16AG310 IRRIGATION ENGINEERING

Hours Per Week :

L	T	P	C
2	0	2	4

Total Hours :

L	T	P
30	0	30

WA/RA	SSH/HSH	CS	SA	S	BS
5	40	5	8	5	-

Course Description and Objectives:

This course deals with the methods of irrigation techniques with various technologies of irrigation. The objective of this course is to impart the knowledge of optimization of irrigation efficiency using various irrigation methods.

Course Outcomes:

The students will be able to:

- acquire knowledge of irrigation.
- develop irrigation project based on requirement of the farmer needs and cost analysis.
- design irrigation efficient system for various crops.
- acquire knowledge of optimizing irrigation water in farm.

SKILLS:

- ✓ *Design an irrigation project for a water scare watershed.*
- ✓ *Estimate of irrigation requirement of a crop in the field.*
- ✓ *Compute irrigation efficiency of agriculture field on the basis of irrigation scheduling.*

UNIT - 1 **L-06**

INTRODUCTION TO IRRIGATION AND ITS STATUS AROUND WORLD AND INDIA : Irrigation, Impact of irrigation on human environment, Major and medium irrigation schemes of India, Purpose of irrigation, Sources of irrigation water, Present status of development and utilization of different water resources of the country.

UNIT - 2 **L-06**

MEASUREMENT TECHNIQUES : Measurement of irrigation water using weir, notches, flumes and orifices and other methods; Water conveyance, Design of irrigation field channels, Underground pipe conveyance system, Irrigation structures, Channel lining, Land grading, Various design methods and estimation of earth work and cost.

UNIT - 3 **L-06**

SOIL, WATER AND PLANT RELATIONSHIP : Soil water plant relationship, Soil water movement, Infiltration, Evapotranspiration, Soil moisture constants, Depth of irrigation, Frequency of irrigation, Irrigation efficiencies.

UNIT - 4 **L-06**

IRRIGATION TECHNIQUES : Surface irrigation methods-Border, Check basin, Furrow irrigation; Introduction to sprinkler and drip irrigation method, Design criteria, Merits, demerits, selection and design.

UNIT - 5 **L-06**

DESIGN OF IRRIGATION PROJECTS : Participatory irrigation management, Economics of water resources utilization, Command area concepts and components, Irrigation terminologies relevant to command area, On farm development works, Farmer participation in water distribution, Water delivery methods, Design of unlined alluvial channels, Silt theories, Design of lined channels, Materials for lining.

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS **Total hours: 30**

1. Soil moisture by different soil moisture measuring instruments.
2. Irrigation water and infiltration rate.
3. Computation of evapotranspiration.
4. Determination of crop water requirement.
5. Irrigation scheduling.
6. Measurement of uniformity coefficient of sprinkler irrigation method.
7. Measurement of uniformity coefficient of drip irrigation method.
8. Design of drip and sprinkler irrigation.

TEXT BOOKS :

1. A. M. Michael. “Irrigation Theory and Practice”, 2nd edition, Vikas Publishing House, 2008.
2. O. W. Israelson and V. E. Hassan. “Irrigation Principles and Practices”, 2nd edition, John Wiley and Sons, New York, 1981.

REFERENCE BOOKS :

1. V. V. N. Murthy, “Land and Water Management”, 6th edition, Kalyani Publishing, New Delhi, 1998.
2. S. K. Garg, “Irrigation Engineering and Hydraulic Structures”, 1st edition, Khanna Publishers, New Delhi, 2006.
3. D. K. Majumdar, “Irrigation Water Management Principles and Practice”, Prentice Hall of India, New Delhi, 2014.
4. P. Modi, “Irrigation Water Resources and Water Power Engineering”, 7th edition, Standard Book House, New Delhi, 2008.

ACTIVITIES:

- *Identify various irrigation methods.*
- *Develop an irrigation project in a water shed.*
- *Calculate water requirement of various crops based on field data.*
- *Design of micro irrigation systems.*