Course Number and Title: ENV 275 Environmental Sustainability

Campus Location:
Georgetown, Stanton

Effective Date:
2018-52

Prerequisite:
CET 240, ENV 190, ENV 260, ENV 271

Co-Requisites:
None

Course Credits and Hours:
3.00 credits
2.00 lecture hours/week
4.00 lab hours/week

Course Description:
The focus of this course is on sustainable growth, design, and development. Emphasis is on Delaware-specific regulations and environmental issues, including water quality, habitat, stormwater and drainage, sustainable development, and sea-level rise. Students identify and evaluate development options that result in more sustainable places to live and work.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
None

Schedule Type:
Classroom Course

Disclaimer:
None

Core Course Performance Objectives (CCPOs):

1. Evaluate a theoretical site design based upon the principles and practices of smart growth and low-impact development (LID). (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 5, 6)
2. Conduct field assessments on the proposed site. (CCC 1, 2, 3, 4; PGC EET 1, 2, 3, 6)
3. Evaluate environmental issues using geographic information systems (GIS) applications. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 5, 6)
4. Examine environmental regulatory issues that impact a theoretical site design. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 3, 5, 6)
5. Design a preliminary stormwater management plan. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 3, 4, 5, 6)
6. Design a theoretical wastewater treatment system. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 3, 4, 5, 6)
7. Analyze key habitats and ecosystems affected by a theoretical site design. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 3, 4, 5, 6)
8. Evaluate sea level rise implications on a theoretical site design. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 3, 4, 5, 6)
9. Create professional quality environmental reports for the theoretical site. (CCC 1, 2, 3, 4, 5, 6; PGC EET 1, 2, 3, 4, 5, 6)
10. Demonstrate professional and ethical conduct as expected in industry. (CCC 1, 4; PGC EET 3)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Evaluate a theoretical site design based upon the principles and practices of smart growth and low-impact development (LID).
    1. Apply principles of Leadership in Energy and Environmental Design (LEED) green building standards to a theoretical site design.
    2. Apply infiltration stormwater best management practices (BMPs) to a theoretical site design.
    3. Characterize the environmental impacts of the construction methods used in a theoretical site design.
    4. Apply smart growth principles to a theoretical site design.
2. Conduct field assessments on the proposed site.
    1. Identify depth to water table, conduct sieve analysis on a soil sample(s), and classify soils with respect to stormwater infiltration practices.
    2. Confirm National Wetland Inventory by U.S. Fish and Wildlife Service delineation by determining hydrology, dominant plant species, and presence or absence of hydric soils on the site.
    3. Conduct a site reconnaissance in accordance with ASTM 1527-13.
3. Evaluate environmental issues using geographic information systems (GIS) applications.
    1. Select appropriate GIS data layers and applications for environmental analysis.
    2. Apply the information gathered from GIS data to inform the theoretical site design.
4. Examine environmental regulatory issues that impact a theoretical site design.
    1. Conduct record reviews to gather information necessary to the theoretical site design.
    2. Discuss tax ditches and the difference between tax ditches and non-tax ditches.
    3. Identify if tax ditches are located within the theoretical site.
    4. Examine local codes/ordinances and state regulations to establish restrictions on development.
    5. Examine local codes and ordinances relative to floodplain management and/or sea level rise.
5. Design a preliminary stormwater management plan.
    1. Conduct a Stormwater Assessment Study (SAS) according to State of Delaware regulations.
    2. Conduct hydrologic calculations in accordance with state and/or local laws.
    3. Design a preliminary stormwater management plan in accordance with state and/or local laws.
6. Design a theoretical wastewater treatment system.
    1. Distinguish between centralized and decentralized wastewater treatment methods in the context of a theoretical site design.
    2. Apply appropriate regulations and standards to a theoretical site design.
    3. Calculate influent and effluent characteristics of wastewater for a theoretical site design.
    4. Calculate nutrient and organic loadings from septic systems and/or centralized wastewater treatment plans for a theoretical site design.
    5. Select an appropriate wastewater treatment process for the theoretical site design.
7. Analyze key habitats and ecosystems affected by a theoretical site design.
    1. Classify the types of habitats and ecosystems in a theoretical site design.
    2. Identify the implications of a theoretical site design on habitats and ecosystems.
    3. Apply federal and/or state and local laws related to habitats, ecosystems, and threatened and endangered species.
8. Evaluate sea level rise implications on a theoretical site design.
    1. Identify the risks of sea level rise in Delaware using appropriate State of Delaware resources.
    2. Examine sea level rise implications on a theoretical site design.
9. Create professional quality environmental reports for the theoretical site.
    1. Develop a wastewater selection report for the theoretical wastewater treatment process.
    2. Development recommendations based upon smart growth, sustainable design, and low impact stormwater management for a theoretical site design.
    3. Develop an Environmental Impact Statement (EIS) according to NEPA for a theoretical site design.
    4. Develop a Phase I Site Assessment according to ASTM 1527-13 for a theoretical site design.
10. Demonstrate professional and ethical conduct as expected in industry.
    1. Identify the need for self-discipline and time management in technical industries.
    2. Communicate and function effectively as a member of a team.

Evaluation Criteria/Policies:
Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	**–**	**100**	**=**	**A**
83	**–**	**91**	**=**	**B**
75	**–**	**82**	**=**	**C**
0	**–**	**74**	**=**	**F**

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:
Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Summative: Phase I Site Assessment	15%
Summative: Environmental Impact Statement	15%
Summative: Wastewater Treatment Design	15%
Summative: Stormwater Management Design	15%
Summative: Final Presentation	15%
Formative: Assignments (Quizzes, Readings, Labs, Journals, Participation, Information Presentations, Etc.)	25%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Apply the knowledge, techniques, skills, and applicable tools of the discipline to engineering activities, including but not limited to site development, hydraulics and hydrology, grading, water and wastewater treatment, pollution prevention and treatment, and sustainable design.
2. Conduct standardized field and laboratory testing.
3. Demonstrate a commitment to quality, timeliness, professional development, and continuous improvement.
4. Use graphic techniques and productivity software to produce technical documents.
5. Explain the major aspects of the normal ecology of the planet and risks associated with polluting the environment.
6. Apply current federal, state, and local environmental and safety regulations.

Disabilities Support Statement:
The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.