Engineering				
CHBE 453	Biological Process and Product Design	P - BIOL 112, CHBE 346, 356, 381 C - CHBE 457, 459	1&2	(6)
CHBE 481	Bioprocess Engineering II	P - CHBE 381	1	(3)
Total Credits				**39**

(1) - All of CHEM 111, 113 or all of CHEM 121, 123 or SCIE 001 or CHEM 154
(2) - One of math 101, 103, 105, SCIE 001
(3) - One of MATH 200, 217, 226, 253, 263
(4) - One of MATH 200, 217, 226, 253, 263
(5) - One of CHBE 251, CIVIL 215, MECH 280, MTRL 263
(6) - Potentially offered in both term 1 & 2. Students may choose to take this course in a different term to accommodate their course schedule.
* See section X for more details

Registration

Students register in a Standard Timetable (STT) for Chemical or Chemical & Biological Engineering includes the CHBE core courses required for that year. Then students must register in electives or core courses from other departments individually.

Co-op students in CHBE normally take one term of courses in third year and spend the other term on a co-op placement by registering for the appropriate STT and dropping the courses for the term that work on co-op.

Registration Issue	Resolution
• A CHBE class or STT is full • Restrictions due to standing	Send email to undergrad@chbe.ubc.ca Include: name, student number and problem description
A core course in another department is full	Contact the department to find out registration procedures **MATH** 604-822-2666 http://www.math.ubc.ca/Ugrad/ugradRegistration.shtml **APSC** 604-822-6556 Engineering Student Services **STATS** 604-822-4821 http://www.stat.ubc.ca/People/#S
You missed taking or failed a core course last year and now two core courses conflict	Send email to undergrad@chbe.ubc.ca Include: name, student number and problem description The issue will be reviewed and you will be advised which one of following options will apply: • There may be another course you could take in another department as an equivalent. • You will be advised to contact each instructor to explain how you will manage the work in both courses and to seek to official approval. You will need to fill in an APSC Course Conflict Form. • You will need to take the course during the summer or in another year. This may result in extending the time for degree completion.

Registration Issue	Resolution
Your transfer credits are not listed on the Degree Navigator	Visit the ESS office to request an updated pre-approved transfer credit on your Degree Navigator
If you wish to take an unlisted technical elective	You need to obtain approval from an Advisor, who will then send an email to the Undergrad Secretary. Your Degree Navigator should be adjusted to reflect the approved elective.
Students taking more than the required technical electives	Students cannot take more than 6 credits of technical elective courses outside of CHBE. Any credits in excess of the graduation requirements will not count towards your degree.
Students taking more courses than the maximum in the academic calendar	Credits taken in excess of the maximum will not count towards your degree.

X. COMPLEMENTARY COURSES

a. Technical Electives

Chemical Engineering program students can select among the following suggested technical electives up to a maximum of **six non-CHBE credits**. Course instructor approval may be required if the pre-requisites have not been taken. For assistance obtaining course instructor approval, contact your undergraduate advisor. Non-listed courses need to be approved by email request to undergraduate advisor on a course-by-course basis.

CHBE Courses		
CHBE 357	3	Interfacial Phenomena
CHBE 373[(1)]	3	Water Pollution Control
CHBE 402[(2)]	3	Chemical Pulping Technology
CHBE 470[(2)]	3	Transport in Biological Systems
CHBE 476	3	Modeling and Optimization in Chemical Engineering
CHBE 477	3	Fuel Cell and Electrochemical Engineering
CHBE 479[(2)]	3	Chemical Engineering Aspects of Occupational Health and Safety
CHBE 482[(2)]	3	Petroleum Refining
CHBE 483[(2)]	3	Energy Engineering
CHBE 484[(1)]	3	Green Engineering
CHBE 485[(1)]	3	Air Pollution Prevention and Control
Non-CHBE Courses		
APSC 486	6	New Venture Design
APSC 498[(3)]	3-6	Directed Studies
MATH 345	3	Applied Nonlinear Dynamics and Chaos
MECH 495	3	Industrial Engineering

MECH 496	3	Engineering Management
MINE 486	3	Mining and the Environment
MTRL 358	3	Hydrometallurgy I
MTRL 458	3	Hydrometallurgy II
Chemical Engineering (CHBE)		
CHBE 381	3	Biological Process Engineering I
CHBE 481	3	Bioprocess Engineering II
CHBE 491[(4)]	1	Thesis Proposal
CHBE 492[(4)]	5	Thesis (after CHBE 491)
Chemical and Biological Engineering (CHBE)		
CHBE 474	3	Process Control Engineering
CHBE 495[(5)]	1	Thesis Proposal - Biotechnology Topic
CHBE 496[(5)]	5	Thesis - Biotechnology Topic (after CHBE 495)
Chemical and Biological Engineering (non-CHBE)		
APSC 278	3	Engineering Materials
BIOL 200	3	Cell Biology I: Structural Basis
BIOL 201	3	Cell Biology II: Intro to Biochemistry
BIOC 202	3	Introductory Medical Biochemistry
BIOC 302	3	General Biochemistry
CAPS 391	3	Introduction to Gross Human Anatomy
CHEM 405	3	Biophysical Chemistry
CIVL 498C	3	Topics in Civil Engineering - LIFE CYCL ASSESS
FNH 301	3	Food Chemistry I
FNH 309	3	Food Process Science
FNH 313	3	Microorganisms in Food Systems
FNH 401	3	Food Chemistry II
MECH 433	3	Biofluids
MTRL 495	3	Biomaterials
PHYS 305	3	Introduction to Biophysics

(1) For students who entered 3rd year in 2014 or later, a selection of 2 out of CHBE 373, 484 or 485 is required (so completing all of these courses provides 3 of the technical electives credits required in the 4th year). The added environmental course replaces the requirement for a technical elective in 3rd year. For students who entered 3rd year in 2011, 2012 or 2013, one of CHBE 373, or 485 is required (so completing both of these courses provides 3 technical electives credits).

(2) Not offered every year, subject to change

(3) A proposal of the course must be submitted and approved by the student's option advisor

(4) These two courses, CHBE 491 and CHBE 492, must be taken together

(5) These two courses, CHBE 495 and CHBE 496, must be taken together

b. Complementary Courses

(http://students.engineering.ubc.ca/degree-requirements)

Requirement	Credits	Eligible Courses	Exemptions	Notes
English (Communication)	6	ENGL 112 or Equivalent and one of APSC 201, 202, 203 or IGEN 201	N/A	ENGL 112 or equivalent and the Technical Communication course must be completed prior to entering 3rd and 4th year respectively otherwise your registration will be limited
Engineering Economics	3	CHBE 459, CIVL 403, EECE 450, MECH 431, MINE 396, MTRL 455	N/A	Often taken during third or fourth year
Impact of Technology on Society	3	APSC 261, 262,263, CIVL 200, CPSC 430, ECON 339, GEOG 122, 310, HIST 106, 215, 425 (6), PHIL 435 (3/4), POLI (3/6), SOCI 260 (3/6), URST 200	N/A	Students may seek approval from the Dean's Office for other courses in this area.
Humanities and Social Sciences	6	Any course within the Faculty of Arts	Scientific geography, statistics, technical or scientific courses, studio/performance in fine arts, music and theatre courses, introductory language courses in a student's first language, ANTH 140, CLST 301, PHIL 120, 125, 220, and PSYC 218	3 credits of a language course can satisfy this requirement. If more than 3 credits of language course is taken for this requirement, you will then have to take your Impact of Tech on Society credit from the Faculty of Arts
Health and Safety	N/A	N/A	N/A	Content integrated into the core courses of each program
Professional Ethics, Equity and Law	2	APSC 450 or equivalent	N/A	Often taken during the final year of the program
Sustainable Development & Environmental Stewardship	N/A	N/A	N/A	Content integrated into the core courses of each program

c. Minors and Degree Enhancements

The faculty of Applied Science offers various minors and options for duel degrees for students. These options include:

- Minor in Commerce
- Minor in Arts (18 Credits)

- Minor in Arts (30 Credits)
- Minor in Honours Mathematics

The deadlines to apply to these options are April 30th of each year (subject to change). For more information refer to the UBC Academic Calendar at
http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,272,0

XI. GRADUATION

a. English and Complementary Studies Requirements*

-English: ENGL 112 or equivalent and an approved technical communication course
-Complementary Studies Courses:

Engineering Economics (minimum 3 credits)
Impact of Technology on Society (minimum 3 credits)
Humanities and Social Sciences Electives (minimum 6 credits)
Communication (minimum 6 credits)
Health and Safety
Professional Ethics, Equity and Law (minimum 2 credits)
Sustainable development and environmental stewardship

*Please refer to section X for more information on these requirements

b. Degree Navigator

You should use your personal degree navigator to review your program progress, confirm whether you have satisfied the requirements and review specifications and restrictions.
Access your degree navigator with your CWL login at ssc.adm.ubc.ca and select DEGREE NAVIGATOR - VANCOUVER under the Registration tab. On the navigator, you can select your program, and view the requirements. By selecting "Audit – Full Progress", you can verify how your courses (completed and in progress) meet the degree requirements.
For more information and demo videos on using Degree Navigator, please refer to:
http://students.engineering.ubc.ca/how-use-degree-navigator

c. Apply to Graduate

In order to graduate, you must apply for graduation during the application period. Completing your degree requirements does not automatically make you eligible to graduate; all students are required to submit an application. You may complete this application under the graduation tab on the Student Service Center.

For more information on deadlines and details on the application, please refer to:
http://students.ubc.ca/enrolment/graduation/applying-graduate

d. Iron Ring

The Iron Ring has been registered and may be worn on the little finger of the working hand by any engineer who has been obligated at an authorized ceremony of the Ritual of the Calling of the Engineer. The ring symbolizes the pride that engineers have in their profession while simultaneously reminding them of their humility. The ring serves as a reminder to the engineer

and others of the engineer's obligation to live by a high standard of professional conduct. The Ritual of the Calling of an Engineer has been instituted with the simple end of directing the newly qualified engineer toward a consciousness of the profession and its social significance and indicating to the more experienced engineer their responsibilities in welcoming and supporting the newer engineers when they are ready to enter the profession.

The Iron Ring Ceremony that applies to UBC students is often held during the third week of March in Vancouver. The Engineering Undergraduate Society (EUS) coordinates registration, payment and attendance for the Iron Ring Ceremony for graduating engineers at UBC. The CHBE Council 4th year representative will contact all graduating students to complete ring sizing and fee collection in the fall prior to their graduation and will coordinate with the EUS.

XII. EDUCATION ABROAD

UBC is developing for students numerous Go Global program opportunities to travel, study and do research work abroad. For more information on these programs and to search partner universities and institutions worldwide, refer to http://students.ubc.ca/about/go-global.

XIII. CO-OP

a. Benefits and Why You Should Join

Co-op is an option available to all UBC Vancouver engineering disciplines.

As a Co-op student you would:

- Master your resume, cover letter, job search and interview skills
- Work in B.C., elsewhere in Canada or around the world
- Gain up to 20 months of practical, paid technical engineering related work experience
- Develop industry networks and mentoring opportunities with professionals
- Gain up to 12 months work credit towards your Engineer In Training (EIT) status
- Earn a salary while you learn
- Enhance your employability for after graduation

b. Standard Schedule

Academic Calendar	Fall (Sept-Dec)	Winter (Jan-April)	Summer (May-Aug)
Year 1	Study	Study	Vacation
Year 2	Study	Study	Work-Term 1
Year 3	Work-Term 2	Study	Work-Term 3
Year 4	Study	Work-Term 4	Work-Term 5
Year 5	Study	Study	Graduation

*Note that with the consultation and approval of an advisor, you may alter your CO-OP work term schedule

c. Basic Eligibility

- Second-year standing in the Faculty of Applied Science undergraduate program
- First-year standing in the Faculty of Applied Science Masters of Engineering, Applied Science, or Software Systems program
- Minimum GPA of 60 per cent
- Proficient communication skills (written and verbal)
- Willingness to abide by the Engineering Co-op Program Terms and Conditions

d. Application and Admission

A CO-OP representative will attend one of the Standard Timetable courses in the fall semester to inform you of the deadlines and a brief overview of the program. You can apply to the UBC Engineering CO-OP Program by reviewing admission eligibility and general requirements, applying online through https://www.ubcengcore.com/students/student-login.htm and signing up for the intake group presentation.

XIV. SAFETY

a. Labs

When in the lab:

- Minimum PPE – lab coat, safety glasses and waterproof footwear.
- When handling chemicals, wear latex gloves as appropriate
- Introduction to lab safety required
- Dispose of sharps appropriately
- Handle chemicals in accordance with MSDS

Hazardous Material Response: 911

b. Building Safety

Fire and Emergency Evacuation: Use the stairs. Do not use the elevators. Exit the building and cross the road. For more information, refer to: http://emergency.ubc.ca/procedures/fire-safety/

Earthquake: Drop! Cover! Hold On!
For more information, refer to: http://emergency.ubc.ca/procedures/earthquake/
First Aid: Call 911

c. Bomb Threats and Lockdowns

If you receive a bomb threat, ask as many questions as possible, call 911 immediately and survey your immediate surrounding. Do not touch any suspicious objects. For more information, refer to: http://emergency.ubc.ca/procedures/bomb-threats/
In case of a lockdown alert, comply with instructions provided by the emergency personnel only and at all times. Avoid calling 911 unless you have immediate concern for your safety, the safety of others or feel you have critical information that will assist emergency personnel in the response.
For more information, refer to: http://emergency.ubc.ca/procedures/lockdown-procedures/

d. Safewalk

Safewalk is a free service offered by the Alma Mater Society (AMS) that is looking out for your safety on campus and operates most nights during the school year with its walking service. Safewalk will send a co-ed pair of walkers to any point on campus and will walk anyone to any point on campus where they need to go. Safewalk works closely with campus security and the RCMP to keep your safety top priority. Look for Safewalkers on campus with their red jackets, flashlights, and radios. Hours of operation are **9 PM to 2 AM** nightly.

For a walk:

- Add Safewalk to your phone
- Call **604.822.5355**
- Use a UBC Blue Phone and ask for Safwalk
- Approach any Safewalk Team
- Drop by Safewalk on the main floor of the Student Union Building in room 100A (across from the Gallery Lounge)

e. Campus Security and RCMP

When Safewalk is not operating feel free to contact either of these services to address your safety needs:

- **Campus Security:** Non-Emergency **604.822.2222**
- **RCMP:** Emergency **911**, Non-Emergency **604.224.1322**

f. UBC Alert

UBC Alert provides emergency messages on UBC's main website (ubc.ca), Twitter (@ubcnews), and digital signs across campus. To receive emergency text messages on your cell phone, you can update your number under "Personal Information" in the Student Service Centre. Cell phone numbers collected are used solely for emergency purposes and are stored in accordance with university policy standards.

g. Campus Weather Closure

If UBC is subject to extreme winter weather, the administration may decide to cancel classes and curtail non-essential services. Faculty, staff and students should visit www.ubc.ca for closure notices and information. While the University will inform TV and radio stations of campus closures, the UBC homepage is the most authoritative source for all information.

Sources

http://www.ironring.ca/
http://www.cheminst.ca/about/cic/csche
http://www.aiche.org/
https://www.apeg.bc.ca/
https://www.cim.org/