COURSE TITLE	**AIR SPACE AND AIR TRAFFIC MANAGEMENT**
COURSE CODE	**04MB0377**
COURSE CREDITS	**4**

Course Outcomes: After completion of this course, student will be able to:

1. Understanding of the global and national ATM systems, including the roles and responsibilities of different stakeholders such as air traffic controllers (ATCs), air navigation service providers (ANSPs), and regulatory bodies
2. Ability to classify airspace (Class A to G), understand airspace design principles, and propose design solutions to optimize air traffic flow while maintaining safety and compliance with international standards.
3. Apply traffic flow management strategies to optimize the flow of air traffic, balancing demand and capacity, and mitigating congestion in high-density airspace.
4. Analyze and apply safety management systems (SMS) and risk management techniques to identify and mitigate risks in air traffic operations, and evaluate security measures to protect airspace from threats.

Pre-requisite of course:na

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Introduction to Air Space and Air Traffic ManagementFront Office operations** • Overview of ATM Systems:- Definition, importance, and components of ATM, Role of ATC in ensuring safe and efficient air operations, Types of air traffic services: En-route, Approach, Tower, and Ground Global vs. national ATM systems • Global Air Traffic Control Network:- ICAO, FAA, En-route control, ANSPs, Overview of the air navigation system and its operators. Regulatory bodies and their roles in ATM	15

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Contents : Unit	Topics	Contact Hours
2	**Airspace Structure and Classification** • ICAO airspace classification (Class A to G): Understanding of classifications define the rules and procedures for air traffic control and are designed to provide a clear structure for airspace management.• Control zones, restricted, and special use airspace: Understanding The goal of a control zone is to manage traffic arriving or departing from an airport, ensuring separation between aircraft and facilitating smooth transitions between IFR (Instrument Flight Rules) and VFR (Visual Flight Rules) traffic. Air Traffic Flow and Capacity Management • Prohibited area at Air side: Understanding of Military training zones. Missile or rocket testing. Areas of military conflict or sensitive national security operations. • Design of airways and routes: - Understanding the Design of runways, numbering of runway and air side, hanger and apron for better visual effects while take-off and landing	15
3	**Air Traffic Flow and Capacity Management and ICAO and Global Standards** • Air Traffic Flow Management: Understanding of Air Traffic Flow Management is the overall process of managing the flow of air traffic to ensure that aircraft can move safely and efficiently across the airspace system, from departure to arrival. • Capacity Forecasting and Analysis: Understanding of Capacity management refers to the ability of the airspace, air traffic control (ATC) services, and airport infrastructure to handle a specific number of flights in a given period. Slots of Parking bay, Landing and Take of Flights, • TSAT(Target Start up approval time): Understanding the ground delay, Airborne delay Route Adjustment and flow control, emergency landing and techniqual delay • ICAO and Global Standards :- Understanding of ICAO's role in establishing global ATM standards Overview of ICAO's Annex 11 (Air Traffic Services) and Annex 2 (Rules of the Air) Air traffic control licensing and training standards	15
4	**Communication, Navigation, and Surveillance (CNS) Technologies** • Communication Technologies in Aviation: Understanding of VHF (Very High frequency radio(Voice command) Data Communication, Satellite communication • Navigation Technologies in Aviation: Understanding of key feature of Global Navigation System, Performance Base Navigation and Area Base Navigation system for Landing and Take-off procedure. • Surveillance Technologies: Understanding of types Radar, Automatic dependency surveillance and Spaced based surveillance • CNS Integration and Advancements : Knowledge of CNS technologies in aviation are increasingly being integrated to provide more seamless, efficient, and automated air traffic management.	15
Total Hours		**60**

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Textbook :

1 Fundamentals of Air Traffic Control, Michael S. Nolan, Brooks Cole, 2020

2 Air Traffic Management: Principles, Performance, Markets, Marina Efthymiou, Routledge, 2019

References:

1 Aviation Management “Global and National Perspective , Aviation Management “Global and National Perspective , Ratandeep Singh, Kanishka Publishers & Distributors, 2019

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	10.00	20.00	20.00	20.00	20.00

Instructional Method:

1 CLASSROOM TEACHING, CASE STUDY

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