FACULTY OF APPLIED SCIENCE
SCHOOL OF ENGINEERING

Civil Engineering

Advising Sheet 2025W

All courses required for the Bachelor of Applied Science in Civil Engineering are listed below with course vectors, prerequisites (in red), and corequisites (in orange). Students are advised to take 6 courses per term to complete their degree in 4 years, or 5 courses per term to complete it in 5 years. Full course descriptions can be found here. Review this document thoroughly and annually, particularly the 4th year electives starting on Page 2, which change year to year.

	Term 1	Term 2	
4-year track / 5-year track			
Year 1 of 4 / Year 1 of 5	**APSC_O 169** Fundamentals of Sustain. Eng. Design [3-2-0]	**APSC_O 173** Engineering Analysis II [3-0-1] *APSC_O 172*	
	APSC_O 172 Engineering Analysis I [3-0-1]	**APSC_O 177** Engineering Computation and Instrumentation [3-2*-0][1]	
	APSC_O 179 Linear Algebra for Engineers [3-0-0]	**APSC_O 178** Electricity, Magnetism, and Waves [3-0-1] *APSC_O 172, 173*	
	APSC_O 180 Statics [3-0-2] *APSC_O 179*	**APSC_O 181** Dynamics [3-0-2] *APSC_O 172, 180, 173*	
	APSC_O 182 Matter and Energy I [2-2*-2*]	**APSC_O 183** Matter and Energy II [2-2*-2*]	
	APSC_O 176 Engineering Communication [3-0-0]	**APSC_O 171** Engineering Drawing and CAD/CAM [3-0-2]	
Year 2 of 4 / Year 2 of 5	**APSC_O 246** System Dynamics [3-0-1] *APSC_O 173, 179, 181*	**APSC_O 201** Technical Communication [3-0-0] *APSC_O 176*	
	APSC_O 248 Engineering Analysis III [3-0-1] *APSC_O 173*	**APSC_O 253** Fluid Mechanics I [3-2*-1] *APSC_O 180, 181, 248*	
	APSC_O 254 Instrumentation and Data Analysis [3-2*-1] *APSC_O 172, 178*	**APSC_O 260** Mechanics of Materials I [3-0-1] *APSC_O 173, 180*	
	APSC_O 259 Materials Science I [3-2*-0] *APSC_O 182, 183*	**APSC_O 261** Theory of Structures [3-0-2] *APSC_O 173, 180, 259, 260*	
	APSC_O 252 Thermodynamics [3-0-1] *APSC_O 173, 182*	**APSC_O 258** Applications of Eng. Design [3-1-0] *APSC_O 169, 177, 179, 254*	
	APSC_O 256 Numerical Methods for Analysis [3-1-0] *APSC_O 173, 177, 179*	*Humanities Elective* [2]	
Year 3 of 4 / Year 3 of 5	**ENGR_O 325** Civil Engineering Materials [3-2*-0] *APSC_O 259*	**ENGR_O 340** Soil Mechanics [3-2*-0] *APSC_O 253, 260*	
	ENGR_O 327 Reinforced Concrete Design I [3-2*-1] *APSC_O 259, 260, 261, 325*	**ENGR_O 305** Engineering Economic Analysis [3-0-0] *2nd yr. standing*	
	ENGR_O 347 Environmental Engineering [3-0-0] *APSC_O 182, 183, 253*	**ENGR_O 330** Reliability and Risk Analysis... [3-0-0] *APSC_O 254, 258*	
	ENGR_O 303 Engineering Project Management [3-0-0] *APSC_O 169, 201*	**ENGR_O 331** Infrastructure Management I [3-0-0] *ENGR_O 305, 330*	
	ENGR_O 341 Engineering Hydrology [3-0-0] *APSC_O 253, 254*	**ENGR_O 332** Surveying and GIS Analysis [3-2*-0] *APSC_O 169, 254*	
	ENGR_O 342 Open Channel Flow [3-2*-0] *APSC_O 253*	**ENGR_O 335** Transportation Engineering [3-2*-0] *APSC_O 254*	
Year 4 of 4 / Year 4 of 5	**ENGR_O 440** Foundation Engineering [3-0-1*] *ENGR_O 340, ENGR_O 327*	*Design / Technical Elective (see next page)*	
	ENGR_O 447 Design of Processes for Water and Wastewater Treatment [3-0-1*] *ENGR_O 347*	*Design / Technical Elective*	
	Design / Technical Elective	**ENGR_O 413** Law and Ethics for Engineers [3-0-0] *Third-year standing*	
Year 5 of 5	*Design / Technical Elective*	*Design / Technical Elective*	
	Design / Technical Elective	*Design / Technical Elective*	
	ENGR_O 499 Engineering Capstone Design Project [2-3-0; 0-6-0] *Fourth-year standing*		

[1] COSC_O 111 can be substituted for APSC_O 177, especially for students planning to pursue the Minor of Computer Science. If taken instead of APSC_O 177, COSC_O 111 will count towards the Minor requirements and the program requirements.
[2] Students in the 5-year degree track could take ENGR_O 331 in Year 3/5 and move the humanities elective to Year 4/5 if they choose

Fourth Year Guide 2025W

Civil Engineering Fourth Year Curriculum:

ENGR_O 413 Law and Ethics for Engineers (Term 2) *Third-year standing*	3 credits
ENGR_O 440 Foundation Engineering (Term 1) *ENGR_O 340, 327*	3 credits
ENGR_O 447 Design of Processes for Water and Wastewater Treatment (Term 1) *ENGR_O 347*	3 credits
ENGR_O 499 Engineering Capstone Design Project (Terms 1&2) *Fourth-year standing*	6 credits
Design Electives[3] – Chosen from List A	9 credits
Technical Electives – Chosen from List B or C	12 credits

[3] Design electives all must have 50% engineering design content, as defined by the Canadian Engineering Accreditation Board (CEAB) and are taught by specific faculty who are licensed as Professional Engineers (P.Eng) in Canada. These courses can only be taken at UBC Okanagan.

Students planning on the Environmental Concentration, please review Page 4.
Students planning on the Resilient Infrastructure Management (RIM) Concentration, please review Page 5.

List A: Approved Design Electives (DE) - Students must choose at least 3 courses.

Term 1:

ENGR_O 427 Reinforced Concrete Design II
[3-0-0] *ENGR_O 325, 327*
ENGR_O 438 Rock Mechanics and Rock Eng.
[3-2*-0] *ENGR_O 340*
ENGR_O 444 Solid Waste Engineering
[3-0-0] *ENGR_O 340, 347*

Term 2:

ENGR_O 424 Smart Cities
[3-0-0] *Fourth-year standing*
ENGR_O 425 Design of Steel and Timber Structures
[3-0-0] *ENGR_O 325, 327*
ENGR_O 429 Rehab. of Concrete Structures
[3-0-0] *ENGR_O 325, 327*
ENGR_O 441 Adv. Water Treatment Processes
[3-0-0] *ENGR_O 447*
ENGR_O 445 Design of Water and Wastewater Conveyance Systems [3-0-0] *ENGR_O 341*

ENGR_O 407 Inclusive Design [3-2-0] Third-year standing* ***Offered Summer 2025*** *as a* ***Design Elective***

List B: Approved Technical Electives (TE) - Students must choose at least 2 courses and up to 4 courses.

Term 1:

ENGR_O 409 Construction Digitalization and Informatics
[3-0-0] *ENGR_O 303 or MANF 470*
ENGR_O 418 Applied Machine Learning for Engineers
[3-0-0] *Fourth-year standing*
ENGR_O 426 Analysis of Indeterminate Structures
[3-0-0] *APSC_O 179, ENGR_O 327*
ENGR_O 428 Earthquake Engineering
[3-0-0] *ENGR_O 327*
ENGR_O 432 Infrastructure Management II
[3-0-0] *ENGR_O 303, 305, 330, 331*
ENGR_O 436 Transportation Planning
[3-2*-0] *ENGR_O 335*
ENGR_O 489 Multicriteria Optimization & Design of Experiments
[3-2*-0] *Fourth-year standing*
ENGR_O 492 Finite Element Analysis
[3-0-0] *Fourth-year standing*

Term 2:

ENGR_O 400 Applied Machine Vision for Engineers
[3-0-0] *Fourth-year standing*
ENGR_O 414 Precast Concrete Structures
[3-2*-0] *ENGR 325 and ENGR 327*
ENGR_O 460 Tools and Applications in Environmental and Engineering Microbiology [3-0-0] *APSC_O 182, 183, third-year standing*
ENGR_O 433 Construction Eng. and Management
[3-0-0] *ENGR_O 303*
ENGR_O 453 Internet of Things
[3-2*-0] *APSC_O 254*

*ENGR_O 437 Railway Systems Engineering [3-2*0] ENGR_O 335* ***Offered Summer 2025*** *as a* ***Technical Elective***

Any design elective course (from List A) taken above the minimum requirement of 3 courses will be counted as a technical elective.

List C: Alternative Technical Electives - Students may choose up to 2 courses.

1. Engineering Complementary Studies electives:
   - ENGR_O 405 Engineering Leadership [3-0-0] *Fourth-year standing* ***Offered 2025 Summer***
   - ENGR_O 411 Technology Entrepreneurship for Engineers [3-0-0] *Fourth-year standing* ***Offered 2025 Winter (Term 2)***
2. Civil Engineering Graduate courses (APSC_O 5XX and ENGR_O 5XX)
   - Courses must be from within the Civil Engineering program.
   - For courses cross-listed as undergraduate (400 level) and graduate (500 level) courses, you must register in the undergraduate version.
   - Eligibility: you must satisfy the following three requirements
     a) completed at least half of required 300- and 400- level courses (at least 36 credits) with a minimum average of 80% in those courses,
     b) completed all prerequisites, and
     c) endorsement from the course instructor.

   - If you meet the criteria, you must complete the Registration Waiver Request to be registered in a graduate course.
3. Engineering courses from other programs (APSC_O, ENGR_O, or MANF 300- or 400-level courses)
   - Registration in such courses is subject to prerequisite requirements (or prerequisite waiver approval if the prerequisite requirements are not met).
4. External (non-Engineering) Courses
   - Some external courses are pre-approved as technical electives (see below).
   - Note that not all of these courses are offered each academic year and you will need to check the course schedule to see availability.
   - If you are missing the course's prerequisite(s), you need to complete the registration waiver process for the external course's instructor/department. The School of Engineering cannot register you in external courses.
   - If you would like to request permission to take a course outside of SOE as an alternative elective that does not appear on this list, please contact soe.academicservices@ubc.ca and include a course syllabus. It will be reviewed by the Civil Engineering Program Chair.

COSC 301 Introduction to Data Analytics
COSC 304 Introduction to Databases
COSC 310 Software Engineering
COSC 406 Numerical Optimization
COSC 407 Introduction to Parallel Computing
ECON 372 Natural Resource Economics
EESC 314 Environmental Impact Assessment: PRA
EESC 315 Environmental Impact Assessment: T&P
EESC 325 Structural Geology
EESC 335 Field Techniques
EESC 342 Hydrogeology
EESC 350 Exploration Geophysics
EESC 390 Geological Field Mapping
EESC 422 Fluvial Geomorphology
EESC 431 Quaternary Glacial Environments
EESC 434 Sediment Transport Mechanics
EESC 435 Fluvial Field Techniques
EESC 456 Soil Science
GEOG 310 Environment and Resources
GEOG 316 Geography of Natural Hazards
GEOG 351 Urban Social Geography
GEOG 354 Urban Canada: Growth, Form, and Structure
GEOG 414 Applied Climatology
GEOG 451 Urban Planning
MATH 340 Introduction to Linear Programming
MATH 350 Complex Variables and Applications
MGMT 412 Negotiations
MGMT 423 E-Commerce
MGMT 450 Entrepreneurship and the Smaller Firm
MGMT 480 Law and Business
MGMT 481 Strategy and Change Management

Notes

- For inquiries regarding registration or academic advising, contact an Academic and Career Advisor
- Civil Program Chair: Dr. Zheng Liu zheng.liu@ubc.ca
- **Graduation: In your final year, you are required to apply for graduation, even if you don't plan on attending the ceremony.** If you intend to graduate, you must apply to graduate by the deadline. Students are responsible for taking the correct courses to fulfill degree requirements and to apply for graduation before the deadline.
    - Once you are registered in the final courses for your degree, you are strongly encouraged to request an update to your Academic Progress Report by the Engineering Academic Services team so you can see whether you are fulfilling all requirements by filling out the APR Update Request.
- Courses:
    - The 4th year advising sheet changes annually. Courses offered this year may not be offered in subsequent years. If a course switches between design and technical elective designations between years, the student should refer to the sheet from the year the course was taken to know how it will be used to fulfill their degree requirements.
    - Courses are subject to minimum and maximum enrolments. The School of Engineering reserves the right to cancel a course if the minimum enrolment is not met. If a course is cancelled, you will be notified via e-mail. Check the UBC course schedule to see the course availability.
    - Depending on the level of engineering design and the assigned instructor, the classification of a course as either a design elective or a technical elective is subject to change.
    - Course descriptions, with prerequisites, can be found on the Academic Calendar. In case of conflict between the information in this sheet and the calendar, the calendar takes precedence: https://okanagan.calendar.ubc.ca/course-descriptions-0

Environmental Engineering (ENVR) Concentration

The Environmental Engineering (ENVR) Concentration is available for civil engineering students interested in environmental engineering. There is information on Concentrations on the Academic Calendar and the School of Engineering website. Concentrations do not have enrolment caps and students must declare their Concentration themselves in Workday before submitting their application for graduation.

The Environmental Engineering (ENVR) Concentration Concentration requires completion of 12 credits of the following electives. These electives will be counted towards the requirements of the Bachelor of Applied Science in Civil Engineering AND the ENVR Concentration if completed before graduation.

Choose 4 courses from the following list:
ENGR_O 402 Biotechnology: Fundamentals and Applications[4]
ENGR_O 420 Fundamentals of Healthy Buildings **Not Offered in 25W**
ENGR_O 442 Water Quality Engineering **Not Offered in 25W**
ENGR_O 443 Environmental Engineering Laboratory **Not Offered in 25W**
ENGR_O 444 Solid Waste Engineering **(DE)**
ENGR_O 445 Design of Water and Wastewater Conveyance Systems **(DE)**
ENGR_O 446 Biological Treatment Processes **Not Offered in 25W**
ENGR_O 460 Tools and Application in Environmental and Engineering Microbiology **(TE)**
EESC_O 314 Environmental Impact Assessment: Process, Regulation and Administration[4]
EESC_O 315 Environmental Impact Assessment: Techniques and Practice[4]
GEOG 310_O Environment and Resources [4] **Not Offered in 25W**

[4] *ENGR_O 402, EESC_O 314, EESC_O 315, GEOG_O 310 (if selected) will count as an Alternative Technical Elective. Students are limited to no more than 6 credits of these courses (see Page 3).*

The student is responsible for ensuring that electives chosen meet the Civil Engineering program requirements for design (9 credits) and technical courses (12 credits). If the student opts into the concentration before submitting the application to graduate and successfully completes the concentration requirements, the notation "Environmental Concentration" will be included on the student's transcript.

Resilient Infrastructure Management (RIM) Concentration

The Resilient Infrastructure Management Concentration (RIM) is available for civil engineering students interested in the skills, theories, and design methodologies needed to work in different capacities with municipalities, consultants, and governments. There is information on Concentrations on the Academic Calendar and the School of Engineering website. Concentrations do not have enrolment caps and students must declare their Concentration themselves in Workday before submitting their application for graduation.

The Resilient Infrastructure Management (RIM) Concentration requires completion of 12 credits of the following electives. These electives will be counted towards the requirements of the Bachelor of Applied Science in Civil Engineering AND the RIM Concentration if completed before graduation.

Take (required):
ENGR_O 432 Infrastructure Management II **(TE)**
AND
Choose 3 courses from the following list:
ENGR_O 417 Pipeline Integrity Management **Not Offered in 25W**
ENGR_O 420 Fundamentals of Healthy Buildings **Not Offered in 25W**
ENGR_O 424 Smart Cities **(DE)**
ENGR_O 429 Rehabilitation of Concrete Structures **(DE)**
ENGR_O 433 Construction Engineering and Management **(TE)**
ENGR_O 436 Transportation Planning **(TE)**
ENGR_O 444 Solid Waste Engineering **(DE)**
ENGR_O 445 Design of Water and Wastewater Conveyance Systems **(DE)**
ENGR_O 453 Internet of Things **(TE)**
ENGR_O 489 Multi-Criteria Optimization & Design of Experiments **(TE)**
EESC_O 314 Environmental Impact Assessment: Process, Regulation and Administration[5]
EESC_O 315 Environmental Impact Assessment: Techniques and Practice[5]
GEOG_O 316 Geography of Natural Hazards[5]
GEOG_O 354 Urban Canada: Growth, Form, and Structure[5] **Not Offered in 25W**
GEOG_O 414 Applied Climatology[5] **Not Offered in 25W**
GEOG_O 451 Urban Planning[5] **Not Offered in 25W**

[5] *EESC_O 314, EESC_O 315, GEOG_O 316, GEOG_O 354, GEOG_O 414, GEOG_O 451 (if selected) will count as an Alternative Technical Elective. Students are limited to no more than 6 credits of these courses (see Page 3).*

The student is responsible for ensuring that electives chosen meet the Civil Engineering program requirements for design (9 credits) and technical courses (12 credits). If the student opts into the concentration before submitting the application to graduate and successfully completes the concentration requirements, the notation “Resilient Infrastructure Management Concentration” will be included on the student’s transcript.