

## 22ELCT204 MANAGEMENT OF CANAL IRRIGATION SYSTEM

Hours Per Week :

| L | T | P | C |
|---|---|---|---|
| 2 | 0 | 2 | 3 |

**PREREQUISITE KNOWLEDGE:** Basics of irrigation system and channel.

### COURSE DESCRIPTION AND OBJECTIVES:

This course deals with the basics of irrigation system, effect of canal irrigation system, estimation of water requirement of canal command area, duty, delta, silt theory, channel design and materials used in canal lining and design.

### MODULE-1

#### UNIT-1

8L+0T+8P=16 Hours

##### IRRIGATION:

Purpose benefits and ill effects of irrigation: Typical network of canal irrigation system and its different physical components, canal classification based on source of water, financial output, purpose, discharge and alignment; canal alignment and general considerations for alignment.

#### UNIT-2

8L+0T+8P=16 Hours

##### CANAL IRRIGATION SYSTEM:

Performance indicators for canal irrigation system evaluation, Estimation of water requirements for canal command areas and determination of canal capacity, water duty and delta, relationship between duty, base period and delta, factors affecting duty and method of improving duty.

##### PRACTICES:

- Estimation of water requirement of canal commands.
- Determination of canal capacity.
- Layout of canal alignments on topographic maps.
- Drawing of canal sections in cutting, full banking and partial cutting and partial banking.

### MODULE-2

#### UNIT-1

8L+0T+8P=16 Hours

**CHANNEL DESIGN:** Silt theory: Kennedy's theory, design of channels by Kennedy's theory, Lacey's regime theory and basic regime equations, design of channels by Lacey's theory, maintenance of unlined irrigation canals, measurement of discharge in canals, rostering (canal running schedule) and warabandhi.

#### UNIT-2

08L+0T+8P=16 Hours

**CANAL LINING:** Necessity of canal lining: Advantages and disadvantages, types of canal lining and desirable characteristics for the suitability of lining materials, design of lined canals; functions of distributary head and cross regulators, canal falls, their necessity and factors affecting canal fall, sources of surplus water in canals and types of canal escapes, requirements of a good canal outlet and types of outlet.



Source : [https://lh3.googleusercontent.com/CLFrHb-Riyekfk7mht2WXmQPotFt\\_6BxfCLOyFZWeelnF25y1B9J4hkyhpcA620eEA6FYA=s103](https://lh3.googleusercontent.com/CLFrHb-Riyekfk7mht2WXmQPotFt_6BxfCLOyFZWeelnF25y1B9J4hkyhpcA620eEA6FYA=s103)

**SKILLS:**

- ✓ *Estimation of water requirement of canal commands.*
- ✓ *Determination of canal capacity and longitudinal section of canals.*

**PRACTICES:**

- Determination of longitudinal section of canals.
- Design of irrigation canals based on silt theories.
- Design of lined canals.
- Formulation of warabandhi.
- Study of canal outlets, regulators, escapes and canal falls.

**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 their knowledge on selection of suitable materials for construction of canals and lining of canal network systems for increasing water conveyance efficiency and controlling losses. | Apply        | 1          | 1, 2, 7          |
| 2      | Analyze the tools and components of optimum water use techniques in agriculture, horticulture, aquaculture, sericulture and veterinary in view of establishing integrated farming system.  | Analyze      | 1          | 1, 2, 4          |
| 3      | Create and take up the various projects on the present research gaps in management of canal irrigation systems to promote and address the demands and needs of the farming community.      | Evaluate     | 2          | 1, 2, 4, 6, 7    |
| 4      | Evaluate steps involved for transforming and translating the status and scenario of substance agriculture into sustainable agriculture through effective canal irrigation systems.         | Evaluate     | 2          | 1, 2, 4, 6, 7    |

**TEXT BOOKS:**

1. Garg S. K. Irrigation Engineering and Hydraulic Structures, Khanna Publishers New Delhi, 2014.
2. Sahasrabudhe SR. "Irrigation Engineering and Hydraulic structures" SK Kataria & Sons Reprint, 2015.

**REFERENCE BOOKS:**

1. Arora, K.R. "Irrigation, Water Power and Water Resources Engineering. Standard Publishers Distributors" 2011 Delhi.
2. Michael A.M. "Irrigation: Theory and Practice" Vikas Publishing Vikas Publ.House New Delhi, 2012.