

# GRADUATE PROGRAMS IN GEOLOGICAL ENGINEERING 2016-2017

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

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

\* 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.* Please consult the UBC Calendar to see which courses are being offered for the 2016/2017 Winter Session:

CORE PROGRAM (REQUIRED)		CREDITS	TERM
EOSC 598 <sup>1</sup>	M.Eng. Graduating Paper	3	1-2
<sup>1</sup> 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 <sup>1</sup>	Field Laboratory in Groundwater Hydrology	3	2
EOSC 533	Advanced Groundwater Hydrology	3	1
EOSC 534 <sup>2</sup>	Geological Engineering: Soils and Weak Rocks	3	2
EOSC 535	Transport Processes in Porous Media	3	2
EOSC 536 <sup>3</sup>	Advanced Rock Engineering	3	1
EOSC 537	Topics in Groundwater Hydrology	3	1
EOSC 540 <sup>4</sup>	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 <sup>5</sup>	Directed Studies	3	1/2
<sup>1</sup> Co-taught with EOSC 428. Not eligible if already taken during undergraduate/graduate degrees. <sup>2</sup> Co-taught with EOSC 434. Not eligible if already taken during undergraduate/graduate degrees. <sup>3</sup> Co-taught with EOSC 433. Not eligible if already taken during undergraduate/graduate degrees. <sup>4</sup> Co-taught with EOSC 430. Not eligible if already taken during undergraduate/graduate degrees. <sup>5</sup> 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.			

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	1
EOSC 514	Introduction to Geological Fluid Mechanics	3	2
EOSC 528	Advanced Coal Geology	3	2
EOSC 544	Global Geodynamics	3	2
EOSC 545	Advanced Models in Mineral Deposits	3	1
EOSC 554	Theoretical Glaciology	3	1
EOSC 595	Directed Studies (max. 6 credits)	3	1/2
CIVL 504	Seismicity and Seismic Design Parameters	2	2
CIVL 523	Project Management for Engineers	3	2
CIVL 540	Advanced Coastal Engineering	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 579	Geosynthetics	2	1
CIVL 580	Geotechnical Earthquake Engineering	3	1
CIVL 581	Soil Dynamics for Design Practice	3	2
MINE 504 <sup>1</sup>	Rock Fragmentation	2	2
MINE 505	Advanced Topics in Rock Engineering	3	1
MINE 507 <sup>2</sup>	Block Caving Systems	3	2
MINE 540	Acid Rock Drainage	3	2
MINE 544	Mining Environment Case Studies	3	1
MINE 551	Applied Underground Rock Mechanics	3	2
MINE 552	Mining Geostatistics	3	2
MINE 556 <sup>3</sup>	Rock Slope Engineering	2	1
<sup>1</sup> Co-taught with MINE 304. Not eligible if already taken during undergraduate/graduate degrees.			
<sup>2</sup> Co-taught with MINE 485. Not eligible if already taken during undergraduate/graduate degrees.			
<sup>3</sup> Co-taught with MINE 403. Not eligible if already taken during undergraduate/graduate degrees.			

TECHNICAL ELECTIVES - UNDERGRADUATE (MAX. 6 CREDITS ALLOWED AT 300/400 LEVEL)		CREDITS	TERM
EOSC 323	Structural Geology I	3	1
EOSC 329	Groundwater Hydrology	3	1
EOSC 330	Principles of Geomorphology	3	1
EOSC 331	Introduction to Mineral Deposits	3	1
EOSC 350	Environmental, Geotechnical, and Exploration Geophysics	3	1
EOSC 429	Groundwater Contamination	3	1
EOSC 431	Groundwater Remediation	3	2
EOSC 433	Geotechnical Engineering Practice	3	1
EOSC 434	Geological Engineering Soils and Weak Rocks	3	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
GEOB 308	Quaternary and Applied Geomorphology	3	2
GEOB 370	Advanced Geographic Information Science	3	1
MINE 403	Rock Mechanics Design	3	1
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/>.