

B.E. Semester: VI

Department of Civil Engineering

Subject Name: Docks, Harbour and Airport Engineering (CV606-N-B)

Course Category: Program Course Core (PCE)

A. Course objective:

- To have an overall knowledge of the design and construction of airport, docks, harbours and ports as a whole
- To understand the function of different components of airports, docks and harbours

B. Teaching /Examination Scheme:

Teaching Scheme				Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		IE	CIA	Pra/Viva	
hrs	hrs	hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
3	1	0	4	4	3	70	30	20	30	150

C. Detailed Syllabus:

Docks and Harbour

1. General:

Advantages and Disadvantages of Water Transportation, Elements of Water Transportation, Classification of Harbours, Ports Development in India, Port Authorities, Bodies and Association

2. Harbour Planning:

Selection of Site and Planning of Harbours, Ship Characteristics, Characteristics of Good Harbour, Size of Harbour

3. Natural Phenomena:

Tides, Wind, Water Waves, Currents Phenomena, Characteristics and Effects on Marine Structures, Littoral Drift

- 4. Marine Structure:**
General Design Aspects, Breakwaters - Function, Types General Design Principles, Wharves, Jetties, Piers, Dolphin, Fenders, Mooring Accessories
- 5. Navigation Aids:**
Necessity, Types of navigation aids, Requirement of signals, Fixed and floating navigation aid
- 6. Docks and Repair Facilities:**
Harbour Docks, Wet Docks, Repair Docks, Lift Docks, Floating Docks, Slipways
- 7. Port Facilities and Dredging:**
Port Building Facilities, Transit Sheds, Warehouses, Cargo Handling Facility, Services for Shipping Terminals, Classification of Dredging Works, Types of Dredgers, Uses of Dredged Material
- 8. Coastal Protection:**
Sea wall, Revetment, Bulkhead, Cathodic Protection

Airport Engineering

- 9. General:**
History, National Airport Authority, Air Craft's and its Characteristics, Airport Classifications
- 10. Air Port Planning:**
Objective, FAA Recommendation for Master Plan, Regional Planning, Data Required before Site Selection, Airport Site Selection, Surveys for Site selection, Estimation of Future Air Traffic Needs
- 11. Run Way Design:**
Runway Orientation, Wind Rose, Basic Runway Length, Runway Geometric Design
- 12. Taxiway Design:**
Controlling Factors, Geometric Design Standards, Exit Taxiways
- 13. Terminal Area Design:**
Building Function, Site Location, Passenger and Baggage Flow Chart, Parking Area, Apron, Hanger

14. Airport Grading and Drainage:

Grading –Purpose, Computation of Earthwork Drainage – Requirement, Design Surface and Subsurface Drainage System

15. Visual Aids:

Airport Marking, Airport Lighting

16. Air Traffic Control:

Need of Air Traffic Control, Air Traffic Control Network, Air Traffic Control Aids

D. Lesson Planning:

Unit No	Title of the Unit	Minimum Hours	Weightage (%)
1	Docks and Harbour, Airport Engineering, General	2	05
2	Harbour Planning	3	05
3	Natural Phenomena	3	05
4	Marine Structure	3	10
5	Navigation Aids	4	10
6	Docks and Repair Facilities	3	05
7	Port Facilities and Dredging	3	05
8	Coastal Protection	2	05
9	Air Port Planning	3	05
10	Run Way Design	4	10
11	Taxiway Design	4	10
12	Terminal Area Design	4	10
13	Airport Grading and Drainage	3	05
14	Visual Aids, Air Traffic Control	4	10
Total:		45	100

E. List of Practical/Assignments:

- Minimum 10 theory questions from each unit

F. Instructional method and pedagogy (Continuous Internal Assessment Scheme CIA):

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures, practical and tutorial which carry 05 marks.
- At regular intervals assignments is given. In all, a student should submit all assignments of 05 marks each.
- Classroom participation and involvement in solving the problems in tutorial rooms carries 05 marks.
- Viva voce will be conducted at the end of the semester of 05 marks.
- One internal exam of 30 marks is conducted as a part of mid semester evaluation.

G. Students Learning Outcomes:

- The students will gain an experience in the implementation of docks, harbour and airport engineering on engineering concepts which are applied in field of water and air transportation engineering
- The students will get a diverse knowledge of docks, harbour and airport engineering practices applied to real life problems
- The students will learn to understand the theoretical and practical aspects of docks, harbour and airport engineering along with the design and management applications

H. Recommended Study Materials:

a. Text Books:

1. Alonzo Def. Quinn, Design and Construction of Ports and Marine Structure, McGraw - Hill Book Company, New York
2. Ashford N. And Wright P. H., Airport Engineering, John Wiley and Sons, Inc., New York
3. Horonjeff R and Mackelvey F. X., Planning and Design of Airports fourth Intl, Edition, McGraw Hill book Co., New Delhi
4. Dr. S. K. Khanna, M. G. Arora and S. S. Jain, Airport planning & Design, Nem Chand & Bros., Roorkee

5. S. P. Bindra A Course in Docks and Harbour Engineering, 1992, Dhanpat Rai & Sons, New Delhi
6. R. Srinivasan and S. C. Rangwala, Harbour, Dock and Tunnel Engineering, 1995, Charotar Pub House, Anand
7. G. V. Rao Airport Engineering, Tata McGraw Hill Pub. Co., New Delhi

b. Indian Standards:

1. IS:4651, Indian standard Code of practice for planning and design of ports and harbour, Bureau of Indian Standards, New Delhi
2. Airport planning and terminal designing-ICAO and Ministry of civil aviation

c. Web Materials:

1. <http://www.faa.gov/airport>
2. <http://www.dphu.org/uploads/attachments/books>