

## Airport System Planning and Design

**01TR1303**

**(PEC)**

### Objective of the Course:

- To introduce airport planning.
- To introduce airside and landside components of airport and their importance.
- To introduce knowledge of various methods for traffic forecasting, drainage and pavement construction.

**Credit Earned: 3**

### Students learning outcomes:

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

1. Understand planning of airport.
2. Understand concept of terminal planning and geometric design.
3. Analyse air traffic demand and drainage of airport.
4. Design the runway structure.

### Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
03	0	0	03	50	30	20	25	25	150

### Detailed Syllabus

Sr No.	Title of the unit	Number of hours
<b>1</b>	<b>Airport planning</b>	<b>06</b>
	Air Transport Planning in the India and in Europe/USA, Airport Master Plan: - Definition and Objectives - Hierarchy of Planning - Elements of Airport Master Plan: - FAA - ICAO Guidelines for Structure of Master Plan - Airport Layout Design - Structure of Master Plan Report - Airport Site Selection	
<b>2</b>	<b>Configuration and Geometric design of Airside</b>	<b>06</b>
	Principles of Airport Layout - Airfield Configuration - Runway Orientation - Obstructions to Airspace: - FAA and ICAO Standards - Runway Length - Separation of Parallel Runways - Runway and Taxiway Cross Section - Longitudinal-Grade Design for Runways and Stop-ways - Longitudinal-Grade Design for Taxiways -Taxiway Design - Holding Aprons - Terminal Aprons	
<b>3</b>	<b>Forecasting of Air transport demand</b>	<b>12</b>

	Conventional Airport Forecast Methods - General Aviation Forecasts - Airport ground access mode choice modeling process - Use of airport ground access models in airport planning - Integration of airport ground access models in regional planning process	
<b>4</b>	<b>Passenger and Cargo Terminal</b>	<b>08</b>
	Function of Airport Passenger and Cargo Terminal - Facilities Required at Passenger Terminal - Passenger and Baggage Flow - Elements to Be Considered in Design of Air Freight Terminals - Example of Design of Middle -Technology Freight Terminal	
<b>5</b>	<b>Airport drainage and Pavement Design</b>	<b>10</b>
	Estimation of Runoff - Collection and Disposal of Runoff - Subsurface Drainage - Wind Rose Analysis - Aircraft and Pavement Classification Numbers - Flexible-Pavement Design Methods (India Practice - McLeod Method - FAA Design Procedure - Corps of Engineers Designs) - Rigid-Pavement Design Methods (Indian Practice - Corps of Engineers Designs - FAA design - Joint and reinforcement requirements)	
		<b>42</b>

### 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
5%	5%	20%	25%	25%	20%

### Instructional Method and Pedagogy:

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

### Reference Book:

1. Geoffrey D. Gosling; *Airport ground access mode choice models*, Transportation Research Board, Washington, D.C., 2008
2. Norman J. Ashford, Saleh Mumayiz, Paul h. Wright; *Airport Engineering Planning, Design, and Development of 21st century Airports*, John Wiley & Sons, Inc.,2011
3. Horenjeff Robert; *The planning & Design of Airports*, McGraw Hill Book Co., 2007
4. Yang H. Huang; *Design of functional pavements*, Pearson Prentice Hall, 2004
5. Yoder, E.J. and Witzak, M.W; *Principles of Pavement Design*, John Wiley and sons,1975
6. Robert G. Packard, *Design of Concrete Airport Pavement*, Portland Cement Association, USA,1995