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**Pre – requisite: 13 - CE 305**

**SYLLABUS**

**Railway Engineering:** Historical Development of Railways in India, Advantages of Railways, Classification of Railways, Permanent Way & its components, functions. Track volume and Track capacity. Rail Joints, Welding of rails and Creep of rails; **Track Geometric Design** - Gradients, Horizontal and Vertical curves, super elevation, Negative Super elevation, Coning of Wheels. Turnouts: Left/ Right Hand Turnout, Track Junctions, Points and crossings, Tracks Drainage, Railway Stations and Yards, Signaling. **Airport Engineering:** Factors affecting Selection of site for Airport – Aircraft Characteristics- Geometric Design of Runway- Computation of Runway length – Correction for runway length – Orientation of Runway – geometric design of taxiway, Wind Rose Diagram – Runway Lighting system. **Dock & Harbour Engineering:** Layout of Port components – Functions – Classification of Ports – Site selection – Natural Phenomenon – Tides, Winds, Waves, Currents – Drift – Navigational aids. Harbours - layouts, shipping lanes, anchoring, location identification; Littoral transport with erosion and deposition; sounding methods; Dry and Wet docks, components and operational Tidal data and analyses.

**TEXT BOOKS:**

1. Railway Engineering by S.C. Saxena & S. Arora.
2. Airport Planning and Design- S.K.Khanna and Arora,Nemchand Bros.
3. Dock & Harbour by Srinivasan

**REFERENCE BOOKS:**

1. Railway Engineering by Rangwala.
2. Air Transportation Planning & design – Virendhra Kumar & Statish Chandhra – Gal Gotia Publishers (1999).
3. Dock & Harbour Engineering by Ozha & Ozha