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Term	Course Number	Course Name	1.Knowledge Base	1a. Demonstrate understanding of concepts in mathematics	1b. Demonstrate understanding of concepts in natural science	1c. Demonstrate understanding of engineering fundamentals	1d. Demonstrate understanding of specialized engineering knowledge	2. Problem Analysis	2a. Formulate a problem statement	2b. Develop models to solve engineering problems including identifying approximations, assumptions and constraints	2c. Critically evaluate solutions of engineering problems	3. Investigation	3a. Create investigative studies of complex engineering problems	3b. Gather information from relevant sources to address complex engineering problems	3c. Synthesize information from multiple sources to reach to reach valid conclusions	4. Design	4a. Define design requirements and specifications for complex, open-ended engineering problems	4b. Critically evaluate and compare design choices	4c. Generate and refine potential solutions to complex, open-ended design problems	5. Use of Engineering Tools	5a. Select appropriate engineering tools, considering their limitations	5b. Modify and/or create appropriate engineering tools, identifying their limitations	5c. Use engineering tools appropriately	6. Individual and Team Work	6a. Contribute as an active team member or leader to complete individual tasks	6b. Collaborate with others to complete tasks effectively as a team	7. Communication Skills	7a. Orally present information within the profession and to society at large	7b. Communicate in a written format within the profession and to society at large	7c. Interpret information, including instructions	8. Professionalism	8a. Articulate the roles and responsibilities of the professional engineer in society with reference to the protection of the public and its interest	8b. Describe the importance of codes, standards, best practices, laws, and regulations within engineering	9. Impact of Engineering	9a. Identify the relevance of and uncertainty associated with the different aspects (social, cultural, economic, health, safety, legal, environmental), of an engineering project	9b. Analyze the social, health, safety, and environmental aspects of an engineering project, incorporating sustainability considerations and environmental stewardship in making decisions	10. Ethics & Equity	10a. Identify ethical and unethical behavior in professional situations	10b. Identify how an engineer is accountable to multiple stakeholders in engineering practice	10c. Identify equitable and inequitable situations or behaviors	11. Economics & Project Management	11a. Apply project management techniques and other business practices in engineering projects, with attention to risk and change	11b. Perform economic analyses of engineering projects with attention to uncertainty and limitations	12. Life-long Learning	12a. Identify gaps in their knowledge, skills and abilities	12b. Obtain and evaluate information or training from appropriate sources	12c. Reflect on the use of information or training received
1A	ENVE 100	Environmental and Geological Engineering Concepts											I						I													I	I					I	I									
	ENVE 115	Linear Algebra		I					I						I						I																											
	CIVE 104	Mechanics 1			I																I				I												I		I							I		
	MATH 116	Calculus 1 for Engineering		I					I						I						I																											
	CHE 102	Chemistry for Engineers			I	I									I							I																										
	ENGL 191	Communication in the Engineering Profession																										I	I	I																	
	COOP 1																																														
	PD 20	Engineering Workplace Skills 1																																													
1B	ENVE 121	Computational Methods		D		I								I								D																									
	ENVE 123	Electrical Circuits and Instrumentation				I				I	I		I										I																								
	ENVE 153	Earth Engineering												I			I	I																									I	I			I	
	CIVE 105	Mechanics 2			I	D															I		I																								
	MATH 118	Calculus 2 for Engineering		D					I						I																																
	COOP 2																																														
	PD 21	Engineering Workplace Skills 2																																													
2A	ENVE 223	Differential Equations and Balance Laws		D					I	I					D																																
	ENVE 224	Probability & Statistics		D		I			D				D																																		I
	ENVE 275	Environmental Chemistry					I			D														I			I																				
	ENVE 280	Fluid Mechanics			D		D				D				D															D																	
	ENVE 298	Seminar																																													
	ERS 215	Environmental and Sustainability Assessment 1																																													
	COOP 3																																														
	PD E1	Engineering Workplace Skills Elective 1																																													
2B	ENVE 225	Environmental Modelling									D				D						D		D																								
	ENVE 277	Air Quality Engineering				D	D																												D				D									
	ENVE 279	Energy and the Environment			D	D				D																											I	I										
	ENVE 382	Hydrology and Open Channel Flow							A	A																D											I										D
	ENVE 299	Seminar																																													
	BIOL 240	Fundamentals of Microbiology			D										D																														D	D	D
	COOP 4																																														
	WKRPT 200	Work-term Report																																													
	PD E2	Engineering Workplace Skills Elective 2																																													
3A	ENVE 330	Lab Analysis and Field Sampling Techniques												A														D								D							I		D		
	ENVE 375	Physico-Chemical Processes		A			D												D												D																
	ENVE 392	Economics and Life Cycle Cost Analysis											D																					D						D	D				D			
	ENVE 398	Seminar																																													
	GEOE 353	Geotechnical Engineering 1			A	D								D								D				D																					
	EARTH 458	Physical Hydrogeology		A	D				D		D																														D						
	EARTH 458L	Field Methods in Hydrogeology																			A	A	A							A																	
	COOP 5																																														
	WKRPT 300	Work-term Report																																													
	PD E3	Engineering Workplace Skills Elective 3																																													
3B	ENVE 335	Decision Making for Environmental Engineers											A				D	D																								D		D	A				
	ENVE 376	Biological Processes				A					A			A			A		A																													
	ENVE 383	Advanced Hydrology and Hydraulics					A		A	A															A	A																						
	ENVE 391	Law and Ethics for Environmental and Geological Engineers																																A	A					A	A	A						
	ENVE 399	Seminar																																													
	TE 1	Technical Elective 1																																													
	COOP 6																																														

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4A	ENVE 400	Environmental Engineering Design Project 1													A													A								A										A		
	ENVE 498	Seminar																																														
	TE 2	Technical Elective 2																																														
	TE 3	Technical Elective 3																																														
	TE 4	Technical Elective 4																																														
	CSE 1	Complementry Studies Elective 1																																														
	WKRPT 400	Work-term Report																																														
4B	ENVE 401	Environmental Engineering Design Project 2																A													A						A									A	A
	TE 5	Technical Elective 5																																														
	TE 6	Technical Elective 6																																														
	TE 7	Technical Elective 7																																														
	CSE 2	Complementry Studies Elective 2																																														

Technical Electives

List A - Engineering Design Intensive Technical Electives

F,W	CHE 361	Bioprocess Engineering																																														
F	CHE 514	Fundamentals of Petroleum Production																																														
F	CHE 516	Energy Systems Engineering																																														
F	CHE 571	Industrial Ecology																																														
W	CHE 572	Air Pollution Control																																														
W	CHE 574	Industrial Wastewater Pollution Control																																														
F	CIVE 241	Transport Principles and Applications					I		D										I										D							I												
W	CIVE 341	Transportation Engineering Applications								A													A							A						D									D		
F,W,S	CIVE 495	Design Intensive Special Topics in Civil Engineering				A				A				A					A														A														
W	EARTH 438	Engineering Geology												A														D					D				D					D					
F,W,S	ENVE 495	Design Intensive Special Topics in Environmental Engineering																																														
W	ENVE 577	Engineering for Solid Waste Management																																														
W	ENVE 583	Design of Urban Water Systems																																														
F	GEOE 354	Geotechnical Engineering 2					A							D				D								A	A																				
W	GEOE 554	Geotechnical Engineering 3									A		A				A		A																									A				
W	ME 452	HVAC Load Analysis and Design Fundamentals					A			D	D			D	D		D	D	D		A		A					A					D	A		D	A		D	D	D						A	
W	ME 571	Air Pollution																																														
W	SYDE 532	Introduction to Complex Systems																																														
F	SYDE 533	Conflict Resolution																																														
F	SYDE 575	Image Processing																																														

List B - Technical Electives

F,S	BIOL 354	Environmental Toxicology 1																																														
F	BIOL 364	Mathematical Modelling in Biology																																														
F	BIOL 447	Environmental Microbiology																																														
F	BIOL 455	Ecological Risk Assessment and Management																																														
F	BIOL 462	Applied Wetland Science																																														
F	BIOL 470	Methods of Aquatic Ecology																																														
W,S	CHEM 237	Introductory Biochemistry																																														
F,W	CHEM 262	Organic Chemistry for Engineering			D	D				D																																				D	D	
W	CIVE 422	Finite Element Analysis																																														
W	CIVE 440	Transit Planning and Operations																																														
W	CIVE 507	Building Science and Technology							A	A	A										A														A													
W,S	EARTH 221	Introductory Geochemistry																																														
F	EARTH 342	Geomorphology and GIS Applications																																														
F	EARTH 421	Advanced Geochemistry																																														

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W	EARTH 439	Flow and Transport Through Fractured Rocks																																																
F	EARTH 440	Quaternary Geology																																																
F	EARTH 444	Applied Wetland Science																																																
W	EARTH 456	Numerical Methods in Hydrogeology																																																
W	EARTH 459	Chemical Hydrogeology																																																
F,W,S	ENVE 497	Special Topics in Environmental Engineering																																																
W	ENVE 573	Contaminant Transport																																																
W,S	GEOG 209	Hydroclimatology																																																
F	GEOG 305	Fluvial Geomorphology																																																
F	GEOG 371	Advanced Remote Sensing Techniques																																																
W,S	GEOG 381	Advanced Geographic Information Systems																																																
W	GEOG 409	Energy Balance Climatology																																																
W	GEOG 471	Remote Sensing Project																																																
W,S	ME 354	Thermodynamics 2			D	D																	D																											
F,S	ME 459	Energy Conversion																																																
F,S	ME 559	Finite Element Methods																																																
F	SYDE 411	Optimization and Numerical Methods																																																
W	SYDE 531	Design Optimization Under Probabilistic Uncertainty																																																