

GRADUATE PROGRAMS IN GEOLOGICAL ENGINEERING 2018-2019

Prior to registering for courses, students should consult with their supervisor. The minimum requirements for program completion are as follows:

M.A.Sc.:	Course Credits (18) Thesis Credits (12) Total Credits (30)	Note: Consult with Research Supervisor Note: Register for EOSC 599
M.Eng.:	Core Credits – See below (3) Constrained Elective Credits (9) Unconstrained Elective Credits (18) Total Credits (30)	Note: Also applies to M.Sc. (non-thesis) students registered in Geo. Eng. Note: Consult with Grad Supervisor Note: Consult with Grad Supervisor
Ph.D.:	Course Credits* (0) Thesis (12) Total Credits (12)	Note: Consult with Research Supervisor Note: Register for EOSC 699

* There are no course requirements for the Ph.D. program. Appropriate coursework may be selected in consultation with the student's research supervisor and supervisory committee.

The following courses are required for the **M.Eng.** program. *Note that some classes are only offered in alternative years.* Those in light gray text are not currently scheduled for 2018/19. However, please consult the UBC Calendar to confirm which courses are being offered or not:

CORE PROGRAM (REQUIRED)		CREDITS	TERM
EOSC 598 ¹	M.Eng. Graduating Paper	3	1-2
¹ Students in the M.Sc. (non-thesis) program supervised in Geological Engineering should register for EOSC 548 instead.			

CORE PROGRAM (MUST TAKE MINIMUM OF 9 CREDITS FROM THIS LIST)		CREDITS	TERM
EOSC 526	Mechanics of Natural Deformation	3	2
EOSC 529	Advanced Geotechnics	3	2
EOSC 531	Exploration Methodology	3	2
EOSC 532 ¹	Field Laboratory in Groundwater Hydrology	3	2
EOSC 533	Advanced Groundwater Hydrology	3	1
EOSC 534 ²	Geological Engineering: Soils and Weak Rocks	3	2
EOSC 535	Transport Processes in Porous Media	3	2
EOSC 536 ³	Advanced Rock Engineering	3	1
EOSC 537	Topics in Groundwater Hydrology	3	1
EOSC 540 ⁴	Advanced Groundwater Geochemistry	3	1
EOSC 541	Multi-component Reactive Transport Modelling in Groundwater	3	2
EOSC 546	Advanced Field Methods in Earth Science	3	2
EOSC 547	Tunneling and Underground Engineering	3	2
EOSC 562	Mechanics of Earthquakes and Faulting	3	1
EOSC 595 ⁵	Directed Studies	3 to 6	1 or 2
¹ Co-taught with EOSC 428. Not eligible if already taken during undergraduate/graduate degrees. ² Co-taught with EOSC 434. Not eligible if already taken during undergraduate/graduate degrees. ³ Co-taught with EOSC 433. Not eligible if already taken during undergraduate/graduate degrees. ⁴ Co-taught with EOSC 430. Not eligible if already taken during undergraduate/graduate degrees. ⁵ A maximum of 6 credits of Directed Studies may be counted towards the overall program requirements. However, only 3 credits may be counted towards fulfilling the core program requirement, unless approved by the Director.			

TECHNICAL ELECTIVES (INCLUDES THOSE FROM PREVIOUS LIST; OTHER COURSES MAY BE APPROVED ON REQUEST)		CREDITS	TERM
EOSC 510	Data Analysis in Atmospheric, Earth and Ocean Sciences	3	2
EOSC 511	Numerical Techniques for Ocean, Atmosphere and Earth Scientists	3	1
EOSC 514	Introduction to Geological Fluid Mechanics	3	2
EOSC 520	Advanced Mineralogy	3	2
EOSC 528	Advanced Coal Geology	3	2
EOSC 542	Advanced Volcanology	3	1
EOSC 544	Geodynamics	3	2
EOSC 545	Advanced Models in Mineral Deposits	3	1
EOSC 550	Linear Inverse Theory	3	2
EOSC 554	Theoretical Glaciology	3	2
EOSC 595	Directed Studies (max. 6 credits)	3	1/2
CIVL 504	Seismicity and Seismic Design Parameters	2*	2
CIVL 522	Project and Construction Economics	3	2
CIVL 523	Project Management for Engineers	3	2
CIVL 526	Virtual Design and Construction	3	2
CIVL 537	Computational Mechanics I	3	1
CIVL 538	Computational Mechanics II	3	2
CIVL 540	Advanced Coastal Engineering	3	2
CIVL 547	Estuary Hydraulics	2*	3
CIVL 559	Advanced Water and Wastewater Treatment Technology	3	1
CIVL 561	Assessment and Control Strategies in the Geo-Environment	3	2
CIVL 562	Environmental Contaminant Analysis Laboratory	3	2
CIVL 570	Soil Mechanics	3	1
CIVL 572	Contaminated Site Investigation and Management	3	2
CIVL 574	Experimental Soil Mechanics	3	2
CIVL 575	Constitutive Models for Soil	2*	1
CIVL 579	Geosynthetics	2*	1
CIVL 580	Geotechnical Earthquake Engineering	3	1
CIVL 581	Soil Dynamics for Design Practice	3	2
GEOB 505	Permafrost	3	2
MINE 504 ¹	Rock Fragmentation	2*	2
MINE 505	Advanced Topics in Rock Engineering	3	1
MINE 506	Mining Methods	3	2
MINE 507 ²	Block Caving Systems	3	2
MINE 515	Mining in the Future	3	2
MINE 540	Acid Rock Drainage	3	2
MINE 541	Environmental Technologies and Issues in Mining	3	1
MINE 544	Mining Environment Case Studies	3	1
MINE 551	Applied Underground Rock Mechanics	3	2
MINE 552	Mining Geostatistics	3	2
MINE 555	Mining and Society	3	1
MINE 556 ³	Rock Slope Engineering	2*	1
MINE 559	Mineral Resource Development and Canadian Aboriginal People	3	1

¹Co-taught with MINE 304. Not eligible if already taken during undergraduate/graduate degrees.
²Co-taught with MINE 485. Not eligible if already taken during undergraduate/graduate degrees.
³Co-taught with MINE 403. Not eligible if already taken during undergraduate/graduate degrees.
* Note that this is a 2-credit course that will require extra consideration to ensure you meet the required credits for graduation.

TECHNICAL ELECTIVES - UNDERGRADUATE (MAX. 6 CREDITS ALLOWED AT 300/400 LEVEL)		CREDITS	TERM
EOSC 323	Structural Geology I	3	1
EOSC 328	Field Geology	3	2
EOSC 329	Groundwater Hydrology	3	1
EOSC 330	Principles of Geomorphology	3	1
EOSC 331	Introduction to Mineral Deposits	3	1
EOSC 332	Tectonic Evolution of North America	3	2
EOSC 340	Global Climate Change	3	1 or 2
EOSC 350	Environmental, Geotechnical, and Exploration Geophysics	3	1
EOSC 424	Advanced Mineral Deposits	3	2
EOSC 429	Groundwater Contamination	3	1
EOSC 430	Aqueous Geochemistry	3	1
EOSC 431	Groundwater Remediation	3	2
EOSC 432	Fossil Fuels	3	2
EOSC 433	Geological Engineering Practice I - Rock Engineering	3	1
EOSC 434	Geological Engineering Practice II - Soil Engineering	3	2
EOSC 442	Climate Measurement and Analysis	1*	1 or 2
CIVL 316	Hydrology and Open Channel Flow	4*	2
CIVL 408	Geo-Environmental Engineering	3	2
CIVL 410	Foundation Engineering I	3	1
CIVL 413	Design of Earth Dams and Containment Structures	3	2
CIVL 415	Water Resource Engineering	3	2
CIVL 417	Coastal Engineering	3	2
CIVL 418	Engineering Hydrology	3	1
ENVR 410	ENVR 410 Energy, Environment, and Society	3	2
GEOB 305	Introduction to Hydrology	3	2
GEOB 308	Quaternary and Applied Geomorphology	3	2
GEOB 309	Geographical Sciences Field Course	3	2
GEOB 370	Advanced Geographic Information Science	3	1
GEOB 373	Introductory Remote Sensing	3	2
GEOB 405	Fluvial Geomorphology	3	1
GEOB 406	Watershed Geomorphology	3	1
GEOB 408	Snow and Ice Processes	3	2
GEOG 316	Geography of Natural Hazards	3	2
GEOG 318	Sustainability in a Changing Environment	3	1
GEOG 319	Environmental Impact Assessment	3	1
IGEN 450	Pipeline Engineering	3	1
MINE 302	Underground Mining and Design	3	2
MINE 303	Rock Mechanics Fundamentals	3	2
MINE 304	Rock Fragmentation	3	2
MINE 310	Surface Mining and Design	3	1
MINE 403	Rock Mechanics Design	3	1
MINE 404	Mine Management	3	2
MINE 406	Mine Project Valuation and Risk Assessment	3	2
MINE 420	Applied Geostatistics	3	1
MINE 455	Mine Water Management	3	2
MINE 480	Mine Waste Management	3	2
MINE 485	Cave Mining Systems: Design and Planning	3	2
MINE 486	Mining and The Environment	3	2
MINE 488	Heavy Oil Sand Mining and Processing	3	2

ADVICE TO ASSIST YOU WITH REGISTRATION:

- Please check the UBC Course Calendar for course availability as **some of the listed courses are not offered every year.**
- M.Eng. students are encouraged to take a selection of elective credits that best reflect their professional interests.
- Students must **obtain permission from the host department** for courses they would like to take that are outside EOAS.
- Students may take a **maximum of six (6) credits of 300/400 level Undergraduate Courses.**
- Students may register for a **maximum of six (6) credits** towards **directed studies coursework.**
- Students requiring remedial course work at the 200 level (e.g. EOSC 210 Geology for Engineers) should register to **Audit** the course(s); note that 200 level classes cannot be used for credit towards a graduate level degree.
- All students are individually responsible for ensuring that they meet all requirements for graduation.
- For more information, please visit our website at <http://www.geoeng.ubc.ca/>.