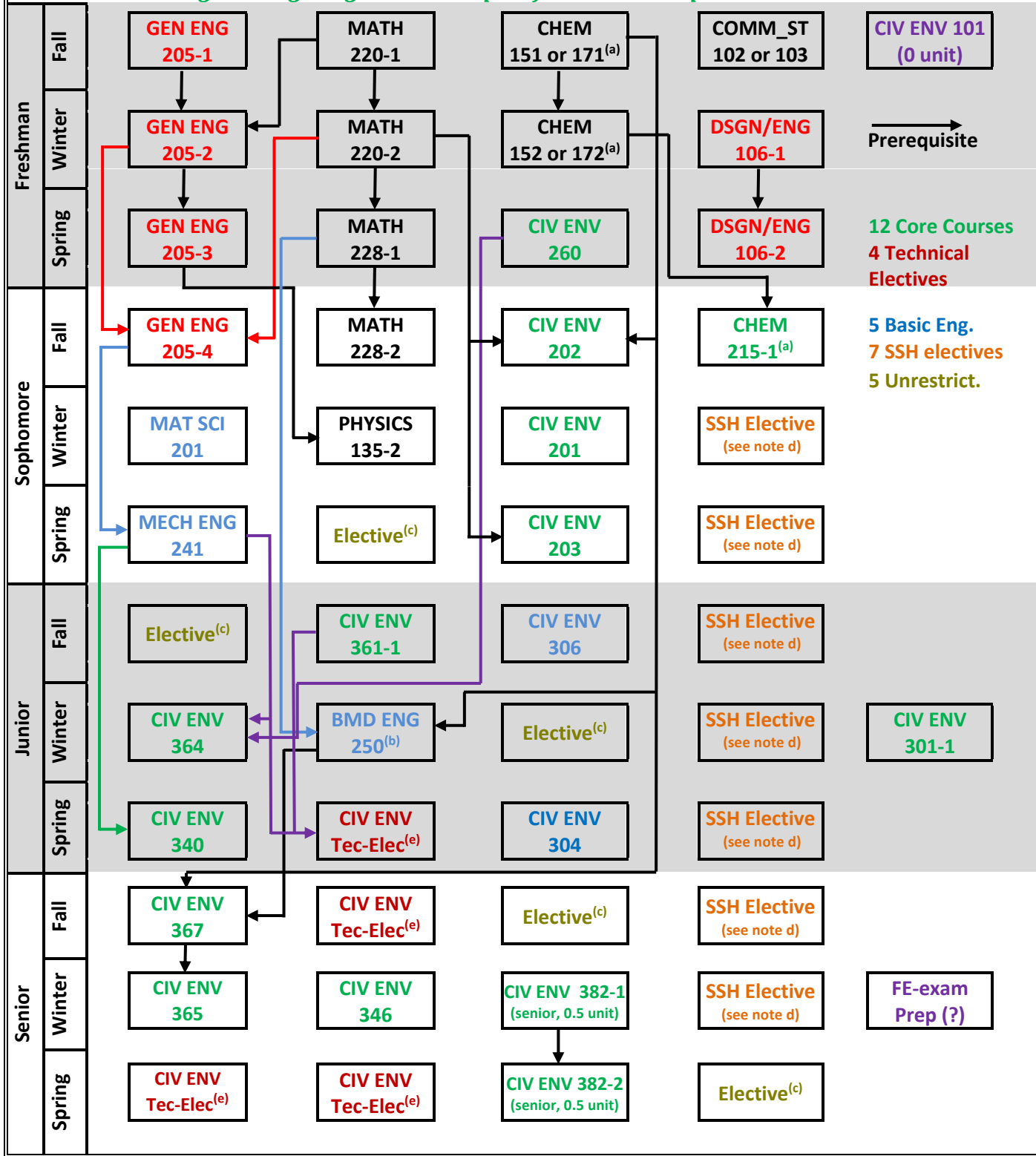


**Environmental Engineering Program - example of a curriculum path 2022-2023**



**Notes:**

- These courses have a laboratory requirement CHEM 161, 162, or 181, 182. If no placement in Chemistry then take CHEM 110 in the Fall, and then CHEM 131, 132 with associated laboratories CHEM 141, 142. CHEM 215-1 has a laboratory requirement CHEM 235-1.
- May choose from BME 250 or CHEM ENG 211 (need approval from ChemE for enrollment). Other Basic Engineering Thermodynamics course can be taken after approval.
- May choose from any course offered for credit by the University.
- Courses must be selected to meet the Social Science-Humanities requirement.
- Choose courses from the approved list: at least 3 must carry 100% engineering topics; courses listed are recommended.

## Environmental Engineering Program 2022-2023

### **Social Science-Humanities Requirement (7 units)**

Seven courses are required to satisfy the requirements of this subgroup. The seven courses must meet the following criteria.

- Maximum of 5 units from either social science or humanities category
- At least 3 units must be thematically related
- No more than 3 units of 100-level courses
- AP credits allowed

Foreign language study can be incorporated into the program, but should be started as early as possible, preferably in the freshman year.

Courses taken for a student's Social Science/Humanities requirement must be approved in advance by the McCormick Humanities Panel. Complete requirement information is at the McCormick Undergraduate Engineering Office web site, <http://www.mccormick.northwestern.edu/students/undergraduate/social-science-humanities-theme/index.html>. You must submit your theme form via McCormick Advising System (MAS).

### **Technical Electives (TE) – choose four courses**

Technical Electives must be taken from the lists below. We are suggesting 3 different tracks based on sets of courses organized around specific themes. **General rule:** *a minimum of three (3) of these electives must carry 100% engineering topics<sup>(1)</sup>, only one (1) CIV ENV 399 can be counted towards a technical elective.*

Urban Sustainability	
	CIV_ENV 368 - Sustainability: The City
	CIV_ENV 387 - Design of Sustainable Urban Districts
	CIV_ENV 353 – Energy Geostuctures and Geosystems
	CIV_ENV 309 – Climate and Energy - Law & Policy - (100% general topic course)
Fate of contaminants in the Environment	
	CIV_ENV 361-2 – Public and Environmental Health
	CIV_ENV 370 – Emerging Organic Contaminants
	CIV_ENV 314 – Organic Geochemistry (100% MTS)
	CIV_ENV 395 - Projects Practicum in Environmental Engineering
Resource Recovery	
	CIV_ENV 353 – Energy Geostuctures and Geosystems
	CIV_ENV 368 - Sustainability: The City
	CIV_ENV 442/443 - Environmental Biotechnology/Microbial Ecology for Resource Recovery
	CIV_ENV 399 - Research project (100% Eng.)

**A la carte<sup>(2)</sup>:** If you do not want to follow any of these tracks you need to take 3 courses that count towards 100% engineering content with 2 from {CIV\_ENV 361-2, 368, 370, 395-Practicum} and any engineering 300 level - or higher - course counting towards 100% engineering content, and then one<sup>(1)</sup> 300 level course choose that you can choose from {CIV\_ENV: 303; 314; 317; 395-20,23,25; EARTH 340; 343; 361; 370}. You can also choose courses at the graduate level courses such as CIV\_ENV 440<sup>(2)</sup>, CIV\_ENV 442/443<sup>(2)</sup>. Only 1 CIV\_ENV 399 can be counted towards a technical elective content. You need to receive permission from your advisor and the EES program director – Prof. Jean-François Gaillard- for this selection of technical elective courses.

<sup>(1)</sup> (100% MTS), <sup>(1)</sup> <https://www.mccormick.northwestern.edu/academics/undergraduate/abet/course-partitioning.html>

<sup>(2)</sup> Requires instructor permission and a permission number from the CIV ENV office.

## BS in Environmental Engineering Curriculum - at a Glance (48 units)

### McCormick Requirements (27 units)

Mathematics (4 units)	
1	Math 220-1: Differential Calculus of One Variable Functions
2	Math 220-2: Integral Calculus of One Variable Functions
3	Math 228-1: Differential Calculus of Multivariable Functions
4	Math 228-2: Multiple Integration and Vector Calculus

Engineering Analysis (4 units)	
5	EA1 (Programming and Linear Algebra)
6	EA2 (Statics and Dynamics)
7	EA3 (Systems Dynamics Analysis)
8	EA4 (Differential Equations)

Basic Science (4 units - 1 included in major)	
9	Chemistry 131, 151, 171
10	Chemistry 132, 152, 172
11	Physics 135-2
12	

Design and Communication (3 units)	
13	DSN 106-1,2: Design Thinking & Communication
14	ENG 106-1,2: Writing
15	COMM_ST 102/103 Public Speaking/Argumentation and Debate

Humanities Theme (7 units)	
16	
17	
18	
19	
20	
21	
22	

Unrestricted Electives (5 units)	
23	CIV ENV 301-1 Professional Development (0.3 units)*
24	
25	
26	
27	

\* Units can combined with lab units to yield 1 credit

### Environmental Eng Major Requirements (21 units)

Gateway Courses (3 units)	
1	CIV ENV 201– Engineering Possibilities: Decision Science in the Age of Smart Technologies
2	CIV ENV 202– Biological & Ecological Principles
3	CIV ENV 203– Earth in the Anthropocene

ENV ENG Core Courses (9 units)	
4	CHEM 215-1 – Organic Chemistry I
5	CIV ENV 260 – Environmental Systems and Processes
6	CIV ENV 340 – Hydraulics and Hydrology
7	CIV ENV 361-1 – Environmental Microbiology
8	CIV ENV 346 – Ecohydrology
9	CIV ENV 364 – Sustainable Water Systems
10	CIV ENV 365 – Environmental Laboratory
11	CIV ENV 367 – Chemical Processes in Aquatic Systems
12	CIV ENV 382 -1,2 – Capstone Design

Basic Engineering (5 units)	
13	MAT SCI 201: Material Science
14	MECH ENG 241: Fluid Mechanics I
15	BMD ENG 250, or CHEM ENG 211: Thermodynamics
16	CIV ENV 304 - Civil and Environmental Engineering Analysis
17	CIV ENV 306: Uncertainty Analysis
	CIV ENV 301-1 Professional Development (0.3 units)*

Technical Electives (4 units) - See tracks below and the approved list of courses\*

\*At least 3 units must be 100% Engg Topic & only 1 399 can count as Tech Elective

#### Urban Sustainability Track

- CIV ENV 368 - Sustainability: The City
- CIV ENV 387 - Design of Sustainable Urban Districts
- CIV ENV 353 – Energy Geostrutures and Geosystems
- CIV ENV 395 – Climate and Energy - Law & Policy - (100% general topic course)

#### Fate of contaminants in the Environment Track

- CIV ENV 361-2 – Public and Environmental Health
- CIV ENV 370 – Emerging Organic Contaminants
- CIV ENV 314 – Organic Geochemistry (100% MTS)
- CIV ENV 395 - Project Practicum in Environmental Engineering

#### Resource Recovery Track

- CIV ENV 353 – Energy Geostrutures and Geosystems
- CIV ENV 368 - Sustainability: The City
- CIV ENV 442/443- Environmental Biotechnology/Microbial Ecology for Resource Recovery
- CIV ENV 399 - Research project (100% Eng)