

B.E. (Civil) Semester: VI

Subject Name: DOCKS, HARBOUR AND AIRPORT ENGINEERING (CV602)

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				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract/ Tut.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	02	00	05	05	03	70	30	20	30	150

C. Detailed Syllabus

Module I : Docks

1 General

History, Advantages and disadvantages of water transportation, Modern trends in water transportation, Elements of water transportation, Historical development in India, 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, Quays, Jetties, Piers, Pier heads, 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

Harbor docks, Wet docks, Repair docks, Lift docks, Floating docks, Slipways

7 Port Facilities

Port building facilities, Transit sheds, Warehouses, Cargo handling facility, Services for

shipping terminals ,Inland port facilities planning

8 Dredging

General ,Classification of dredging works, Types of dredgers, Uses of dredged material ,Execution of dredging work

9 Coastal Protection

Sea wall, Revetment ,Bulkhead, Cathodic Protection

Module II : Air port Engineering

10 General

History ,National airport authority, Air craft's and its characteristics, Air port classifications

11 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

12 Run Way Design

Runway orientation, Wind rose ,Basic runway length, Runway geometric design `

13 Taxiway Design

Controlling factors, Geometric design standards, Exit taxiways, Separation clearance, Turnaround or bypass taxiway

14 Terminal Area Design

Building function ,Site location, Passenger and baggage flow chart ,Parking area ,Apron, Hanger,

15 Airport Grading and Drainage

Grading –purpose, Computation of earthwork Drainage-requirement ,Design surface and subsurface drainage system

16 Visual Aids

Airport marking, Airport lighting

17 Air Traffic Control

Need of Air traffic control, Air traffic control network, Air traffic control aids

D. Lesson Planning

Sr. No.	Title of the Unit	Minimum Hours	Weightage%
1.	Docks and Harbour, Airport Engineering, General	2	5
2.	Harbour Planning	2	5
3.	Natural Phenomena	5	10
4.	Marine Structure	4	10

5.	Navigation Aids	5	10
6.	Docks and Repair Facilities	2	5
7.	Port Facilities	2	5
8	Dredging	2	5
9	Coastal Protection	2	5
AIRPORT ENGINEERING,			
11	Air Port Planning	3	5
12	Run Way Design	5	10
13	Taxiway Design	5	10
14	Terminal Area Design	2	5
15	Airport Grading and Drainage	2	5
16	Visual Aids, Air Traffic Control	2	5
		45	100

E. List of Tutorial

1	Introduction, Harbour Planning, Natural Phenomena
2	Marine Structure, Navigation Aids
3	Docks and Repair Facilities, Port Facilities
4	Dredging, Coastal Protection
5	Air Port Planning ,Run Way Design
6	Taxiway Design, Terminal Area Design
7	Airport Grading and Drainage, Visual Aids, Air Traffic Control

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 and practical which carries marks.
- At regular intervals assignments will be given. Students should submit all assignments during given period.
- Classroom participation and involvement in solving the problems in Tutorial rooms Carries Marks

- Internal exam of 30 marks will be conducted as a part of Mid semester evaluation.
- Experiments shall be performed in the field related to course contents.
- The course includes a practical, where students have an opportunity to build an appreciation for the concept being taught in lectures.

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

Reference 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