

For students starting second year fall 2023

Students are expected to follow either the 4 year or the 5 year model program as closely as possible. This will ensure future prerequisite and timetable requirements are met.

Note: c = corequisite

Offered in all 3 terms (Fall/Winter/Summer)

Offered fall & winter terms

* common to all engineering programs

PRELIMINARY YEAR COURSES - students must complete a minimum of 8 of these courses by the end of the winter term to be eligible for fall admission.

Prerequisites			Prerequisites		
ENG 1430 *	Eng Design	3	MATH 1210 *	C/L Algebra	3
ENG 1440 *	Eng Statics	3	MATH 1510 *	App Calc 1	3
ENG 1450 *	Intro Elec Eng	3	MATH 1710 *	App Calc 2	3 1500/1510, p or c PHYS 1050
ENG 1460 *	Thermal Sci	3	COMP 1012 *	Comp Prog Eng	3 p or c MATH 1510
CHEM 1100 *	Intro Chem 1	3	PHYS 1050 *	Physics	3 p or c MATH 1510
CHEM 1122 *	Intro Chem Techs for Engineering 1	1.5	Complementary Elective (Arts or Management) * 3 (PHIL 1290 or other)		
Written English Requirement *	Choose course from approved List	3			

NOTE: CHEM 1122 is not considered in the admission process

FALL TERM				WINTER TERM			
SECOND YEAR (2023)		Prerequisites (8 hrs +)		(2024)		Prerequisites (13 hrs)	
CIVL 2830	Graphics	2	c CIVL 2840	CIVL 2790	Fluid Mechanics	4	ENG 1440, MATH 1700/1710
CIVL 2840	CE Geomatics	3	p or c MATH 1210, c CIVL 2830	GEOL 1340	Dynamic Earth	3	(formerly GEOL 2250)
MATH 2130 *	Math Analysis 1	3	MATH 1700/1710,1210	MATH 2132 *	Math Analysis 2	3	MATH 1700/1710, MATH 1210
Any remaining first year courses should be completed this year and can be scheduled in this term and in 2024 winter term.				ENG 2030	Eng Communication	3	Written English Course, ENG 1430
				or ENG 2040	Eng Communication		
THIRD YEAR (2024)		(18.5 hrs)		(2025)		(20 hrs)	
CHEM 1110	Intro Chem 2	3	CHEM 1100	CIVL 2770	CE Materials	5	ENG 1440; CIVL 2800
CHEM 1126	Intro Chem Techs for Engineering 2	1.5	CHEM 1120 will be accepted for [CHEM 1122 AND CHEM 1126]	CIVL 2780	CE Systems	4	MATH 1700/1710
CIVL 2800	Solid Mech 1	4	MATH 1700/1710, ENG 1440	CIVL 3590	Numerical Meth	4	COMP 1012, p or c MATH 2132
CIVL 3750	Hydrology	4	CIVL 2790, p or c STAT 2220	CIVL 3740	Hydraulics	4	CIVL 2790
STAT 2220 *	Eng Statistics	3	MATH 1700/1710	ENG 3000*	Eng Economics	3	
Indigenous Knowledge Course	Choose course from approved list. See last page or civil website		3 hrs				
(Indigenous Knowledge Course can be taken any term as scheduling allows)							
FOURTH YEAR (2025)		(20 hrs)		(2026)		(16 hrs)	
CIVL 3690	Enviro Eng Analysis	4	CHEM 1110 & 1126, ENG 2030/40, STAT 2220	CIVL 3700	Enviro Eng Des	4	CIVL 3690
CIVL 3730	Geo Mat Analysis	4	CIVL 2800,2770 GEOL 1340	CIVL 3770	Design of Steel Struct	4	CIVL 2770, 3760
CIVL 3760	Struct Analysis	4	CIVL 2800	1 or 2 Technical Electives		8	
CIVL 3790	Fund Transport & Traffic Eng	4	CIVL 2840,2770,2780 STAT 2220	(5 technical electives required in total)			
Technical Elective		4					
(5 technical electives required in total)							
FIFTH YEAR (2026)		(20 hrs)		(2027)		(13 hrs)	
CIVL 4220	Geotech Des	4	CIVL 3730	ENG 3020	Tech & Society	3	Written English
CIVL 4380	Infrastructure	4	CIVL 4050 or ENG 3000	CIVL 4590	Design Project	6	ENG 2030/40, minimum 120 credit hrs one of [CIVL 3700, 3740, 3770 4220 or 4400]
CIVL 4390	Reinforced Con Struct	4	CIVL 2770, 3760	1 or 2 Technical Electives		4	
CIVL 4400	Transport Eng Design	4	CIVL 3790	(5 technical electives required in total)			
Technical Elective		4					
(5 technical electives required in total)							

Technical electives (TE) offered vary from year to year. See final page for complete TE course list or on the Civil website

Course scheduling may change. Aurora and the Civil Engineering Timetable on the UofM website will have current information.

Total credit hrs: 166

For students starting second year fall 2023

Students are expected to follow either the 4 year or the 5 year model program. This will ensure prerequisite and timetable requirements are met. Students should only consider the 4 year model if they have already completed all 13 courses in the Preliminary Engineering program and are planning to take up to six courses per term.

FALL TERM				WINTER TERM			
FIRST YEAR (2022)	hr	Prerequisites	(19.5 hrs)	(2023)	hr	Prerequisites	(18 hrs)
Complementary Elective (Arts or Management) * 3				ENG 1430	Eng Des	3	
CHEM 1100 & 1122	Intro Chem1 and lab	4.5		ENG 1440	Eng Statics	3	
COMP 1012	Comp Prog Eng	3		ENG 1450	Intro Elec	3	
MATH 1510	App Calc 1	3		ENG 1460	Thermal Sci	3	
PHYS 1050	Physics	3	p or c 1500/1510	MATH 1210	C/L Algebra	3	
Written English Requirement	Choose course from approved List	3		MATH 1710	App Calc 2	3	1500/1510, p or c PHYS 1050
SECOND YEAR (2023) (22.5 hrs)				(2024) (23 hrs)			
CHEM 1110 & 1126	Intro Chem2 and lab	4.5	(CHEM 1100 or previous 1300)	CIVL 2770	CE Materials	5	ENG 1440, CIVL 2800
CIVL 2800	Solid Mec 1	4	MATH 1710/1700, ENG 1440	CIVL 2780	CE Systems	4	MATH 1710 or 1700
CIVL 2830	Graphics	2	c CIVL 2840	CIVL 2790	Fluid Mech	4	ENG 1440, MATH 1710
CIVL 2840	CE Geomatics	3	p or c MATH 1210, c CIVL 2830	CIVL 3590	Numerical Meth	4	COMP 1012, p or c MATH 2132
ENG 2030 or ENG 2040	Eng Communication	3	Written English Crs, ENG 1430 (or the former ENG 2010)	GEOL 1340	Dynamic Earth	3	
MATH 2130	Math Analysis 1	3	MATH 1710,1210	MATH 2132	Math Analysis 2	3	MATH 1710, MATH 1210
STAT 2220	Eng Statistics	3	MATH 1710/1700				
THIRD YEAR (2024) (23 hrs)				(2025) (23 hrs)			
CIVL 3690	Env Eng Analysis	4	CHEM 1310, ENG 2030/40, STAT 2220	CIVL 3700	Env Eng Des	4	CIVL 3690
CIVL 3730	Geo Mat Analysis	4	CIVL 2800,2770 GEOL 1340	CIVL 3740	Hydraulics	4	CIVL 2790
CIVL 3750	Hydrology	4	CIVL 2790, p or c STAT 2220	CIVL 3770	Design of Steel Struct	4	CIVL 2770, 3760
CIVL 3760	Struct Analysis	4	CIVL 2800	ENG 3000	Eng Economics	3	TAKE IN SUMMER SESSION
CIVL 3790	Fund Transport & Traffic Eng	4	CIVL 2840,2770,2780 STAT 2220	Technical Elective #1		4	
Indigenous Knowledge Course	Choose course from approved list. See last page			Technical Elective #2		4	
1 Technical Elective Course may be taken this term. Move Indigenous Knowledge course to a different term.							
FOURTH YEAR (2025) (20 hrs)				(2026) (17 hrs)			
CIVL 4220	Geotech Des	4	CIVL 3730	ENG 3020	Tech Soc	3	Written English (formerly CIVL 4460)
CIVL 4380	Infrastructure	4	CIVL 4050	CIVL 4590	Design Project	6	ENG 2030/40, minimum 120 credit hrs one of [CIVL 3700, 3740, 3770 4220 or 4400]
CIVL 4390	Reinforced Con Struct	4	CIVL 2770, 3760	Technical Elective #4		4	
CIVL 4400	Transport Eng Design	4	CIVL 3790	Technical Elective #5		4	
Technical Elective #3		4					

Note: c = corequisite

Technical electives (TE) offered vary from year to year. See final page for complete TE course list or on the Civil website

Check current course schedule on Civil Engineering website for details.

Total credit hrs: 166

Students are required to take at least 5 technical electives. A minimum of 3 courses must be taken from List A and up to 2 from List B. No more than one course may be outside the Department of Civil Engineering.

Students interested in pursuing more focused studies may choose to complete a **stream**. Specific technical elective courses are required if students wish to pursue a **Stream**.

Students wanting to pursue a more general degree may choose technical electives from a variety of research areas from the approved list of technical elective courses.

Please note:

- Technical elective course offerings vary from year to year and may have limited enrollment.
- Most technical electives courses are offered on two-year rotation.
- Check current course schedules on the Civil Engineering website and Aurora Schedule for details.
- Information regarding individual course content is posted in UM Learn in the **Civil UG Advising** course.
- Students are encouraged to discuss their program with members of the academic staff to obtain advice concerning the best choice of electives for their needs.

List A (Select 3 to 5 courses)

Course #	Course Title	Hrs	Prerequisites	Stream(s) *
CIVL 3710	Finite Element Analysis	4	CIVL 2790, 2800, 3590	GEO/SC/TR
CIVL 4020	Masonry Design and Construction	4	CIVL 2770, 3760	SC
CIVL 4022	Properties and Design of Concrete Mixtures	4	CIVL 2770	SC/TR
CIVL 4024	Sustainable Building Design	4	p or c CIVL 3770	SC
CIVL 4028	Building Information Modeling in Construction	4	ENG 3000	SC
CIVL 4030	Advanced Structural Design	4	p or c 3770	SC
CIVL 4032	Bridge Engineering	4	CIVL 2770, 3760	SC/TR
CIVL 4040	Structural Dynamics	4	CIVL 3760	SC
CIVL 4100	Engineering Management & the Environment	4	p or c CIVL 3700	EW
CIVL 4120	Water Treatment Plant Design	4	CIVL 3690	EW
CIVL 4130	Solid Waste Management	4	p or c CIVL 3700	EW/GEO
CIVL 4180	Environmental Systems	4	CIVL 2780,3690,3750	EW
CIVL 4200	Groundwater Contamination	4	GEOL 1340,CIVL 2790, p or c CIVL 3690	EW/GEO
CIVL 4230	Geotechnical Engineering	4	CIVL 3730	GEO
CIVL 4232	Geotechnical Earthquake Engineering	4	CIVL 3730	GEO
CIVL 4250	Groundwater Hydrology	4	GEOL 1340, CIVL 2790, MATH 2130, 2132	EW/GEO
CIVL 4300	Design of Urban Water Systems	4	CIVL 2790, p or c CIVL 3750	EW
CIVL 4350	Hazardous Waste Treatment	4	CIVL 3690	EW
CIVL 4360	Water Resources Planning and Management	4	CIVL 2780, 3590, p or c 3750	EW
CIVL 4410	Transportation Systems	4	CIVL 3790	TR
CIVL 4420	Pavement Engineering	4	p or c CIVL 3790	TR
CIVL 4470	Watershed Processes	4	CIVL 3750, p or c CIVL 3740	EW

List B (Up to 2 courses, only 1 from outside of Civil Engineering.)

BIOE 4560	Structural Design in Wood	4	CIVL 3770	SC
CIVL 4000	Uncertainty Analysis in Civil Eng Systems	4	CIVL 3590, MATH 2130, STAT 2220	EW/SC/TR
CIVL 4332	Civil Engineering Thesis Project	4	ENG 2010/30/40 & 120 cr hrs	EW/GEO/SC/TR
CIVL 4500	Contemporary Topics in Civil Engineering	4	Varies - topic may be eligible for List A & Stream(s). Confirm with Dept.	

* Stream Abbreviations

Environmental and Water Resources Stream (EW)
Geotechnical and Geo-environmental Stream (GEO)

Structures and Construction Stream (SC)
Transportation Stream (TR)



Environmental and Water Resources Stream (EW)

Five courses are required. Minimum of 3 courses must be taken from List A and up to 2 from List B, no more than one course from outside of Civil Eng.

List A (Select 3 to 5 courses)

Course	Title	Prerequisites
CIVL 4100	Eng Mngmnt & Enviro	p or c CIVL 3700
CIVL 4120	Water Treat Plant Design	CIVL 3690
CIVL 4130	Solid Waste Management	p or c CIVL 3700
CIVL 4180	Enviro Systems	CIVL 2780,3690,3750
CIVL 4200	Grndwater Contamination	GEOL 1340,CIVL 2790, p or c CIVL 3690
CIVL 4250	Grndwater Hydrology	GEOL 1340, CIVL 2790, MATH 2130, 2132
CIVL 4300	Urban Water System	CIVL 2790, p or c CIVL 3750
CIVL 4350	Haz Waste	CIVL 3690
CIVL 4360	Water Resource Plan & Mgt	CIVL 2780, 3590, p or c 3750
CIVL 4470	Watershed Processes	CIVL 3750, p or c CIVL 3740
CIVL 4500 T5	Chem Reac Water Treatment	CIVL 3690

List B (Up to 2 courses, only 1 from outside of Civil Engineering)

Course	Title	Prerequisites
BIOE 4460	Air Pollution Assess & Mngmt	CIVL 2790
CIVL 4000/ CIVL 4500 T01	Uncertainty Analysis	CIVL 3590, MATH 2130, STAT 2220
CIVL 4332	CE Thesis Project ²	ENG 2030/40 & 120 cr hrs
SOIL 4500	Remed of Contam Land	Instructor Consent

Geotechnical and Geo-environmental Stream (GEO)

Five courses are required. Select 5 courses from below.

List A

Course	Title	Prerequisites
CIVL 3710	Finite Element Analysis	CIVL 2790, 2800, 3590
CIVL 4130	Solid Waste Management	p or c CIVL 3700
CIVL 4200	Groundwater Contamination	GEOL 1340,CIVL 2790, p or c CIVL 3690
CIVL 4230	Geotechnical Engineering	CIVL 3730
CIVL 4232	Geotechnical Earthquake Eng	CIVL 3730
CIVL 4250	Groundwater Hydrology	GEOL 1340, CIVL 2790, MATH 2130, 2132

List B

Course	Title	Prerequisites
CIVL 4332	CE Thesis Project ²	ENG 2030/40 & 120 cr hrs

Structures and Construction Stream (SC)

Five courses are required. Minimum of 3 courses must be taken from List A and up to 2 from List B, no more than one course from outside of Civil Eng.

List A (Select 3 to 5 courses)

Course	Title	Prerequisites
CIVL 3710	Finite Element Analysis	CIVL 2790, 2800, 3590
CIVL 4020	Masonry Design and Construct	CIVL 2770, 3760
CIVL 4022	Propert & Des of Concrete Mix	CIVL 2770
CIVL 4024	Sustainable Building Design	p or c CIVL 3770
CIVL 4028/ CIVL 4500 T4	Build Info Modeling in Construct	ENG 3000
CIVL 4030	Advanced Structural Design	p or c 3770
CIVL 4032/ CIVL 4500 T3	Bridge Engineering	CIVL 2770, 3760
CIVL 4040	Structural Dynamics	CIVL 3760
CIVL 4500 T2	Sustainable Construction	CIVL 2780, ENG 3000

List B (Up to 2 courses)

Course	Title	Prerequisites
BIOE 4560	Structural Design in Wood	CIVL 3770
CIVL 4000/ CIVL 4500 T01	Uncertainty Analysis	CIVL 3590, MATH 2130, STAT 2220
CIVL 4332	CE Thesis Project ²	ENG 2030/40 & 120 cr hrs

Transportation Stream (TR)

Five courses are required. A minimum of 3 courses must be taken from List A and up to 2 from List B.

List A (Select 3 to 5 courses)

Course	Title	Prerequisites
CIVL 3710	Finite Element Analysis	CIVL 2790, 2800, 3590
CIVL 4022	Propert & Des of Concrete Mix	CIVL 2770
CIVL 4032	Bridge Engineering	CIVL 2770, 3760
CIVL 4410	Transportation Systems	CIVL 3790
CIVL 4420	Pavement Engineering	p or c CIVL 3790
CIVL 4500 T6	Des & Develop of Public Transp Sys	p or c CIVL 3790

List B (Up to 2 courses)

Course	Title	Prerequisites
CIVL 4000/ CIVL 4500 T01	Uncertainty Analysis	CIVL 3590, MATH 2130, STAT 2220
CIVL 4332	CE Thesis Project ²	ENG 2030/40 & 120 cr hrs

Notes:

1. Students may only complete one stream.
2. Subject to approval of Faculty Advisor.
3. Courses taken towards a stream take the place of the Technical Electives required in the Civil Engineering program.



Indigenous Knowledge Course

Students are required to take at least one of the courses from the list of Indigenous Knowledges courses. ENG 4100* may be used to meet this requirement when the course content satisfies the requirements for an Indigenous course.

Prerequisites must be met for all courses.

ENG 4100*	Contemporary Topics in Eng. Practice (4) (see note above)
INDG 1200	Indigenous Peoples in Canada (6)
INDG 1220	Indigenous Peoples in Canada Part 1 (3)
INDG 1240	Indigenous Peoples in Canada Part 2 (3)
INDG 2012/ HIST 2010	Indigenous History in Canada (6)
INDG 2020/ HIST 2020	The Metis in Canada (3)
POLS 2802	Introduction to Indigenous Politics (3)

Note: NATV subject code was revised to INDG as of Fall 2022.