

PCCI4305 IRRIGATION ENGINEERING (3-0-0)

MODULE-I

1. **Introduction:** Necessity of Irrigation in India, Advantages and disadvantages of Irrigation, Techniques of water distribution in farms, Quality of irrigation water.
2. **Water requirements of Crops:** Crops and crop season, Duty and Delta, Consumptive use, Irrigation requirements, Estimation of consumptive use of water by climatic approaches, Irrigation efficiencies, Soil moisture-irrigation relationship.
3. **Canal Irrigation:** Classification of canals, Canal losses, Alignment of canals, Design of stable channels using Kennedy's and Lacey's theory, Garret's diagram, Cross section of irrigation canals
4. **Lining of Irrigation Canals:** Advantages and economics of lining, Various types of lining, Design of lined canals.

MODULE-II

5. **Reclamation of Water Logged and Saline Soils:** Causes and control of water logging. Reclamation of saline and alkaline land, Surface and Sub-surface drainage.
6. **Types of Cross-Drainage Works:** Types of CD works, Selection of a suitable type to suite a particular condition, Design consideration for CD works.
7. **Diversion Head works:** Weirs and Barrages, Types of weirs and barrages, Layout of a diversion head works, Introduction to different components of a diversion head works.
8. **Design of weirs and barrages:** Bligh's creep theory, Design of weir using Bligh's theory, Lane's weighted creep theory, Khosla's theory, Khosla's method of independent variables, Exit gradient.
9. **Canal Falls:** Necessity, Proper location, Types, Design and detailing of one type of fall.

MODULE-III

10. **Gravity Dams:** Typical cross section, Various forces acting on gravity dam, Combination of forces for design, Modes of failure and criteria for structural stability, High and low gravity dam, Design of high dam, Typical section of low gravity dam.
11. **Earth Dams:** Types, Causes of failure, Preliminary section of an earth dam, Seepage control in earth dams
12. **Spillways:** Descriptive study of various types of spillways.

Reference Books:

1. Irrigation Engineering and Hydraulic Structures by S. K. Garg, Khanna Publication, New Delhi
2. Irrigation Engg. By B.C. Punmia and Pande, Laxmi Publication, New Delhi
3. Irrigation Engg. By Birdie and Das, Dhanpat Rai, New Delhi
1. Irrigation Engg. By Sharma and Sharma, S. Chanda and Company, New Delhi