



3170623 Port and Harbor Engineering

SEMESTER: 7



CIVIL ENGINEERING DEPARTMENT

GOVERNMENT ENGINEERING COLLEGE - DAHOD

Academic Year: 2022-23

:: VISION STATEMENT OF THE INSTITUTE ::

To be a value-based engineering institute to disseminate globally acceptable education and nurturing research, innovation and entrepreneurship.

:: MISSION STATEMENTS OF THE INSTITUTE ::

1. To provide quality education in the engineering disciplines through creative balance of academics and extracurricular programs.
2. To provide learning environment for innovation and entrepreneurship.
3. To disseminate ethical values, social values and sensitivity towards environmental issues.

:: VISION STATEMENT OF THE CIVIL ENGINEERING DEPARTMENT ::

To be a recognized department in the field of civil engineering education to produce professional civil engineers, innovators and entrepreneurs for the development of the society.

:: MISSION STATEMENTS OF THE CIVIL ENGINEERING DEPARTMENT ::

1. To provide quality education to civil engineering undergraduates through creative balance of academic, professional and extra-curricular activities.
2. To impart knowledge in the field of civil engineering for the development of infrastructure facilities with environmental concern for betterment of the society.

3. To contribute in the nation's development through innovative ideas in the field of civil engineering.

:: PROGRAM OUTCOMES (POs) ::

Program Outcomes (POs) as identified by National Board of Accreditation (NBA), India are the attributes that the students are expected to attain at the point of graduation. Following are the POs of B.E Civil Engineering program:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The Engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

:: PROGRAM SPECIFIC OUTCOMES (PSOs) ::

Program Specific Outcomes (PSOs) are what the graduates of a specific undergraduate engineering program should be able to do at the time of graduation.

Civil Engineering Graduates shall have

PSO 1: Ability to analyze, design and rehabilitate the infrastructural projects of civil engineering.

PSO 2: Ability to use advanced civil equipment, software, techniques and work seamlessly in teams.

PSO 3: Ability to apply gained knowledge to choose from the innovative career paths, to be an entrepreneur, and a zest for higher studies.

:: PROGRAMME EDUCATION OBJECTIVES (PEOs) ::

Program Educational Objectives (PEOs) describe the career and professional accomplishments that programs are preparing graduates to attain within a few years (3-5 years) of graduation.

Following are the PEOs of B.E Civil Engineering Program:

1. Establish themselves as civil engineering professionals in government, public and private sectors
2. Manage infrastructural and sanitary facilities
3. Solve real world problems environmental concerns to serve society
4. Adapt to changing trends in analysis and design of civil engineering structures.
5. To do testing, survey and planning of civil engineering structures using modern tools

:: COURSE OUTCOMES (COS) ::

Course Outcomes are narrower statements that describe what students are expected to know, and be able to do at the end of each course. These relate to the skills, knowledge, and behaviour that students acquire in their matriculation through the course.

PROGRAM NAME: B.E. CIVIL ENGINEERING		
COURSE NAME: 3170623 Port and Harbor Engineering		
SEMESTER: 7	A.Y 2021-22	Weightage %
3170623.1	understand important planning concepts of harbor and ports	30%
3170623.2	know important functional components of harbor and ports	30%

3170623.3	understand important design concepts of harbor and ports components	40%
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DISTRIBUTION OF THEORY MARKS					
R Level	U Level	A Level	N Level	E Level	C Level
15%	15%	20%	20%	15%	15%

Legends: **R**: Remembrance; **U**: Understanding; **A**: Application; **N**: Analyze; **E**: Evaluate **C**: Create and above Levels (As per revised Bloom's Taxonomy)

:: TEACHING AND EXAMINATION SCHEME ::

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE (V)	PA (I)		
3	1	0	4	70	30	0	0	100

ESE - END SEMESTER EXAMINATION, **PA** - PROGRESS ASSESSMENT, **ALA** - ACTIVE LEARNING ASSIGNMENTS, **OEP** - OPEN ENDED PROBLEM

:: LABORATORY / TUTORIAL PLANNING ::

Sr. No.	Content	Topic Name	Planning Date	Actual Date
1	Tutorial – 1	CO1-Understand Important Planning Concepts Of Harbor And Ports	20-Jul-22	
2	Tutorial – 2		27-Jul-22	
3	Tutorial – 3		3-Aug-22	
4	Tutorial – 4		10-Aug-22	
5	Tutorial – 5		17-Aug-22	
6	Tutorial – 6	CO2-Know Important Functional Components Of Harbor And Ports	24-Aug-22	
7	Tutorial – 7		7-Sep-22	
8	Tutorial – 8		14-Sep-22	
9	Tutorial – 9		21-Sep-22	
10	Tutorial – 10		28-Sep-22	
11	Tutorial – 11	CO-3 Understand Important Design Concepts Of Harbor And Ports Components	5-Oct-22	
12	Tutorial – 12		12-Oct-22	
13	Tutorial – 13		19-Oct-22	

:: REFERENCE BOOKS ::

1. Dr. S. K. Khanna, M.G.Arora and S.S. Jain, Airport Planning & Design, Nem Chand & Bros.,Roorkee
2. IS Codes: 4651 (Part I to V), 7314, 9527 (Part I, III, IV, VI), 10020 (Part IV).
3. R. Srinivasan and S. C. Rangwala, Harbour, Dock and Tunnel Engineering, 1995, Charotar Pub.House, Anand
4. S. P. Bindra, A Course in Docks and Harbour Engineering, 1992, DhanpatRai& Sons, NewDelhi
5. Alonzo Def. Quinn, Design and Construction of Ports and Marine Structure, McGraw - Hill Book Company, New York

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:: INDEX ::

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BE- 7th SEMESTER

3170623 _Port and Harbor Engineering

CO1- Understand important planning concepts of harbour and ports	
Tutorial 1	Date: 20-Jul-22

1. Enlist and explain the major sea ports in India and in Gujarat also.
2. What is the significance of water transportation compare to other modes of transportation? Explain in detail.
3. Give a brief History of Water Transportation in India
4. Give Advantages and Disadvantages of Water Transportation
5. Write a Short note on Inland Water Transportation in India
6. Draw the schematic diagram of harbour layout showing all components
7. Distinguish between Port and Harbour
8. Explain the following terms with neat sketch artificial Harbour natural Harbour semi natural Harbour

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CO1- Understand important planning concepts of harbour and ports	
Tutorial 2	Date : 27-Jul-22

1. What are requirements of good Harbour
2. What are the factors to be considered while selecting Harbour
3. Write a note on harbour classification
4. Write a note on Port classification
5. Explain Harbour dimensioning in Detail
6. Write a note on ship characteristics and define various terms

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CO- Understand important design concepts of harbor and ports components	
Tutorial 3	Date: 3-Aug-22

1. How the water waves are generated? Explain by drawing sketch shallow waves and deep waves
2. What are Important Wind Characteristics and explain Beaufort scale and its use
3. Describe wave breaking phenomenon on SEA structures explain the effects of these forces on SEA structure
4. Briefly explain the generation and movement of sea waves How length, period and velocity are related
5. Write short notes on littoral drift, wind rose, wave rose tidal datums,
6. Explain how tides are produced explain various types of ocean currents

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CO1- Understand important planning concepts of harbour and ports	
Tutorial 4	Date: 10-Aug-22

1. Explain with neat diagram the action of various forces under the influence of wave
2. Write a short note Transshipment Ports
3. Explain Port of call
4. Write a note on Fundamental Principles of Traffic Demand Forecasting
5. Which points should be included in method for forecasting of traffic demand
6. Explain qualitative method of traffic forecasting
7. Explain quantitative method of traffic forecasting

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CO1- Understand important planning concepts of harbour and ports	
Tutorial 5	Date: 17-Aug-22

1. Write a note on Cargo Handling Capacity of Port
2. Write a note on Surveys to be carried out for seaport planning
3. How cargo handling capacity of port is determined
4. Write a note on Port administration
5. Explain wave velocity, fetch, wave height and wave length
6. Explain with neat sketch Refracted wave action
7. .What is wave Reflection
8. Explain with neat sketch Breaking wave action

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CO2- know important functional components of harbor and ports	
Tutorial 6	Date: 24-Aug-22,

1. Explain the necessity for providing dock distinguish between Harbour dock and tidal basin .
2. What are the repair Docks classify different types of repair Docks what is grieving Docks
3. Explain the method of dry docking
4. What is floating dock give its advantages and disadvantages
5. What are slipways explain the functions of its component parts
6. Explain the operation of lock gates

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CO2- know important functional components of harbor and ports	
Tutorial 7	Date: 7-Sep-22,

1. What are different types of lockets gates explain with neat sketch
2. Why are fenders provided draw a neat sketch of wooden and rubber fender
3. What is need of break water explain its various types with neat sketch
4. Write short notes with neat sketch on wharf,
5. Write short notes with neat sketch on jetty,
6. Write short notes with neat sketch on moles,

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CO2- know important functional components of harbor and ports	
Tutorial 8	Date: 14-Sep-22,

1. Write short notes with neat sketch on trestle,
2. Write short notes with neat sketch on Quay walls
3. Write short notes with neat sketch on dolphins,
4. Write short notes with neat sketch on piers
5. What is ferry describe different types of ferry
6. Write a short note on transfer bridge

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CO2- know important functional components of harbor and ports	
Tutorial 9	Date: 21-Sep-22,

1. What are floating landing stages what are its uses
2. Explain with neat sketches warehouse,
3. Explain with neat sketches apron,
4. Explain with neat sketches cold storage,
5. Explain with neat sketches transit shed
6. Write short notes on Lighthouse

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CO2- know important functional components of harbor and ports	
Tutorial 10	Date: 28-Sep-22

1. Write short notes on Beacon lights ,Lights on piers Wharf and dolphin
2. Write short notes on Bouys with neat sketch
3. Write short notes on Lightships with neat sketch
4. What are are requirements of good signal a short note on LORAN and RADAR with neat sketch
5. What is necessity and Purpose of dredging of explain different types of dredgers with neat sketch
6. What are causes of beach erosion
7. Write short notes on
 - Bulk heads
 - Groynes
 - Revetment

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CO3- Understand important design concepts of harbor and ports components	
Tutorial 11	Date: 05-Oct-22

1. Explain the effect of current on Moored Vessels
2. Write a note on coastal sediment Transport
3. What are the design considerations of Mound Type of Breakwater
4. write a note on design of Fenders
5. Describe Economic evaluation of Port
6. Write a note on impact of water quality by Port activities and its mitigation measures

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C03- Understand important design concepts of harbor and ports components	
Tutorial 12	Date: 12-Oct-22

1. Write a note on impact of Air quality by Port activities and its mitigation measures
2. Write a note on impact of Noise quality by Port activities and its mitigation measures
3. Write a note on impact of Ecology by Port activities and its mitigation measures
4. Write a note on impact of Land and soil by Port activities and its mitigation measures
5. Write a note on LOADS, FORCES AND STRESSES (GENERAL DESIGN CONSIDERATIONS) IS 4651 Please mention page no and year of Code

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Write one page summary of Research Papers for any three of the following topics

CO3- Understand important design concepts of harbor and ports components

Tutorial 13	Date: 19-Oct-22
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1. Forecasting of Cargo, Passengers for the Seaport
2. Windrose diagram and wave rose diagram
2. Lay out planning of Seaport
3. Components design of Seaport Infrastructure using IS codes
4. Dredging computation for the seaport area
5. Economic evaluation of the Port
6. Environmental impact analysis of the Port area