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Department of Civil Engineering	
Drainage Systems (61544)	
Total Credits	**3**
major elective	
Prerequisites	P1 : Hydrology (61441) P11Synch. : Hydrology (61441)

Course Contents

Review of pipe networks and open channel hydraulics. Drainage systems and design requirements, design of drainage structures (pipes, channels, culverts, etc.). Principles of storm water management. Applications including system design of wastewater collection systems, urban storm water drainage systems, and agriculture drainage. Practical software applications using sewerCad and stormCad

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Ability to collect and deal with water data sources and data processing.	A B F G	10 %
2	Ability to estimate and analyze design variables for water drainage systems.	A B	7 %
3	Ability to design elements of water drainage systems including pipes, culverts, inlets, channels, etc.	A B C D E	18 %
4	Ability to design wastewater collection systems.	C D E F	20 %
5	Ability to design urban storm water drainage systems.	C D E F	20 %
6	Ability to utilize computer models in simulating and designing water drainage systems.	B C D E J	20 %
7	Ability to use techniques, skills and modern engineering tools in water drainage systems.	K	5 %

Textbook and/ or Refrences

No specific Text Book, but handouts, design manuals, tables and sheets.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Projects	20 %
Final Exam	40 %

Course Plan

Week	Topic
1	Introduction to the course objectives and requirements. Forming of the design teams. Design projects
2 &3	Review of sewer networks and open channel hydraulics
4 &5	Design of elements of water drainage systems and drainage structures including pipes, culverts, inlets, channels, etc. (Examples)
6	Selection of pumps for water drainage systems
7	Elements of wastewater collections systems
7	Midterm Exam
8, 9 &10	Design of wastewater collection system (project)
11	Elements of storm water systems
12	IDF curves and Rational Formula
13, 14	Design of urban storm water drainage system (project)

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