

# 22IADE202 IRRIGATION ENGINEERING

Hours Per Week :

L	T	P	C
2	0	2	3

**PREREQUISITE KNOWLEDGE:** Basics of flow characteristics and sources of irrigation and different types of irrigation techniques.

## COURSE DESCRIPTION AND OBJECTIVES:

This course deals with the basic concepts on sources of irrigation, measurement of irrigation water. The objective of this course is to apply the knowledge of land grading, soil moisture characteristics, impact of evapotranspiration to build up irrigation system in to field and optimization of various irrigation efficiencies.

## MODULE-1

### UNIT-1

8L+0T+8P=16 Hours

#### INTRODUCTION TO IRRIGATION:

Major and medium irrigation schemes of India. Purpose of irrigation, environmental impact of irrigation projects, source of irrigation water, present status of development and utilization of different water resources of the country, measurement of irrigation water weir, flumes, an orifices and other methods.

### UNIT-2

8L+0T+8P=16 Hours

#### DESIGN IRRIGATION SYSTEM:

Open channel water conveyance system: Design and lining of irrigation field channels, on farm structures for water conveyance, control and distribution. underground pipe conveyance system, components and design, land grading, criteria for land levelling and levelling design methods, estimation of earth work.

#### PRACTICES:

- Measurement of soil moisture by different soil moisture measuring instruments.
- Measurement of irrigation water.
- Measurement of infiltration characteristics.
- Determination of bulk density, field capacity and wilting point.
- Estimation of evapotranspiration.
- Land grading methods.

## MODULE-2

### UNIT-1

8L+0T+8P=16 Hours

#### IRRIGATION MANAGEMENT:

Soil water plant relationship: Soil properties influencing irrigation management, soil water movement, infiltration, soil water potential, soil moisture characteristics, soil moisture constants, measurement of soil moisture, moisture stress and plant response.

### UNIT-2

8L+0T+8P=16 Hours

#### IRRIGATION METHODS:

Water requirement of crops: Concept of evapotranspiration (ET), measurement and estimation of ET, water and irrigation requirement of crops, depth of irrigation, frequency of irrigation, irrigation efficiencies: surface methods of water application; border, check basin and furrow irrigation-adaptability, specification and design considerations.



Source:  
[https://www.imgc.nl/wp-content/uploads/2017/03/52de913ab-3e72c42d000002\\_54176946\\_x.jpg?swifty=1](https://www.imgc.nl/wp-content/uploads/2017/03/52de913ab-3e72c42d000002_54176946_x.jpg?swifty=1)

**SKILLS:**

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

**PRACTICES:**

- Design of underground pipeline system.
- Estimation of irrigation efficiency.
- Study of advance, recession and computation of infiltration opportunity time infiltration by inflow-outflow method.
- Evaluation of border irrigation method.
- Evaluation of furrow irrigation method.
- Evaluation of check basin irrigation method.

**COURSE OUTCOMES:**

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply the knowledge of sources of water to take up different irrigation project at rural area.	Apply	1	1, 2, 4, 7
2	Investigate land grading and apply the knowledge of earthwork to design graded irrigation system.	Apply	2	1, 2, 3, 4, 5, 6, 7
3	Investigate causes and impact irrigation required in to field.	Analyze	2	1, 2, 4, 5, 7
4	Compute irrigation water in different channels or reservoirs.	Evaluate	1	1, 2, 4, 5, 7
5	Design and develop different irrigation methods.	Create	2	1, 2, 3, 4, 5, 6, 7, 12

**TEXT BOOKS:**

1. Subramanya, K. "Engineering Hydrology" 3rd Edition, Tata McGraw-Hill Publishing Co., New Delhi, 2017.

**REFERENCE BOOKS:**

1. Chow, V.T., D.R. Maidment and L.W. Mays. "Applied Hydrology" McGraw Hill Publishing Co., New York, 2018.
2. Jaya Rami Reddy, P. "A Text Book of Hydrology" University Science Press, New Delhi, 2016.