

**ACADEMIC – GRADUATE STUDIES AND RESEARCH DIVISION**

**FIRST SEMESTER 2022-2023**

**Course Handout (Part II)**

# Date: 01.08.2022

In addition to Part-I (General Handout for all courses appended to the timetable), this portion gives further specific details regarding the course.

*Course No.* **: CE G545**

*Course Title* **: Airport Planning and Design**

*Instructor-in-charge* **: Sridhar Raju**

# Scope & Objective of the course:

Air Transport structure and organization; forecasting air travel demand, trend forecasts and analytical methods; air freight demand; airport system; characteristics of the aircraft; airport capacity and configuration; airport master planning: site selection, layout plan, orientation and length of runway as per ICAO specifications; geometric design of runway taxiway and aprons; structural design of runway and taxiway pavements; airfield pavement drainage; airport runway structural evaluation using Heavy Falling Weight Deflectometer (HFWD), overlay design. Passenger terminal function, passenger and baggage flow, analysis of flow through terminals, parking configurations and apron facilities; air cargo facilities-flow through cargo terminals, airport lighting; airport access problem; environmental impact of airports.

# Text Book:

**T1** Robert M. Horonjeff, Francis X Mckelvey, Willian J Sproule and Seth B Young, “Planning and Design of Airports” McGraw- Hill Professional Publishing, 6th Revision, 2011

# Reference Books:

R1: Norman J Ashford, Saleh Mumeyiz and Paul H. Wright, “Airport Engineering: Planning, Design and Development of 21st Century Airports” John Wiley & Sons; 4th Edition, 2011

# Course Plan:

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| **Lecture No.** | **Topics to be covered** | **Learning Objectives** | **Reference** |
| 1 | Introduction to air transportation | About air transportation as a part of Transportation engineering, and the Organization chart | Chapter-1 |
| 2-5 | Characteristics of aircrafts | Importance of aircraft weight, runway performance, aircraft characteristics and the basic dimensions. | Chapter-2 |
| 6-7 | Airport planning studies | System plan, master plan, land the and-use plan | Chapter-4 |
| 8-9 | Forecasting for airport planning | Forecasting methods | Chapter-5 |
| 10-11 | Airport capacity | Capacity, factors affecting capacity and delay | Chapter-7 R1 |
| 12-18 | Runway | Layout plan, Runway orientation, Length of runway, runway system dimensions | Chapter-6 |
| 19-21 | Taxiways and aprons | Widths and slopes, separation requirement, sight distance, exit taxiway geometry and location | Chapter-6 |
| 22-28 | Pavement design | Soil investigation and evaluation, FAA pavement design method, Design of flexible and rigid pavement, Joint and spacing, Continuously reinforced pavement, pavement evaluation and management system. | Chapter-7 |
| 29-30 | Airport drainage | Purpose, design storm for surface runoff, amount of runoff, layout of surface drainage. | Chapter-9 |
| 31-32 | Passenger terminal functions | Terminal system, design considerations, planning process, apron gate system. | Chapter-10 |
| 33-34 | Airport lighting | Requirements of visual aids, approach lighting, threshold lighting, runway and taxiway lighting. | Chapter-8 |
| 35-36 | Air Traffic Control | Introduction to Air Traffic Management and Airport Traffic Control Tower. | Chapter-3 |
| 37-38 | Air cargo facilities | Understand the design concepts for flow through terminals and to study the air cargo facilities-flow through cargo terminals | Chapter 10 and 11 |
| 39-40 | Environmental impact of airports | Impact on the life of the people living nearby, the effect on the Fauna and Flora. | Chapter-14 |

1. **Evaluation Scheme:**

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| --- | --- | --- | --- | --- | --- |
| **S. No.** | **Evaluation Component** | **Duration (min)** | **Weightage (%)** | **Date & Time** | **Remarks** |
| 1 | Midsem Test | 90 | 25 | 01/11 9.00 - 10.30AM | CB |
| 2 | Comprehensive Examination | 180 | 35 | 20/12 FN | OB |
| 3 | Assignments |  | 20 | Continuous | OB |
| 4 | Projects and Presentations |  | 10 | To be announced in the class | OB |
| 5 | Quizzes | 50 | 10 | To be announced in the class | OB |

1. **Chamber Consultation Hour:** Every Monday 05.00 PM – 06.00 PM, in addition to the consultation hour, you are free to meet the IC at any time.
2. **Notices:** Notices concerning this course will be displayed on CMS.
3. **Make-up Policy:** Prior permission for all make ups are a must. For medical emergencies, an email request has to be sent to the IC.
4. **Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all students throughout and no academic dishonesty is acceptable.

# Instructor-In-Charge

# CE G545