GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEMESTER : VII

CIVIL ENGINEERING

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

	Course Content
A. HARBOUR ENGINEERING	
1	**General:** History, development and policy, harbour and development policy port, classification of harbours, major ports in India, administrative set up, harbour economics,
2	**Harbour Planning:** Harbour components, ship characteristics, characteristics of good harbour, and principles of habour planning, size of harbour, site selection criteria and layout of harbours.
3	**Natural Phenomena:** Wind, waves tides and currents phenomena, their generation characteristics and effects on marine structures, silting, erosion and littoral drift.
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.
5	**Docks and Locks:** Tidal basin, wet docks-purpose, design consideration, operation of lock gates and passage, repair docks - graving docks, floating docks, marine railway.
6	**Port Amenties:** Ferry, transfer bridges, floating landing stages, transit sheds, ware houses, cold storage, aprons, cargo handling equipments, purpose and general description.
7	**Navigation Aids:** Channel and entrance demarcation, buoys, beacons, light house electronic communication devices.
8	**Harbour Maintenance:** Costal protection-purpose and devices, dredging-capital and maintenance dredging, purpose, methods, dredgers-types, suitability, disposal of dredged material.
B. AIRPORT ENGINEERING	
1	**General:** History, development, policy of air transport, aircrafts, aerodromes, air transport authorities, air transport activities, air crafts and its characteristics, air port classifications.
2	**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.

3	**Run Way Design:** Wind rose and orientation of runway, factors affecting runway length, basic runway length, corrections to runway length, runway geometrics, and runway patterns (configurations).
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 and erosion control.
5	**Terminal Area Design :** Terminal area elements and requirements, terminal building functions, space requirements, location planning concepts, vehicular parking area and circulation network.
6	**Grading and Drainage :** Air port grading-importance operations, earthwork computations, airport drainage-aims, functions, special characteristics, basic requirements, surface and subsurface drainage systems.
7	**Air Traffic Control and Visual Aids :** Air traffic control-objectives, control system, control network-visual aids-landing information system, airport markings and lighting.

Field Visit:

Field visits based on course content are suggested.

Reference Books:

1 Port planning , design , operation and maintenance by T. Sinker
2 Docks, harbours and tunneling by R. Srinivasan
3 Airport Engineering by Rangwala S.C.
4 Airport Engineering by Oza S. P.