

01TR0303: Airport System Planning and Design

Objective of the Course: Objectives of introducing this subject at second year level in Masters of civil engineering are:

- To understand the fundamentals of Airport Engineering.
- To determine the runway orientation, design of runway and airport facilities.
- To plan geometric design, and construction of various facilities of the Airport.
- To forecast passenger and freight demand.
- To know the operational management of the various facilities of the Airport.
- To provide basic understanding of various planning and operational component of Airport Systems

Credit Earned:4

Students learning outcomes:

After successful completion of the course it is expected that student will be able to:

1. Develop the knowledge of Airport Engineering in the context of regional mass transportation systems
2. Design of Air transportation systems along with infrastructures required for Airports.
3. Estimate the environmental and other impacts impended due to Airport projects.
4. Design of runway, taxiway, aprons and cargo facilities with pavement design.
5. Design of parking configurations and apron facilities at Airport.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	CSE (M)	Internal (I)	Viva (V)	Term Work (TW)	
3	2	0	4	50	20	30	25	25	150

Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	General Introduction	
	Characteristics of Air Transportation, structure and organization, challenges and the issues, Airport master plan	3
2	Introduction of Airport and Aircraft	
	Characteristics of the aircraft, Airport requirements, site selection, layout plan and financial plan	5
3	Demand Forecasting	
	Forecasting air travel demand, Air freight demand.	5
4	Geometric Design	
	Geometric design of runway, taxiway, aprons, Design of passenger terminal, analysis of flow through terminals.	10
5	Pavement and Drainage Design	
	Design of air cargo facilities, Airfield pavement and drainage design	10
6	Environment Impacts	
	Environment impact of Airports	5
7	Lighting and Signalling	
	Air traffic control lighting and signing.	2
8	Configurations of airport, parking and apron	
	Airport capacity and configuration, parking configurations and apron facilities.	5

Suggested lists of experiments

1. Problems based on forecasting of passenger and freight traffic for airways.
2. Problems based on costing and pricing strategy in airways.
3. Planning and design of airway network, routes and schedules for the actual or hypothetical regional area development.
4. Planning and design of infrastructures required for air ports Road Unevenness Measurement by Bump-Integrator.
5. Problems for design of runways, taxiways, aprons, terminals etc. for Airports

Master of Technology

Civil Engineering (Transport)

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
10%	15%	10%	35%	20%	10%

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Recommended Study Material:

Reference Book:

1. 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
3. De Neufille Richard and Odoni Amedeo, Airport Systems Planning and Design, McGraw Hill
4. Ashford Norman. J., Mumayiz Sakleh.A and Wright Paul.H., Airport Engineering Planning Design and Development of 21st Century Airports, John Wiley and sons
5. Wells, Alexander; Young, Seth, Airport Planning & Management, McGraw Hill

Web Resources

- <http://nptel.ac.in/>
- www.scilab.org/
- <https://ocw.mit.edu/courses/transportation-courses/>
