

Irrigation and Drainage Engineering Module					
Course Title		Surface Irrigation			
Course Code		WRIE3142			
Program		B.Sc in Water Resources Irrigation Engineering			
Module Name		Irrigation and Drainage Engineering			
Module Coordinator		Name: Office location Mobile:; e-mail: Consultation Hours: _____			
Instructor Name		Name: Office location Mobile:; e-mail: Consultation Hours: _____			
Course Information		Academic Year Year: III Semester : II Meeting Day: To be arranged at the beginning of the semester Meeting Time: To be arranged at the beginning of the semester Meeting Location: To be arranged at the beginning of the semester			
ECTS		5 ECTS			
Students' work load in hrs		Lecture	Tutorial	Lab	Home study
		2	2	0	4
Course objectives		The objective of this course is to introduce students with the concept, necessity and benefits of irrigation and irrigated agriculture and to offer the knowledge of soil-water-plant relationship. Students are also able to determine crop water requirement using different approaches, undertake planning and detail design of surface irrigation system components and will have ample knowledge of land leveling and miscellaneous irrigation systems after completion of the course.			
Course Description		Introduction: definitions, concepts and needs for land and water development in rural and urban areas. Soil-Plant-Water system: general description of soil system, definition of soil water, soil moisture characteristics, soil water retention, basic concepts of soil water dynamics, methods of determining soil water content, infiltration. Irrigation Water Requirement: consumptive use and its estimation, dependable and effective rainfall, net and gross irrigation requirement, field and scheme water supply. Irrigation scheduling: irrigation depth and interval, planning irrigation schedule. Surface Irrigation Methods: classification, (Basin, Furrows, Border, and Wild Flooding), system selection. Basic concepts of surface irrigation: advance and recession curves, storage, depletion, surface irrigation models, irrigation efficiencies. System Design (level basins, graded borders, furrow): selection of application time, stream size, field layout. Tertiary Unit Design: layout and water delivery to tertiary systems. Tank Irrigation. Land leveling			
Pre-requisite		Nil			
Course status		Compulsory			
Schedule/Syllabus					
Week	Topics			Required Text	

1	1. Introduction (lec=2hrs) 1.1 Definition, Concepts and needs for land and water development in rural and urban areas	Arora, (2002). Irrigation, Water Power and Water Resources Engineering, A.K. Jain, New Delhi.
	2. Soil-plant-water system (lec=5hrs, tut=8hrs) 2.1 Introduction 2.2 General description of soil water 2.3 Definitions of soil water 2.4 Soil moisture characteristics 2.5 Soil water retention 2.6 Basic concepts of soil water dynamics 2.7 Methods of determining soil water contents 2.8 Infiltration	
	3. Irrigation water requirement (lec=3hrs, tut=5hrs) 3.1 Introduction 3.2 Consumptive use and its estimation 3.3 Dependable and effective rainfall 3.4 Net and gross irrigation requirement 3.5 Field and scheme water supply	Arora, (2002). Irrigation, Water Power and Water Resources Engineering, A.K. Jain, New Delhi.
	4. Irrigation scheduling(lec=2hrs, tut=5hrs) 4.1 Introduction 4.2 Irrigation depth and interval 4.3 Planning irrigation schedule	Arora, (2002). Irrigation, Water Power and Water Resources Engineering, A.K. Jain, New Delhi.
	5. Surface irrigation methods(lec=3hrs, tut=7hrs) 5.1 Introduction 5.2 Classification (basin, furrow, borders and wild flooding) 5.3 System selection	Engineering, A.K. Jain, New Delhi.
2	6. Basic concepts of surface irrigation(lec=5hrs, tut=5hrs) 6.1 Advance and recession curves 6.2 Storage and depletion 6.3 Surface irrigation models 6.4 Irrigation efficiencies	
	7. system design (level basins, graded borders, furrow) (lec=5hrs, tut=5hrs) 7.1 Introduction 7.2 Selection of application time 7.3 Stream size 7.4 Field layout	Recahrd H. Cuenca (1989). Irrigation System Design: An Engineering Approach.

3	8. Tertiary unit design (3 rd week, for the 1 st three days) (lec=2hrs, tut=5hrs) 8.1 Introduction 8.2 Layout and water delivery to tertiary systems		
	9. Tank irrigation(lec=1hrs, tut=2hrs)		
	10. Land leveling(lec=2hrs, tut=3hrs)		
	Summary of Teaching and Learning Method		Lecture, tutorials, discussion, individual work, problem solving, project work
Assignments		At the end of each session assignment will be given.	
Assessment arrangements	10% Quiz		All chapters
	20% Test		All chapters
	10% project work		Instructor selection
	50% Final-exam		All chapters
Course Expectation		Preparedness and participation: both students and the teacher should be prepared since education is an interactive process. Students should be active participants in the teaching-learning process. They should be interested to the course and come to class with the necessary materials such as exercise books and pen. In addition, they should to take responsibility in their education. Teachers are also expected be prepared and interested to the course, which they are offering. They have to consult the essential materials ahead of time and try share their knowledge in an efficient and effective manner. Material availability: reference materials are expected to be available in the library nearest to respective faculties.	
Policy		Attendance: students should attend at least 85% Assignments: all students must do all the assignments given Tests/quizzes: all students must site/take all tests/quizzes given Cheating/plagiarism: cheating/plagiarism is strictly forbidden. It will result in disqualification of the course.	
Reference			
<div>➤ Arora, (2002). Irrigation, Water Power and Water Resources Engineering, A.K. Jain, New Delhi.</div> <div>➤ Hansen, V.E. Israelson and Stringham, (1979), Irrigation Principles and methods, 4th Edition, John Wiley & Sons, New York.</div> <div>➤ Michael A.M. (1978) Irrigation, Theory and Practice, Vikas Publishing house ltd, New Delhi.</div> <div>➤ Recahrd H. Cuenca (1989). Irrigation System Design: An Engineering Approach.</div> <div>➤ Sahasrabudhe, S.R., (1994). Irri gation □Engineering and Hydraulic structures, 6th Edition, Nai Sarak, Delhi.</div> <div>➤ FAO 24, 33. FAO Technical Papers, FAO Publications</div>			