

Branch Name:	Civil Engineering
Semester/Year:	Semester VII / Forth Year
Subject Title:	Dock, Harbour and Airport Engineering (Elective - II)
Subject Code:	1ET1060705
Pre-requisite:	Design and Construction and Maintenance of Dock Harbour and Airport Engineering.

Course Objective:

- To give knowledge of design and construction and maintenance of Dock Harbour and Airport Engineering.
- To know the fundamentals of planning of various marine structures
- To understand the fundamentals of planning of Airport structures.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
03	02	00	05	70	30	-	-	100

Subject Contents			
Sr. No	Topic	Total Hours	Weightage (%)
A	DOCK HARBOUR ENGINEERING		
1	General: History of water transportation at world level and at national level development and policy, classification of harbours, natural and artificial. Major ports in India, administrative set up.	01	03
2	Harbour Planning: Harbour components, ship characteristics, characteristics of good harbour and principles of harbour planning, size of harbour, site selection criteria and layout of harbours. Surveys to be carried out for harbor planning.	03	07
3	Natural Phenomena: Wind, waves, tides formation and current phenomena, their generation characteristics and effects on marine structures, silting, erosion and littoral drift.	03	07
4	Marine Structures: General design aspects, breakwaters – function types general design principles, wharves, quays, jetties, piers, pier heads, dolphin, fenders, mooring accessories – function, types, suitability, design and construction features.	06	14

5	Docks and Locks: Tidal basin, wet docks-purpose, design consideration, operation of lock gates and passage, repair docks - graving docks, floating docks.	03	07
6	Port Amenities and Navigational Aids: Ferry, transfer bridges, floating landing stages, transit sheds, warehouses, cold storage, aprons, cargo handling equipments, purpose and general description, Channel and entrance demarcation, buoys, beacons, light house electronic communication devices.	03	07
7	Harbour Maintenance: Costal protection-purpose and devices, dredging, purpose, methods, dredgers-types, suitability, disposal of dredged materials .mechanical and hydraulic dredgers.	02	05
B	AIRPORT ENGINEERING		
1	General: History, development, policy of air transport, aircrafts, aerodromes, air transport authorities, air transport activities, air crafts and its characteristics, airport classifications as per ICAO.	02	05
2	Airport Planning : Regional planning-concepts and advantages, location and planning of airport as per ICAO and F.A.A. recommendations, airport Elements - airfield, terminal area, obstructions, approach zone,zoning laws, airport capacity, airport size and site selection, estimation of future air traffic, development of new airport, requirements of an ideal airport layout.	05	10
3	Run Way Design: Wind rose and orientation of runway ,wind coverage and crosswind component, factors affecting runway length, basic runway length, and corrections to runway length, runway geometrics and runway patterns (configurations).Runway marking, threshold limits cross section of runway	04	10
4	Taxiway Design: Controlling factors, taxiway geometric elements, layout, exit taxiway, location and geometrics, holding apron, turnaround facility. Aprons - locations, size, gate positions, aircraft parking configurations and parking systems ,hanger-site selection, planning and design considerations, Fuel storage area, blast pads . wind direction indicator	03	10
5	Terminal Area Design: Terminal area elements and requirements, terminal building functions, space requirements, location planning concepts, vehicular parking area and Circulation network. passenger requirements at terminal building	03	05
6	Grading and Drainage : Airport grading-importance – operations, airport drainage aims,functions, special characteristics, basi requirements, surface and subsurface drainage systems.	02	05
7	Air Traffic Control and Visual Aids: Air traffic control- objectives, control system,control network-visual aids-landing information system, airport markings and lighting.	02	05

Course Outcome:

After learning the course the students should be able to:

- To make students aware of design of runway and taxiways at Airport
- To make students aware of the operations at Airport
- To give knowledge of design and construction and maintenance of Dock Harbour and Airport Engineering.
- To understand the various elements of Harbour and Airport

List of Reference Books:

1. R. Srinivasan and S. C. Rangwala, Harbour, Dock and Tunnel Engineering, 1995, Charotar Pub.House, Anand
2. Dr. S. K. Khanna, M.G.Arora and S.S. Jain, Airport Planning & Design, Nem Chand & Bros.,Roorkee
3. Airport Engineering, Charotar Publishing House Pvt. Ltd, Anand
4. G.V. Rao Airport Engineering, Tata McGraw Hill Pub. Co., New Delhi
5. Airport Engineering, Charotar Publishing House Pvt. Ltd, Anand

Technical Visit:

1. The visit of any harbour and port structure should be carried out to understand the various structures, its construction and operations.
2. The visit of Airport site should be carried out to understand the various structures, its construction and operations.

E-Resources (If any):

<http://nptel.ac.in/>