



IRRIGATION AND DRAINAGE

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INTENDED AUDIENCE : Agricultural Engineering/Agricultural Sciences

PRE-REQUISITES : An introductory background in chemistry, physics and Maths (calculus) will be needed.

INDUSTRIES APPLICABLE TO : All irrigation based companies.

COURSE OUTLINE :

Agricultural engineering has been applying scientific principles for the optimal use of natural resources in agricultural production for the benefit of humankind. This particular course deals with application of both irrigation and drainage principles in agriculture for achieving profitable crop production with minimal environmental implications. This is one of the core courses of Agricultural Engineering program recommended for under graduate and graduate students. In this course we will focus on soil- water-plant-atmosphere relationship, crop water requirement, irrigation scheduling, irrigation water conveyance, measurement of irrigation water, water application methods, irrigation systems design and their performance evaluation, drainage of agricultural lands, management of salt affected soils, performance evaluation of drainage systems, ground water hydrology, irrigation wells and water-lifting devices-pumps. It involves weekly quizzes, in-class numerical problem solving, assignments and class tests..

ABOUT INSTRUCTOR :

Prof. D.R. Mailapalli graduated from the Indian Institute of Technology (IIT)- Kharagpur with a Ph.D degree in 2007. After having 6 years of postdoctoral research experience from the U.S. universities (UC-Davis and UW-Madison), Dr. Mailapalli joined as a faculty at IIT-Kharagpur in 2013. Since then he has been teaching On-farm water management (theory and lab), Tube wells and pumps, Surface water hydrology and Non-point source pollution control and management at UG and PG level. His research interests are in agricultural water management, irrigation hydraulics, sediment and nutrients transport and non-point source pollution. He has published more than 30 research articles and 20 conference papers, volunteered as a reviewer for more than 30 research papers.

COURSE PLAN :

Week 1 : Soil-Water-Plant-Atmosphere Relationship, Quiz-1, Problem set1

Week 2 : Crop Water Requirement and Irrigation Scheduling, Quiz-2, Problem set2

Week 3 : Irrigation Water Conveyance and Measurement of Irrigation Water, Quiz-3, Problem set3

Week 4 : Water Application Methods, Quiz-4, Problem set4

Week 5 : Irrigation Systems Design-1, Quiz-5, Problem set5

Week 6 : Irrigation Systems Design-2; class test, Quiz-6, Problem set6, Class test 1

Week 7 : Performance Evaluation of Irrigation System, Quiz-7, Problem set7

Week 8 : Drainage of Agricultural Lands, Quiz-8, Problem set8

Week 9 : Management of Salt affected soils, Quiz-9, Problem set9

Week 10 : Performance Evaluation of Drainage Systems, Quiz-10, Problem set10

Week 11 : Ground Water Hydrology, Quiz-11, Problem set11

Week 12 : Irrigation wells and Water-lifting devices-pumps; Quiz-12, Problem set12, Class test-2