School of Engineering

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A School within the Faculty of Applied Science

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The School of Engineering at the UBC Okanagan campus offers the Bachelor of Applied Science (B.A.Sc.) degree in Civil Engineering, Electrical Engineering, and Mechanical Engineering. Each program is accredited by the Canadian Engineering Accreditation Board. Qualified applicants can be admitted directly from secondary school into Engineering One. Students may also enter the Engineering program after having successfully completed the equivalent of first-year Science. There are also admission routes via engineering transfer programs at various colleges and Engineering Bridge programs with Okanagan College and Camosun College.

Following entry from secondary school, the B.A.Sc. degree generally requires four or five years to complete.

The first-year Engineering One program is common to all Engineering disciplines and lays the foundation for Engineering specializations in subsequent years. Engineering One is equivalent to first-year Engineering at the UBC Vancouver campus. The engineering-specific curriculum emphasizes project-based team learning, and offers first-year students the opportunity to implement the principles of engineering in a second-term design project. Upon successful completion of Engineering One, students have the option of continuing at the UBC Okanagan campus in the second year of the integrated program - Engineering Two - or transferring to the UBC Vancouver campus. Students who elect to transfer compete for program spaces with students at the UBC Vancouver campus.

Students who choose to continue their Engineering education at the UBC Okanagan campus will take the Engineering Two program, which is common to all specializations. Students will specialize in Civil Engineering, Electrical Engineering, or Mechanical Engineering in their third- and fourth-year programs.

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

An optional Co-operative Education program, which integrates academic study with supervised work experience, is available during the second year.

Bachelor of Applied Science Program

Bachelor of Applied Science Program > Admission Requirements
Application for admission to the School of Engineering must be made through Enrolment Services. Procedures, policies, and admission requirements of UBC and the School of Engineering are specified in Admissions [http://www.calendar.ubc.ca/okanagan/index.cfm?tree=2,0,0].

Due to limited resources, the School has been authorized to restrict enrolment in Engineering One and within individual Engineering programs at the second-year level. Attainment of the minimum academic requirements listed below implies 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.

**Note:** proficiency in mathematics is an important part of preparing 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 British Columbia 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.

### Admission from a Post-Secondary Institution

Applicants from another faculty at UBC or another post-secondary institution may be considered for admission to the School of Engineering. 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 admission as specified in Applicants from a College or University [http://www.calendar.ubc.ca/okanagan/index.cfm?tree=2,344,0].

Applicants must also have an average of at least 70% in all chemistry, mathematics, and physics courses that 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 fewer than 24 transferable credits from a post-secondary institution are evaluated against both secondary and post-secondary admission criteria.

Applicants with more than 24 credits that transfer to first-year Engineering may be eligible for second-year Engineering. Advice on transfer credit is available from the School of Engineering. Deficiencies from first year must be completed prior to graduation.

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

### 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 average of at least 65%.
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 BASc degree program.

Program selection is competitive, and all students will be asked to rank both their preferred campus and their eligible program. 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 BASc 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 Vantage College Engineering programs and here for details on Okanagan engineering programs.

Students transferring into the program may be granted transfer credit if they have completed courses of equivalent content.

Bachelor of Applied Science Program > Academic Advising
Academic advising is available through Engineering Advising. Engineering Advising assists students in academic planning, interpreting Faculty course requirements and regulations, and resolving academic and personal problems.

Bachelor of Applied Science Program > Academic Regulations

Students transferring into the program may be granted transfer credit if they have completed courses of equivalent content.
Second Year

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>APSC 201</td>
<td>Technical Communication</td>
<td>3</td>
</tr>
<tr>
<td>APSC 246</td>
<td>System Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>APSC 248</td>
<td>Engineering Analysis III</td>
<td>3</td>
</tr>
<tr>
<td>APSC 252</td>
<td>Thermodynamics and Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>APSC 254</td>
<td>Instrumentation and Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>APSC 256</td>
<td>Numerical Methods for Analysis</td>
<td>3</td>
</tr>
<tr>
<td>APSC 258</td>
<td>Applications of Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>APSC 259</td>
<td>Materials Science I</td>
<td>3</td>
</tr>
<tr>
<td>APSC 260</td>
<td>Mechanics of Materials I</td>
<td>3</td>
</tr>
</tbody>
</table>

Humanities/Social Sciences Elective

3 credits

Total Credits: 37

Bachelor of Applied Science Program > Civil Engineering

In the third and fourth years, students will follow a program in Civil Engineering, Electrical Engineering, or Mechanical Engineering.

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</tr>
</thead>
<tbody>
<tr>
<td>ENGR 303</td>
<td>Engineering Project Management</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 305</td>
<td>Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 325</td>
<td>Civil Engineering Materials</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 327</td>
<td>Reinforced Concrete Design I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 330</td>
<td>Optimization and Decision Analysis for Civil Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 331</td>
<td>Infrastructure Management I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 332</td>
<td>Surveying and GIS Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 335</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 340</td>
<td>Soil Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 341</td>
<td>Engineering Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 342</td>
<td>Open-Channel Flow</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 347</td>
<td>Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGR 413</td>
<td>Law and Ethics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 440</td>
<td>Foundation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 447</td>
<td>Design of Processes for Water and Wastewater Treatment</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 448</td>
<td>Engineering Capstone Design Project</td>
<td>6</td>
</tr>
</tbody>
</table>

Design Electives

3 credits

Total Credits: 39

Bachelor of Applied Science Program > Electrical Engineering

In the third and fourth years, students will follow a program in Civil Engineering, Electrical Engineering, or Mechanical Engineering.

<table>
<thead>
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<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
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<td>ENGR 303</td>
<td>Engineering Project Management</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 305</td>
<td>Engineering Economic Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 315</td>
<td>Systems and Control</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 320</td>
<td>Electromechanical Devices</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 350</td>
<td>Linear Circuit Theory</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 351</td>
<td>Microelectronics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 353</td>
<td>Semiconductor Devices</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 359</td>
<td>Microcomputer Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 360</td>
<td>Engineering Probability and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 361</td>
<td>Signals and Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 362</td>
<td>Digital Signal Processing I</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 365</td>
<td>Engineering Electromagnetics</td>
<td>3</td>
</tr>
<tr>
<td>Total Credits</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>
The Mechatronics Option under Electrical Engineering requires the following courses:

- Required 4th year courses (as listed above) and Elective requirements:
  - 3 credits of Design Electives & 12 credits of Technical Electives from a list of Mechatronics Elective choices, including mandatory courses ENGR 480, ENGR 481.

Note that it is the student’s responsibility to ensure that the electives chosen meet the program requirements for design and technical elective graduation requirements.

The option consists of a typical third year, followed by a set of prescribed fourth year courses with 2 additional required Computer Science courses beyond the Bachelor of Applied Science degree.

Students may encounter difficulty fitting these 2 Computer Science (COSC) courses into their schedule. Careful planning is essential and completion of the Option may require a summer session or additional term of study beyond that required to complete the Bachelor of Applied Science degree alone.

Entry into and continuation in the Option requires that the student remains in Good Standing. Upon successful completion of the option, the notation “Mechatronics Option” will be added to the student’s transcript.

Bachelor of Applied Science Program > Mechanical Engineering

In the third year and fourth years, students will follow a program in Civil Engineering, Electrical Engineering, or Mechanical Engineering.

- Required 4th year courses (as listed above) and Elective requirements:
  - 3 credits of Design Electives & 12 credits of Technical Electives from a list of Mechatronics Elective choices, including mandatory courses ENGR 303, ENGR 435, ENGR 436.

Note that it is the student’s responsibility to ensure that the electives chosen meet the program requirements for design and technical elective graduation requirements.

- Required 4th year courses (as listed above) and Elective requirements:
  - 3 credits of Design Electives & 12 credits of Technical Electives from a list of Mechatronics Elective choices, including mandatory courses ENGR 303, ENGR 435, ENGR 436.

Note that it is the student’s responsibility to ensure that the electives chosen meet the program requirements for design and technical elective graduation requirements.

- Required 4th year courses (as listed above) and Elective requirements:
  - 3 credits of Design Electives & 12 credits of Technical Electives from a list of Mechatronics Elective choices, including mandatory courses ENGR 303, ENGR 435, ENGR 436.

Note that it is the student’s responsibility to ensure that the electives chosen meet the program requirements for design and technical elective graduation requirements.

The minor consists of 30 credits: 12 lower-level and 18 upper-level COSC credits, together with any necessary prerequisites. No more than six COSC upper-level credits may be counted towards the technical elective requirements for the B.A.Sc.

Bachelor of Applied Science Program > Minor in Computer Science

Application to the Minor in Computer Science is open to all students in the Bachelor of Applied Science program. Admission will be competitive based on GPA. Applications for admission must be made through the Engineering Advising Office by May 31st. Admission will be competitive based on GPA. Applications for admission must be made through the Engineering Advising Office by May 31st. Admission will be competitive based on GPA.

Bachelor of Applied Science Program > Minor in Management

Application to the Minor in Management is open to all students in the Bachelor of Applied Science program. Admission will be competitive based on GPA. Applications for admission must be made through the Engineering Advising Office by May 31st. Admission will be competitive based on GPA. Applications for admission must be made through the Engineering Advising Office by May 31st. Admission will be competitive based on GPA.
### Bachelor of Applied Science Program > Co-operative Education Program

The Engineering Co-operative Education program is intended to provide motivated and qualified students with paid, faculty-monitored work experience that is directly related to their academic program. The Engineering Co-op program is an optional, year-round program that normally requires completion of the work term, including one Winter and one Fall placement. This program requires an additional year to complete the B.A.Sc. requirements. Faculty advisors at the student's home department will assist them in choosing courses that will allow smooth integration of the work experience into the existing three engineering programs, and are there in parallel with engineering courses.

- **ENG 112** (value of APSC 112 & 113)
- **CHIM 121 & 123** (value of APSC 121 & 123)

The completion time for this program is 12 months.

Application for transfer of work terms must be made to the director of Co-operative Education prior to undertaking any additional work terms at UBC.

### Master of Engineering Leadership in Resource Engineering Management (M.E.L. in R.E.M.)

The objective of this program is to meet identified need to educate engineers with a unique combination of leadership and strong technical, multidisciplinary knowledge applicable to the resource engineering sector. This program is suited to students who wish to pursue their education in Resource Engineering Management beyond the undergraduate level, but who do not wish to pursue a thesis research program. This is not the appropriate program for students who are considering being a Doctor of Philosophy (Ph.D.) in the future. The completion time for this program is 12 months.

Minimum English language requirements for the M.E.L. program include a TOEFL score of 580 (PBT) or equivalent.

### Other Graduate Programs (M.A.Sc., M.Eng., Ph.D.)

Information on the Master of Applied Science (M.A.Sc.) program is available at calendar.ubc.ca/okanagan/2018/2019-ubc-okanagan-calendar-masters programmes. The Master of Applied Science (M.A.Sc.) program is designed to provide advanced technical education for professionals who have already completed a professional degree who do not meet the admission standards, but who have solid background in engineering and have previous professional experience. The Master of Applied Science (M.A.Sc.) program is intended for students with a professional degree in engineering who wish to pursue advanced studies in a particular field of engineering. The completion time for this program is 2 years.

Students applying for admission to the Master of Applied Science (M.A.Sc.) program are required to have completed an engineering degree with an average of at least a B+ (76%) in a recognized university. The completion time for this program is 2 years.

Information on the Master of Engineering (M.Eng.) program is available at calendar.ubc.ca/okanagan/2018/2019-ubc-okanagan-calendar-masters programmes. The Master of Engineering (M.Eng.) program is designed to provide advanced technical education for professionals who have already completed a professional degree who do not meet the admission standards, but who have solid background in engineering and have previous professional experience. The Master of Engineering (M.Eng.) program is intended for students with a professional degree in engineering who wish to pursue advanced studies in a particular field of engineering. The completion time for this program is 2 years.

Information on the Master of Philosophy in Engineering (M.Eng.) program is available at calendar.ubc.ca/okanagan/2018/2019-ubc-okanagan-calendar-masters programmes. The Master of Philosophy in Engineering (M.Eng.) program is designed to provide advanced technical education for professionals who have already completed a professional degree who do not meet the admission standards, but who have solid background in engineering and have previous professional experience. The Master of Philosophy in Engineering (M.Eng.) program is intended for students with a professional degree in engineering who wish to pursue advanced studies in a particular field of engineering. The completion time for this program is 2 years.

Information on the Master of Engineering Leadership in Resource Engineering Management (M.E.L. in R.E.M.) program is available at calendar.ubc.ca/okanagan/2018/2019-ubc-okanagan-calendar-masters programmes. The Master of Engineering Leadership in Resource Engineering Management (M.E.L. in R.E.M.) program is designed to provide advanced technical education for professionals who have already completed a professional degree who do not meet the admission standards, but who have solid background in engineering and have previous professional experience. The Master of Engineering Leadership in Resource Engineering Management (M.E.L. in R.E.M.) program is intended for students with a professional degree in engineering who wish to pursue advanced studies in a particular field of engineering. The completion time for this program is 2 years.

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### Professional Associations

The right to practice 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 practice in BC should be enrolled with the Association as an “Engineer in Training.” During this period the graduate must comply with the by-laws of the Association and meet the requirements of the Society of Manufacturing Engineers. In the course of his practice, an Engineer in Training may not identify himself as a Professional Engineer, and must clearly state on his letterhead or any other written communication, and in general publicity for the work environment, that he is subject to the jurisdiction of the Association.

Students applying for admission to the M.E.L. in R.E.M. program in Resource Engineering Leadership in Resource Engineering Management must meet the following requirements:

- The program in which the work term was undertaken is accredited;
- The program in which the work term was undertaken is accredited;
- The student is a registered Engineer in Training with the Association of Professional Engineers of British Columbia (APEC-BC);
- The student has completed at least 40 credits in the engineering field;
- The student is registered with the Association as an “Engineer in Training.”

### Course Requirements

The School of Engineering will work with the Faculty of Management to provide a list of available courses for students to choose from. The list of courses will be provided to students in the Spring of each year and will be updated annually. The School of Engineering will also provide course descriptions and prerequisites for these courses.

### Academic Staff

- **Professor J. Cheng, B.Eng. (McGill), M.Eng. (Calgary), Ph.D. (Calgary), P.Eng.**
- **Professor P. Angenheister, B.Eng. (Calgary), M.Eng. (Calgary), Ph.D. (Calgary), P.Eng.**
- **Professor J. W. D. Grieve, B.Sc. (Calgary), M.Eng. (Calgary), Ph.D. (Calgary), P.Eng.**
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