CVX7348 Coastal Engineering and Coastal Zone Management

Level	7
Course Code	CVX7348
Course Title	Coastal Engineering and Coastal Zone Management
Credit value	3
Core/Optional	Optional (Civil Engineering)
Course Aim/s	To teach the principles of coastal engineering and coastal zone management so that the student can plan, design and implement sustainable solutions to coastal problems
Course Learning Outcomes (CLO):	At the completion of this course student will be able to: CLO1: Explain problems of coastal development in the global and Sri Lankan contexts and describe the physical, ecological and socio-economic characteristics of the Sri Lankan coast [Multi-structural] CLO2: Derive governing equations for linear waves and use the solutions to explain wave transformations in coastal waters and explain coastal currents and their impact on coastal processes [Multi-structural] [Relational] CLO3: Explain shoreline change in the context of imbalances in coastal sediment transport and describe different methods of managing shoreline change [Multi-structural] [Relational] CLO4: Develop design conditions and design coastal structures; Select suitable coastal structures [Multi-structural] [Relational] CLO5: Explain the principles and practice of Integrated Coastal Zone Management with reference to case studies from Sri Lanka [Uni-structural] [Multi-structural] [Relational] CLO6: Describe coastal disasters and their impact with reference to climate change; Describe disaster management strategies in the Coastal Zone of Sri Lanka [Multi-structural] [Relational]
	Outline Syllabus: Unit 1: Introduction Session 01: Introduction to coasts – global and Sri Lankan contexts, Resource use conflicts Session 02: Coastal geomorphology and coastal processes of Sri Lanka Session 03: Coastal ecosystems and coastal communities Unit 2: Coastal Hydrodynamics Session 04 : Linear wave theory and limitations Session 05 : Wave refraction, diffraction and shoaling Session 06 : Wave breaking and longshore current Session 07 : Tides, Tidal currents, Water exchange with estuaries Session 08 : Mixing and dispersion in coastal waters, salinity intrusion, ocean effects Unit 3: Coastal Sediment Transport and Shoreline Change Session 09 : Coastal Sediment Budget and Estimation of Longshore Transport Session 10 : Case Studies of Shoreline Change in Sri Lanka Session 11 : Management of Shoreline Change and Sand Nourishment Unit 4: Coastal Structures Session 12 : Types of coastal structures, Materials and methods of construction, Selection of coastal structures Session 13 : Design conditions for coastal structures, Estimation of design waves and water levels Session 14 : Hydrodynamic modeling in coastal waters, Hydrodynamic similitude and model tests Session 15 : Design of breakwaters, revetments and groynes Unit 5: Integrated Coastal Zone Management Session 16 : Principles of integrated CZM and Methods

	Session 17 : Land-ocean interactions in the coastal zone, Drivers of change in the coastal zone Session 18 : Institutional background to CZM in Sri Lanka, Coast Conservation Act, Coastal Zone Management Plan Session 19 : Case Studies of Coastal Zone Management in Sri Lanka Session 20 : Coastal disasters – tsunami, storm surge, cyclones, floods, storms Session 21: Disaster Management in the Coastal Zone, Implications of climate change **Designs**: Design of breakwaters, groynes and revetments **Mini-Project:** Development of a Coastal Zone Management Plan for a selected area.