

Academic Course Description

<p>BHARATH UNIVERSITY Faculty of Engineering and Technology Department of Civil Engineering</p> <p>BCE076-COASTAL ENGINEERING Sixth Semester, 2016-17 (Even Semester)</p>

Course (catalog) description

To provide an overview of the analysis and design procedures used in the field of coastal engineering.

To introduce the processes of including coastal and estuarine circulation, coastal and shelf waves, surf zone hydrodynamics, sediment transport, hurricane-induced storm surge and inundation, beach nourishment etc .

To enable students apply these engineering principles to solve the problems in this environment such as shoreline erosion, natural flooding hazards, water quality deterioration and coastal habitat evanescence.

Compulsory/Elective course : Elective for Civil students

Credit / Contact hours : 3 credits /45 hours

Course Coordinator : Ms.B.Kaviya, Assistant Professor

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@bharathuniv.ac.in)	Consultation
Ms.B.Kaviya	Final year Civil	Civil Block		kaviyacivil@bharathuniv.ac.in	9.00 - 9.50 AM

Relationship to other courses:

Pre –requisites : BCE 304 Fluid Mechanics

Assumed knowledge : Basic knowledge in Wave Forecasting and harbor design

Following courses : NIL

Syllabus Contents

UNIT I WAVES GENERATION, PROPAGATION AND FORCE 9

Definition – Wave classification – Linear theory of waves- Assumptions and derivations of relationship of wave characteristics- Pressure within progressive wave- Wave energy -Fundamental aspects of stokes theory..

UNIT II WAVE FORECASTING 9

Need for forecasting – SMB and PNJ methods of wave forecasting.

UNIT III TIDES 9

Origin and classification of tides - Karwin’s equilibrium theory of tides- Effects on structure -Seiches, surges and Tsunamis.

UNIT IV SEDIMENT MOVEMENT 8

Types of sediment movement – Types of beaches and beach profile – long shore drift and its engineering significance – Causes of coastal erosion and methods of protection.

UNIT V HARBOURS 10

Classification - types of their requirements – Requirements of modern port -Selection of site. BreakWater and their types of selection - Functional design of entrance Channel and breakwaters- Dredging - Need & types of selection of dredgers.

TEXT BOOKS:

Garrison .T, "Oceanography", Wadsworth Publications, 4th edition, 2002.

REFERENCE:

1. Sorenson .R. M, "Coastal Zone Engineering", Chapman & Hall, 3rd edition, 2006. Wiegand. R.L., Oceanographical Engineering Prentice Haff, Englewood Cliff's, New Jersey, 1964.
2. Mutreja K N, Applied Hydrology, Tata McGraw Hill Publications, New Delhi, 1998.

Computer usage: NIL

Professional component

General	-	0%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	100%

Broad area: Harbour design | Sediment transport

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 1 st week	Session 1 to 14	2 Periods
2	Cycle Test-2	March 2 nd week	Session 15 to 28	2 Periods
3	Model Test	April 2 nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

This Course is to introduce the principles of various surveying methods and applications to Civil Engineering projects.	Correlates to program outcome		
	H	M	L
1. To provide an overview of the fundamental principles of ocean science and technology.	a		

2. To provide the background needed to undertake coastal oceanographic investigations and sets them in context by incorporating case studies and sample problems based on local and global examples	a	c	
3. To facilitate students to work across disciplinary boundaries and develop an approach that will enable them to incorporate human society in their exploration and analysis of coastal areas.	a,f	j	
4. To be able to “see” the features and components of the natural, engineering and human aspects of the coast, the functions of components and relationship between them.	a		
5. To provide students understanding of the materials and processes associated with the major natural natural and artificial harbours.	a		

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I WAVES GENERATION, PROPAGATION AND FORCE			
1.	Definition – Wave classification	NO	[T1, R2]
2.	Linear theory of waves-	NO	
3.	Assumptions and derivations of relationship of wave characteristics	NO	
4.	Assumptions and derivations of relationship of wave characteristics	NO	
5.	Pressure within progressive wave	NO	
6.	Pressure within progressive wave	NO	
7.	Wave energy	NO	
8.	-Fundamental aspects of stokes theory.	NO	
9.	-Fundamental aspects of stokes theory.	NO	
UNIT II WAVE FORECASTING			
10.	Need for forecasting	NO	[T1, R1 & R2]
11.	Need for forecasting	NO	
12.	SMB and PNJ methods of wave forecasting.	NO	
13.	SMB and PNJ methods of wave forecasting.	NO	
14.	SMB and PNJ methods of wave forecasting.	NO	
15.	SMB and PNJ methods of wave forecasting.	NO	
16.	SMB and PNJ methods of wave forecasting.	NO	
17.	SMB and PNJ methods of wave forecasting.	NO	
18.	SMB and PNJ methods of wave forecasting.	NO	

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT III TIDES			
19.	Origin and classification of tides	NO	[T1, R1]
20.	Origin and classification of tides	NO	
21.	Karwin's equilibrium theory of tides	NO	
22.	Karwin's equilibrium theory of tides	NO	
23.	Karwin's equilibrium theory of tides	NO	
24.	Effects on structure -	NO	
25.	Seiches, surges	NO	
26.	Seiches, surges	NO	
27.	Tsunamis.	NO	
UNIT IV SEDIMENT MOVEMENT			
28.	Types of sediment movement	NO	[T1, R1,R2]
29.	Types of beaches and beach profile	NO	
30.	Types of beaches and beach profile	NO	
31.	long shore drift and its engineering significance	NO	
32.	long shore drift and its engineering significance	NO	
33.	Causes of coastal erosion and methods of protection	NO	
34.	Causes of coastal erosion and methods of protection	NO	
35.	Causes of coastal erosion and methods of protection	NO	
UNIT V HARBOURS			[T1, R1]
36.	Classification	NO	
37.	types of their requirements –	NO	
38.	Requirements of modern port	NO	
39.	Selection of site	NO	
40.	BreakWater and their types of selection -	NO	
41.	Functional design of entrance Channel and breakwaters-	NO	
42.	Functional design of entrance Channel and breakwaters-	NO	
43.	Dredging	NO	
44.	Need & types of selection of dredgers.	NO	
45.	Need & types of selection of dredgers.	NO	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	5%
assignment	-	5%
Attendance	-	10%
Final exam	-	70%

Prepared by: Ms.B.Kaviya, Assistant Professor , Department of Civil

Dated :

Addendum**ABET Outcomes expected of graduates of B.Tech / Civil / program by the time that they graduate:**

- a. An ability to apply knowledge of mathematics, science, and engineering
- b. An ability to design and conduct experiments, as well as to analyze and interpret data
- c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- d. An ability to function on multidisciplinary teams
- e. An ability to identify, formulate, and solve engineering problems
- f. An understanding of professional and ethical responsibility
- g. An ability to communicate effectively
- h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- i. A recognition of the need for, and an ability to engage in life-long learning
- j. A knowledge of contemporary issues
- k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives**PEO1: PREPARATION**

Civil Engineering graduates will have knowledge to apply the fundamental principles for a successful profession and/or for higher education in Civil Engineering based on mathematical, scientific and engineering principles, to solve realistic and field problems that arise in engineering and non engineering sectors

PEO2: CORE COMPETENCE

Civil Engineering graduates will adapt to the modern engineering tools and construction methods for planning, design, execution and maintenance of works with sustainable development in their profession.

PEO3: PROFESSIONALISM

Civil Engineering Graduates will exhibit professionalism, ethical attitude, communication and managerial skills, successful team work in various private and government organizations both at the national and international level in their profession and adapt to current trends with lifelong learning.

PEO4: SKILL

Civil Engineering graduates will be trained for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS

Civil Engineering graduates will be installed with ethical feeling, encouraged to make decisions that are safe and environmentally-responsible and also innovative for societal improvement.

Course Teacher	Signature
Ms.B.Kaviya	

Course Coordinator

HOD/CIVIL