CVX4347 Irrigation Engineering

Level	4
Course Code	CVX4347
Course Title	Irrigation Engineering
Credit value	3
Core/Optional	Elective (Civil Engineering)
Course Aim/s	To provide knowledge of theoretical and practical concepts of Irrigation Engineering
Course Learning Outcomes (CLO):	At the completion of this course student will be able to: CLO1: Explain the necessity of irrigation engineering; identify important aspects of irrigation, relationship between soil, plants and water, factors related to suitability of land for irrigation. [Multi-structural] CLO2: Perform laboratory experiments to visualize and understand techniques and applications of irrigation engineering. [Multi-structural] CLO3: Determine crop water requirements, field irrigation requirements and irrigation efficiencies. [Multi-structural] CLO4: Identify components of an irrigation scheme, different types of components and their features and purposes. [Relational] CLO5: Explain design aspects of irrigation structures, their construction methods and maintenance; identify data and procedures required for design of irrigation structures. [Relational] CLO6: Understand the practical applications of irrigation engineering based on a field visit. [Relational]
Content (Main topics, sub topics)	**Outline Syllabus:** Unit 1: Introduction Session 01: Introduction to Irrigation Engineering Unit 2: Irrigation Design Session 02:Crop water requirements and Irrigation duty Session 03:Data Required for design – Stream flow Session 04:Data Required for design – Topographical surveys Session 05:Data Required for design – Foundations Session 06:Data Required for design – Construction materials (Soils) Session 07:Data Required for design – Construction materials (Rock, Sand, Timber, Concrete) Unit 3: Irrigation Structures Session 08:Dams, their characteristics and selection Session 09:Conveyance System – Alignment of Canals, Canal capacities and Irrigation efficiency Session 10:Canal Design Session 11:Design of Reservoirs – Storage, Capacity and Flood studies Session 12:Design of Reservoirs – River Weirs and Gates Session 13:Diversion Structures – Design of Weirs on Permeable Foundations Unit 4: Dams Session 14:Foundations of Dams Session 15:Gravity Dams Session 16:Earth Dams – Design Criteria and design cross section Session 17:Earth Dams – Rock fill dams and diversion during construction Session 18:Earth Dams – Construction and Maintenance Unit 5: Spillways Session 19:Spillways and Open Channel Flow Session 20:Surplus works – Spillway Energy Dissipators Session 21:Overflow and Chute Spillways Session 22:Morning Glory Spillways and Construction aspects of Spillways Unit 6: Canals and Water Resource Management Session 23:Outlet works of Reservoirs

	Session 24:Conduits – Design, limiting velocity transitions and tunnels Session 25:Masonry works across Canals Session 26:Measurement of Distributed water, Land drainage and Reclamation Session 27:Water Management, Hydraulic models and Backwater **Laboratory work** 1. Discharge Rating Curve 2. Spillways 3. Callibration of Parshall Flume 4. Streamflow measurements These classes are conducted at Hydraulic Research Lab of Department of Irrigation, Jawatta Rd, Colombo 05. **Field Visit:** One day field visit to a selected Irrigation Scheme in each year.