Airport Engineering

01CI0717

Objective of the Course:

- 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 know the operational management of the various facilities of the Airport.

Credit Earned: 03

Student's learning outcomes:

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

1. Explain Airport Engineering in the Context of Regional Mass Transportation Systems.
2. Apply design principles of planning to Airport Infrastructure.
3. Evaluate Parking Configurations and Apron Facilities.
4. Design Runways, Taxiways, Aprons, and Cargo Facilities.

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	00	00	03	50	30	20	25	25	150

Detailed Syllabus

Sr. No	Topic name	Hours
1	**Introduction to Air transportation**	**08**
	1.1 History of Air transportation, policy of air transportation, air transport activities.	02
	1.2 Various organizations – AAI, DGCA, ICAO their functions and guidelines, Development of Air transportation in India, Major Airports of India, Airport classification by ICAO	06

2	**Airport and Aircrafts**	**08**
	2.1 Terminologies related to aircraft, Characteristics of aircraft – static and dynamic, Comparison of Civil and Military aircraft	02
	2.2 Terminologies related to Airport, Factors affecting site selection of an airport, General requirements of an airport, Layout plan, Master plan of an airport as per FAA and ICAO guidelines	06
3	**Design of Airport Infrastructure**	**12**
	3.1 Wind rose diagram – types and utilities, Orientation of runway, Wind coverage and cross wind component, Factors affecting runway length, Corrections to runway length, Runway patterns.	04
	3.2 Taxiway geometric elements, controlling factors, Exit taxiway – location, layout and geometrics, Aprons – locations, size, gate positions, Holding apron and turnaround facilities.	04
	3.3 Aircraft parking configurations and parking systems, Hanger – site selection, planning and design consideration. Fuel storage area, blast pad, wind direction indicators	04
4	**Grading and Drainage of Airport**	**06**
	4.1 Airport grading – importance and operations,	02
	4.2 Airport drainage – Aim, Importance, Basic requirements, Surface and Sub-surface drainage.	04
5	**Terminal Building, Air traffic control and Visual Aids**	**08**
	5.1 Terminal area elements and requirements, Terminal building – functions, space requirements, vehicular parking area and circulation network, passenger requirements at terminal building	04
	5.2 Air traffic control – objectives, control system, control network – visual aids landing information system, airport markings and lighting.	04
	TOTAL	**42**

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 an effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	10%	30%	30%	15%	10%

Instructional Method and Pedagogy:

1. Prerequisite of the course and its pattern shall be discussed on the commencement of the course.
2. Lectures shall be conducted in class room using various teaching aids.

3. Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation.
4. At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.

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 Links

- https://archive.nptel.ac.in/courses/105/107/105107123/