7CE161 Irrigation Engineering and Hydraulic Structures

L-T-P- Cr: 3-0-0-3

Prerequisite: A Pass grade or having obtained at least 75% of the classes conducted or at least 60% attendance and a minimum of 40% marks in the course (s) Engineering Hydrology and open Channel flow (CE 126).

Objective: To impart knowledge and skills in basic principles and design of irrigation and Hydraulic

Structure. Theory: 1. Irrigation Principles and Practices: Introduction, Necessity, Advantages and disadvantages of irrigation, Types of irrigation, Methods of water distribution in the farms, Quality of irrigation water. 4 Lectures

2. Water Requirements of Crops: Soil-Plant-Water relation, Crop period, base period, Duty and Delta and their relationship, Crop seasons, optimum use of irrigation water, Irrigation efficiencies, Different methods of estimation of consumptive use, Crop Coefficients. 5 Lectures

3. Irrigation scheduling: Irrigation scheduling for both irrigated dry and wet crops, irrigation scheduling in command areas. 3 Lectures

4. Canals: Classification of Canals, Canals alignments, Distribution system for canal irrigation, Regime theories: Kennedy’s silt theory and design of channels on its basis, Lacey’s silt theory and Design of channels on its basis. 5 Lectures

5. Canal Head works: Selection of site for storage and diversion head-works, Weir and barrages, types and layout of diversion head-works and their components, Theories of seepage and Design of weirs and barrages on permeable foundations. 10 Lectures

6. Canal Falls and Outlets: Types of falls and design of vertical drop fall: Types of Canals outlets or modules. 4 Lectures 7. Cross Drainage Works: Types of C-D works, Aqueducts, Siphon Aqueducts, Super passages, Siphon super passages, level crossing. 5 Lectures

8. Introduction to Dams: Gravity dams, earth and rock-fill dams. 6 Lectures

Text Books: 1. Irrigation Engineering and Hydraulic Structures by S K Garg, Khanna Publication, Delhi. 2. Fundamentals of Irrigation Engineering by Bharat Singh: Nemchand Bros., Roorkee. 3. Irrigation Water Resources and Water Power Engineering by P.N. Modi, Standard Book House, New Delhi.

4. Irrigation, Water Power and Water Resources Engineering by K. R. Arora, Nem Chand Brothers, Delhi. 5. Irrigation Engineering by B. C. Punima, Laxmi Publication, Delhi. Reference Books: 1. Water Resources Engineering, by R.K. Linsley and J.L.H. Paulhus, McGraw Hill Book Co., New Delhi 2. Hydroelectric Handbook by W.P. Creager and J.D. Justin, John Wiley, New York.

End Semester Examination (3 Hrs.): The duration of the examination will be 3 hrs. The questions will be comprehensive, i.e. from the entire unit, may have subsections with theory and numerical with approximately 50% weight age and may / may not have choices. Minimum five questions will have to be answered.

Expected Outcome: The students will be able to know the principles of irrigation, its type and different methods of irrigation. They will be imparted the knowledge of the hydraulics structures.