

## AIR TRANSPORTATION SYSTEM

<b>VI Semester: AE</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AAE 526	Core	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
<b>Contact Classes: 45</b>		<b>Tutorial Classes: Nil</b>		<b>Practical Classes: Nil</b>			<b>Total Classes: 45</b>	
<p><b>OBJECTIVES:</b></p> <p><b>The course should enable the students to:</b></p> <ol style="list-style-type: none"> <li>I. Apply knowledge and skills in the aviation industry and make more effective decisions for organization.</li> <li>II. Provide insight into current trends and issues in civil aviation, such as aviation safety and security, law and new technology.</li> <li>III. Understand complexity of air transport operation and to find best solution for the issues.</li> <li>IV. Understand many transport issues involved in handling passengers, freight of aircraft.</li> </ol> <p><b>COURSE OUTCOMES (COs):</b></p> <p>CO 1 : Explain the roles of the International Civil Aviation Organization and the International Air Transport Association in fostering safe and efficient air transport</p> <p>CO 2 : Describes national and international rules and regulations for air transportation</p> <p>CO 3 : Identify organizations controlling the regulatory processes in international aviation</p> <p>CO 4 : Apply basic science principles in estimating stopping and passing sight distance requirements</p> <p>CO 5 : Understand the factors influencing road vehicle performance characteristics and design.</p> <p><b>COURSE LEARNING OUTCOMES (CLOs):</b></p> <ol style="list-style-type: none"> <li>1. Communicate at technical level with aviation service providers and aerospace professionals and organizations about aircraft and their systems.</li> <li>2. Describe the effects the atmosphere has on aircraft operations and the implications for the air transport industry.</li> <li>3. Analyze the aerodynamic and associated performance characteristics for aircraft and infer the corresponding economic implications.</li> <li>4. Assess the impact of contemporary challenges and practical aspects in air transportation.</li> <li>5. Evaluate pros and cons of emerging technological aspect and responses.</li> <li>6. Develop an applied knowledge to the global aviation industry and key issues.</li> <li>7. Understand international law and policies related to air transportation activities.</li> <li>8. Assess the impact of airline activities and operations on economics and finances.</li> <li>9. Evaluate the various factors influencing aviation industry and effects of these factors on air transportation.</li> <li>10. Developing capability to asses' functions of airports, the basic principles of aviation policy.</li> <li>11. Execution of aviation policies related to airline economics and flight planning..</li> <li>12. Implementing standard procedure for air cargo handling and its management.</li> <li>13. Exposit legal, social, economic, ethical and environment interest while undertaking air transportation system.</li> <li>14. Acquire the competencies to handle airspace, aircrafts and air traffic control system.</li> <li>15. Develop knowledge to coordinate with different organization in the air transportation system.</li> </ol>								

<b>UNIT-I</b>	<b>AVIATION INDUSTRY</b>	<b>Classes: 08</b>
Introduction, history of aviation, evolution, development, growth, challenges; Aerospace industry, air transportation industry- economic impact, types and causes; Airline industry, structure and economic characteristics; Airlines as oligopolists, other unique economic characteristics; Significance of airline passenger load factors.		
<b>UNIT-II</b>	<b>NATURAL ENVIRONMENT, REGULATORY ENVIRONMENT AND OPERATIONAL ENVIRONMENT</b>	<b>Classes: 10</b>
The earth as a habitat, The Earth: physical issues affecting demand- surface, core, continents; Shape of demand; Demand forecasting- based on historical data, comparative analysis, theoretical demand models; Reliability of forecasts; The breadth of regulation- ICAO, IATA, national authorities (DGCA, FAA); Service properties: service volumes, international air service agreements, deregulation, privatization; Evolution: 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, laser-INS; Surveillance: SSR, ADS; Airborne elements: AFCS, PMS, electronic control and monitoring/engine instrumentation and central automated systems, EFIS, FMS, GPWS, TCAS- future trends.		
<b>UNIT-III</b>	<b>AIRCRAFT</b>	<b>Classes: 10</b>
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.		
<b>UNIT -IV</b>	<b>AIRPORTS AND AIRLINES</b>	<b>Classes: 09</b>
Setting up an airport: airport demand, airport siting, runway characteristics, length, declared distances, aerodrome areas, obstacle safeguarding; Runway capacity, evaluating runway capacity, sustainable runway capacity; Setting up an airline, modern 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, regulatory compliance, efficient use of resources, effective service		
<b>UNIT -V</b>	<b>AIRSPACE</b>	<b>Classes: 08</b>
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 system, current generation radar and computer-based ATC systems; Aerodrome air traffic control equipment and operation - ICAO future air-navigation systems (FANS); Air-navigation service providers as businesses		
<b>Text Books:</b>		
1. Hirst, M., The Air Transport System, Woodhead Publishing Ltd, Cambridge, England, 2008		

**Reference Books:**

1. Wensven, J.G., Air Transportation: A Management Perspective, Ashgate, 2nd Edition 2007.
2. Belobaba, P. Odoni, A. and Barnhart, C., Global Airline Industry, 2nd Edition Wiley, 2009.
3. M. Bazargan, M., Airline Operations and Scheduling, Ashgate, 1st Edition 2004.

**Web References:**

1. <https://pdfs.semanticscholar.org/7f85/e5cfcdd85e25bd495b5762e1ca4facda739.pdf><http://andromeda.rutgers.edu/~jy380/research/air-schedule/chapter50.pdf>

**E-Text Books:**

1. <https://link.springer.com/book/10.1007%2F978-3-7091-1880>