CE605-TRANSPORTATION ENGINEERING - II

Lecture: 3 hrs/Week Internal Assessment: Marks
Tutorial: 1 Hrs/Week Semester End Examination: Marks
Practical: -- Credits: 3

Course Learning Objectives:

The objective of this course is:

- 1. To know various components and their functions in a railway track
- 2. To acquire design principles of geometrics in a railway track.
- 3. To know various techniques for the effective movement of trains.
- 4. To acquire design principles of airport geometrics and pavements.
- 5. To know the planning, construction and maintenance of Docks and Harbours.

Course Outcomes:

At the end of course, Student can

- a. Design geometrics in a railway track.
- b. Provide good transportation network
- c. Design airport geometrics and airfield pavements.
- d. Plan, construct and maintain Docks and Harbours.

SYLLABUS:

A.RAILWAY ENGINEERING

UNIT - I

Components of Railway Engineering:Permanent way components – Railway Track Gauge - Cross Section of Permanent Way - Functions of various Components like Rails, Sleepers and Ballast –Rail Fastenings – Creep of Rails- Theories related to creep – Adzing of Sleepers- Sleeper density – Rail joints.

UNIT - II

Geometric Design of Railway Track: Alignment – Engineering Surveys - Gradients- Grade Compensation- Cant and Negative Super elevation- Cant Deficiency – Degree of Curve – safe speed on curves – Transition curve – Compound curves – Reverse curves – Extra clearance on curves – widening of gauge on curves – vertical curves – cheek rails on curves.

UNIT - III

Turnouts & Controllers: Track layouts – Switches – Design of Tongue Rails – Crossings – Turnouts – Layout of Turnout – Double Turnout – Diamond crossing – Scissors crossing.

Signal Objectives – Classification – Fixed signals – Stop signals – Signalling systems – Mechanical signalling system – Electrical signalling system – System for Controlling Train Movement – Interlocking – Modern signalling Installations.

B.AIRPORT ENGINEERING

UNIT - IV

Airport Planning & Design: Airport Master plan – Airport site selection – Air craft characteristics – Zoning laws – Airport classification – Runway orientation – Wind rose diagram – Runway length – Taxiway design – Terminal area and Airport layout – Visual aids and Air traffic control.

UNIT - V

Runway Design: Various Design factors – Design methods for Flexible pavements – Design methods for Rigid pavements – LCN system of Pavement Design – Airfield Pavement Failures – Maintenance and Rehabilitation of Airfield pavements – Evaluation & Strengthening of Airfield pavements – Airport Drainage – Design of surface and subsurface drainage.

C.DOCKS & HARBOURS

UNIT – VI

Planning, Layout, Construction & Maintenance Of Docks & Harbours: Classification of ports — Requirement of a good port — classification of Harbours — Docks - Dry & wet docks — Transition sheds and workhouses — Layouts; Quays — construction of Quay walls — Wharves — Jetties — Tides - Tidal data and Analysis — Break waters — Dredging — Maintenance of Ports and Harbours — Navigational aids.

TEXT BOOKS:

- 1. Railway Engineering by Satish Chandra and Agarwal M.M., Oxford University Press, New Delhi
- Airport Engineering by Khanna & Arora Nemchand Bros, New Delhi.

3. Docks and Harbour Engineeringby Bindra S.P. - Dhanpathi Rai & Sons, New Delhi.

REFERENCES:

- 1. 'Railway Engineering'by Saxena & Arora Dhanpat Rai, New Delhi.
- 2. 'Transportation Engineering Planning Design' by Wright P.H. & Ashfort N.J. John Wiley & Sons.
- 3. 'Airport Engineering' by Virendra Kumar, Dhanpat Rai Publishers, New Delhi.
- 4. 'Transportation Engineering' by Srinivasa Kumar R, University Press, Hyderabad
- 5. 'Highway, Railway, Airport and Harbour Engineering' by Subramanian KP, Scitech Publications (India) Pvt. Limited, Chennai.