Storm Water Management Course Syllabus

Course Title:
Storm Water Management

Course Code:
WATR-4375/5375

Credits:
3

Instructor:
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Course Description:
This course provides an in-depth understanding of storm water management, focusing on the design, implementation, and maintenance of systems that control storm water runoff. Students will explore the environmental impacts of storm water, regulatory requirements, and best management practices (BMPs). The course combines theoretical knowledge with practical applications, including case studies and fieldwork.

Course Objectives:
By the end of this course, students will be able to:
1. Understand the principles of storm water management and hydrology.
2. Identify and evaluate the environmental impacts of storm water runoff.
3. Understand and apply regulatory requirements and guidelines for storm water management.
4. Design and implement effective storm water management systems.
5. Utilize best management practices (BMPs) in various settings.

Course Outline:
1. Introduction to Stormwater Management

- **Overview of stormwater challenges and principles.**

- **Importance of sustainable stormwater management.**

2. Low-Impact Development (LID) Techniques

- **Structural and non-structural approaches for minimizing environmental impacts.**

- **Key practices in LID and their applications.**

3. Stormwater Pollutant Removal

- **Criteria and strategies for meeting water quality performance standards.**

- **Techniques for pollutant filtration and removal.**

4. Stormwater Quantity and Quality Standards

- **Design storms and their role in runoff computations.**

- **Methods for calculating runoff rates, volumes, and pollutant loads.**

5. Groundwater Recharge

- **Methodology and the importance of groundwater recharge.**

- **Tools and design approaches for effective recharge.**

6. Landscaping for Stormwater Management

- **Role of vegetation and landscaping in stormwater systems.**

- **Selecting and maintaining appropriate plantings.**

7. Green Infrastructure BMPs (Small-Scale)

- **Overview of small-scale practices, including:**

  - **Cisterns, dry wells, grass swales, green roofs.**

  - **Pervious paving, small-scale bioretention, infiltration basins, and vegetative filter strips.**

- **Analysis tools for design and implementation.**

8. Green Infrastructure BMPs (Large-Scale)

- **Applications of large-scale systems:**

  - **Bioretention systems, infiltration basins, sand filters.**

  - **Constructed wetlands and wet ponds.**

9. Non-Green Infrastructure BMPs

- **Alternatives for groundwater recharge and runoff management:**

- o **Blue roofs, extended detention basins, manufactured treatment devices, subsurface gravel wetlands.**

- o **Sand filters and wet ponds.**

Assessment and Grading:

- SWIM Model: 10%
- Paper Presentation: 25%
- Final Design Project : 25%
- Final Exam: 40%

Optional Textbooks:
- "Stormwater Management for Smart Growth" by Allen P. Davis and Richard H. McCuen
- "Designing Urban Stormwater Controls" by Thomas N. Debo and Andrew J. Reese

Contact Information:
For any questions or concerns, please contact the instructor during office hours or via email.