



THE UNIVERSITY OF BRITISH COLUMBIA

# **UBC Vancouver**

# **ACADEMIC**

# **CALENDAR**

**2021/22**

[www.calendar.ubc.ca/vancouver](http://www.calendar.ubc.ca/vancouver)



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Dean's Office



## Introduction

Dean's Office  
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Faculty of Applied Science (<http://www.apsc.ubc.ca>)

The Faculty of Applied Science offers undergraduate and graduate programs in engineering, architecture, and nursing. The Faculty offers engineering programs through the Departments of Chemical and Biological Engineering, Civil Engineering, Electrical and Computer Engineering, Materials Engineering, Mechanical Engineering, and Mining Engineering, as well as through three boards of study: Engineering Physics, Geological Engineering, and Integrated Engineering. The two schools in the Faculty offer programs in their respective disciplines, as described in [The School of Architecture and Landscape Architecture](#) and [The School of Nursing](#).

Extension of engineering studies to the graduate level is becoming increasingly important. The Faculty offers graduate programs leading to the degrees of Master of Applied Science (M.A.Sc.), Master of Engineering ([http://www.engineering.ubc.ca/prospective\\_students/graduate/index.php](http://www.engineering.ubc.ca/prospective_students/graduate/index.php)) (M.Eng.), and Doctor of Philosophy (Ph.D.), and provides research facilities in many areas of engineering. The Faculty of Graduate and Postdoctoral Studies lists requirements for admission (<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,204,340,0>) to the M.A.Sc. and Ph.D. programs, while the Faculty of Applied Science lists requirements for admission to the M.Eng program.

## Bachelor of Applied Science

### Bachelor of Applied Science > Introduction

The Faculty offers programs of undergraduate study leading to the Bachelor of Applied Science in the following areas of engineering: Biomedical Engineering, Chemical Engineering, Chemical and Biological Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Engineering Physics, Environmental Engineering, Geological Engineering, Integrated Engineering, Manufacturing Engineering, Materials Engineering, Mechanical Engineering, and Mining Engineering. It also offers the Bachelor of Applied Science in Environmental Engineering as a joint program with the University of Northern British Columbia.

The Faculty of Applied Science admits suitably qualified applicants directly from secondary school into first-year engineering. These students will normally complete the Bachelor of Applied Science in four years of academic study, except in the case of the Engineering Physics program, which requires five years' study. Students may also enter the engineering program after spending one or more years in the Faculty of Science, either because they wish to avail themselves of a broader range of electives or because they do not meet the entrance requirements for admission directly from secondary school ([see Admission from BC/Yukon Grade 12 \(or equivalent\)](#)). Depending on the transfer credit in engineering received from first-year Science ([see Admission from Science](#)), such students may be able to complete an engineering degree with three further years of study, otherwise they will require four



further years.

Scheduled field trips, and the activities of professional and technical societies all contribute to the rounding out of the undergraduate programs and students are expected to participate in them as fully as circumstances permit.

The Faculty will consider proposals from qualified applicants for part-time study towards the Bachelor of Applied Science. Since the flexibility for such study may be limited, approval must be obtained from the Dean's Office.

## Bachelor of Applied Science > Academic Advising

Academic advising duties are shared between the Engineering Student Services Office and department or program advisors. The Engineering Student Services Office is located at 2332 Main Mall, Room 1100. Department offices have the names of the department advisors. The Engineering Student Services Office handles advising for all first-year students and for courses given by other faculties. Department advisors deal with questions regarding courses taken within the student's own department.

## Bachelor of Applied Science > Admission

Application for admission to the Engineering program must be made through an online application form (<http://you.ubc.ca/applying-ubc/>) no later than January 15. The applicant is responsible for ensuring that all supporting documents, including official transcripts, are submitted to Enrolment Services by the deadlines provided following the submission of an application, otherwise the application will not be considered.

Due to limited resources, the Faculty has been authorized to restrict enrolment in first-year engineering, and within individual engineering programs at the second-year level. Attainment of the minimum academic requirements listed below means that the applicant is eligible for selection, but does not provide assurance of admission. The selection is based on academic standing. For most engineering programs, the competition for places is such that standing above the minimum prescribed requirements is necessary to ensure admission.

The attention of applicants is drawn to the importance of mathematics as a preparation for engineering courses. Experience has shown that UBC students with grades below 65% in mathematics (below B at a college) are likely to have difficulty with many engineering courses.

### *Admission from BC/Yukon Grade 12 (or equivalent)*

In addition to satisfying university admission requirements, applicants must have completed mathematics, physics, and chemistry at the BC Grade 12-level, or the equivalent. Students will be selected on the basis of their standing in Grade 12 courses in mathematics, chemistry, physics, and English. Applicants from schools where either Physics 12 or Chemistry 12 is not available may petition to be excused this deficiency. Candidates not having grade 12 Physics may still apply. A strong background in alternative grade 12 science courses<sup>1</sup> and/or additional preparation in mathematics<sup>2</sup> will be considered an asset in such cases, and will be used by the Faculty in conjunction with the personal profile statement to assess the candidate's preparedness for an engineering program. Candidates deemed outstanding by the Faculty may be admitted. Successful candidates lacking an admissions requirement would need to address any such deficiencies, either in the summer before commencing at UBC or by completing a modified first year program extending into the summer following first year, before proceeding with a second year program.

UBC is prepared to offer early admission to secondary school students graduating in June based on interim or projected final grades submitted by the schools.

In addition to high academic standards, the Faculty recognizes the benefits of previous technical work, advanced academic preparation<sup>1,2</sup>, and extracurricular activities. The UBC application process includes a personal profile statement in which the



applicant will have the opportunity to provide additional information. For the most up-to-date information on the application process, see Personal Profile (<http://you.ubc.ca/admissions/how-to-apply/personal-profile/>) and Direct Entry from BC High Schools (<http://engineering.ubc.ca/eng/students/admissions/high-school>).

The personal profile statement, in conjunction with academic records, will be used by the Faculty in selecting a portion of the students entering engineering.

<sup>1</sup>e.g., Biology 12, Geography 12, Computer Science 12, or equivalent  
<sup>2</sup>e.g., Calculus 12

### Admission from a Post-Secondary Institution

Applicants from another faculty at UBC or another post-secondary institution may be considered for admission to the engineering program of the Faculty of Applied Science. An overall average of at least 65%, including any failed courses, is required. The overall average is calculated in accordance with the general admission requirement for undergraduate applicants from a college or university (Calendar page <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=2,25,73,0#139>).

Applicants must also have an average of at least 70% in all chemistry, mathematics, and physics courses which transfer to the first-year engineering program. Courses to be considered in this average of mathematics, chemistry, and physics courses are not limited to the last 30 credits only. Where two courses, or one repeated course, have been taken which transfer to one of the courses of the first-year engineering program, only the grade of the latest course will be used in calculating this average.

Admission to the engineering program is competitive. Applicants who meet all of these criteria are not guaranteed admission.

Applicants with less than 24 transferable credits from a post-secondary institution are evaluated against both secondary and post-secondary admission criteria.

Applicants with more than 26 credits of transfer credit in first-year engineering may be eligible for second-year engineering. Advice on transfer credit is available from the Dean's Office, Engineering Student Services. Deficiencies from first-year must be completed prior to graduation.

Students admitted to second year must complete a Second Year Program Preference Form by May 15.

Exemptions are given for courses in first-year Applied Science for the following Science courses:

#### Exemptions for Applied Science

Course	Exemption
CHEM 121 and 123	CHEM 154
MATH 221 or 223	MATH 152
PHYS 117, 118 and 119	PHYS 157, 158 and 159

MATH 221, or equivalent, is required for students wishing to enter the Departments of Electrical and Computer Engineering or Mechanical Engineering.

Successful completion of UBC Science One (<http://www.scienceone.ubc.ca>) provides transfer credit for first-year engineering for CHEM 154, MATH 100, MATH 101, and PHYS 157, PHYS 158, and PHYS 159.



Applicants with less than 25 transfer credits in engineering will normally enter first-year engineering and take a program similar to the one described in the table, [Typical Transfer Program Following First-Year Science](#). They will normally require four years following first-year Science to complete their engineering programs.

### ***Transition from UBC Vantage College Engineering Stream***

The Faculty of Applied Science delivers engineering programs at both UBC campuses: Okanagan and Vancouver. The Faculty has reserved space for all UBC Vantage College Engineering stream students to be able to transition to a second year program. Half of the reserved spaces are located on the Okanagan campus, and the other half are located at the Vancouver campus.

UBC Vantage College students who pass all courses in the Engineering stream with an average of at least 60% will be eligible for year two of the B.A.Sc. degree program.

Program selection is competitive, and all students will be asked to rank both their preferred campus and their eligible program<sup>1</sup>. Academic performance at the end of the Winter Session and a personal statement are considered in placing students into programs in second year.

Students who do not successfully complete the full UBC Vantage College Engineering stream or who achieve an average lower than 60% in the full program can apply to be reviewed on a case-by-case basis for evidence of academic promise for continued study in Engineering at UBC.

The UBC Vantage College Engineering stream is not equivalent to the direct entry B.A.Sc. first year program. Therefore, while successful completion of the Vantage College Engineering stream will result in eligibility for second year standing, there are program requirements normally completed in first year that will not have been met and that must be completed prior to graduation. Please consult [here](#) for details on Vancouver Engineering programs and here (<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,317,989> <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,317,989,1184>) for details on Okanagan Engineering programs.

<sup>1</sup>Eligible programs include: Okanagan Campus: Electrical, Mechanical, and Civil Engineering. Vancouver Campus: Chemical, Chemical and Biological, Computer, Electrical, Environmental, Geological, Integrated, Materials, and Mining Engineering.

### ***Admission from UBC Engineering Transfer Programs***

Students who have completed first-year engineering at a college offering a UBC transfer program are eligible to be considered for admission to second-year engineering provided that they have obtained an overall grade point average as published by the Faculty here (<http://www.engineering.ubc.ca/admissions/undergraduate/transfers>). Students transferring into the second year of the Biomedical Engineering program who have not completed all required first year BME courses may be required to complete first year course work during second year.

### ***Admission Following Two-Year Technology Diploma Programs***

Students are eligible to be considered for admission if they have completed an appropriate two-year technology diploma program with an overall average of at least 70%. Admission is normally into first-year engineering.

### ***Camosun Bridging Program***

Students with a two-year diploma in Civil, Mechanical or Mining Technology will be admitted to third year of the B.A.Sc. program in Civil Engineering, Mechanical Engineering, or Mining Engineering upon successful completion of the Engineering Bridging program offered by Camosun College. Applications for entry into the Bridging program are considered on an individual basis and approval for admission must be obtained from both the Faculty of Applied Science and Camosun College before registering in any of the bridging courses. Students may be required to take additional first- or second-year UBC courses to make up deficiencies.



### ***UBC-Langara Aboriginal Transfer Partnership (ATP)***

To be eligible to transfer to UBC through this partnership (<http://you.ubc.ca/applying-ubc/requirements/aboriginal-students/aboriginal-transfer-partnership/>), Aboriginal students must meet the general requirements for admission as a post-secondary transfer student (above) as well as the following specific requirements:

- Successful completion of the Engineering Transfer Program with a GPA of 2.8 or better over a 24-month period ending no later than April 30 preceding September entry.
- Successful completion of the ATP Transition Plan offered by Langara in collaboration with UBC.

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## **Bachelor of Applied Science > Academic Regulations**

### ***Dean's Honour List***

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.

### ***Degree with Distinction***

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.

### ***Student Classification***

The required courses and electives for the Winter Session are shown in the following sections. Historically, the average credit load taken by students is 33 per session, and normal completion time is four to five years. Students may take higher loads than those shown below with the approval of the Dean's Office.

Regular students are considered to be "full-time" or "part-time" as follows:

In order to be considered as full-time, a student must carry a credit load in the Winter Session which is equal to at least 80% of the standard credit load for the year and program in which the student is registered. Note that the Faculty's definition of full-time status may not be the same as that used by Enrolment Services (<http://students.ubc.ca/about/enrolment-services>) in determining eligibility for financial assistance. Students wishing to ensure that they are eligible for consideration for scholarships or other forms of award should check with an Enrolment Services Advisor.

A student who has approval for a credit load in a Winter Session which is less than that required for full-time status shall be considered as a part-time student. A part-time student will not normally be eligible for scholarships or for a Degree with Distinction.

Students are advised that the BASc degree should normally be completed in a maximum of 7 years from admission to the Faculty, inclusive of interruptions in study. Failure to complete the degree in this time may result in a requirement that additional courses be completed in order for a student to be eligible for graduation.

### ***Examinations***



Examinations are held in December and in April. In any course which includes both lecture and laboratory work, a student must complete the laboratory assignments with satisfactory standing before being admitted to the written examination of the course and must pass in the material of both components before standing will be granted in the subject. The minimum passing mark in each course is 50%.

Applications for special consideration for examinations missed on account of illness or domestic affliction must be submitted to the Dean before or immediately after the missed examination(s). For information regarding medical certificates see Academic Concession (Calendar page <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,329,0,0#26562>).

### *Academic Standing and Promotion Requirements*

Academic Standing will be determined by the student's Sessional Academic Average at the end of each Winter Session and Summer Session!

One of three Academic Standings is assigned as a result of a Sessional Academic Evaluation: Good Standing, Academic Probation, or Failed Year. All students are in Good Standing when first admitted to the Faculty.

Academic Standings and progression requirements are listed in the table below.

Year Level	Sessional Average	Academic Standing at the Time of Evaluation	Resulting Academic Standing	Promotion Status
1	60% or more	Any standing	Good Standing	Eligible to continue; eligible for Year 2 <sup>1</sup>
1	50% - 54.9%	Not Probation	Academic Probation	Eligible to continue; not eligible for Year 2
1	55% - 59.9%	Not Probation	Academic Probation	Eligible to continue; eligible for Year 2 <sup>1</sup> ; eligible for Undeclared status
1	50% - 59.9%	Probation	Failed Year	Required to discontinue
1	Less than 50%	Any Standing	Failed Year	Required to discontinue
2-5	55% or more	Any Standing	Good Standing	Eligible to continue <sup>2,3</sup>
2-5	50% - 54.9%	Not Probation	Academic Probation	Eligible to continue <sup>2,3</sup>
2-5	50% - 54.9%	Probation	Failed Year	Required to discontinue
2-5	Less than 50%	Any Standing	Failed Year	Required to discontinue

<sup>1</sup> Students must successfully complete a minimum of 27 credits of the first year program before being permitted to continue to Year 2.

<sup>2</sup> Students must successfully complete a minimum of 80% of the credits required for year levels 2 and higher before being permitted to continue to the next year level.

<sup>3</sup> Note that additional registration restrictions may apply. See Communication Requirement.

A student with a second assigned Failed Standing will be required to withdraw from the University. See Advancement Regulations (Calendar page <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,43,0,0#234>).

<sup>1</sup> Students in their 2<sup>nd</sup> year of the Engineering Physics program will be evaluated at the end of the Summer Session, in place of regular Winter Session evaluations.

### *Undeclared Status*

Students who are eligible for Year 2 having an average between 55% and 59.9% may opt to continue for one year with Undeclared Status. This status will allow students to register for select second year courses from multiple departments in consultation with, and approved by, an academic advisor. The standard rules for academic probation will apply, including credit limits and the need for an



approved study plan. A student may remain on Undeclared Status for only one year, must clear any outstanding first year program requirements during that year, and must submit a new program preference form at the end of the winter academic session. Students should be aware that Undeclared Status may result in additional time required to complete a program, and that not all courses completed during the Undeclared year may be applicable to a student's eventual program of study.

### ***Guaranteed Program Placement***

Winners of the Presidential Scholars Awards may be accorded conditional selection of an engineering specialization that is normally granted to students upon second year via a competitive process. For Guaranteed placement, students so admitted must complete a minimum of 27 credits towards the first year of the Bachelor of Applied Science program with a minimum average of at least 75%, upon which they will be eligible to choose placement in one of the participating programs. Students who do not meet both requirements may be considered for guaranteed placement at the discretion of the Faculty. Not all specializations are available and the Faculty reserves the right to limit enrolment in participating programs.

### ***Returning to Good Standing from Probation***

Students who are on Probation in Year 1, i.e., with a sessional average between 50% and 59.9%, must achieve a sessional average of 60% or greater in an approved schedule of courses during their next registered Winter Session in order to return to Good Standing. Students must meet with an Engineering Student Services Advisor to establish an appropriate schedule of courses, which must be approved by the Director of Engineering Student Services or designate.

Students who are on Probation in Year 2 or higher, i.e., with a sessional average between 50% and 54.9%, must achieve a sessional average of 55% or greater in an approved schedule of courses during their next registered Winter Session in order to return to Good Standing. Students must meet with a Program/Department Advisor to establish an appropriate schedule of courses, which must be approved by the Program Director/Department Head or designate.

### ***Returning after a Failed Year***

Students who have been required to withdraw because of a failed year must apply in order to be readmitted to the program. The earliest a student may be readmitted is 12 months after being required to withdraw due to a Failed Year. Readmission is not guaranteed. For details, see [Readmission After a Failed Year](#) below.

### ***Readmission After a Failed Year***

Readmission after a Failed Year is not guaranteed. Readmission decisions take into account the amount of space available as well as the size and strength of the applicant pool in a given year. All students seeking to return after a Failed Year must submit an application for readmission by the stated deadline (Calendar page <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=2,295,0,0#189>). The earliest a student may be readmitted is one full year (12 months) following the requirement to withdraw.

Requirements for readmission depend on the year level a student was in when they left. Minimum requirements by year level are stated below. Additional information regarding applying for readmission can be found under Readmission (Calendar page <http://www.c>  
<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=2,273,0,0#1398>).

#### **Readmission After a Failed Year in First Year**

Students seeking to return after a Failed Year in year one of the Engineering program will be considered for readmission based on a combination of:

- Performance in a minimum of 24 transferrable credits from another recognized post-secondary institution; and



- A letter of appeal outlining how the student has prepared to succeed in further studies at UBC.

Students should meet with an Engineering Student Services Advisor at UBC to develop a plan for applying for readmission.

### **Readmission After a Failed Year in Second Year or Higher**

Students seeking to return after a Failed Year in year two or higher of an Engineering program will be considered for readmission based on a combination of:

- Further academics in a related field at another post-secondary institution and/or work experience related to their field of study;
- A letter of appeal outlining how the student has prepared to succeed in further studies at UBC; and
- Two reference letters pertaining to the student's academic and/or work experience.

Students should meet with an advisor in their program or department to develop a plan for applying for readmission.

### **Communication Requirement**

The Faculty recognizes that good communication skills in English are essential to the understanding of course material and to the successful practice of engineering. Term essays and examination papers may be refused a passing mark if they are poorly written.

Students are encouraged to complete ENGL 112, WRDS 150, or an acceptable substitute prior to beginning their second year. Some programs additionally require that students have successfully completed ENGL 112 or equivalent to be eligible for registration in second year courses.

Students must pass ENGL 112, WRDS 150, or equivalent before being permitted to continue with the third year of their programs. Individual programs may have additional advancement regulations.

Students must pass an approved technical communication course before being permitted to continue with the fourth year of their programs. Consult the program requirements in the Academic Calendar for the appropriate course for your program.

Any student who does not meet one of these timing requirements will be permitted to take up to 12 credits in the first term after the requirement is not met, but will not be allowed to take any courses, other than WRDS 150 (or equivalent) or the prescribed technical communication course as appropriate, after that time.

### **Supplemental Examinations**

Supplemental exams are generally restricted to 400-level courses within the Faculty. However, supplemental examinations may not be available in all 400-level courses or in all cases. At the discretion of the Faculty, a supplemental exam may be granted to a student for a 300-level course provided that the course is either a published requirement in the final year of a student's program or is the last remaining course required for degree completion. Supplemental examinations are only available to students who are in good standing for the Winter Session just completed. In order to be eligible to write a supplemental examination for a course, the final grade received for the course must be between 40% and 49.9%. Supplemental examinations are only offered during the deferred/supplemental examination period of July to August. All applications for supplemental exams must be made through Enrolment Services.

Supplemental examinations for courses which terminate in December will normally be made available to students only during the supplemental examination period in July to August.



### *Appeals*

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

Applications for readmission from non-current students should be directed to Enrolment Services.

### *Field Trips*

Students who are required to participate in field trips will be responsible for expenses incurred in such trips.

### *Credit/D/Fail Standing*

Students in the Bachelor of Applied Science program will not be eligible to take courses on a Credit/D/Fail basis. Exceptions may be made if it is determined that the course(s) is not required for the student's degree program. Students may seek approval from the Dean's Office, Engineering Student Services.

For students pursuing a B.A./B.A.Sc. dual degree, this exclusion applies only to the engineering degree; courses which apply only toward the B.A. degree must follow the requirements of the Faculty of Arts.

Students transferring into engineering may not apply any of the courses previously taken using Credit/D/Fail grading toward their engineering degree. The student must change the course to a percentage grade upon entry into the engineering program or must retake the course once admitted into the engineering program.

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## **Bachelor of Applied Science > Degree Requirements**

A student will be granted a Bachelor of Applied Science only after obtaining credit for all courses listed in the program of study for a given engineering program. This requirement will normally be met by completing four Winter Sessions with full credit load (five Winter Sessions for the Engineering Physics Program, and nine academic terms for the Biomedical Engineering Program). With the approval of the Dean's Office, a student may be allowed to study on a part-time basis. Credit will be granted for courses completed during the Summer Session.

A student transferring from an engineering program at another university or from a science faculty may be granted transfer credit for courses if the student has completed courses of equivalent content.

### *Elective Courses in Engineering*

Students are advised that enrolment in elective courses offered within the Faculty may be restricted.

### *English Requirement*

The Faculty of Applied Science recognizes that good communication skills in English are essential to the understanding of course material and to the successful practice of engineering. To qualify for the B.A.Sc., a student must complete ENGL 112 (or equivalent) and an approved technical communication course. Students admitted directly from secondary schools are required to take English in



their first year if eligible to do so. Once admitted to UBC, students will not normally be permitted to satisfy the English requirements at another institution. Students should take particular notice of the English requirements for advancement in the Faculty (see [Advancement](#)). Students in the Biomedical Engineering program who plan on applying to medical school should take an additional English course.

Note that students who plan on applying to medical school will need 6 credits in ENGL in order to apply. Students should confirm application requirements with the medical schools of their choice and may need to take an additional ENGL course as one of their humanities and social sciences electives.

### *Complementary Studies Courses*

In order to satisfy accreditation requirements, all students must complete seven elements of complementary studies, including a minimum of 20 credits of complementary studies courses as follows:

1. Engineering economics and project management: minimum 3 credits
2. Humanities and social sciences electives: minimum 6 credits<sup>1</sup>
3. Oral and written communication: minimum 6 credits
4. Health and safety<sup>2</sup>
5. Professionalism, ethics, equity and law: minimum 2 credits
6. Impact of technology on society<sup>3</sup>
7. Sustainable development and environmental stewardship<sup>3</sup>

<sup>1</sup>Students need 6 credits in ENGL in order to apply to medical school. Students should confirm application requirements with the medical schools of their choice and may need to take an additional ENGL course as one of their humanities and social sciences electives if they intend to apply to medical school.

<sup>2</sup>Content integrated into the core courses of each program

<sup>3</sup>Minimum 3 credits for entries 6 and 7 combined.

Some of the 20 credits of course requirements shown above may be integrated into core courses of some programs. For up to date lists of acceptable courses in each area of study, as well as program specific information on complementary studies requirements, please consult the Applied Science Engineering Student Services Electives web page (<http://students.engineering.ubc.ca/degree-requirements>)

Last updated: June 16, 2021

## **Bachelor of Applied Science > Minor in Arts**

A student in an engineering program may undertake a minor in Arts:

- An acceptable minor program must comprise courses in the Faculty of Arts that are for credit toward a B.A. degree and must consist of 18 upper-level credits in a single subject or field of specialization.
- Students should design a coherent and academically sound course of studies for the proposed minor.
- The program must be approved by an advisor in Engineering Student Services on the recommendation of an advisor from the appropriate department or program office within the Faculty of Arts.
- All courses must be acceptable for a B.A. major in the proposed subject area or field, although the student is not bound by other requirements of the Faculty of Arts.

A minor in Mathematics, Computer Systems, Cognitive Systems, or where there is significant overlap between the student's engineering program and the proposed subject or field for the minor is not permitted. A dual degree and a minor in Arts cannot be combined, although a student may pursue a minor within the B.A. degree.



Upon successful completion of the minor program, the notation "Minor in Arts" will be added to the student's transcript.

Students wanting a subject-specific minor may also undertake a minor in a specific Arts discipline's minor program, which requires the completion of at least 30 credits in a single subject field of specialization, of which at least 18 credits must be numbered 300 or higher.

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## Bachelor of Applied Science > Minor in Commerce

Students desiring a stronger foundation in business are encouraged to consider the Minor in Commerce. Upon successful completion of this minor program, the notation "Minor in Commerce" will be placed on the student's transcript.

Enrolment in the program is limited. Applications for admission must be made through Engineering Student Services by May 15. For an application to be considered, the student must be eligible for at least third-year standing in the Faculty of Applied Science with a cumulative average of at least 68% in the previous two years. Meeting the stated minimum requirements does not guarantee admission into the minor. Preference will be given to students who have already completed ECON 310 and 311 (or ECON 101 and 102). The program will consist of the following:

COMR 457	3
COMR 465	3
One of COMR 329, 458 or 473	3
ECON 310 (or 101)	3
ECON 311 (or 102)	3
An engineering economics course appropriate for the program in which the student is enrolled	3
<b>Total Credits</b>	<b>18</b>

Note that ECON 310 (or 101) and ECON 311 (or 102) meet the 6-credit humanities and social sciences elective component of the complementary studies course requirements; and the engineering economics course meets the 3-credit engineering economics component of the complementary studies course requirements. Therefore, it is possible for students to count 9 credits of their complementary studies course requirements towards the requirements of the Minor in Commerce with the appropriate course selection. Counting of one 3-credit Commerce course as a technical elective towards BASc program requirements is only allowed if explicitly indicated on the program's website. Therefore, the Minor may entail as few as 9 credits, not 18, of additional coursework beyond the requirements of the BASc degree.

Minor in Commerce students will take two years to obtain the necessary course requirements due to prerequisite requirements.

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## Bachelor of Applied Science > Minor in Entrepreneurship

Students desiring foundations in the knowledge and practical skills related to the formation of an entrepreneurial enterprise are encouraged to consider the Minor in Entrepreneurship. Upon successful completion of this minor program, the notation "Minor in Entrepreneurship" will be placed on the student's transcript.

Enrolment in the program is limited. Applications for admission must be made through Engineering Student Services by May 15. For an application to be considered, the student must be in good standing and eligible for at least third-year standing in the Faculty of Applied Science with a cumulative average of at least 68% in the previous two years. Meeting the stated minimum requirements



does not guarantee admission into the minor. Preference will be given to students who have completed COMM 280.

The program will consist of the following:

COMR 280	3
COMR 382	3
COMR 387	3
And either	
APSC 486	6
Plus 1 Entrepreneurship Elective*	3
OR	
COMR 497	3
Plus 2 Entrepreneurship Elective*	6

Enrolment in the minor program does not change the requirements for the major program of study. Students may be required to take all 5-6 courses in addition to the requirements of their major program. Each major program reserves the right to determine if any of the courses constituting the minor will qualify as credits within the major. Students will be required to consult their program advisor/director regarding how many/if any of the courses in the minor can be used as electives or as a capstone in their program.

All courses constituting the minor program must be taken at the Vancouver campus of UBC.

\* The course(s) will be chosen from a list of approved electives, which will be published annually by the program.

Last updated: June 16, 2021

## Bachelor of Applied Science > Minor in Honours Mathematics

Students wanting a stronger foundation in mathematics are encouraged to consider the Minor in Honours Mathematics. Upon successful completion of this Minor, the notation "Minor in Honours Mathematics" will be placed on the student's transcript.

The Minor in Honours Mathematics consists of two components: 200-level MATH courses, and 300- and 400-level MATH courses. An overall average of at least 68% must be obtained in each of the two components of the Minor.

A minimum of 9 credits of 200-level MATH courses are required in the first component.

- 200-level MATH courses from a student's engineering program (excluding MATH 221 and 223) may be included in this total.
- Students must include at least one of MATH 217, 227, 263, 264, or 317 (students who have successfully completed MECH 222 are exempt from this requirement).
- Additional eligible courses are MATH 220 and 257.

The 300- and 400-level MATH courses required in the second component are:

MATH 300 or 305	3
MATH 320 <sup>1</sup>	3



Two of MATH 301, 321, 322, and 400	6
Elective 300- and 400-level MATH courses <sup>2</sup>	12

<sup>1</sup> The prerequisites for MATH 320 will be waived for students who earn an overall average of at least 80% on the best 5 or more credits of 200-level MATH courses from the first component. Other students must obtain at least 80% in MATH 220.

<sup>2</sup> Eligible elective 300- and 400-level MATH courses are: MATH 301, 257/316, 318, 321, 322, 331, 345, 400-406, 412, 416-440, 443, and 449.

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## Bachelor of Applied Science > Minor in Science

Enrolment in the Minor in Science is limited to students eligible for third-year standing with an average of at least 68% in each of the previous two years.

Courses taken for the Minor in Science must be courses in the Faculty of Science that are acceptable for a B.Sc. major or honours in the proposed subject area or field. The minor consists of at least 18 upper-level credits either in a single subject area or area of specialization, together with any necessary prerequisites. The following subject areas have additional constraints or requirements in the selection of courses for the minor: [Astronomy](#), [Biochemistry](#), [Chemistry](#), [Environmental Sciences](#), [Oceanography](#), and [Physics](#). Note that there is a separate [Minor in Honours Mathematics](#) that is distinct from the Minor in Science in Mathematics. Please refer to the hyperlinked Calendar entry for each of these subject areas for additional minor requirements. For some programs, course planning as early as first year may be advisable in order to complete pre-requisite courses for some minor subject areas in a timely fashion.

Students are strongly advised to design a coherent and academically sound course of studies for their proposed minor, which must be approved by the Applied Science Engineering Student Services office at the beginning of third year.

Applications for admission must be made through Engineering Student Services by May 15.

Entry into and continuation in the Minor requires that the student remains in Good Standing. Where space in courses required for the Minor is limited, students may be required to maintain a sessional average higher than the minimum for Good Standing. Upon successful completion of the Minor program, the notation "Minor in [Subject]" will be denoted on the student's transcript.

Students might encounter difficulty fitting the courses for the Minor into their program timetable; careful planning is essential, and completion of the Minor program might require an additional term or terms beyond that required to complete the B.A.Sc. degree alone.

No more than six upper-level credits that count toward the restricted elective requirements for the B.A.Sc. degree may be double-counted to fulfill requirements for the Science minor.

Note: Students who wish to pursue a Minor in Science should be aware of the pre-requisites of many of the upper-level science courses. Space in many courses is limited. Admission to a science minor does not guarantee access to courses agreed upon for the minor.

Last updated: June 16, 2021

## Bachelor of Applied Science > Dual Degree Program in Arts and Applied Science

This program offers capable students the opportunity to earn a Bachelor of Arts and a Bachelor of Applied Science degree in five years of study, in most combinations of one Arts degree program and one Engineering degree program. A board of studies administers and oversees admission to the program. Please contact Arts Advising or Engineering Student Services for more information.



## Admission

Application for admission to the program is made to the board of studies through either the Arts Advising Office or Engineering Student Services. Applicants may be registered in either faculty but must be admissible to the other faculty at the time of admission to the program. Acceptance into the program will be determined based on a review of the applicant's transcript, an interview, and on a review of a portfolio or other such material that the applicant wishes to submit. Normally, application for admission will be made immediately upon acceptance into either faculty. Admission to the program at a later date is also possible but may imply a longer time to complete the program.

## Requirements

Students must satisfy all of the program requirements for both the Bachelor of Arts and Bachelor of Applied Science degrees in their chosen programs. Individual courses may be considered to satisfy program requirements for both degrees. Courses taken within the Faculty of Applied Science will have the same standing as courses taken within the Faculty of Science for the purpose of satisfying requirements for a Bachelor of Arts for students enrolled in this program. The regulations governing the granting of a second degree apply to this program, with either of the two degrees being considered as the 'second' degree even though both are being taken simultaneously. Where possible, students should meet with an advisor from the board of studies prior to enrolling in their first year of courses.

Last updated: June 16, 2021

## Bachelor of Applied Science > Pre-Med Alternative Path

This alternative path is intended for students with an engineering background wishing to apply to medical schools. It provides access to courses required by many medical schools for students to be considered for admission. Registration in this alternative path is very competitive and is limited.

Students in this path follow the same requirements for first year engineering with the following modifications, in which they take:

- CHEM 121 and 123 instead of CHEM 154
- a first-year English course (ENGL 110, 111, 120, or 121) in place of a humanities elective (this is in addition to the required ENGL 112)

The following courses are also strongly recommended after first year:

- BIOL 121
- CHEM 205, 233, and 235
- BIOC 202 and 302, or BIOC 303

Special standard timetables are available for first-year courses.

Given the additional courses taken over and above the engineering degree, students should on the average expect an additional term to complete these course requirements along with their engineering degree requirements. Some courses may be offered in the summer term. Some programs may accept selected courses above as part of their degree requirements, thus reducing the additional time needed. Consult the specific programs for details.

Different medical schools have different course requirements. Students are strongly advised to verify the course requirements with prospective medical schools. It should also be noted that the course requirement is only one of the criteria used by medical schools to assess applications. It is the student's responsibility to be informed of the applicable criteria.



## The Biomedical Engineering Program

The Biomedical Engineering Program is another Pre-Med path available to UBC engineering students. Students who wish to apply to medical school who are enrolled in the Biomedical Engineering Program should take one additional English course as one of their complementary studies electives. Other courses in the Biomedical Engineering program are accepted as meeting the [UBC Faculty of Medicine recommendations](#). Students are advised to consult with other Medical programs if they plan on applying to other schools.

Last updated: June 16, 2021

## Bachelor of Applied Science > Curriculum and First Year

### First Year

Students admitted into the Engineering program directly from secondary school will take the first-year curriculum. Students identified as being eligible to take Biomedical Engineering Program content in first year will receive a modified first year timetable.

The typical transfer program is appropriate for most students transferring into the Faculty from the first year of a science program at UBC or another university or college. Applicants with more than 26 credits of engineering transfer credit may be eligible for second-year engineering. See [admission from a Post-Secondary Institution](#).

For information about the first year curriculum and transferring into the Biomedical Engineering Program, refer to the UBC calendar page for the [Biomedical Engineering program](#).

Other students will need to contact Engineering Student Services for advice on their first-year program.

### First-Year Curriculum

First Year	
APSC 100	3
APSC 101 <sup>1</sup>	3
APSC 160	3
CHEM 154 <sup>1</sup>	3
WRDS 150 <sup>2</sup>	3
MATH 100	3
MATH 101	3
MATH 152	3
PHYS 157	3
PHYS 158	3
PHYS 159	1
PHYS 170	3
Complementary Studies electives <sup>3</sup>	3
<b>Total Credits</b>	<b>37</b>

<sup>1</sup> Students transferring into Engineering with CHEM 121 and 123 will not be required to take APSC 101 or CHEM 154, but will be required to take APSC 100.

<sup>2</sup> Or another first-year English course.

<sup>3</sup> See [Complementary Studies Courses](#).



**Typical Transfer Program Following First-Year Science**

First Year	
APSC 100	3
APSC 160	3
APSC 201	3
MATH 152	3
MATH 253	3
MATH 255	3
PHYS 170	3
STAT 251	3
Complementary Studies electives <sup>1</sup>	6
<b>Total Credits</b>	<b>30</b>

<sup>1</sup> See Complementary Studies Courses.

**Options in Third and Fourth Years**

In some departments selected groups of courses are offered as options which represent different areas of interest. High-quality performance in any option or field qualifies the student to continue his studies at the graduate level if he chooses to do so. Students entering third year should consult representatives of the departments concerned before registering for the courses offered.

Last updated: June 16, 2021

**Bachelor of Applied Science > Biomedical Engineering**

**Program Overview**

The Faculty of Applied Science offers a program leading to the Bachelor of Applied Science (B.A.Sc.) in Biomedical Engineering. Biomedical Engineering (BME) addresses fundamental problems where human biology and physical design principles intersect. The program gives biomedical engineers the skills required to make scientific discoveries and inventions that promote health.

Typically, UBC engineering programs begin with a common first year after which students apply for, and are registered in, a specific engineering discipline in second year. However, entry into the second year of the BME B.A.Sc. program requires BME-specific versions of the first year courses and students wishing to study in the BME program in their second year are strongly encouraged to apply for registration in the “Pre Biomedical Engineering Standardized Timetable (PBME STT)” after they apply to UBC’s first year Engineering Program. The PBME STT is a modified version of the common first year and selection for the modified timetable is limited and competitive. This timetable allows students to take introductory material core to the BME program in year one.

Students apply for the BME B.A.Sc. after completing first year engineering (or a comparable program at another university or college). Students who are admitted to the BME B.A.Sc. without completing the PBME STT will have to complete any missing course requirements.

Students completing their first year of the PBME modified first year timetable will also be eligible for 2nd year placement into other Engineering programs at UBC.

The program is designed with four streams of technical electives to allow students to focus on particular areas of Biomedical



Engineering: Cellular Bioengineering; Biomedical Systems and Signals; Biomechanics and Biomaterials; and Biomedical Informatics. After their second year, BME students indicate their prioritized stream preferences. Prospective students should be aware that a maximum enrolment limit may apply to each stream. If student preferences for a stream exceed capacity for that stream, the program Director will select students for the stream based on academic standing and demonstrated interest and ability in that specific stream.

Consult the program website for technical elective selection for each stream.

The program is designed to align with admissions criteria for medical school. Students intending to apply to medical school after their biomedical engineering program must take a first year English course as a complementary study. Other courses within the program are considered equivalent for the purposes of the Biology content recommended by the UBC Faculty of Medicine.

### Program Requirements

First Year	
APSC 100	3
APSC 160	3
BMEG 101 <sup>1</sup>	3
BMEG 102 <sup>1</sup>	2
CHEM 121	4
CHEM 123	4
MATH 100	3
MATH 101	3
MATH 152	3
PHYS 157	3
PHYS 158	3
PHYS 170	3
WRDS 150	3
<b>Total Credits</b>	<b>40</b>
Second Year	
BMEG 201	3
BMEG 210	3
BMEG 220	4
BMEG 230	4
BMEG 245	4
BMEG 250	4
BMEG 257	4
CHBE 251	3
CPEN 221 <sup>2</sup> or CPEN 223	4
MATH 253 or 226	3
MATH 256	3
MATH 264	1
<b>Total Credits</b>	<b>40</b>



Third Year	
BIOC 202	3
BMEG 310	4
BMEG 321	3
BMEG 350	4
BMEG 357	3
BMEG 371	3
CHEM 233	3
CHEM 235	1
STAT 251	3
Stream-based Courses	9
Complementary Studies Electives <sup>3</sup>	3
<b>Total Credits</b>	<b>39</b>
Fourth Year	
BMEG 401	3
BMEG 455	3
BMEG 457	6
STAT 300	3
Stream-based Courses	18
Complementary Studies Electives <sup>3</sup>	6
<b>Total Credits</b>	<b>39</b>

<sup>1</sup> Students who come into Biomedical Engineering without taking BMEG 101 and BMEG 102 must take all of APSC 101, PHYS 159 (or equivalent) and BMEG 200.

<sup>2</sup> Students planning to complete the Bioinformatics option should take CPEN 221.

<sup>3</sup> See Complementary Studies Courses (<http://calendar.ubc.ca/vancouver/index.cfm?tree=12,195,272,30#1116>). Students planning to apply to Medical School should take a first year English course as their complementary studies elective. Students should confirm the specific pre-requisite courses for the Medical School(s) to which they will apply.

### Stream Based Courses

Students completing the **Cellular Bioengineering Stream** must complete the following:

BIOC 302	3
BMEG 374	3
BMEG 470	3
CHBE 381	3
Additional technical electives <sup>4</sup>	15

Students completing the **Biomedical Informatics Stream** must complete the following:

BIOC 302	3
CPSC 221	4
CPSC 340	3
Either MATH 220	3
Or CPSC 121	4
Additional technical electives <sup>4</sup>	13 (if taking CPSC 121) 14 (if taking MATH 220)



Students completing the **Biomedical Systems and Signals Stream** must complete the following:

BMEG 320	3
ELEC 221	4
Additional technical electives <sup>4</sup>	20

Students completing the **Biomaterials and Biomechanics Stream** must complete the following:

APSC 278	3
APSC 279	1
BMEG 330	3
MECH 260	3
Additional technical electives <sup>4</sup>	17

<sup>4</sup> To be chosen from a course list available on the program website and in consultation with an undergraduate advisor.

### Cooperative Education Experiential Work Terms

Cooperative education experiential learning placements are an integral part of the Bachelor of Applied Science in Biomedical Engineering program. Students will typically complete four 4-month experiential learning placements coordinated through the Applied Science Co-op Program. Work terms can take place during the Winter or Summer terms. Students should refer to the program website for the current schedule. Students unable to complete one or more co-op terms should consult with a departmental advisor.

Last updated: June 16, 2021

## Bachelor of Applied Science > Chemical and Biological Engineering

The Department of Chemical and Biological Engineering offers programs leading to the Bachelor of Applied Science in Chemical Engineering and to the Bachelor of Applied Science in Chemical and Biological Engineering. Interested students should apply for the Chemical Engineering or Chemical and Biological Engineering program after completing first year engineering, or equivalent if applying from another institution. Prospective students should be aware that the number of available spaces in either of the programs of study may be limited.

Without the successful completion of WRDS 150 or equivalent (ENGL 100, 110, 111 or 112) prior to entry, the program will require an extra year for completion. Therefore, prospective students are advised to complete WRDS 150 or equivalent (ENGL 100, 110, 111 or 112) prior to September 1st.

First year English is a pre-requisite of CHBE 201 (Integrated Technical Communications). CHBE 201 is a co-requisite of CHBE 220 (Introduction to Chemical and Biological Engineering Laboratory Practice) so students cannot register in either CHBE 201 or CHBE 220 until successful completion of First year English requirements. For further information visit Chemical and Biological Engineering.

### Chemical Engineering or Chemical and Biological Engineering

#### Second Year

CHBE 201	3
CHBE 220	4
CHBE 221	4
CHBE 230	3
CHBE 241	3
CHBE 244	3



CHBE 251	3
CHBE 263	1
CHBE 264	3
CHEM 250	3
CHEM 260	3
MATH 253	3
MATH 256	3
Total Credits	39

**Third Year**

CHBE 345	4
CHBE 346	3
CHBE 352	4
CHBE 355	3
CHBE 356	4
CHBE 362	3
CHBE 370	3
CHBE 376	4
STAT 251	3
Complementary Studies electives <sup>1</sup>	3
Plus one of the programs listed below:	

**Chemical Engineering**

APSC 278	3
CHBE 366	3

**Chemical and Biological Engineering**

CHBE 365	3
CHBE 381	3
Total Credits	40

**Fourth Year**

APSC 450	2
CHBE 456	3
CHBE 459	3
CHBE 464	4
Complementary Studies electives <sup>1</sup>	3
Plus one of the programs listed below:	

**Chemical Engineering**

CHBE 454	8
CHBE 471	4
CHBE 474	3
Technical electives <sup>2</sup>	9

**Chemical and Biological Engineering**

CHBE 453	8
CHBE 481	4



Technical electives <sup>2</sup>	12
Total Credits	39

<sup>1</sup> See Complementary Studies Courses.

<sup>2</sup> To be chosen from a list of electives available from the Department.

Last updated: June 16, 2021

## Bachelor of Applied Science > Civil Engineering

The Department of Civil Engineering offers a program leading to the Bachelor of Applied Science in Civil Engineering. Interested students should apply for the Civil Engineering program after completing first year engineering, or after second year if applying from another institution.

Prospective students should be aware that an enrolment limit may apply, and that, without the successful completion of ENGL 112 or equivalent prior to entry, the program will require an additional year for completion. Therefore, prospective students are advised to have completed ENGL 112 or equivalent prior to the second term of the summer session. For further information visit Civil Engineering (<http://www.civil.ubc.ca/>).

The second-year program in Civil Engineering requires all students to take the course CIVL 201 (Introduction to Civil Engineering) in the first term following entry to the program. The course commences with a communication skills module that is delivered over the two weeks before the normal start of Term 1 classes at UBC. Attendance during the two-week period is mandatory for those students who do not meet specified requirements relating to marks in ENGL 112 or equivalent: visit CIVL 201 (<http://www.civil.ubc.ca/academic-programs/undergraduate-program/civil-201-requirements>) for additional information and instructions. Due to the early start date, affected students who plan to live on-campus in UBC Housing are required to apply for early arrival.

### Civil Engineering

Second Year	
APSC 278	3
APSC 279	1
CIVL 201	3
CIVL 203	3
CIVL 204	3
CIVL 210	4
CIVL 215	4
CIVL 230	4
CIVL 231	4
CIVL 235 <sup>1</sup>	4
EOSC 210	3
MATH 253	3
MATH 256	3
STAT 251	3
Total Credits	45
Third Year	
CIVL 300	3
CIVL 301	3



CIVL 302 <sup>2</sup>	3
CIVL 303	3
CIVL 305	3
CIVL 311	4
CIVL 315	4
CIVL 316	4
CIVL 320	3
CIVL 331	4
CIVL 332	3
CIVL 340	3
Total Credits	40
<b>Fourth Year</b>	
CIVL 402 <sup>3</sup>	3
CIVL 403	3
CIVL 409	3
CIVL 430	4
CIVL 445	3
CIVL 446	2
Technical electives <sup>4</sup>	15
Complementary Studies Electives <sup>5</sup>	3
Total Credits	36

<sup>1</sup> End of Term 2, second year.

<sup>2</sup> This course satisfies the impact of technology on society requirement within the Complementary Studies Courses.

<sup>3</sup> This course counts towards the professional development requirements within the Complementary Studies Courses.

<sup>4</sup> See 4th Year Technical Electives (<http://civil.ubc.ca/academic-programs/undergraduate-program/4th-year-technical-electives>); several elective streams are possible

<sup>5</sup> See Complementary Studies Courses.

Last updated: June 16, 2021

## Bachelor of Applied Science > Electrical and Computer Engineering

The Department of Electrical and Computer Engineering offers programs leading to the Bachelor of Applied Science in Electrical Engineering and to the Bachelor of Applied Science in Computer Engineering. A minor in Honours Mathematics option is available in both programs.

Three options are available in Electrical Engineering: Biomedical Engineering, Electrical Energy Systems, and Nanotechnology and Microsystems. An option in Software Engineering is available in Computer Engineering.

Students choosing Biomedical Engineering must apply prior to second year; students opting for other options enter at the third year level (refer to website below for application information pertinent to the individual Options). Students should be aware that enrolment restrictions in the Options may apply.

**NOTE: The intake of students into the Electrical Energy Systems, Nanotechnology and Microsystems, and Software Engineering options has been suspended effective 2015.**



For further information visit Electrical and Computer Engineering (<http://www.ece.ubc.ca>).

**Second Year**

(For Electrical Engineering)

CPEN 211	5
CPSC 259	4
ELEC 201	4
ELEC 202	4
ELEC 211	2
ELEC 221	4
ELEC 281	3
ELEC 291 <sup>1</sup>	6
MATH 253	3
MATH 256	3
MATH 264	1
Total Credits	39

<sup>1</sup> Students in the Biomedical Engineering Option will take ELEC 271 and ELEC 292 instead of ELEC 291.

(For Computer Engineering)

CPEN 211	5
CPEN 221	4
CPEN 281	3
CPEN 291	6
CPSC 221	4
CPEN 212	4
ELEC 201	4
MATH 220	3
MATH 253	3
MATH 256	3
Total Credits	39

**Computer Engineering**

<b>Third Year</b>	
CPEN 331	4
CPEN 391	6
CPSC 320	3
One of MATH 318, STAT 251, MATH 302, STAT 302	3
Electives <sup>1</sup>	16



Complementary Studies electives <sup>2</sup>	6
Total Credits	38

**Fourth Year**

APSC 450	2
CPEN 481	3
CPEN 491	10
Electives <sup>1</sup>	20
Science elective <sup>1</sup>	3
Total Credits	38

<sup>1</sup> To be chosen based on Department-approved list of Computer Engineering electives.

<sup>2</sup> See Complementary Studies courses.

**Software Engineering Option (enrolment suspended)**

The Software Engineering Option, in Computer Engineering, puts a greater emphasis on methods and process for the design of software-intensive computer systems, including requirements elicitation, software design, software quality, user-interface, and software project management.

Students who satisfactorily complete the following program will be given recognition as receiving the Bachelor of Applied Science in Computer Engineering (Software Engineering Option).

**Third Year (for students who enter the program in September 2013)**

CPEN 311	4
CPEN 321	4
CPEN 331	4
CPEN 391	6
CPSC 221	4
CPSC 304	3
CPSC 320	3
One of MATH 318, STAT 251, MATH 302, STAT 302	3
Complementary Studies electives <sup>1</sup>	6
Total Credits	37

**Third Year (for students who enter the program in September 2014 or later)**

CPEN 311	4
CPEN 321	4
CPEN 331	4
CPEN 391	6
CPSC 221	4
CPSC 304	3
CPSC 320	3
ELEC 221	4
One of MATH 318, STAT 251, MATH 302, STAT 302	3
Complementary Studies electives <sup>1</sup>	3



Total Credits	38
<b>Fourth Year</b>	
APSC 450	2
CPEN 421	4
CPEN 422	4
CPEN 481	3
CPEN 492	10
Science elective <sup>2</sup>	3
Electives <sup>2</sup>	13
Total Credits	39

<sup>1</sup> See [Complementary Studies courses](#).

<sup>2</sup> To be chosen based on Department-approved list of Software Engineering electives.

### Electrical Engineering

<b>Third Year</b>	
ELEC 301	4
ELEC 311	4
ELEC 315	4
ELEC 321 or STAT 321	4
ELEC 341	4
ELEC 342	4
ELEC 391	6
Breadth Electives <sup>1</sup>	4
Total Credits	40

<b>Fourth Year</b>	
APSC 450	2
ELEC 481	3
ELEC 491	10
Electives <sup>2</sup>	18
MATH elective <sup>2</sup>	3
Total Credits	36

<sup>1</sup> See [Complementary Studies courses](#).

<sup>2</sup> To be chosen based on Department-approved list of Electrical Engineering electives.

### Biomedical Engineering Option

The Biomedical Engineering Option, in Electrical Engineering, allows students interested in the application of technology to medicine and the life sciences to have a course and project concentration in these areas. The option provides core courses in Electrical Engineering as well as a broad range of specific courses traditionally covered in Biomedical Engineering: anatomy, physiology, biomedical instrumentation, biosignals and systems, medical imaging, regulatory standards, design processes, and the emerging areas of micro and nanotechnology.

Students will be admitted to the option at the end of first year by permission of the option coordinator, based on a demonstrated



interest in biomedical engineering, and the grade point average obtained in the first year of engineering.

Students accepted into the option will take a modified version of the standard Electrical Engineering program.

Students who satisfactorily complete the following program will be given recognition as receiving the Bachelor of Applied Science in Electrical Engineering (Biomedical Engineering Option).

Third Year	
BMEG 410	3
BMEG 456	3
ELEC 301	4
ELEC 311	4
ELEC 341	4
ELEC 371	3
ELEC 391	6
Breadth Electives <sup>1</sup>	8
One of STAT 251, MATH 302, MATH 318, STAT 302	3
Complementary Studies electives <sup>2</sup>	3
<b>Total Credits</b>	<b>41</b>
Fourth Year	
APSC 450	2
ELEC 422	3
ELEC 471	3
ELEC 473	3
ELEC 481	3
ELEC 494	10
Electives <sup>1</sup>	9
Complementary Studies electives <sup>2</sup>	3
<b>Total Credits</b>	<b>36</b>

<sup>1</sup> To be chosen based on Department-approved list of Biomedical Engineering electives.

<sup>2</sup> See [Complementary Studies Courses](#).

#### Electrical Energy Systems Option (enrolment suspended)

The Electrical Energy Systems Option in Electrical Engineering will provide students with theoretical and practical experience in the electric energy related fields. Students will be admitted at the third-year level. Those who satisfactorily complete the following program will be given recognition as receiving the Bachelor of Applied Science in Electrical Engineering (Electrical Energy Systems Option).

Third Year	
ELEC 301	4
ELEC 311	4
ELEC 321 or STAT 357	4
ELEC 341	4



ELEC 342	4
ELEC 352	4
ELEC 391	6
Breadth Elective	4
Complementary Studies electives <sup>1</sup>	6
<b>Total Credits</b>	<b>40</b>

**Fourth Year**

APSC 450	2
ELEC 451	4
ELEC 453	4
ELEC 454	4
ELEC 481	3
ELEC 492	10
Electives <sup>2,3</sup>	9
<b>Total Credits</b>	<b>36</b>

<sup>1</sup> See Complementary Studies courses.

<sup>2</sup> To be chosen based on Department-approved list of Electrical Energy Systems electives.

<sup>3</sup> Students who have not completed EECE 392 or EECE 492 should complete EECE 392 (4 credits) and at least 5 credits of electives.

**Nanotechnology and Microsystems Option (enrolment suspended)**

The Nanotechnology and Microsystems Option, in Electrical Engineering, allows students course concentration and practical project experience in electronics including emerging nanodevices; micro/nanoscale mechanisms and methods (physical, chemical, mechanical, biological and numerical); micro/nano system design and analysis; micrometer and nanometer scale fabrication and instrumentation; and electromagnetics at small length scales.

Students will be admitted at the third-year level. See the Department website for application information.

Students who satisfactorily complete the following program will be given recognition as receiving the Bachelor of Applied Science in Electrical Engineering (Nanotechnology and Microsystems Option).

**Third Year**

ELEC 301	4
ELEC 311	4
ELEC 315	4
ELEC 321 or STAT 357	4
ELEC 361	4
ELEC 391	6
Breadth Electives <sup>1</sup>	8
Complementary Studies Electives <sup>2</sup>	6
<b>Total Credits</b>	<b>40</b>

**Fourth Year**

APSC 450	2
ELEC 461	3



ELEC 462	3
ELEC 463	3
ELEC 481	3
ELEC 493	10
Electives <sup>1</sup>	12
Total Credits	36

<sup>1</sup> To be chosen based on Department-approved list of Nanotechnology and Microsystems Option.

<sup>2</sup> See Complementary Studies courses.

Last updated: June 16, 2021

## Bachelor of Applied Science > Engineering Physics

The mission of the Engineering Physics program is to provide the best possible broad-based engineering degree which emphasizes the fundamentals of physics and mathematics to prepare graduates for engineering research and innovation in technology companies and research labs. Numerous specializations are available within Engineering Physics, by appropriate choice of several technical electives. These include specializations in Mechanical Engineering, Electrical Engineering, Bioengineering, Biophysics, Applied Physics, Applied Mathematics, Materials Engineering, Astronomy, and Technology Entrepreneurship among others. Technical electives for these specializations will be chosen from a list of relevant courses or by approval of the program director.

Students wishing to complete part of their study abroad may apply in third year for the Coordinated International Exchange (CIE) Program. Students participating in this program will complete most of their technical electives at a partner university during the fall term of their fourth year.

Inquiries regarding admission to an engineering program should be directed to Engineering Student Services, room 1100, Kaiser Building. For information regarding the deadline to apply for admission to the Faculty of Applied Science, please consult the Application and Document Deadlines (Calendar page <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=2,295,0,0#17631>) section of the UBC Calendar.

Students completing first year are required to submit a program preference form, available online in the spring from the Faculty of Applied Science. Students will rank their choices of engineering programs and submit the form electronically to the Engineering Student Services Office. Please consult Second-Year Placement ([http://www.engineering.ubc.ca/current\\_students/undergraduate/first\\_year/placement\\_options/placement.php](http://www.engineering.ubc.ca/current_students/undergraduate/first_year/placement_options/placement.php)) for deadlines and procedures.

Applicants to Engineering Physics must attend an in-person interview, usually held in April, to be considered for admission. Please consult the Engineering Physics webpage (<http://www.engphys.ubc.ca>) in March to reserve an interview time.

The completion of a Bachelor of Applied Science in Engineering Physics will normally take five years. Having completed first year engineering in the Faculty of Applied Science, students must complete four more years in the Engineering Physics program.

Most students choose to obtain technical work experience by enrolling in the Co-operative Education Program. Four Co-op work terms of four months each are built into the Engineering Physics program, as shown in the Co-op Sequence of Placements below.

Students wishing to obtain technical work experience outside the Co-op Program should confer with the Director of Engineering Physics.

Students completing first year in the Faculty of Science will normally have the following course deficiencies: APSC 151, APSC 160,



MATH 152, and PHYS 170. Some deficiencies will need to be completed as soon as possible, as they are pre-requisites for core courses. All deficiencies from first year must be completed prior to graduation.

The Engineering Student Services Office handles advising for all first-year students, for courses given by other faculties, and provides advice on transfer credits.

Inquiries regarding the Engineering Physics program should be made through the Engineering Physics program office, room 333A, Hennings Building. Academic Advising is available through the program office, or by appointment with the program director.

Engineering Physics is a program under the jurisdiction of the Dean of Applied Science and is administered by the Department of Physics and Astronomy in the Faculty of Science.

The following program-year curriculum tables are specific to students registered in the corresponding years of Engineering Physics for the current Academic Year.

### Engineering Physics

Second Year	
CPEN 221	4
ELEC 204	4
ENPH 253 <sup>2</sup>	5
ENPH 259	3
ENPH 270 <sup>2</sup>	2
MATH 217 <sup>1</sup>	4
MATH 255	3
MATH 257 <sup>2</sup>	3
MECH 260	3
PHYS 203 <sup>2</sup>	4
PHYS 250 <sup>2</sup>	3
Complementary Studies electives <sup>3</sup>	3
<b>Total Credits</b>	<b>41</b>

<sup>1</sup> If unable to take MATH 217, replace with MATH 253 and 317.

<sup>2</sup> Taken during the summer academic term.

<sup>3</sup> See [Complementary Studies Courses](#).

Third Year	
APSC 278	3
APSC 279	1
CPEN 312	3
ELEC 221	4
ENPH 353	3
MATH 307	3
MATH 305	3
MECH 280	3



MECH 325	4
MECH 360	3
PHYS 301	3
PHYS 304	3
PHYS 350	3
Total Credits	39

**Fourth Year**

ENPH 459	5
MATH 318	3
MATH 400	3
PHYS 401	3
One of ELEC 341, MECH 466	4
Technical elective <sup>1</sup>	3
Total Credits	21

<sup>1</sup> Chosen in consultation with the Director. Technical elective requirements may be waived in part at the discretion of the Director for students pursuing dual degrees, minors, or equivalent study. Students enrolled in CIE may obtain technical elective credit while on exchange.

**Fifth Year**

APSC 450	2
ELEC 301	4
ELEC 481	3
ENPH 352	2
ENPH 479 <sup>1</sup>	6
PHYS 403	3
PHYS 408	4
One of MATH 401, 405, 406, PHYS 410 <sup>2</sup>	3
Technical electives <sup>3</sup>	9
Complementary Studies elective <sup>4</sup>	3
Total Credits	39

<sup>1</sup> ENPH 479 may be replaced with APSC 486 for students pursuing the Entrepreneurship Minor, or at the discretion of the Program Director.

<sup>2</sup> Students planning on graduate studies in math or physics should take one of MATH 401 or MATH 406

<sup>3</sup> Chosen in consultation with the Director. Technical elective requirements may be waived in part at the discretion of the Director for students pursuing dual degrees, minors, or equivalent study. Students enrolled in CIE may obtain technical elective credit while on exchange.

<sup>4</sup> See [Complementary Studies Courses](#)

**Specialization in Mechanical Engineering**

To qualify for a specialization in Mechanical Engineering, students must take at least the following courses as part of their technical electives:

- 1) MECH 426



- 2) Two courses from the following list: MECH 375, MECH 380, MECH 463
- 3) One additional course with subject code MECH

**Specialization in Electrical Engineering**

To qualify for a specialization in Electrical Engineering, students must take at least the following courses as part of their technical electives:

- 1) ELEC 431
- 2) One of ELEC 342, ELEC 343
- 3) One additional course with subject code ELEC

**Co-operative Education Sequence of Placements**

The degree will normally require the students to take nine academic ("Acad") semesters and four co-operative education placements ("Coop"). Students who have deficiencies in their program before entering Engineering Physics are encouraged to complete as many of those as possible during the "open" summer semester. Please seek the advice of an advisor in Engineering Physics.

**Co-op Sequence of Placements**

Year	Term 1	Term 2	Summer
1 Applied Science	Acad	Acad	Open
2 Engineering Physics	Acad	Coop #1	Acad
3 Engineering Physics	Acad	Acad	Coop #2
4 Engineering Physics	Coop #3	Acad	Coop #4
5 Engineering Physics	Acad	Acad	

Students accepted into Engineering Physics who are interested in the Co-operative Education program must contact the Science Co-op Office (<http://www.sciencecoop.ubc.ca>), located in Room 170 of the Chemistry/Physics Building.

Last updated: June 16, 2021

**Bachelor of Applied Science > Environmental Engineering**

**Program Overview**

The Faculty of Applied Science offers a program leading to the Bachelor of Applied Science in Environmental Engineering (ENVL). Interested students are eligible to enter the ENVL program after completing the first year engineering program and should apply for the ENVL program during term 2 of the first year engineering program.

The Mission of the ENVL program is to develop engineers possessing a combined analytical and open mind-set, who contribute to the health of ecosystems and the provisioning of ecosystem services to people, by addressing complex, often ill-structured, problems associated with the quality of air, land, water and living systems. The program is grounded in strong engineering foundations, an ecosystem approach to environmental engineering problems, collaborative community-focused projects and a reciprocal active-learning environment created between students, stakeholders, and instructors.



Graduates of the UBC ENVL program will be uniquely qualified via training in both chemical, biological, and civil engineering to contribute to: a) the design of facilities, management systems, and information systems associated with ensuring clean air, water and healthy living systems; b) the performance of impact assessments (including regulatory, sustainability, environmental, social, and risk); c) sustainability planning and design; and d) environmental policy formulation.

The UBC Environmental Engineering differs from, and is not compatible with, the Joint UNBC/UBC Environmental Engineering program. For information about the Joint UNBC/UBC Environmental Engineering program, see: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,195,491,0>

Graduates from the UBC Environmental Engineering program will be eligible for Professional Engineering (P.Eng.) status in the field of their practice through EGBC.

### Program Requirements

<b>Second Year</b>	
CHBE 241	3
CHBE 244	3
CIVL 204	3
CIVL 215	4
ENVE 200	4
ENVE 201	3
ENVE 202	4
ENVE 203	4
MATH 253	3
MATH 256	3
STAT 251	3
<b>Total Credits</b>	<b>37</b>
<b>Third Year</b>	
CHBE 230	3
CHBE 364 or CIVL 407	3
CHBE 373 or CIVL 406	4
CHBE 370	3
CHBE 485	3
CIVL 305	3
CIVL 315	4
CIVL 316	4
CIVL 408	3
ENVE 301	3
EOSC 329	3
Complementary Studies Elective <sup>1</sup>	3
<b>Total Credits</b>	<b>37</b>
<b>Fourth Year</b>	



CHBE 459 or CIVL 403	3
CHBE 483	3
CHBE 486	3
CIVL 402	3
CIVL 409	3
CIVL 416	3
ENVE 401	6
EOSC 429	3
MINE 486	3
Technical Electives <sup>2</sup>	6
<b>Total Credits</b>	<b>36</b>

<sup>1</sup> For a list of eligible courses see degree requirements on the engineering website at <http://students.engineering.ubc.ca/enrolment/degree-requirements/>

<sup>2</sup> For a list of eligible Technical Electives, see the ENVL program website or speak to your academic advisor.

### Cooperative Education Experiential Work Terms

Cooperative education experiential learning placements are an important option within ENVL program. Work terms take place during the Winter and Summer terms, following the standard APSC COOP schedule. Students should refer to the program website for details. Students unable to complete one or more co-op terms should consult with the program advisor.

#### Contact Information

The Faculty of Applied Science  
Dean's Office  
5000-2332 Main Mall  
Vancouver, BC V6T 1Z4  
[www.apsc.ubc.ca](http://www.apsc.ubc.ca) (<http://www.apsc.ubc.ca>)

Last updated: July 8, 2021

## Bachelor of Applied Science > Geological Engineering

Geological Engineering is an interdisciplinary program under the jurisdiction of the Dean of the Faculty of Applied Science and administered by a board of study. Inquiries regarding the program and student advising should be made through Dr. Erik Eberhardt ([erik@eos.ubc.ca](mailto:erik@eos.ubc.ca)), Director, Geological Engineering, Room 251, Department of Earth, Ocean and Atmospheric Sciences, 604.827.5573.

### Geological Engineering

Second Year	
APSC 201	3
CIVL 210	4
CIVL 215	4
CIVL 230	4
EOSC 210	3
EOSC 213	3
EOSC 220	3



EOSC 221	3
EOSC 223 <sup>1</sup>	3
EOSC 240	3
MATH 253	3
STAT 251	3
Total Credits	39

<sup>1</sup> Includes one week field school, end of Term 2.

### Third Year

CIVL 311	4
CIVL 316	4
EOSC 323	3
EOSC 328 <sup>1</sup> or 428 <sup>1</sup>	3
EOSC 329	3
EOSC 330	3
EOSC 350	3
MINE 303	4
Earth Sciences technical elective <sup>2</sup>	3
Technical electives	6
Complementary Studies electives <sup>3</sup>	6
Total Credits	42

<sup>1</sup> End of third year.

<sup>2</sup> 300- or 400-level EOSC course from the Department of Earth, Ocean and Atmospheric Sciences.

<sup>3</sup> See [Complementary Studies Courses](#).

### Fourth Year

CIVL 402	3
CIVL 410	3
CIVL 411	3
EOSC 429	3
EOSC 433	3
EOSC 434	3
EOSC 445	6
One of CHBE 459, CIVL 403, CPEN 481, ELEC 481, MTRL 455, MECH 431, MINE 396	3
Technical electives	12
Total Credits	39



## Bachelor of Applied Science > Integrated Engineering

Integrated Engineering (IGEN) is a multi-disciplinary engineering program that places a strong focus on team-based engineering design by means of three full year project courses. In addition to developing a broad foundation in engineering, the student develops primary and secondary knowledge in specific engineering disciplines via 18 credits of technical electives in third and fourth year.

Completion of a B.A.Sc. in Integrated Engineering will normally take four years of study. Students may enter the program from first-year Applied Science or via transfer from the first-year Science or Engineering transfer program at a community college. Students entering from first-year Science will normally have course deficiencies that must be made up. Consult the IGEN Student Advisor for assistance in such cases.

There is a Co-operative Education option (Co-op) where students normally take eight academic semesters and five Co-op semesters over a five-year period. Students normally apply for Co-op between January of first year and September of the second year of the program. Visit Engineering Co-op (<http://www.coop.apsc.ubc.ca/home>) for more information.

All inquiries concerning the program should be directed to the Program Director. See Integrated Engineering (<http://www.igen.ubc.ca>) for contact information.

### Integrated Engineering Program

Second Year	
APSC 278	3
APSC 279	1
CHBE 241	3
CHBE 244	3
CIVL 215	4
CPEN 312	3
ELEC 204	4
ELEC 205	1
IGEN 201 <sup>1</sup>	3
IGEN 230	6
MATH 253	3
MATH 255	3
MECH 260	3
Total Credits	40
Third Year	
CHBE 344	3
COMM 280	3
ELEC 344	3
IGEN 330	6
MECH 360	3
MECH 375	3



MTRL 280	3
STAT 251	3
One of CHBE 356, ELEC 341	3
Technical electives <sup>2</sup>	6
Complementary Studies electives <sup>3</sup>	3
<b>Total Credits</b>	<b>39</b>

**Fourth Year**

APSC 450	2
CIVL 305	3
IGEN 430	6
MTRL 340	3
One of MINE 455 or MINE 465	3
One of CHBE 459, CIVL 403, ELEC 481, MECH 431, MINE 396, MTRL 455	3
Technical electives <sup>2</sup>	12
Complementary Studies electives <sup>3</sup>	3
<b>Total Credits</b>	<b>35</b>

<sup>1</sup> Students failing IGEN 201 will be required to pass APSC 201 subsequently.

<sup>2</sup> Of the 18 credits of technical electives, 9 credits must be in one engineering discipline and 6 in another discipline. Several elective streams are possible. Consult the IGEN Student Advisor for assistance.

<sup>3</sup> See Complementary Studies Courses.

Last updated: July 8, 2021

## Bachelor of Applied Science > Manufacturing Engineering

### *Bachelor of Applied Science (B.A.Sc.) in MANUFACTURING ENGINEERING*

#### Program Overview

The Faculty of Applied Science offers a program leading to the Bachelor of Applied Science in Manufacturing (MANU) Engineering. The program is offered jointly between the departments of Mechanical Engineering and Materials Engineering.

The Mission of the MANU program is to develop engineers with technical and managerial skills preparing them for sought-after careers in the exceptionally demanding and evolving domain of advanced design and manufacturing.

#### Program Requirements

**Second Year**

APSC 278	3
APSC 279	1
CPEN 223	4
ELEC 203	3
MANU 201	3
MANU 230	4



MANU 261	3
MANU 265	3
MATH 253	3
MATH 255	3
MECH 260	3
MTRL 263	3
MTRL 264	3
<b>Total Credits</b>	<b>39</b>

**Third Year**

One of APSC 261 or APSC 262 <sup>1</sup>	3
CPEN 333	3
MANU 270	3
MANU 330	6
MANU 378	3
MANU 380	3
MANU 386	3
MECH 360	3
MECH 368	3
MECH 491	3
MTRL 455	3
STAT 251	3
<b>Total Credits</b>	<b>39</b>

**Fourth Year**

APSC 450	2
MANU 370	3
MANU 430	6
MANU 480	3
MANU 481	3
MANU 485	3
MECH 462	3
MECH 463	4
MECH 467	4
Technical Electives <sup>2</sup>	6
Complementary Study <sup>3</sup>	3
<b>Total Credits</b>	<b>40</b>

<sup>1</sup> This course satisfies the Impact of technology on society, Sustainable development and environmental stewardship within the Complementary Studies Courses

<sup>2</sup> To be chosen in consultation with departmental advisors

<sup>3</sup> See Complementary Studies Courses (<http://calendar.ubc.ca/vancouver/index.cfm?tree=12,195,272,30>).



**Cooperative Education Experiential Work Terms**

The optional cooperative education experiential learning placements is a valuable aspect of the Bachelor of Applied Science in Manufacturing Engineering program. Students are highly encouraged to take advantage of this program. Participating students will typically complete five 4-month experiential learning placements coordinated through the Applied Science Co-op Program. Work terms can take place during the Winter or Summer terms. Students should refer to the program website for the current schedule. Students wishing to participate but unable to complete one or more co-op terms should consult with a departmental advisor.

**Contact Information**

The Faculty of Applied Science

Mechanical Engineering Department  
2054-6250 Applied Science Lane  
(604) 822-2781  
reception@mech.ubc.ca

Materials Engineering Department  
309-6350 Stores Road  
(604) 822-2676  
enquiry@mtrl.ubc.ca

Last updated: July 8, 2021

**Bachelor of Applied Science > Materials Engineering**

Materials Engineering is concerned with the characterization, processing, and use in design of metallic and non-metallic materials. An optional Co-operative Education program is available which permits students to obtain twenty months of related experience in the last three years of the program.

**Materials Engineering**

Second Year	
APSC 278	3
APSC 279	1
MATH 253	3
MATH 255	3
MECH 260	3
MTRL 201	3
MTRL 250	4
MTRL 252	4
MTRL 263	3
MTRL 264	3
MTRL 280	3
Complementary Studies electives <sup>1</sup>	6
<b>Total Credits</b>	<b>39</b>
Third Year	



MTRL 320	3
MTRL 340	3
MTRL 350	4
MTRL 358	3
MTRL 359	1
MTRL 361	4
MTRL 363	3
MTRL 365	3
MTRL 378	3
MTRL 381	1
MTRL 382	4
MTRL 394	4
STAT 251	3
Total Credits	39
<b>Fourth Year</b>	
APSC 450	2
MTRL 455	3
MTRL 456	3
MTRL 460	3
MTRL 466	3
MTRL 467	3
MTRL 489	1
Technical electives <sup>2</sup>	21
Total Credits	39

<sup>1</sup> See [Complementary Studies Courses](#).

<sup>2</sup> To be chosen from a course list available in the Department Office and in consultation with an Undergraduate Advisor.

Last updated: July 8, 2021

## Bachelor of Applied Science > Mechanical Engineering

In addition to the regular Mechanical Engineering program, options in Aerospace, Biomechanics and Medical Devices, Mechatronics, and Thermofluids are also available.

Students must have access to a computer that meets UBC security requirements and has a webcam, microphone, and speaker. Details on what software the computer will have to run for each course, with specifications, can be found at [mech.ubc.ca](http://mech.ubc.ca) (<http://mech.ubc.ca>).

Students enter Mechanical Engineering in a common second-year program known as Mech 2. Mech 2 begins the week before the normal start of Term 1 classes at UBC. Attendance during the first week is mandatory. Due to the early start date, students planning to live on campus in UBC Housing are required to apply for early arrival. Visit the Mech 2 (<http://mech.ubc.ca/undergraduate/mech-2/>) for information and instructions.

Students transferring into Mech 2 from other faculties or schools should consult Mech 2 (<http://mech.ubc.ca/undergraduate/mech-2/>)



for information regarding prerequisite courses and transfer credits. In particular, any students missing any of MATH 100, MATH 101, MATH 152, PHYS 157, PHYS 158, PHYS 170, one of PHYS 159, BMEG 102, and one of ENGL 112, WRDS 150, APSC 176 must have received credit for these courses no later than August 1st. Any student who fails to do so will not be permitted to start Mech 2 that year and will forfeit his/her seat in Mech 2 until a subsequent year in which he/she is able to meet the prerequisites by the above deadline.

In undergraduate MECH courses where at least 50% of the final grade is assigned to examinations, students may only pass the course if they achieve a weighted average examination grade of at least 50%. The "examination grade" includes scores from the final examination, midterms, and other tests done individually in a classroom setting. This policy applies unless it is explicitly waived by the instructor in the course syllabus.

**Note:** A student's degree requirements are initially defined by the program that was in effect the year that the student entered Mech 2. For students that transfer into the department in third year, their degree requirements will be initially defined by the program that was in effect during the Winter Session of their first course registration in the department. Some students will not take courses in the order below, depending on their Co-op schedule. Please refer to the Department website for recommended course sequences.

### Mechanical Engineering

Students who completed Mech 2 in 2017W and are on a co-op schedule, or students who completed Mech 2 in 2018W and are on a non-co-op schedule, or earlier, should follow the following course schedule:

Second Year	
MATH 254	3
MATH 258	3
MECH 220 <sup>1</sup>	4
MECH 221	12
MECH 222	6
MECH 223	7
MECH 224	1
MECH 225	1
MECH 226 or MECH 227 <sup>2</sup>	3 or 5
Total Credits	40 or 42
Third Year	
MECH 305	6
MECH 325	4
MECH 326 or MECH 426	3
MECH 327	3
MECH 328	3
MECH 358	3
MECH 360	3
MECH 368	3
MECH 375	3
MECH 380	3
MECH 392	2
Total Credits	36



**Fourth Year**

APSC 450	2
ELEC 344	3
MECH 329	3
MECH 431	3
MECH 457 <sup>3</sup>	6
MECH 463	4
MECH 466	4
Technical electives <sup>4</sup>	9
Complementary Studies electives <sup>5</sup>	6
<b>Total Credits</b>	<b>40</b>

<sup>1</sup> Taken prior to Term 1 of second year.

<sup>2</sup> MECH 227 is taken in the summer after Second Year.

<sup>3</sup> MECH 457 may be replaced by APSC 486 and APSC 496 with permission from Department.

<sup>4</sup> To be chosen from a course list available on the Department website.

<sup>5</sup> See [Complementary Studies Courses](#).

Students who completed Mech 2 in 2018W and are on a co-op schedule, and onward, should follow the following course schedule:

**Third Year**

MECH 305	6
MECH 325	4
MECH 327	3
MECH 328	3
MECH 329	3
MECH 358	3
MECH 360	3
MECH 368	3
MECH 375	3
MECH 380	3
MECH 392	2
<b>Total Credits</b>	<b>36</b>

**Fourth Year**

APSC 450	2
MECH 426	3
ELEC 344	3
MECH 431	3
MECH 457 <sup>3</sup>	6
MECH 463	4
MECH 466	4
Technical electives <sup>4</sup>	9
Complementary Studies electives <sup>5</sup>	6



**Total Credits**

40

<sup>1</sup> Taken prior to Term 1 of second year.

<sup>2</sup> MECH 227 is taken in the summer after Second Year.

<sup>3</sup> MECH 457 may be replaced by APSC 486 and APSC 496 with permission from Department.

<sup>4</sup> To be chosen from a course list available on the Department website.

<sup>5</sup> See [Complementary Studies Course](#).

**Aerospace Option**

The Aerospace Option in Mechanical Engineering allows students interested in aircraft, spacecraft, and related systems to have a course and project concentration in these areas.

Students will be admitted to the option at the end of second year by permission of the option coordinator, based on academic achievement and a demonstrated interest in aerospace engineering.

To complete this option, students will modify the standard Mechanical Engineering third- and fourth-year programs.

Note: Some students will not take courses in the order below, depending on their Co-op schedule. Please refer to the Department website for recommended course sequences.

**Mechanical Engineering Aerospace Option**

Third Year	
ELEC 344	3
MECH 305	6
MECH 327	3
MECH 328	3
MECH 358	3
MECH 360	3
MECH 375	3
MECH 380	3
MECH 426	3
MECH 466	4
MECH 481	3
Complementary Studies electives <sup>1</sup>	3
<b>Total Credits</b>	<b>40</b>
Fourth Year	
APSC 450	2
MECH 431	3
MECH 453 or APSC 496 <sup>2</sup>	6
MECH 462	3
MECH 463	4
MECH 477	3



MECH 479	3
MECH 484	3
MECH 485	3
MECH 489	4
MTRL 494	3
Complementary Studies electives <sup>1</sup>	3
<b>Total Credits</b>	<b>40</b>

<sup>1</sup> See Complementary Studies Courses.

<sup>2</sup> Department approval required for APSC 496.

### Biomechanics and Medical Devices Option

The Biomechanics and Medical Devices Option in Mechanical Engineering allows students interested in biomedical engineering, biomechanics and related topics to have a course and project concentration in these areas.

Students will be admitted to the option at the end of second year by permission of the option coordinator, based on academic achievement and a demonstrated interest in biomedical engineering. Enrolment in this option is limited.

To complete this option, students will modify the standard Mechanical Engineering third- and fourth-year programs.

**Note:** Some students will not take courses in the order below, depending on their Co-op schedule. Please refer to the Department website for recommended course sequences.

Students who completed Mech 2 in 2017W and are on a co-op schedule, or students who completed Mech 2 in 2018W and are on a non-co-op schedule, or earlier, should follow the following course schedule:

Third Year	
BMEG 410	3
MECH 305	6
MECH 325	4
MECH 326 or MECH 426	3
MECH 328	3
MECH 358	3
MECH 360	3
MECH 368	3
MECH 375	3
MECH 380	3
MECH 463	4
<b>Total Credits</b>	<b>38</b>
Fourth Year	
APSC 450	2
BMEG 456	3
ELEC 344	3
MECH 431	3



MECH 439	1
MECH 459 <sup>1</sup>	6
MECH 466	4
MTRL 495	3
Technical electives <sup>2</sup>	9
Complementary Studies electives <sup>3</sup>	6
<b>Total Credits</b>	<b>40</b>

<sup>1</sup> MECH 459 may be replaced by APSC 486 and APSC 496 with permission from Department.

<sup>2</sup> To be chosen from a course list available on the Department website.

<sup>3</sup> See [Complementary Studies Courses](#).

Students who completed Mech 2 in 2018W and are on a co-op schedule, and onward, should follow the following course schedule:

Third Year	
BMEG 410	3
MECH 305	6
MECH 325	4
MECH 328	3
MECH 358	3
MECH 360	3
MECH 368	3
MECH 375	3
MECH 380	3
MECH 463	4
Complementary Studies electives <sup>3</sup>	3
<b>Total Credits</b>	<b>38</b>
Fourth Year	
APSC 450	2
BMEG 456	3
ELEC 344	3
MECH 426	3
MECH 431	3
MECH 439	1
MECH 459 <sup>1</sup>	

<sup>6</sup> MECH 466 <sup>4</sup> MTRL 495 <sup>3</sup> Technical electives<sup>2</sup> <sup>9</sup> Complementary Studies electives<sup>3</sup> <sup>3</sup> Total Credits 40 <sup>1</sup> MECH 459 may be replaced by APSC 486 and APSC 496 with permission from Department. <sup>2</sup> To be chosen from a course list available on the Department website. <sup>3</sup> See [Complementary Studies Courses](#). **Mechatronics Option** The Mechatronics Option in Mechanical Engineering allows students interested in mechanical systems integrated with embedded electronics, sensors, actuators, and related systems to have a course and project concentration in these areas. Students will be admitted to the option at the end of first or second year by permission of the option coordinator, based on academic achievement and a demonstrated interest in mechanical engineering and electronic design. To complete this option, students will modify the standard Mechanical Engineering third- and fourth-year programs. **Note:** Some students will not take courses in the order below, depending on their Co-op schedule. Please refer to the Department website for recommended course sequences.

Third Year	
CPEN 312	3
CPSC 259	4
ELEC 302	3
ELEC 343	3
MECH 306	4
MECH 325	4
MECH 328	3
MECH 360	3



MECH 366	3
MECH 375	3
MECH 392	2
MECH 463	4
<b>Total Credits</b>	<b>39</b>

**Fourth Year**

APSC 450	2
CPEN 333	3
MECH 420	3
MECH 421	4
MECH 423	4
MECH 431	3
MECH 458 <sup>1</sup>	6
MECH 467	4
Technical electives <sup>2</sup>	3
Complementary Studies electives <sup>3</sup>	6
<b>Total Credits</b>	<b>38</b>

<sup>1</sup> MECH 458 may be replaced by APSC 486 + APSC 496 with permission from Department.

<sup>2</sup> To be chosen from a course list available on the Department website.

<sup>3</sup> See Complementary Studies Courses.

**Thermofluids Option** The Thermofluids Option in Mechanical Engineering allows students interested in aircraft, naval architecture, engines, and related systems to have a course and project concentration in these areas. Students will be admitted to the option at the end of second year by permission of the program director, based on a demonstrated interest in engineering thermofluids. Students can continue into the Thermofluids Option in the Master of Engineering degree program if they have a strong interest in a particular area of thermofluids and are eligible for graduate studies. To complete this option, students will modify the standard Mechanical Engineering third- and fourth-year programs. Mechanical Engineering Thermofluids Option

**Third Year**

MECH 305	6
MECH 325	4
MECH 327	3
MECH 328	3
MECH 358	3
MECH 360	3
MECH 375	3
MECH 380	3
MECH 386	3
Complementary Studies electives <sup>1</sup>	6
<b>Total Credits</b>	<b>37</b>

**Fourth Year**

APSC 450	2
ELEC 344	3
MECH 431	3
MECH 454 <sup>2</sup>	6
MECH 463	4
MECH 466	4
MECH 479	3
MECH 489	4
Technical electives <sup>3</sup>	9
<b>Total Credits</b>	<b>38</b>

<sup>1</sup> See Complementary Studies Courses.

<sup>2</sup> MECH 454 may be replaced by APSC 486 and APSC 496 with permission from Department.

<sup>3</sup> To be chosen from a course list available on the Department website.

Last updated: July 8, 2021

**Bachelor of Applied Science > Mining Engineering**

Mining Engineering is concerned with the optimal exploitation of mineral resources while minimizing environmental impact. The discipline requires a broad knowledge of engineering and scientific subjects. Mining Engineering

**Second Year**

APSC 201	3
CIVL 210	4
EOSC 210	3
MATH 253	3
MATH 255	3



MECH 260	3
MECH 280, CIVL 215, or CHBE 251	3 (4)
MINE 224	4
MINE 291	3
MINE 292	3
MINE 293	1
STAT 251	3
Complementary Studies electives <sup>1</sup>	3
<b>Total Credits</b>	<b>39 (40)</b>

**Third Year**

APSC 278	3
APSC 279	1
ELEC 203	3
MINE 302	4
MINE 303	4
MINE 310	4
MINE 331	3
MINE 333	3
MINE 350	3
MINE 380	3
MINE 396	3
Complimentary Studies Electives <sup>2</sup>	3
<b>Total Credits</b>	<b>37</b>

**Fourth Year**

APSC 450	2
MINE 402	3
MINE 403	3
MINE 432	3
MINE 465	3
MINE 380	3
MINE 486	3
MINE 491	6
Technical Electives	6
Complementary Studies electives <sup>1</sup>	3
<b>Total Credits</b>	<b>35</b>

<sup>1</sup> See Complementary Studies Courses.  
<sup>2</sup> Selected with the approval of the Department.

Last updated: July 8, 2021

**Co-operative Education Program**

The Engineering Co-operative Education Program provides motivated and qualified students workshops, coaching and support, including the employer job posting system, to search and secure paid, program monitored work experience, which is directly related to their academic program. Through participation in the job search and work terms co-op students gain valuable skills that can assist them with their academic program path while preparing for their post-degree career. The Co-op Program is available in Biomedical Engineering, Chemical Engineering, Chemical and Biological Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Environmental Engineering, Geological Engineering, Integrated Engineering, Materials Engineering, Mechanical Engineering, and Mining Engineering. (Note: Co-op is available for Engineering Physics and it is administered by the Science Co-op office). The program is an optional, year-round program that normally requires completion of a minimum of four work terms including one work term in either of Term 1 or Term 2 of a Winter session. To remain in the co-op program students must continue to meet the co-op requirements, including academic, and be eligible for advancement in their academic program. Students must end their degree program on an academic term. The Co-op Program requires an additional year to complete the Bachelor of Applied Science requirements. Students intending to enter the Co-op program normally apply between the end of first year, May, and beginning of second year, September. Application at the beginning of third year may also be possible for some disciplines. Specific application procedures and deadlines are available from the Co-op Program office Co-op coordinators conduct student-employer visits during each work term, assist in workplace learning, and provide advice on the written or oral assignments that are a requirement of the program for each work term. Students who wish to be considered for the program must meet all requirements of the Faculty of Applied Science (engineering) and will be selected on the basis of academic performance, written and oral communication skills, and general suitability for the work environment. The total enrolment is subject to the current state of the market as well as the resources available to support coaching and job development. Acceptance into the program does not guarantee students employment in each work term. Students who are accepted to the Engineering Co-op program are required to accept and comply with the Program's Terms & Conditions (<http://coop.engineering.ubc.ca/terms-and-conditions>) and are required to pay the co-op administration and workshop fee (see Program and Course Fees (Calendar page: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=14,296,0,0#18093>)) upon admission. For each work term, students securing a confirmed position will be registered in the appropriate 6-credit co-op course and will be required to pay the co-op course (see Program and Course Fees (Calendar page: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=14,296,0,0#18093>)) and related fees. Students are unable to withdraw from the co-op work term course without permission of the Co-op Program. In order to graduate with the co-operative education designation, a student must have satisfactorily completed the required number of work terms, in addition to the normal academic requirements of their discipline. Co-operative education course credits cannot be used in lieu of or to complement academic course credits required. Transfer Students: Normally, students transferring from other institutions with accredited Co-op programs may be given credit for work terms completed at their former institution if they meet the following requirements:

- the student must be accepted into the UBC Co-op Program;
- the program in which the work term was undertaken is accredited;
- the work term is officially recognized, (i.e., noted on the transcript), by the institution where the work term originated; and
- the work term was granted for experience in the same or similar discipline into which the student is transferring.

Regardless of the number of work terms accepted, students will be required to complete at least 50% of the required work terms in the new program into which they are transferring. Acceptance into a co-op program at one institution does not guarantee acceptance into UBC's Co-op Program. Application for transfer of work terms must be made in writing to the Co-op Education program prior to undertaking any additional work terms at UBC. For more information please visit Engineering Co-operative Education (<http://www.coop.apsc.ubc.ca>). Last updated: July 8, 2021

**Professional Associations**

The right to practise engineering and accept professional responsibility in Canada is limited to those who are registered members of the Association of Professional Engineers in the Province concerned. During the period between graduation and registration, the graduate who intends to practise in BC should be enrolled with the Association as an "Engineer in Training." All of the Bachelor of Applied Science programs at UBC are accredited by the Canadian Engineering Accreditation Board (CEAB) of Engineers Canada. Graduates of CEAB-accredited programs are accepted as being fully qualified academically for professional engineering registration anywhere in Canada. However, there are also experience qualifications and professional practice requirements that must be fulfilled before full registration is granted. These qualifications vary within Canada and applicants should obtain the necessary details from the appropriate association (M.Eng., M.A.Sc., or Ph.D. degrees alone do not form an acceptable basis for application to Associations of Professional Engineers in Canada. Last updated: July 8, 2021



**Joint UNBC/UBC Program: Environmental Engineering**

The Environmental Engineering program is a four and one-half year (nine semester) joint degree between the UBC and the University of Northern British Columbia. The program starts with a two-year foundation in mathematics and the basic sciences from the College of Science and Management of the University of Northern British Columbia. In the third and fourth years, the program provides a thorough education and training in engineering fundamentals, engineering analysis and engineering design, largely through courses in Civil Engineering and Chemical and Biological Engineering at UBC. The final term at UNBC will expose students to practical environmental engineering problems. The Environmental Engineering program is a joint program under the jurisdiction of the Dean of the Faculty of Applied Science at UBC and the Dean of the College of Science and Management at the University of Northern British Columbia. The program is administered by a joint board of study. The program has been developed to satisfy Canadian Engineering Accreditation Board (CEAB) requirements for accreditation of engineering programs. There is a Co-operative Education option (Co-op) where students normally take five work semesters in addition to the nine academic semesters. Accounting for summer work terms, this option results in a total duration of five and one-half years. Environmental Engineering

First Year (taken at UNBC) <sup>1</sup>	
CHEM 100	3
CHEM 101	3
CHEM 120	1
CHEM 121	1
CPSC 110	3
ENGR 110	3
ENGR 117	3
ENGR 130	4
ENGR 151	1
ENGR 152	1
MATH 100	3
MATH 101	3
MATH 220	3
PHYS 110	4
<b>Total Credits</b>	<b>36</b>
Second Year (taken at UNBC) <sup>1</sup>	
ENGR 210	3
ENGR 211	3
ENGR 217	3
ENGR 220	3
ENGR 254	4
ENSC 201	3
ENVE 222	3
One of GEOG 210, FSTY 205	3
MATH 200	3
MATH 230	3
STAT 371	3
Elective	3
<b>Total Credits</b>	<b>37</b>
Third Year (taken at UBC) <sup>4</sup>	
CHBE 244	3
CHBE 364	3
CHBE 373	4
CHBE 370	3
CHBE 485	3
CIVL 250	3
CIVL 210	4
CIVL 315	4
CIVL 316	4
MINE 486	3
Technical Elective <sup>2</sup>	3
<b>Total Credits</b>	<b>37</b>
Fourth Year (taken at UBC) <sup>4</sup>	
CHBE 352	4
CIVL 402	3
CIVL 408	3
CIVL 409	3
CIVL 416	3
CIVL 418	3
EOSC 329	3
EOSC 429	3
One of CHBE 459, CIVL 403	3



Technical Electives <sup>2</sup>	9
Total Credits	37
Fifth Year (taken at UNBC) <sup>1</sup>	
ENPL 401	3
ENSC 417	6
ENSC 418	3
Electives <sup>3</sup>	6
Total Credits	18

<sup>1</sup> Course numbers are those of the UNBC course numbering system.

<sup>2</sup> Technical electives to be chosen from a constrained list: <http://www.enve.ubc.ca/current-students/technical-electives/>. 6 out of the 15 credits must be from the primary technical electives portion of the constrained list.

<sup>3</sup> Minimum 6 credits in humanities or social science.

<sup>4</sup> The curriculum tables show the requirements for each program year as they are in the current session.

See course descriptions at UNBC ([http://www.unbc.ca/calendar/undergraduate/course\\_descriptions.html](http://www.unbc.ca/calendar/undergraduate/course_descriptions.html)). Last updated: July 8, 2021

### Graduate Certificates Programs

#### Graduate Certificates Programs > Graduate Certificate in Global Mine Waste Management

The Graduate Certificate in Global Mine Waste Management is a 2 year, 12 credit specialized program for engineers and geoscientists on tailings and mine waste management. The program aims to prepare engineers from relevant disciplines and geoscientists to address challenges with mine waste management and contribute to finding solutions to issues associated with mine waste management, globally. Students who complete the certificate have the option of laddering the coursework into masters programs offered by the Mining Engineering Department (master of engineering or master of applied science degree in Mining Engineering). To facilitate laddering, criteria for admission to the certificate program will be the same as those required for admission to master's programs offered by the Mining Engineering Department. Admissions Requirements: Criteria for admission to the certificate program will be the same as those required for admission to masters programs offered by the Mining Engineering Department at UBC. Currently the department offers a master of engineering (M.Eng.) degree and a master of applied science (M.A.Sc.) degree. Students admitted to M.A.Sc. and M.Eng. degree program normally possess a bachelor's degree in mining engineering or a related area, and must meet general admission requirements for master's degree programs set by the Faculty of Graduate and Postdoctoral Studies. In addition, students should have taken an introductory course in soil mechanics like CIVL 210. Students should have a minimum GPA equivalent to B certificate Requirements: All students must complete the following four courses (12 credits): MINE 586 (3), MINE 587 (3), MINE 588 (3), and MINE 589 (3). Satisfactory progress as defined (<http://www.grad.ubc.ca/current-students/managing-your-program/satisfactory-progress-masters-student>) by the Faculty of Graduate and Postdoctoral Studies for master's students must be maintained. Students must complete their requirements within 4 years of starting the program. Required: CIVL 210 (4) or Introductory Soils Mechanics course; Recommended: MINE 480 (3) (or applicable mine waste management design or operations experience or approval of the faculty). Last updated: July 8, 2021

#### Master of Engineering

The Master of Engineering (M.Eng.) program is suited to students who wish to pursue their engineering education in a preferred area of specialization beyond the undergraduate level, but who do not wish to pursue a thesis research program. Applicants who are considering taking a Doctor of Philosophy (Ph.D.) in the future should apply for admission to the Master of Applied Science (M.A.Sc.) or Master of Science (M.Sc. in Chemical and Biological Engineering) through the Faculty of Graduate and Postdoctoral Studies. Typical completion time for full-time Master of Engineering students is 12-16 months. The Master of Engineering program (<http://www.engineering.ubc.ca/academics/graduate>) is administered by the Faculty of Applied Science. Admission Requirements Note: Master of Engineering degrees alone do not form an acceptable basis for application to associations of professional engineers in Canada. Applicants to the Master of Engineering program in all specializations must hold a credential deemed academically equivalent to a four-year bachelor's degree from UBC, in engineering or a related discipline. The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework, and at least 74% in the remaining senior-level coursework, in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall average of 76% (UBC-equivalency). For all specializations, relevant professional experience is considered an asset. Applicants holding a four-year bachelor's degree who do not meet the admissions minimum, but who have had sufficient formal training and relevant professional experience to offset the academic deficiency, may be granted admission on the recommendation of the graduate advisor in the area of specialization and the approval of the Applied Science Dean's office. For the Naval Architecture and Marine Engineering specialization, applicants must have demonstrated proficiency in the areas of Structural Mechanics, Fluid Mechanics, Automatic Controls and Thermodynamics. Students lacking a background in these subject areas may be required to complete additional coursework. Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of competency prior to being extended an offer of admission. Acceptable English language proficiency tests for applicants to graduate studies include the TOEFL, IELTS, and MELAB. The required minimum is determined by the Graduate program office in the area of specialization, but must be at or above the university minimum for graduate-level study. Students interested in applying to the Master of Engineering program apply through the UBC Graduate Studies Online Application ([http://evision.asit.ubc.ca/urd/sits.urd/run/siw\\_ubc\\_civil](http://evision.asit.ubc.ca/urd/sits.urd/run/siw_ubc_civil)). Lists of the required application documents are available on the respective program websites. Each graduate program office in an area of specialization is responsible for collection and assessment of application documents and issues the offer of admission letter. Transfer Credit Courses taken as an Access Studies or non-degree student may be approved for transfer toward a graduate program degree with the permission of the graduate program in the area of specialization. Consistent with standard transfer credit regulations, students are limited to transferring a maximum of 12 credits or up to 40% of the program credit requirements, whichever is more, toward their master's program. No more than 6 credits of transfer credit may be at the undergraduate level (300-400-level). In order to be eligible for transfer, the course(s):

- must be completed with a minimum B standing (UBC-equivalency)
- must not have been counted toward the completion of another degree or program
- must have been completed no more than five years prior to the time the student commences the degree program
- must not be used as a basis for admission to the graduate program

Financial Assistance Financial assistance is generally not available to students in the Master of Engineering program. Top international students may be eligible to receive an entrance award of up to \$2,000 towards tuition. Review each specialization website for specific assistance information Program Requirements The program requires completion of at least 30 credits. In some program areas, minimum requirements may be higher than 30 credits:

- At least 24 credits must be at the 500-level.
- A minimum of 18 of the 24 credits must be in the program area at the 500-level, including a project, if required, up to a maximum 6 credits.
- A maximum of 6 credits may be taken at the 300-400-level.
- A maximum of 6 credits of 500-level directed studies courses may be counted toward the program requirements.

Students should consult each specialization website for more information. Each student's coursework must be approved by the graduate program office for that area. Specializations Biomedical Engineering (<http://www.bme.ubc.ca>)

Chemical and Biological Engineering (<http://www.chbe.ubc.ca>)

Civil Engineering (<http://www.civil.ubc.ca>)

Clean Energy Engineering (<http://www.cerc.ubc.ca>)

Electrical and Computer Engineering (<http://www.ece.ubc.ca>)

Geological Engineering (<http://www.geoeng.ubc.ca>)

Materials Engineering (<http://www.mtl.ubc.ca>)

Mechanical Engineering (<http://www.mech.ubc.ca>)

Mechatronics Design (<http://www.mech.ubc.ca>)

Mining Engineering (<http://www.mining.ubc.ca>)

Naval Architecture and Marine Engineering (<http://name.engineering.ubc.ca>) Engineering Management Please note: This sub-specialization is no longer accepting students. Contact Information Individual contacts for each program can be found on their respective websites. Last updated: July 8, 2021

#### Master of Engineering Leadership in Advanced Materials Manufacturing

Program Overview The Master of Engineering Leadership in Advanced Materials Manufacturing (MEL in AMM) is a degree within the Faculty of Applied Science. The creation of this program has been driven, in part, by strong interest from the Canadian manufacturing community (includes aerospace, automotive and energy transmission whereby British Columbia will see a high level of activity over the next few decades). The objective of this program is to meet an identified need to educate engineers with a unique combination of leadership and strong technical, multi-disciplinary knowledge on multi-material solutions to advanced materials manufacturing. The MEL in AMM is a degree for professionals who have relevant industry experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MEL admissions website (<http://apscpp.ubc.ca/admissions/>) for more information on both the full time and part time options. The Faculty of Applied Science administers the Master of Engineering Leadership program. Please visit the MEL website (<http://apscpp.ubc.ca/program/advanced-materials-manufacturing/>) for further information and contact details. Admission Requirements The MEL Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must normally hold an undergraduate credential in Material Engineering, Mechanical Engineering, Civil Engineering or related discipline;
- Have a minimum of two years of relevant experience.



The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in AMM are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
- IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
- MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
- PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
- CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
- CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca/>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the AMM program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MEL in AMM degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the AMM program;
- the courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the AMM program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of AMM, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 5. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits. This includes 18 credits of Pillar courses, including 6 credits of constrained electives and 12 credits of Platform courses, including 1.5 credits of approved electives from the Faculty of Commerce and Business Administration. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material and is equivalent to a specialization. Each student's coursework must be approved by the MEL in AMM graduate program office. A complete list of the courses required for successful completion are available on the program website (<http://apscpp.ubc.ca/program/advanced-materials-manufacturing/>). This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the MEL admissions Website (<http://apscpp.ubc.ca/admissions/>) for more information. Contact Information MEL – MHL P Office

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Gerald McGavin Building  
211 - 2386 East Mall  
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Tel: 604.827.4136  
Email: [apscpp@apsc.ubc.ca](mailto:apscpp@apsc.ubc.ca)  
Web: [www.apscpp.ubc.ca](http://www.apscpp.ubc.ca) (<http://www.apscpp.ubc.ca>) Last updated: July 8, 2021

### Master of Engineering Leadership in Clean Energy Engineering

Program Overview Master of Engineering Leadership in Clean Energy Engineering (MEL in CEEN) is a degree within the Faculty of Applied Science. The objective of the Clean Energy Program is to provide students with advanced knowledge in various aspects of energy conversion, distribution, storage and management, including renewable energy technologies, energy distribution networks and energy policy. It is designed to educate and challenge students to critical thinking about topics related to energy conservation and efficiency, energy and environment, and social impact. The curriculum is based on innovative teaching strategies which include a key feature of organizing and promoting interaction between students and industrial partners through seminars, debates on advanced energy related topics, industrially sponsored projects and conferences. The MEL in CEEN is a degree for professionals who have relevant industry experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MEL admissions website (<http://apscpp.ubc.ca/admissions/>) for more information on both the full time and part time options. The Faculty of Applied Science administers the Master of Engineering Leadership program. Please visit the MEL website (<http://apscpp.ubc.ca/program/advanced-materials-manufacturing/>) for further information and contact details. Admission Requirements The MEL Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must normally hold an undergraduate credential in engineering or a BSc in environmental science or related specialization;
- Have a minimum three years relevant experience in the energy sector;
- Have completed a 2nd or 3rd-year-level-course in thermodynamics.

The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in CEEN are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
- IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
- MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
- PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
- CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
- CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca/>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the CEEN program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MEL in CEEN degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the CEEN program;
- The courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the CEEN program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of CEEN, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 5. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits. This includes 18 credits of Pillar courses and 12 credits of Platform courses, including 1.5 credits of approved electives from the Faculty of Commerce and Business Administration, and a 3-credit Capstone course. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material and is equivalent to a specialization. Each student's coursework must be approved by the Applied Science graduate program office. Students in the MEL CEEN will choose in their second term between a Co-operative Education Placement (APSC 412 non-additive credits not counted in the 30 credits program requirement) and an entrepreneurial experience. A complete list of the courses required for successful completion are available on the program website (<http://apscpp.ubc.ca/program/clean-energy/>). This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the MEL admissions Website (<http://apscpp.ubc.ca/admissions/>) for more information. Contact Information MEL – MHL P Office

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### Master of Engineering Leadership in Dependable Software Systems

**Program Overview** The Master of Engineering Leadership in Dependable Software Systems (MEL in DSS) is a program within the Faculty of Applied Science. Dependability of software systems is gaining much attention and importance with the pervasiveness of software systems. The ubiquity of these systems requires that these systems perform correctly with high confidence, and building such systems requires a multifaceted approach. This program addresses key concepts, namely:

- System correctness within specifications
- System robustness outside of specifications
- System security in case of hostile use outside of specification
- Software project lifecycle management for robust systems

The program is supported by a set of leadership, management, and analysis courses aimed at providing professional education for dependable software systems technical leaders. The MEL in DSS is a degree for professionals who have relevant industry experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MEL admissions website (<http://apscpp.ubc.ca/admissions/>) for more information on both the full time and part time options. Admission Requirements The MEL Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must hold an undergraduate degree in Computer Engineering or Computer Science;
- Have prior experience developing software systems;
- Have a minimum three years relevant experience.

The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in DSS are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
- IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
- MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
- PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
- CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
- CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca/>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the DSS program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MEL in DSS degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the DSS program;
- The courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the DSS program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APPP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of DSS, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 6. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits. This includes 18 credits of Pillar courses, including 3 credits of constrained electives and 12 credits of Platform courses, including 1.5 credits of approved electives from the Faculty of Commerce and Business Administration. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material. Each student's coursework must be approved by the MEL in DSS graduate program office. Students in the MEL in DSS will complete a Capstone Project. A complete list of the courses required for successful completion are available on the program website (<http://apscpp.ubc.ca/program/dependable-soft>) <http://apscpp.ubc.ca/program/dependable-soft>). This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the MEL admissions Website (<http://apscpp.ubc.ca/admissions/>) for more information. Contact Information MEL – MHP Office

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### Master of Engineering Leadership in High Performance Buildings

**Program Overview** The Master of Engineering Leadership in High Performance Buildings (MEL in HPB) is a program within the Faculty of Applied Science. The MEL in HPB program develops Highly Qualified Personnel (HQP) for the rapidly evolving high performance green building sector. This building sector is seeing opportunities as the demand for sustainable buildings and cities increases. UBC has an exceptional group of researchers working on green and sustainable buildings, cities and integrated energy systems. The MEL in HPB is a degree for professionals who have relevant industry experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MEL admissions website (<http://apscpp.ubc.ca/admissions/>) for more information on both the full time and part time options. This program is delivered by the Department of Mechanical Engineering and the School of Architecture and Landscape Architecture, both within the Faculty of Applied Science, in collaboration with the Faculty of Commerce and Business Administration (also known as the Sauder School of Business) Admission Requirements The MEL Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must hold an undergraduate credential in either engineering (or equivalent) OR a professional Master of Architecture.
- A minimum of 3 years relevant work experience.

Applicants lacking these requirements may be required to complete additional coursework on the recommendation of the Program Director. Additionally, applicants with backgrounds only in architecture may be required to complete prerequisite coursework in engineering on the recommendation of the Program Director. The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must provide results of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in HPB are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
- IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
- MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
- PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
- CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
- CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.



Applicants who do not meet both the academic and English language proficiency requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and approval of the Dean of Applied Science.

- The courses were not used as a basis for admission to the HPB program;
The courses were not used to satisfy the requirements of another credential;
The courses considered for transfer credit have been taken within five years of commencement of the HPB program;
At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APPP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of HPB, addressed to the Associate Dean of Applied Science.

APPP 503 (1.5) Sustainability and Leadership
APPP 504 (3) Business Acumen for Technical Leaders
APPP 505 (3) Analytics and Interpretation for Applied Sciences
Platform course (1.5) Approved and specified by the MEL program.
1.5 credits of approved Commerce and Business Administration electives. The required core courses for the pillar include: HPB 501 (3) Green Building Contemporary Practice
HPB 502 (3) Regenerative Development
HPB 503 (3) Whole Building Energy Modelling and Simulation
HPB 504 (3) Building Energy Systems Design
HPB 505 (3) Capstone: Greening Existing Buildings
HPB 506 (3) Capstone: New Building Energy Systems Design

Master of Engineering Leadership in Integrated Water Management

Program Overview The Master of Engineering Leadership in Integrated Water Management (MEL in IWME) is a degree program within the Faculty of Applied Science. There has been a rapid expansion in scientific and engineering knowledge around water with many new technologies and practical solutions emerging. These include advanced treatments, sophisticated monitoring tools, powerful information technologies, deeper understanding of natural systems, efficient water use and reuse, and novel biotechnologies.

- Applicants must hold an undergraduate credential in Chemical & Biological Engineering, Civil Engineering, Geological Engineering or related discipline in engineering, Environmental Sciences, Geology, Fluid Mechanics, Hydrology, Biotechnology, Biology, Biogeography (physical geography) or Microbiology or equivalent;
Have a minimum of three years relevant experience.

The minimum admission requirement for students with degrees from institutions in Canada or the United States is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study.

- TOEFL (Test of English as a Foreign Language)
Either:
A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
OR
Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science.

- The courses were not used as a basis for admission to the IWME program;
The courses were not used to satisfy the requirements of another credential;
The courses considered for transfer credit have been taken within five years of commencement of the IWME program;
At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APPP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of IWME, addressed to the Associate Dean of Applied Science.

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Master of Engineering Leadership in Naval Architecture and Marine Engineering

Program Overview The Master of Engineering Leadership in Naval Architecture and Marine Engineering (MEL in NAME) is a degree within the Faculty of Applied Science. The program will combine an essential understanding of the engineering science and physics of ship design, coupled with the broad business training contained in the program's Platform courses.



- Applicants must normally hold an undergraduate credential in engineering;
- Have a minimum of 3 years of relevant experience.

The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in NAME are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 (in reading, listening) and minimum component score of 21 (in writing, speaking);
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
- IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
- MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
- PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
- CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
- CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca/>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the NAME program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MEL in NAME degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the NAME program;
- The courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the NAME program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of NAME, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 5. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits. This includes 18 credits of Pillar courses and 12 credits of Platform courses, including 1.5 credits of approved electives from the Faculty of Commerce and Business Administration. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material and is equivalent to a specialization. Each student's coursework must be approved by the MEL in NAME graduate program office. A complete list of the courses required for successful completion are available on the program website (<http://apscpp.ubc.ca/program/naval-architecture-marine-engineering/>). Students in the MEL in NAME may choose to augment their program with a Co-operative Education Placement, entrepreneurial experience or industry project. Participation in any of these options will not contribute to the degree requirements. Students should be advised that choosing to participate in a co-op term may extend the duration of the program. This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the MEL admissions Website (<http://apscpp.ubc.ca/admissions/>) for more information. Contact Information MEL – MHLP Office

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### Master of Engineering Leadership in Sustainable Process Engineering

Program Overview The Master of Engineering Leadership in Sustainable Process Engineering (MEL in SPE) is a degree within the Faculty of Applied Science. The Sustainable Process Engineering program focuses on developing Highly Qualified Personnel (HQP) to lead the dynamically evolving green economy. This sector is seeing opportunities in the development of green, sustainable products, and processes to replace petroleum-derived products and fuels. UBC has an exceptional and growing group of researchers that are developing and commercializing cleaner processing technologies for the production of bio-based chemicals, fuels, and materials, as well as sustainable energy. Students will be trained in the application of chemical and bioprocess engineering principles towards the design of sustainable products and manufacturing processes that utilize renewable feedstocks. Students will also be trained to perform life cycle and technoeconomic analyses to develop and implement novel business models for the commercialization of sustainable products and processes. The MEL in SPE is a degree for professionals who have relevant industry experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MEL admissions website (<http://apscpp.ubc.ca/admissions/>) for more information on both the full time and part time options. The Faculty of Applied Science administers the Master of Engineering Leadership program. Please visit the MEL website (<http://apscpp.ubc.ca/program/green-bio-products/>) for further information and contact details. Admission Requirements The MEL Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit. This program is delivered by the Department of Chemical & Biological Engineering (within the Faculty of Applied Science).

- Applicants must hold an undergraduate credential in Chemical and Biological Engineering, Mechanical Engineering, Materials Engineering, Biomedical Engineering, Manufacturing Engineering, Engineering Physics, Environmental Engineering.
- Have a minimum of three years relevant experience.

The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in SPE are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 (in reading, listening) and minimum component score of 21 (in writing, speaking);
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
- IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
- MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
- PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
- CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
- CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca/>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the SPE program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MEL in SPE degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the SPE program;
- The courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the SPE program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of SPE, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 5. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits: 12 platform and 18 Pillar credits. Platform courses are designed to give foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across the Applied Science Professional Master's programs and includes 1.5 credits from approved electives offered by the Faculty of Commerce



and Business Administration. The Pillar courses are designed to address relevant technical material and are chosen from an approved list. Each student's coursework must be approved by the MEL in Sustainable Process Engineering graduate program office. A complete list of the courses required for successful completion are available on the program website (http://apscpp.ubc.ca/program/green-bio-products/). This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance based on academic merit and financial need may be available. Students should consult the MEL admissions Website (http://apscpp.ubc.ca/admissions/) for more information. Contact Information MEL – MHLF Office
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Master of Engineering Leadership in Urban Systems

Program Overview The Master of Engineering Leadership in Urban Systems (MEL in URSY) is a degree program within the Faculty of Applied Science. Urban Systems provide the technical infrastructure that underpin modern urban society – transportation, water, waste handling, power, data, etc. The MEL in URSY is a degree for professionals who have relevant industry experience and trains students to fill leadership roles in the planning, design, construction, operation, and overall management of these critical systems. The MEL in URSY is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MEL admissions website (http://www.apscpp.ubc.ca/admissions/) for more information on both the full time and part time options. The Faculty of Applied Science administers the Master of Engineering Leadership program. Please visit the MEL website (http://apscpp.ubc.ca/program/urban-systems/) for further information and contact details. Admission Requirements The MEL Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must hold an undergraduate credential in Civil Engineering, Urban Planning or related discipline;
• Demonstrate competence in quantitative methods;
• Have a minimum of three years of relevant professional experience.

The minimum admission requirement for students with degrees from North American institutions is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside North America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MEL in URSY are:

- TOEFL (Test of English as a Foreign Language)
Either:
• A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
OR
• Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
• IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
• MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
• PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
• CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
• CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (http://apscpp.ubc.ca/). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the URSY program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MEL in URSY degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the URSY program;
• The courses were not used to satisfy the requirements of another credential;
• The courses considered for transfer credit have been taken within five years of commencement of the URSY program;
• At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of URSY, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 6. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits. This includes 21 credits of Pillar courses, including 6 credits of constrained electives, and 9 credits of Platform courses, including 1.5 credits of approved electives from the Faculty of Commerce and Business Administration. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material. Each student's coursework must be approved by the MEL in Urban Systems graduate program office. A complete list of the courses required for successful completion is available on the MEL in Urban Systems program website (http://apscpp.ubc.ca/program/urban-systems/). This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the MEL admissions Website (http://apscpp.ubc.ca/admissions/) for more information. Contact Information MEL – MHLF Office

The University of British Columbia
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Web: www.apscpp.ubc.ca (http://www.apscpp.ubc.ca) Last updated: July 8, 2021

Master of Health Leadership and Policy in Clinical Education

The Master of Health Leadership and Policy in Clinical Education (MHLF in CE) is a degree within the Faculty of Applied Science. This program is designed to prepare professionals to lead, design, and deliver comprehensive clinical education programs in a range of community and institutional settings in both the public and private sectors. The goal of the program is to provide learning experiences that enable graduates to complement their clinical expertise with both substantive knowledge related to clinical education and knowledge of business operations. The MHLF in CE is a degree for professionals who have relevant healthcare experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MHLF admissions website (http://apscpp.ubc.ca/admissions/) for more information on both the full time and part time options. The Faculty of Applied Science administers the Master of Health Leadership and Policy program. Please visit the MHLF website (http://apscpp.ubc.ca/programs/mhlf/) for further information and contact details. Admission Requirements The MHLF Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must hold an undergraduate credential in healthcare or related field (Nursing, Dietetics, Medicine)
• Have a minimum of three years of relevant experience and demonstrate, through references and work experience, that they are proficient and have been identified as having leadership potential in clinical practice.

The minimum admission requirement for students with degrees from recognized institutions within Canada or the United States of America is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside Canada and the United States of America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MHLF in CE are:

- TOEFL (Test of English as a Foreign Language)
Either:
• A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
OR
• Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
• IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
• MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
• PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
• CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
• CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet both the academic and English language proficiency requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess



demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the CE program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MHLP in CE degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the CE program;
- The courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the CE program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of CE, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 6. Transferring credits will not reduce tuition fees. Program Requirements Degree requires completion of 30 credits. This includes 18 credits of Pillar (Nursing discipline) courses and 10.5 credits of specified courses and 1.5 credits of approved elective courses delivered in partnership with the Faculty of Commerce and Business Administration (also known as the Sauder School of Business). The Pillar contains the relevant technical material. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. Each student's coursework must be approved by the MHLP in CE Graduate Program Office. This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Course Requirements for MHLP in CE:

- NURS 531 (3) Theoretical Foundations of Clinical Education
- NURS 504 (3) Research and Evidence-Based Practice
- NURS 541 (3) Clinical Nursing Education
- NURS 560 (3) The Politics of Health Policy
- NURS 512 (3) Leadership in Nursing and Health
- NURS 577 (3) Graduate Practicum in Nursing
- NURS 586 (3) Specialized Domains of Nursing Practice
- APSP 501 (1.5) Project Management and Leadership
- APSP 502 (1.5) Sustainability and Leadership
- APSP 503 (1.5) Organizational Leadership
- APSP 504 (3) Business Acumen for Technical Leaders
- Sauder Elective (1.5) Approved by the Program Office

Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the program website (<http://www.apscpp.ubc.ca>) for more information. Contact Information MEL

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### Master of Health Leadership and Policy in Seniors Care

Program Overview The Master of Health Leadership and Policy in Seniors Care (MHLP in SC) is a degree within the Faculty of Applied Science. This program is designed to prepare professionals to lead, design, and deliver comprehensive care and services for seniors in a range of community and institutional settings in both the public and private sectors. The goal of the program is to provide learning experiences that enable graduates to complement their knowledge of the health of seniors with both substantive knowledge related to seniors care and knowledge of business operations. The MHLP in SC is a degree for professionals who have relevant healthcare experience. It is delivered either as a 12-month, full-time program or a 24-month, part-time program. Students should consult the MHLP admissions website (<http://apscpp.ubc.ca/admissions/>) for more information on both the full time and part time options. The Faculty of Applied Science administers the Master of Health Leadership and Policy program. Please visit the MHLP website (<http://apscpp.ubc.ca/program/senior-care/>) for further information and contact details. Admission Requirements The MHLP Program is a professional leadership degree. Admission takes into consideration a variety of criteria: previous academic performance, English language proficiency, professional experience, maturity, and fit.

- Applicants must hold an undergraduate credential in healthcare or related field (Nursing, Social Work, Occupational or Physical Therapy, Dietetics);
- Have a minimum of three years of relevant experience with at least one year in seniors care.

The minimum admission requirement for students with degrees from recognized institutions within Canada or the United States of America is an average of 76% (UBC-equivalency), calculated from senior-level coursework. An applicant with an average slightly less than 76% may be admitted if they have achieved 80% or higher in at least 12 credits (UBC-equivalency) of senior-level coursework in the prospective area of study. The minimum admission requirement for applicants with degrees from outside Canada and the United States of America is an overall degree average of 76% (UBC-equivalency). Applicants from a university outside Canada in which English is not the primary language of instruction must present evidence of English language proficiency prior to being extended an offer of admission. Tests must have been taken within the last 24 months at the time of submission of your application. Acceptable English language proficiency tests for the MHLP in SC are:

- TOEFL (Test of English as a Foreign Language)
  - Either:
    - A minimum score of 90 (internet-based exam), with minimum component scores of 22 [in reading, listening] and minimum component score of 21 [in writing, speaking];
    - OR
    - Minimum score 55 each for reading, listening, and writing (in the paper-based test), with a minimum score of 4.0 on the Test of Written English (TWE).
  - IELTS (International English Language Testing Service): minimum overall band score of 6.5 with no other component score less than 6.0 of the academic (NOT general) IELTS test.
  - MELAB (Michigan English Language Assessment Battery): minimum overall score of 85, with a minimum score of 3 in the speaking test.
  - PTE (Pearson Test of English - Academic): minimum overall score of 65, with a minimum score of 60 reading, 60 writing, 60 listening, and 60 speaking.
  - CELPIP (Canadian English Language Proficiency Index Program): minimum scores; 4L/4L/4L of the academic (NOT general) test is required.
  - CAEL (Canadian Academic English Language Assessment): minimum overall score of 70, with a minimum score of 60 on the speaking sub-test.

Applicants who do not meet the academic requirements stated above, but who have had other significant formal training, relevant professional experience, and/or otherwise possess demonstrable knowledge or expertise that would prepare them adequately for successful study in the graduate program, may be granted admission on the recommendation of the Program Director and the approval of the Dean of Applied Science. Lists of the required application documents are available on the program website (<http://apscpp.ubc.ca>). The Professional Masters office is responsible for collection and assessment of application documents. Transfer Credit 1. Graduate students who have earned credits for equivalent courses outside of the SC program (e.g., from a different university, in a different UBC master's program, or as an unclassified student) may apply to transfer credits toward their MHLP in SC degree. Typically only 3 credits will be allowed to be transferred, provided that:

- The courses were not used as a basis for admission to the SC program;
- The courses were not used to satisfy the requirements of another credential;
- The courses considered for transfer credit have been taken within five years of commencement of the SC program;
- At least a B standing (UBC 74%) was obtained in courses considered for transfer.

2. Transfer credit may only be at the graduate level (500-/600-level). 3. Transferring credits is not permitted for APSC Professional Programs management and leadership courses, course code: APSP or Sauder business course codes. 4. Requests for transfer credit must be accompanied by a letter or memo of support from the Director of SC, addressed to the Associate Dean of Applied Science. The letter must provide an academic justification for allowing the transfer credit on a course by course basis and be accompanied by a set of original transcripts from the completed course institution. 6. Transferring credits will not reduce tuition fees. Program Requirements Degree completion requires completion of 30 credits. This includes 21 credits of Pillar courses and 9 credits of Platform courses, including 1.5 credits of approved electives from the Faculty of Commerce and Business Administration. Platform refers to foundational coursework focused on the professional skills required for an experienced graduate to be an effective professional leader. These courses are common across many of the Applied Science Professional Master's programs. The Pillar contains the relevant technical material. Each student's coursework must be approved by the MHLP in SC graduate program office. A complete list of the courses required for successful completion are available on the program website (<http://apscpp.ubc.ca/program/senior-care/>). This program also requires the student to attend Welcome Day and successfully participate in a 1-day workshop on professionalism and integrity offered by the department, in order to graduate. Financial Assistance Financial assistance based on academic merit and financial need may be available. Students should consult the MHLP admissions website (<http://apscpp.ubc.ca/admissions/>) for more information. Contact Information MEL – MHLP Office

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