CEE618: Planning, Design, and Management of Urban Stormwater



Spring 2021, 3 Credits Class Time: Wednesday, 3:30 ~ 6:30 PM Location: Online BBCollaborator https://canvas.wisc.edu/courses/230469/external_tools/3041 Class Material: https://canvas.wisc.edu/courses/230469/

http://homepages.cae.wisc.edu/~chinwu/CEE618_Urban_Stormwater/Urban_Stormwater.html

This course aims to provide students in civil and environmental engineering, geological, and water resources management to learn how to plan, design, and manage urban stormwater systems to reduce the impacts of urban stormwater on receiving waters. This course will develop a fundamental understanding with engineering design tools and principles to design stormwater infrastructure. Specifically, the course will include an understanding of infrastructure design and maintenance, analysis/modeling, and selection of appropriate cost effective and regulatory compliant solutions to urban stormwater problems. The course content will include current and future "state-of-practice" fundamentals in urban stormwater management with a focus on practical applications.



Textbook:

• Urban Storm Water, Hormoz Pazwash, 2nd Ed., CRC Press



Schedule and Course Topics Outline Neek 1: Introduction to stormwater management • Class Logistics • Examples of urbanization • Discussion	I W1
Neek 2: Stormwater management ImpactsH• Stormwater quantity• Stormwater quality• Project brainstorm	W2
Neek3: Planning of stormwater hydrology H • Rainfall analysis and design storm • Rational and NRCS-TR-55 Methodology • WinTR-55/HYdroCAD	I W3
Neek 4: Fundamentals of stormwater flow • Open channel flow • • Pipe flow (SWMM) • Culvert analysis (HY8) • Hands-on exercise	1 W4
Neek 5: Design of urban drainage systems H • Drainage elements Runoff conveyance systems • Design competition	I W5
Neek 6: Design of stormwater management systems H • Stormwater routing and detention Stormwater BMPs • Outlet structures SWAT Team Design	1 <mark>W6</mark>
 Neek 7: Modeling drainage and stormwater management systems HydroCAD SWMM Applications 	i W7
 Neek 8: Environmental permits and regulations Erosion Control regulations (state and local ordinances) Stormwater quantity regulation (state and local ordinances) Stormwater quality regulation (Clean Water Act, NPDES, TMDL) Permit Applications 	1 <mark>W8</mark>
 Neek 9: Design of urban stormwater for water quality Treatment BMPs (bioretention, sand filters, infiltration trenches) Proprietary BMP devices (CDS, Up-Flo Filter, ADS, etc.) Current projects - Identification 	W9)

 Week 10: Modeling of urban stormwater for water quality P8, WinSLAMM, RECARGA Raingarden applications 	HW10
 Week 11: Management of stormwater infrastructure Stormwater and Erosion control BMP construction BMP inspection and maintenance BMP life cycle cost estimation Planning and design for a construction site 	HW11
 Week 12: Green Infrastructure (GI) Low-impact development Porous pavement, green roofs, blue roofs Water supply and demand Rainwater harvesting Discussion Forum 	1 W12
 Week 13: Possible topics Urban stormwater measurements (USGS) Social-ecological framework for urban storm water manageme 	nt

- Flash flooding resilience
- Emerging stormwater issues

Week14: Final project Presentation

Grading

HW 50%, Mid-Term 20%, and Final Project 30%

Instructors

- Dr. John Reimer, Assistant Director, Dane County Land and Water Resources Dept. Email: reimer.john@countyofdane.com
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