GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (WATER RESOURCES ENGINEERING) (33)

COASTAL ENGINEERING

SUBJECT CODE: 2743302

M.E. 4TH SEMESTER

Type of course: Coastal Engineering

Prerequisite: Coastal hydraulics and coastal structures

Rationale: Students will be able to understand various forces exerted by waves on coastal structures. They will also be able to understand elementary design of groynes, sea wall, harbor and offshore structures.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks		Practical Marks				
L	T	P	C	ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Motion parameters – wind, tide, current and data collection and analysis.	4	10
2	Formulation of wave motion problem, assumption made in two dimensional cases, small amplitude wave theory, orbital motion and pressure, wave energy, finite amplitude wave theory, Stocke's wave theory (third order), mass transport, Gerstner theory, solitary wave theory, generation of waves, wave forecasting, decay of waves.	8	20
3	Reflection of waves, clapotis or standing waves, superposition of waves, refraction, refraction diagrams, wave fronts and orthogonal methods, diffraction of waves around semi infinite break waters, detached break water of finite length, diffraction through openings.	8	20
4	Forces on vertical walls due to non breaking waves, breaking waves and broken waves base on linear theory, forces on circular cylinders.	4	10
5	Long term and short term changes of shores, factors influencing beach characteristics , beach wave interaction, beach profile modification ,littoral drift, stability of shores, shore erosion due to sea level, on shore and off shore transport, long shore transport, interaction of shore structures, shore erosion in Kerala, mud banks.	8	20
6	Coastal structures, description and effects of break waters, sea walls, groynes of various types, beach nourishment, design of sea walls, break waters, tetra pod, tri-bar etc.	4	10
7	Harbour types and features, ship Features related to port planning, site investigation & selection, port layout, on-shore and offshore structures, cargo handling equipments, Navigational aids, Causes and occurrences of Tsunami and storms.	6	10

Reference Books:

1 Arthar, T. Ippen, Estuary and coastline hydrodynamics , McGraw Hill Book Co.(1964)
2 Alonzo Def. Quinn, Design and Construction of Ports and Marine Structures, McGraw Hill Book Company. (1972).
3 Henry F. Cornik, Dock and Harbour Engineering Vol.–I to IV, Charles Griffin & Company Ltd.London,(1988).
4 Robert, L. Weigel, Oceanographical Engineering, Prentice Hall Inc.(1964)
5 Robert M.Sorensen, Basic Coastal Engineering , Springer, (2006).
6 Ojha S. P. Docks and Harbour engineering., Fourth revised and enlarged edition

Course Outcome:
After learning the course the students should be able:

Students will be able to design groynes, sea wall, harbor and offshore structures. They will also be able to understand wave theory, break water and various forces acting on coastal structures.

List of Tutorials:

1. Study of parameter of coastal engineering and planning
2. Wave theory
3. Related diff-shore structures
4. Shore erosion and coastal protection
5. Coastal structure and pair design parameter
6. Port-layout and planning as per ship serape
7. Tsunami & Storms
8. Negotiation Aids

List of Open Source Software/learning website:

https://en.wikipedia.org/wiki/**Coastal_engineering**
www.journals.elsevier.com/**coastal-engineering**

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.