Sustainable Engineering Minor

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About:

Sustainability: Development that meets the needs of the present without compromising the needs of future generations.

This cross-disciplinary Sustainable Engineering minor prepares students as engineers to confront complex sustainability challenges in the 21st century.

This minor is open to Engineering students only. Students may pursue either the Sustainability Studies minor or the Sustainable Engineering minor, but not both.

Program Learning Objectives:

1. Understand humanity's impact on Earth and the nexus of human and environmental processes in the Anthropocene (current geological age).
2. Define holistically the scope of sustainability through the lens of conceptual frameworks including the triple bottom line and the UN Sustainable Development Goals (SDGs).
3. Approach complex problems in the intersection of engineering and sustainable development through the application of whole-systems thinking through a life-cycle lens and with consideration of the interconnected STEEP (social, technological, economic, environmental, and political) dimensions of sustainability challenges.
4. Apply, on a conceptual level, life-cycle analysis as a tool to evaluate the environmental impacts of engineered products, services, and the built environment.
5. Apply circular design principles to identify opportunities to rethink engineered products, services and infrastructure and the systems surrounding them in advancing a transition from a linear to a circular economy.
6. Articulate the role of the engineering profession and one’s chosen engineering discipline in contributing to sustainable solutions as part of interdisciplinary teams.

Requirements:

The Sustainable Engineering minor requires a total of six courses (18 credits), two of which are required, four of which are elective courses (two Humanities and/or Policy electives, and two Technology electives)

Program: Engineering
Type: Minor

Two Required Courses:

Course	Title	Credits
SUSE 2110	Sus Eng: Risk & Opportunities	3
SUSE 2111	Sus Eng: LCA & Circular Econ	3

Humanities and/or Policy Electives:

Electives are subject to change. Electives may be added to this list at the discretion of the College of Engineering.

Select two courses from the list below:

Course	Title	Credits
	Humanities Electives	3
	Policy Electives	3

Technology Electives:

Up to two of the Technology Electives from within a student's major can be counted toward the minor.

Electives are subject to change. Electives may be added to this list at the discretion of the College of Engineering.

Select two from the list below:

Course	Title	Credits
	Technology Electives	3

Category Descriptions

Humanities Electives

Credits: 3

Any course with the SHUM (Sustainability-Humanities Stem) attribute will count as a Humanities Elective.

Humanities

Course	Title	Credits
ENG 4690/ 4691/ 4692	Amer. Lit. & Cult. after 1945	3
ETH 3010	Topics in Ethics	3
HIS 1065	Topics Nature, Environ & Tech	3
HIS 2276	American Environmental Hist	3
HIS 4499	Topics in World History	3
PHI 2121	Environmental Ethics	3
PHI 2430	Eco-Feminism	3
PHI 4210	Environmental Philosophy	3
PJ 3000	Selected Topics	1
PJ 5000	Selected Topics	3
THL 2460	Bible and Environment	3
THL 4330	Christian Environmental Ethics	3
GEV 3001	Intro to Sustainability Study	3

Permission required: PJ 3000, PJ 5000

Policy Electives

Credits: 3

Any course with the SPOL (Sustainability-Policies Stem) attribute will count as a Policy Elective.

Policy

Course	Title	Credits
ECO 3108	Global Political Econ	3
ECO 4200	Advanced Topics in Economics	3
GEV 1004	Climate Change	3
GEV 2500	Global Change in Local Places	3
GEV 2525	Population Geography	3
GEV 3000	Special Topics	3
GEV 3002	Ecosystem Services	3
GEV 3570	Land Use Planning & Mgmt	3
GEV 3580	Natural Res and Conservation	3
GEV 4330	Spec Topics in Environm Policy	3
GEV 4331	Env. Policy & Management	3
GEV 4332	Water Resources Planning	3
GEV 4333	Politics and the Env.	3
GEV 4334	Environmental Law	3
GEV 4335	Energy Policy	3
GEV 4336	Environmental Economics	3
GEV 4340	Spec Topics in Environm Issues	3
GEV 4510	Special Topics in Geography	3
GEV 4517	Sustainable Development	3
MGT 2208	International Topics	3
MGT 2352	Business in Emerging Markets	3
PA 2000	Public Policy	3
PJ 5000	Selected Topics	3
PSC 4275	Topics in Internat'l Relations	3
GEV 3001	Intro to Sustainability Study	3

Permission required: ECO 4200, GEV 3000, GEV 4330, GEV 4340, GEV 4510, PSC 4275, PJ 5000

Technology Electives

Credits: 3

Any course with the SSCT (Sustainability-Sci & Tech Stem) attribute will count as a Technology Elective.

Course	Title	Credits
BIO 3255	Evolutionary Ecology	4
BIO 3485	Marine Biology	4
BIO 3661	Environment and Human Health	3
BIO 3955	Lec+Lab in Topics in Biology	4
	BIO 4451/52	4
BIO 4801	Conservation Biology	3
CEE 2211	Transportation Engineering	3
CEE 4607	Selected Topics in CEE	3
CEE 4612	CEE Undergraduate Research	3
CHE 4831	Senior Project Studio I	3
CHE 5001	Industrial Liq & Sld Waste	3
CHE 5332	Special Topics in CHE	3
CHE 5715	Alternative Energy	3
CHM 1311	Inorganic Chemistry I	3
SUSE 7110	Fundamentals-Sustainable Engr	3
SUSE 7111	Life Cycle/Impact Assessment	3
SUSE 7112	Econ/Social Equity Integrators	3
SUSE 7113	Sustainable Materials & Design	3
EGR 7800	Solar Therm. Energy Conversion	3
GEV 1051	Environmental Science II	4
GEV 1050	Environmental Science I	4
GEV 1052	Environmental Studies	3
GEV 1053	Environmental Studies II	3
GEV 2500	Global Change in Local Places	3
GEV 3301	Fisheries	3
GEV 3302	Agricultural Science	3
GEV 3003	Environmental Geology	3
GEV 3303	Soil Science	3
GEV 3305	Energy Systems	3
GEV 3306	Alternative Energy	3
GEV 3308	Environmental Health	3
GEV 3521	GIS for Urban Sustainability	3
GEV 4320	Spec. Topics in Env Lab Sci	4
GEV 4328	Climatology	4
GEV 4329	Global Change Research	4
GEV 4350	Spec Topics in Environm Sci	3
GEV 4351	Oceanography	3
GEV 4353	Green Science	3
GEV 4354	Biomimicry	3
GEV 4355	Tropical Ecology	3
GEV 4356	Global Change Science	3
GEV 4511	Climate Variability	3
GEV 4512	Medical Geography	3
GEV 4515	Terrestrial Ecosystems	3
GEV 4700	Geographic Information Systems	4
	MSE 20XX	
ME 5130	Intro to Sustainable Energy	3
ME 5140	Design of Gravity Water Ntwrks	3
ME 7140	Thermal Energy Storage	3
MET 1222	Climate Change:Past & Present	3

- **Pre-requisites, see advisor:** BIO 3255, BIO 4451/52, BIO 4801, CEE 2211, CEE 4607, GEV 1050, GEV 1051
- **AP course credit may be applied:** CHM 1311, GEV 1052
- **Associated lab section required, see advisor:** BIO 4451/52, CHE 4831, GEV 1050, GEV 1051, MSE 20XX
- **Permission required:** CEE 4612, CHE 4831, MSE 20XX