

M.E. (Civil) (Infrastructure Engineering) Semester: I

Subject Name: Railway and Airport Engineering

Subject code : MECV105 -A

A. Learning objectives:

The objective of this course is

- To present the foundations of many basic Engineering tools and concepts related Infrastructure Engineering
- To provide a coherent development to the students for the courses of sector of Engineering like Transportation & Traffic Engineering etc
- To enhance the student's ability to think logically and application of content.
- To give an experience in the implementation of Engineering concepts which are applied in field of Railway and Airport Infrastructure Engineering

B. Teaching Scheme (Credits and Hours)

Teaching Scheme				Credit Scheme			Evaluation Scheme				
Lect Hrs	Tu Hrs	Prac. Hrs	Total	Theory	Pra/TW	Total	UE	IE	CIA	Prac/Viva	Total
04	02	00	06	04	01	05	70	30	20	30	150

C. Detailed Syllabus

Unit No.

Topics

- 1 Rail Transportation System:** Importance of Railway for regional development, Railway Track system & sub-structures, Railway infrastructure, Modernization in track, safety in railways, under-ground railways.
- 2 Demand analysis and forecasting :** For passenger and freight traffic costing and pricing principles, project analysis and design; project interdependencies and programming techniques; systems analysis and systems planning; planning strategies for regional context, macroeconomic transportation simulator; case studies and implementation strategies. Environmental and other impacts.

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- 3 AirTransportation:**Characteristics of Air Transportation, structure and organization, challenges and the issues, Airport Master Plan, Characteristics of the aircraft, Airport Requirements, site selection, layout plan and financial plan, Forecasting air travel demand, Air freight demand
- 4 Geometric Design :** Geometric Design of runway, taxiway, aprons, Design of Passenger Terminal, analysis of flow through terminals, Design of air cargo facilities, Airfield pavement and drainage design.
- 5 Environment impact:** Environment impact of Airports. Air traffic control lighting and signing, Airport Capacity and configuration, parking configurations and apron facilities.

D. Lesson Planning:

Unit No	Topics	Hours	Weightage
1	Rail Transportation System	10	13%
2	Demand analysis and forecasting	17	34%
3	Air Transportation	15	30%
4	Geometric Design	10	13%
5	Environment impact	8	10%

E. List of Tutorials:

Sr. No.	Tutorial Content
1	Problems based on forecasting of passenger and freight traffic for railways and airways.
2	Problems based on forecasting of passenger and freight traffic for railways and airways.
3	Planning and design of railway and airway network, routes and schedules for the actual or hypothetical regional area development.
4	Planning and design of infrastructures required for railways and air ports.
5	Field Visit: Visit to the Railway station, yards and management office.
6	Field Visit: Visit to the Airport terminal building, structures of terminal area and management office.

F. Instructional Method and Pedagogy (Continuous Internal Assessment (CIA) Scheme)

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- Two Faculties will be covering the syllabus in branch for 4 hours in a week. In Tutorial, class must be divided into one class & faculties will be solving or assigning the problem of the subject in each class.
- Attendance is compulsory in lectures and Tutorial which carries 05 Marks.
- At regular intervals assignments is given to all students which carries 30 marks. Evaluation of these assignments will be observed under Daily Homework Daily Assessment (DHDA) System.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries 05 Marks
- Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation
- Viva Voce will be conducted at the end of the semester of 10 Marks.
- One internal exam of 30 marks is conducted as a part of internal theory evaluation.

G. Students Learning Outcomes:

At the end of the course

- The students will be able to think logically for development of Infrastructure in field of Railway & Airport Engineering.
- The students will gain an experience in the implementation of Infrastructure Engineering on engineering concepts which are applied in field of Railway & Airport Engineering

H. Text Books & Reference Books:

- 1 B.Khanna S.K., Arora M.G., Jain S.S., Airport Planning & Design, Nemchand Bros., Roorkee
- 2 Horenjeff Robert, The planning & Design of Airports, McGraw Hill Book Co. Blunder and Black, Land use Transportation System
- 3 Saxena S.C., Railway Engineering, Dhanpat Rai & Sons, 1995.