

<b>Department of Civil Engineering</b>			
<b>Water-Plant-Soil System (61543)</b>			
<b>Total Credits</b>	<b>3</b>		
<b>major elective</b>			
<b>Prerequisites</b>	P1 : Hydrology (61441)		
<b>Course Contents</b>			
The relationship between water, soil, and plant. Crop water requirements. Principles of irrigation scheduling and irrigation management. Water transport and distribution in the unsaturated zone. Design and Evaluation of different irrigation systems. Introduction to the practical reuse of treated wastewater in agriculture and its impacts on the environment. Introduction to software used for crop water requirements and irrigation scheduling			
<b>Intended Learning Outcomes (ILO's)</b>		<b>Student Outcomes (SO's)</b>	<b>Contribution</b>
1	Ability to describe physical and chemical properties of soil and their importance in soil water management	A	10 %
2	Ability to design water conveyance and storage systems to meet irrigation demands	A C	15 %
3	Ability to evaluate the performance and design irrigation systems including gravitational and pressurized systems under realistic constraints and conditions	A C	25 %
4	Ability to analyze and quantify the impacts of irrigation water quality on soil and plant including treated wastewater and brackish water	H J	10 %
5	Ability to estimate irrigation requirements and schedule irrigation	C K	15 %
6	Ability to design drainage systems and structures	A C	5 %
7	Ability to evaluate and design treated wastewater reuse system and options and alternatives .	C H I J K	20 %
<b>Textbook and/ or References</b>			
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<b>Assessment Criteria</b>		<b>Percent (%)</b>	
First Exam		20 %	
Second Exam		20 %	
Projects		20 %	
Final Exam		40 %	
<b>Course Plan</b>			
<b>Week</b>	<b>Topic</b>		
1	Soil Physical and chemical properties		
2	storage of irrigation water		
3	Irrigation water quality		
4	Irrigation water quality		
5	Conveyance of irrigation and drainage water		
6	First hour exam		
7	Crop water requirements		
8	Plant soil water and irrigation scheduling		
9	Irrigation systems: evaluation and design		
10	Irrigation systems: evaluation and design		

11	Second Exam
12	Irrigation with marginal water
13	Irrigation with marginal water
14	Drainage engineering
15	Design of drainage structures
16	Final Exam