6CE150 Land Drainage

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

1. INTRODUCTION: Form and nature of occurrence of water on soils- Soil moisture characteristic - Darcy’s Law and Richard’s equation – Soil Water movement above water table. 3 Lectures

2. AGRICULTURAL DRAINAGE: Needs for drainage - Drainage and crop production – Drainage to control water logging and salinity. 2 Lectures

 3. DRAINAGE SYSTEM: Components of Drainage system – Field drainage system Surface drainage system, Subsurface drainage system and Compound drainage system 3 Lectures

 4. DRAINAGE INVESTIGATION: Water table – Dissolved salts in ground water – Hydraulic conductivity – Drainage co-efficient – Flow at the junction of two drains. 10 Lectures

5. SURFACE DRAINS: Hydraulic design of surface drains and its related structures – construction and maintenance of surface drains. 4 Lectures

 6. SUBSURFACE DRAINS: Types – Design and Depth of subsurface drains esign of spacing subsurface drains. For steady state condition For unsteady state condition – Diameter of pipe drains – Grade of pipe drains – Design of envelope – Construction and maintenance – Economics of subsurface drains. 12 Lectures

7. SOIL SALINTY: Definitions – Saline, alkaline and saline – alkali soils – Drainage for salinity control – Land reclamation techniques for salt affected soils. 8 Lectures

Text Books: 1. Drainage Manual ‘US Department of the Interior, Bureau of reclamation, 1st Edition, 1978, Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi, India.

2. Drainage Principles and application, International Institute Land Reclamation and Improvement, Waganingen, The Netherland, publication No. 16, 1994 9th Revised Edition. 3. Drainage Engineering, J. N. Luthin, John Wiley & sons, New York, USA, 1966.

Reference Books: 1. Diagnosis and Improvement of saline and alkali soil, Agricultural Hand Book No. 60, US Department of Agricultural, Feb, 1954. 2. Hand book of Drainage of irrigated area in India, LBII/WAPCOS (India) Ltd., Technical Report no.5, New Delhi, March 1988. 3. Hand Book of Irrigation Technology, Vol. II, Hermah J. Finkel, CRC press, Inc. Boca Raton, Florida