GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

CIVIL ENGINEERING

Subject Name: **DOCK, HARBOUR & AIRPORT ENGINEERING**

Sr. No.	Course Contents	Total Hrs
I	**DOCKS & HARBOUR ENGINEERING**	24
	General: History, development and policy, classification of harbours, major ports in India, administrative set up, harbour economics	
	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.	
	Natural Phenomena: Wind, waves tides and currents phenomena, their generation characteristics and effects on marine structures, silting, erosion and littoral drift.	
	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.	
	Docks and Locks: Tidal basin, wet docks-purpose, design consideration, operation of lock gates and passage, repair docks - graving docks, floating docks, marine railway.	
	Port Amenities: Ferry, transfer bridges, floating landing stages, transit sheds, ware houses, cold storage, aprons, cargo handling equipments, purpose and general description.	
	Navigation Aids: Channel and entrance demarcation, buoys, beacons, light house electronic communication devices.	
	Harbour Maintenance: Costal protection-purpose and devices, dredging-capital and maintenance dredging, purpose, methods, dredgers-types, suitability, disposal of dredged material.	
II	**AIRPORT ENGINEERING**	24
	General: History, development, policy of air transport, aircrafts, aerodromes, air transport authorities, air transport activities, air crafts and its characteristics, air port classifications	
	Air Port Planning : Regional planning-concepts and advantages, location and planning of airport elements-airfield, terminal area, obstructions, approach zone, zoning laws, airport capacity, air port size and site selection, estimation of future air traffic, development of new airport, requirements of an ideal airport layout.	
	Run Way Design: Wind rose and orientation of runway, factors affecting runway length, basic runway length, and corrections to runway length, runway geometrics and runway patterns (configurations).	
	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 and erosion control.	
	Terminal Area Design: Terminal area elements and requirements, terminal building functions, space requirements, location planning concepts, vehicular parking area and circulation network.	
	Grading and Drainage : Air port grading-importance - operations, airport drainage-aims, functions, special characteristics, basic requirements, surface and subsurface drainage systems.	
	Air Traffic Control and Visual Aids: Air traffic control-objectives, control system, control network-visual aids-landing information system, airport markings and lighting.	

Note: Each Module carries equal weightage
Term work based on above mentioned syllabus

Text Books:

1. Dr. S. K. Khanna, M.G.Arora and S.S. Jain, Airport Planning & Design, Nem Chand & Bros., Roorkee
2. G.V. Rao Airport Engineering, Tata McGraw Hill Pub. Co., New Delhi
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, Dhanpat Rai & Sons, New Delhi

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 Horonjeff R and Mackelvey F.X., Planning and Design of Airports fourth Intl. edition, McGraw Hill Book Co., New Delhi