School of Engineering

Introduction

Bachelor of Applied Science Program

  Admission Requirements
  Academic Advising
  Academic Regulations
  Degree Requirements
  Years 1 & 2
  Civil Engineering
  Electrical Engineering
  Manufacturing Engineering
  Mechanical Engineering
  Minor in Computer Science
  Minor in Management
  Pre-Med Alternative Path (P-MAP)
  Co-operative Education Program


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

Professional Associations

Academic Staff
Introduction

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=2,0,0,0](http://www.calendar.ubc.ca/okanagan/index.cfm?tree=2,0,0,0).

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=2,344,0,0](http://www.calendar.ubc.ca/okanagan/index.cfm?tree=2,344,0,0).

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%.
Students proceeding to second year will have the option of continuing their Engineering program at the UBC Okanagan campus in Civil Engineering, Electrical Engineering, or Mechanical Engineering, or transferring to the UBC Vancouver campus. Details of the specific courses conforming to the above requirements are available from the school.

Program selection is competitive, and all students will be asked to rank both their preferred program 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 Vancouver Engineering programs and here for details on Okanagan Engineering programs. Digital programs include: Okanagan Campus: Electrical, Mechanical and Civil Engineering, Vancouver Campus: Biomedical, Chemical, Chemical and Biological, Computer, Electrical, Environmental, Geodetic, Statistical, Materials, and Mining Engineering.

Students transferring into the program may be granted transfer credit if they have completed courses of equivalent content. Exceptions in engineering courses offered by the School may be admitted to the second year of the B.A.Sc. program upon successful completion of the corresponding Okanagan Engineering Bridge program. Students must successfully complete an Engineering Technology program with a minimum grade of 85% in each course and a minimum average of 85% in all courses other than University Writing (ENGW 100). Admitted students will be required to take UBC Okanagan courses from a list provided by the School of Engineering to fulfill B.A.Sc. degree requirements. Typically, students admitted from each Engineering Bridge program will require two and a half years of additional study at UBC Okanagan to complete B.A.Sc. degree requirements. Admission from Camosun College Engineering Bridge Programs to Civil or Mechanical Engineering Students with a two-year diploma in Civil or Mechanical Technology may be admitted to the third year of Civil Engineering or Mechanical Engineering upon successful completion of an Engineering Bridge program offered by Camosun College. Students must achieve a minimum of 80% in each course and a minimum average of 80% on all courses to be considered for admission to the B.A.Sc. program. Admitted students will be required to take additional UBC Okanagan campus courses from a list provided by the School of Engineering to fulfill B.A.Sc. degree requirements. Typically, students admitted from a Camosun College Engineering Bridge program will require two and a half years of additional study at UBC Okanagan campus to complete the B.A.Sc. degree requirements. Following “Two-Year” Technology Diploma Programs Not Including Bridge 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, unless the student has completed an approved Engineering Bridge program.

Bachelor of Applied Science Program > Academic Advising

Admission Following Two-Year Technology Diploma Programs Not Including Bridge Programs

Eligible programs include: Okanagan Campus: Electrical, Mechanical and Civil Engineering. Vancouver Campus: Biomedical, Chemical, Chemical and Biological, Computer, Electrical, Environmental, Geodetic, Statistical, Materials, and Mining Engineering.

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 Vancouver Engineering programs and here for details on Okanagan Engineering programs. Digital programs include: Okanagan Campus: Electrical, Mechanical and Civil Engineering, Vancouver Campus: Biomedical, Chemical, Chemical and Biological, Computer, Electrical, Environmental, Geodetic, Statistical, Materials, and Mining Engineering.

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Bachelor of Applied Science Program > Academic Advising

Admission for non-current students should be directed to Enrollment Services. Field Trips Students who are required to participate in field trips will be responsible for expenses incurred during such trips.

Bachelor of Applied Science Program > Degree Requirements

Students will be granted a B.A.Sc. degree 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 if completing the Co-operative Education program). With the approval of the Dean’s Office, students may be allowed to study on a part-time basis. Credit will be granted for courses completed during the Summer Session. Students who are required to participate in field trips will be responsible for expenses incurred during such trips.

Details of the specific courses confirming to the above requirements are available from Engineering Advising.

Bachelor of Applied Science Program > Years 1 & 2

First Year Students admitted into the Engineering program directly from secondary school will take the first-year Engineering One curriculum. Other students will need to contact Engineering Advising for advice on their first-year program. Students are not eligible to declare the option of the UBC Okanagan campus in Civil Engineering, Electrical Engineering, or Mechanical Engineering, or transferring to the UBC Okanagan campus in one of the following programs: Biomedical Engineering, Chemical and Biological Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Engineering Physics, Geological Engineering, Integrated Engineering, Materials Engineering, Mechanical Engineering, or Mining Engineering. Admission to a selected program is dependent upon performance in first year.

APSC 169  
Fundamentals of Sustainable Engineering Design  
3

APSC 171  
Engineering Drawing and CAD/CAM  
3

APSC 172  
Engineering Analysis I  
3

APSC 173  
Engineering Analysis II  
3

APSC 176  
Engineering Communication  
3

APSC 177  
Engineering Computation and Instrumentation  
3

APSC 178  
Electricity, Magnetism, and Waves  
4

APSC 179  
Linear Algebra for Engineers  
3

APSC 180  
Statics  
3

APSC 181  
Dynamic  
3
*Criteria must be met and include completion of 37 credits of first year UBC Okanagan Campus Applied Science. The admission process is competitive, with limited seats available. Second Year

### APSC 201
Technical Communication

### APSC 246
System Dynamics

### APSC 248
Engineering Analysis III

### APSC 252
Thermodynamics and Heat Transfer

### APSC 254
Instrumentation and Data Analysis

### APSC 256
Numerical Methods for Analysis

### APSC 258
Applications of Engineering Design

### APSC 259
Materials Science I

### APSC 260
Mechanics of Materials I

### Humanities/Social Sciences Elective

Total Credits: **37**

In general, scientific geography courses, statistical courses, and studio/performance courses in fine arts, music, and theatre will not satisfy this requirement. Courses that teach language skills are not acceptable. See Complementary Studies Courses (http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,317,989,1187#13653)

### Bachelor of Applied Science Program > Civil Engineering

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</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>
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<td>Total Credits</td>
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### Design Electives

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<th>Course Title</th>
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<tbody>
<tr>
<td>ENGR 415</td>
<td>Law and Ethics for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 441</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 449</td>
<td>Engineering Capstone Design Project</td>
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Total Credits: **36**

### Bachelor of Applied Science Program > Electrical Engineering

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<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 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>
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<tr>
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The Mechatronics Option

Available to Mechanical and Electrical students, the Mechatronics Option allows students interested in electromechanical systems integrated with embedded electronics, sensors, actuators, and related systems to have a course focus in these areas. Application to the Mechatronics Option is open to students with Year 2 standing (including Year 2 transfer students) in the Bachelor of Applied Science program specializing in Mechanical or Electrical Engineering. Applications for admission must be made through the Engineering Advising Office by May 31st. Admission will be competitive based on GPA and enrolment in this option is limited. The Mechatronics Option under Electrical Engineering requires the following courses:

- Required 4th year courses (as listed above) and Elective requirements:

  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 on the student’s transcript.

Electives to be chosen from a list of approved Mechatronics Option courses provided by the School of Engineering.

Bachelor of Applied Science Program > Manufacturing Engineering

Program Overview

In the second, third and fourth years, students will follow a program Manufacturing Engineering.

The Mission of the MANF 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

<table>
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<td>APSC 171</td>
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<tr>
<td>APSC 172</td>
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<td>3</td>
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<td>APSC 182</td>
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<td>APSC 183</td>
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Total Credits: 37

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<td>COSC 210</td>
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<td>MANF 230</td>
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<td>MANF 270</td>
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Total Credits: 36

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Total Credits: 36

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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.

**Civil Engineering**

- ENGR 300: Engineering Project Management
- ENGR 305: Engineering Economic Analysis
- ENGR 310: Fluid Mechanics II
- ENGR 315: Systems and Control
- ENGR 320: Electromechanical Devices
- ENGR 375: Energy System Design
- ENGR 376: Manufacturing Processes
- ENGR 377: Manufacturing Processes
- ENGR 470: Design of Machine Elements
- ENGR 481: Kinematics and Dynamics of Machinery
- ENGR 485: Heat Transfer Applications
- ENGR 487: Vibrations of Mechanisms

**Civil Engineering Technical Electives**

- MANF 450
- MANF 455
- MANF 460
- MANF 470

**Total Credits:** 36

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**Electrical Engineering**

- ENGR 303: Engineering Project Management
- ENGR 305: Engineering Economic Analysis
- ENGR 310: Fluid Mechanics II
- ENGR 315: Systems and Control
- ENGR 320: Electromechanical Devices
- ENGR 375: Energy System Design
- ENGR 376: Manufacturing Processes
- ENGR 377: Manufacturing Processes
- ENGR 470: Design of Machine Elements
- ENGR 481: Kinematics and Dynamics of Machinery
- ENGR 485: Heat Transfer Applications
- ENGR 487: Vibrations of Mechanisms

**Electrical Engineering Technical Electives**

- MANF 450
- MANF 455
- MANF 460
- MANF 470

**Total Credits:** 36

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**Mechanical Engineering**

- ENGR 413: Law and Ethics for Engineers
- ENGR 475: Mechanics of Materials II
- ENGR 499: Engineering Capstone Design Project

**Mechanical Engineering Technical Electives**

- To be chosen from a list of Mechanical Engineering elective courses provided by the School of Engineering.

**Total Credits:** 36

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**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 31. Students might encounter difficulty fitting the courses required for the Minor into their schedule. Careful planning is essential and completion of the Minor may require a summer session or additional term of study beyond that required to complete the Bachelor of Applied Science program. Admission to the Minor in Computer Science does not guarantee entry into Computer Science courses beyond those required to complete the B.A.Sc. degree. To accommodate scheduling conflicts, students are encouraged to consider taking COSC courses in the summer session. 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 Management**

Students desiring a stronger foundation in management and/or entrepreneurship are encouraged to consider the Minor in Management. Upon successful completion of the Minor program, the notation “Minor in Management” will be added to the student transcript. For an application to the Minor in Management, the student must be eligible for at least third-year standing in the School of Engineering with a cumulative average of at least 70% in the previous two years. Meeting the stated minimum requirements does not guarantee admission into the Minor. Admission will be based on GPA in conjunction with a statement of intent to be submitted at the time of application. The Minor consists of 18 credits.

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Bachelor of Applied Science Program > Pre-Med Alternative Path (P-MAP)

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