

			I Introduced D Developed A Applied
Terms	Course Number	Course Name	
		1. Knowledge Base	
	CIVE 100	Civil Engineering Concepts	1a. Demonstrate understanding of concepts in mathematics
	CIVE 104	Mechanics 1	1b. Demonstrate understanding of concepts in a natural science
	CIVE 115	Linear Algebra	1c. Demonstrate understanding of engineering fundamentals
	MATH 116	Calculus 1 for Engineering	1d. Demonstrate understanding of specialized engineering knowledge
	CHE 102	Chemistry for Engineers	2. Problem Analysis
	ENGL 191	Communication in the Engineering Profession	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
		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	CIVE 100	Civil Engineering Concepts	
	CIVE 104	Mechanics 1	I
	CIVE 115	Linear Algebra	I
	MATH 116	Calculus 1 for Engineering	I
	CHE 102	Chemistry for Engineers	I
	ENGL 191	Communication in the Engineering Profession	
1B	CIVE 105	Mechanics 2	I D
	CIVE 121	Computational Methods	D I
	CIVE 123	Electrical Circuits and Instrumentation	I
	CIVE 153	Earth Engineering	
	CIVE 199	Seminar	
	MATH 118	Calculus 2 for Engineering	D
	COOP 1		
	PD 20	Engineering Workplace Skills I: Developing Reasoned Conclusions	
2A	CIVE 204	Solid Mechanics 1	D
	CIVE 221	Advanced Calculus	D
	CIVE 224	Probability & Statistics	D I
	CIVE 241	Transport Principles and Applications	I D
	CIVE 265	Structure and Properties of Materials	
	CIVE 298	Seminar	
	COOP 2		
	PD 21	Engineering Workplace Skills II: Developing Effective Plans	
2B	CIVE 205	Solid Mechanics 2	D
	CIVE 222	Differential Equations	D I I
	CIVE 230	Engineering and Sustainable Development	D
	CIVE 280	Fluid Mechanics	D D
	CIVE 299	Seminar	
	CIVE 392	Economics and Life Cycle Cost Analysis	
	COOP 3		
	PD E1	Engineering Workplace Skills Elective 1 (PD 3,4,5,6,7)	
3A	CIVE 303	Structural Analysis	A D D D
	CIVE 332	Civil Systems and Project Management	D A A
	CIVE 341	Transportation Engineering Applications	A
	CIVE 353	Geotechnical Engineering 1	A D
	CIVE 382	Hydrology and Open Channel Flow	A A
	CIVE 398	Seminar	
	CSE 1	Complementary Studies Elective 1	
	WKRPT 200	Work-term Report	
	COOP 4		
	PD E2	Engineering Workplace Skills Elective 2 (PD 3,4,5,6,7)	
3B	CIVE 310	Introduction to Structural Design	A D D
	CIVE 375	Environmental Engineering Principles	A A A A
	CIVE 399	Seminar	
	TE 1	Technical Elective 1	
	TE 2	Technical Elective 2	
	CSE 2 or TE 3	Complementary Studies Elective 2 or Technical Elective 3	
	WKRPT 300	Work-term Report	
	COOP 5		
	PD E3	Engineering Workplace Skills Elective 3 (PD 3,4,5,6,7)	

Terms	Course Number	Course Name			I Introduced	D Developed	A Applied			
			Learning Outcomes							
			LO	Description						
4A	CIVE 400	Civil Engineering Design Project 1	1. Knowledge Base	1a. Demonstrate understanding of concepts in mathematics						
	CIVE 491	Engineering Law and Ethics	1b. Demonstrate understanding of concepts in natural science							
	CIVE 498	Seminar	1c. Demonstrate understanding of engineering fundamentals							
	TE 3 or CSE 2	Technical Elective 3 or Complementary Studies Elective 2	1d. Demonstrate understanding of specialized engineering knowledge							
	TE 4	Technical Elective 4	2. Problem Analysis							
	CSE 3 or TE 5	Complementary Studies Elective 3 or Technical Elective 5	2a. Formulate a problem statement							
	WKRPT 400	Work-term Report	2b. Develop models to solve engineering problems including identifying approximations, assumptions and constraints							
	COOP 6		2c. Critically evaluate solutions of engineering problems							
	CIVE 401	Civil Engineering Design Project 2	3. Investigation	3a. Create investigative studies of complex engineering problems						
	CIVE 499	Seminar	3b. Gather information from relevant sources to address complex engineering problems							
4B	CSE 3 or TE 5	Complementary Studies Elective 3 or Technical Elective 5	3c. Synthesize information from multiple sources to reach to reach valid conclusions							
	TE 6	Technical Elective 6	4. Design	4a. Define design requirements and specifications for complex, open-ended engineering problems	A					
	TE 7	Technical Elective 7	4b. Critically evaluate and compare design choices	A						
	TE 8	Technical Elective 8	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	A						
			7. Communication Skills							
			7a. Orally present information within the profession and to society at large	A						
			7b. Communicate in 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	A	A					
			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	A	A	A				
			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	A	A					
			12c. Reflect on the use of information or training received							

Technical Electives

List A - Engineering Design Intensive Technical Electives

List B - Technical Electives

Terms	Course Number	Course Name	I Introduced	D Developed	A Applied
		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 social, health, safety, and environmental aspects of an engineering project, incorporating sustainability considerations and environmental stewardship in making decisions			
		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			