INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

AIR TRANSPORTATION SYSTEM								
VII Semester: AE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
AAED45	**Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	0	-	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite:								

I. COURSE OVERVIEW:

This course presents air transport system considers route structure options in terms of operational impacts and describes the context and boundaries of the industry – the natural, regulatory, and operational environments 'Systems' perspectives are introduced to integrate the discussion of aircraft, airlines, airports, and airspace issues. Examines major operational elements of the world's air transport system Considers route structure options in terms of operational impacts the natural, regulatory, and operational boundaries of the industry.

II. COURSES OBJECTIVES:

The students will try to learn

I. The characteristics of aircraft, airlines and airport and air transport systems.
II. The various authorities involved in airport management airport planning, airport operations.
III. The environmental regulation and airport fee, rates taxes and charges meteorological services.
IV. The safety regulation followed according to the rules with the economic regulation and aviation security.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

CO1 Define and explain the fundamental principles and concepts of air transportation, including the history, evolution, and key components of the aviation industry.
CO2 Analyze the various types of aircraft, their design principles, and technological advancements in aviation.
CO3 Understand the role of air traffic control in managing air traffic flow and ensuring safety in the airspace.
CO4 Investigate safety protocols, emergency procedures, and risk management strategies within the aviation industry.
CO5 Examine the business and economic aspects of airline operations, including cost structures, revenue management, and market trends.
CO6 Evaluate the environmental impact of air transportation, including emissions, noise pollution, and sustainable aviation practices.

IV. COURSE CONTENT:

MODULE-I: AVIATIONINDUSTRY&ITSREGULATORYAUTHORITIES (9)
Introduction, history of aviation-evolution, development, growth, challenges. Aerospace industry, air transportation industry-economic impact-types and causes. Airline Industry-structure and economic characteristics the breadth of regulation- ICAO, IATA, national authorities (DGCA, FAA). Safety regulations-risk assessment human factors and safety, security regulations, environmental regulations.

MODULE-II: AIRPORT PLANNING (11)
Categories of airspace-separation minima, airspace sectors-capacity, demand, and delay. Evolution of air traffic control system-procedural ATC system, procedural ATC with radar assistance, first generation 'automated' ATC system, current generation radar and computer-based ATC systems. Aerodrome air traffic control equipment and Operation ICAO future air navigation system service provides as businesses. Communication navigation and surveillance systems (CNSS). Radio communications-VHF, HF, ACARS, SSR, ADS. Navigation- NDB, VOR, DME, area-navigation systems(R-Nav), ILS, MLS, GPS, INS.

MODULE-III: AIRCRAFT (10)
Costs-project cash-flow, aircraft price. Compatibility with the operational infrastructure. Direct and indirect operating costs. Balancing efficiency and effectiveness- payload range, fuel efficiency.

technical contribution to performance, operating speed and altitude, aircraft field length performance, typical operating costs. Effectiveness-wake-vortices, cabin dimensions, flight deck.

MODULE-IV: AIRPORTS (9)
Setting up an airport-airport demand, airport sitting, runway characteristics-length, declared distances, aerodrome areas, obstacle safeguarding. Runway capacity- evaluating runway capacity -sustainable runway capacity. Runway pavement length, Maneuvering area-airfield lighting, aprons, Passenger terminals terminal sizing and configuration. Airport demand, capacity, and delay.

MODULE-V: AIRLINES (9)
Setting up an airline-modern airline objective. Route selection and development, airline objectives. Route selection and development, airline fleet planning, annual utilization and aircraft size, seating arrangements. Indirect operating costs. Aircraft- buy or lease. Revenue generation, Computerized reservation systems, yield management. Integrating service quality into the revenue-generation process. Marketing the seats. Airline scheduling, Evaluating success financial viability, regularity compliance, efficient use of resources, effective service.

V. TEXT BOOKS:

1. Hirst M, “The Air Transport System”, Woodhead Publishing Ltd, Cambridge, 2008.

VI. REFERENCE BOOKS:

1. Wensven J.G, “Air Transportation: A management Perspective”,Ashgate,2007.
2. Belobaba and Barnhart C, “Global Airline Industry”, Wiley, 2009.
3. M.Bazargan M, “Airline Operations and Scheduling”, Ashgate, 2004.
4. Nolan M.S, “Fundamentals of Air Traffic Control”, Thomson Learning, 4th Edition 2004.
5. Wells and Young S, “Airport Planning and Management”, McGraw-Hill, 5th Edition 1986.

VII. ELECTRONICS RESOURCES:

1. www.nasa.gov/centers/armstrong/images/UAV/index.html
2. www.drdo.gov.in/unmanned-aerial-systems-uas

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech talk topics

4. Open end experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper - II
9. Lecture notes
10. E-learning readiness videos (ELRV)
11. Power point presentation