3rd SEM BTTM-Bachelor Travel and Tourism Management

UNIVERSITY OF CALICUT

AIR TRANSPORTATION AND AIRPORT OPERATIONS

2018 ADMISSION

Prepared By

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SYLLABUS

TTM3B03: Air transportation and Airport Operations

Lecture Hours Per Week: 5 **Credits: 4**

Objective: To enable the student to understand the air transportation system and to learn about the structure and facilities of airports along with acquitting with the airport operations.

Module I

Air Transportation: Aviation and air transportation- Types of Aviation-Military Aviation General Aviation and types- Civil Aviation Types- Air transport system- Airports-Aircraft Aircraft-Air navigation services- Aircrafts parts and types-aircraft manufactures- International regulations- bilateral agreements, Multilateral Agreements and freedoms of air- Chicago and Warsaw conventions.

Module II

History of air transportation-Early history- evolution till second world war-growth of air transportation after world war- Deregulation and effects- Open sky policy- Mergers and alliance History of civil aviation in India – public and private sector airlines in India. ICAO-Formation, objectives and activities- Role of AAI and DGCA. IATA and activities, role of IATA in air transportation, Air Corporation Act, 1953, Role of Aviation Sector in tourism.

Module III

Airports: Concept and Definition- Functions- Socio-economic Situations- Airport product and consumers- Revenue Sources- Airport Ownership- Structure of a airport- Airside various parts and facilities- Terminal parts and facilities- Landside parts and facilities- Certifications for airports- organization structure and personnel

Module IV

Airport Operations: Ground handling- Deplaning and boarding- Cargo and baggage loading Turn around operations- Refueling- Power supply-rescue and firefighting-winter operations. Safety and Security Issues-Measures for safety and security in airports.

Module V

Passenger handling - Departure Procedures- check-in formalities, free baggage allowance- types of baggage-excess baggage allowance- baggage pooling-security check- emigration services-gate handling and boarding-Arrival Procedures- transit passenger handling-emigration activities-baggage claim-missed baggage-customs formalities-red channel and green channel-Baggage handling procedure- Air navigation services- Air cargo operation. Airport Codes (IATA airport codes of major cities)

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MODULE 1

Aviation in India

- The Indian Aviation Industry is among the world's fastest growing industries.
- It has undergone huge transformation following the liberalization of the aviation industry in India.
- Once owned by the Government, the aviation sector of India is now privately owned with full service airways and affordable carriers.
- Almost 75% of the domestic aviation sector consists of the private airlines.
- Earlier viewed as a costly means of transportation, afforded by few, air travel is now cheap and can be availed by many.
- The aviation sector has become the most important segment in the economic development of a nation.
- It plays a vital role in moving people or products from one place to another, be it domestic or international, especially when the distances involved are far.

Types of Aviation

1. **Civil aviation**

   It is one of two major categories of flying, representing all non-military aviation, both private and commercial.

   Civil aviation includes two major categories:

   a) *Scheduled air transport*

   It includes all passenger and cargo flights operating on regularly scheduled routes.

   b) *General aviation (GA)*

   It represents all civil aviation "aircraft operation other than a commercial air transport or an aerial work operation". It includes all other civil flights, private or commercial.

   There are five major manufacturers of civil transport aircrafts:

   - Airbus, based in Europe
   - Boeing, based in the United States

- Bombardier, based in Canada
- Embraer, based in Brazil
- United Aircraft Corporation, based in Russia

2. Military aviation

It is the use of military aircraft and other flying machines for the purposes of conducting or enabling aerial warfare, including national airlift (air cargo) capacity to provide logistical supply to forces stationed in a theater or along a front.

Types of military aircrafts

Some of the military aircrafts are given below,

a) Airborne Early Warning : provides advance warning of enemy activities to reduce the chance of being surprised.

b) Bombers : These are capable of carrying large payloads of bombs and may sacrifice speed or maneuverability to maximize payload.

c) Experimental aircraft : These are designed to test advanced aerodynamic, structural, avionic, or propulsion concepts.

d) Fighters : These are establish and maintain air superiority. Speed and maneuverability are usually requirements and they carry a variety of weapons, including machine guns and guided missiles, to do this.

e) Forward Air Control : directs close air support aircraft to ensure that the intended targets are nullified and friendly troops remain uninjured.

f) Ground-attack aircraft : It supports ground troops by weakening or nullifying enemy defenses.

g) Liaison aircraft : These are usually small, unarmed aircraft used to deliver messages and key personnel.

h) Reconnaissance aircraft : and scout helicopters are primarily used to gather intelligence. They are equipped with photographic, infrared, radar, and television sensors. This role is increasingly being filled by spy satellites and unmanned aerial vehicles.

i) Training aircraft : These are used to train recruits to fly aircraft and to provide additional training for specialized roles such as in air combat.

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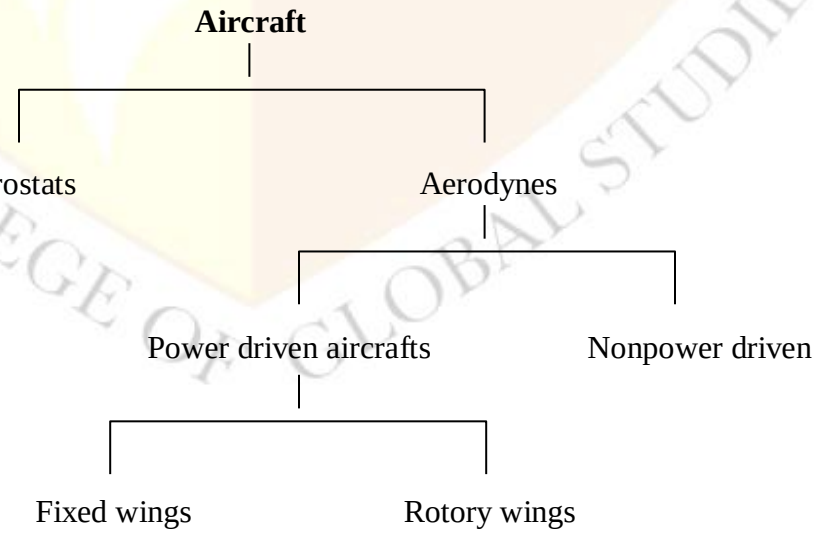
Aircrafts and Types

Aircraft

- It is a vehicle that is able to fly by gaining support from the air.
- It counters the force of gravity by using either static lift or by using the dynamic lift of an airfoil or in a few cases the downward thrust from jet engines.

Types of Aircrafts

Mainly there are two types of aircraft,



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1. Aerostats / Lighter than air.

   Aircraft whose lifting capability depends on being inflated with a gas such as hot air, hydrogen or helium.

2. Aerodynes / Heavier than air.

   Aircraft whose lift is produced by a reaction between aerofoil and motion through the air. Eg.- airships.

   a) Power driven aircrafts:

      Aircraft, whose propulsion through the air is supported by engine power.

      - Fixed wings-

        Aircraft whose lift is produced by a reaction between fixed wings and motion of the air about them.

      - Rotory wings-

        Aircraft whose lift is produced by rotating wings

   b) Nonpower driven:

      Aircraft whose propulsion through the air is derived from gravity and aerodynamic forces, and it is not supported by engine power.

AIR NAVIGATION SERVICE

- An **Air Navigation Service provider** (**ANSP**) is a public or a private legal entity providing Air Navigation Services.
- It manages air traffic on behalf of a company, region or country.
- Airports Authority of India (AAI) is the air navigation service provider in India.
- Depending on the specific mandate an ANSP provides one or more of the following services to airspace users,
  - Air Traffic Management (ATM)
  - Communication navigation and surveillance systems (CNS)
  - Meteorological service for air navigation (MET)
  - Search and rescue (SAR)

- Aeronautical information services/aeronautical information management (AIS/AIM).

These services are provided to air traffic during all phases of operations (approach, aerodrome and en-route).

Air navigation service providers are government departments, state-owned companies, or privatized organizations. The majority of the world's Air Navigation Service Providers are members of the Civil Air Navigation Services Organization located at Amsterdam Airport Schiphol.

Aircrafts Parts and Types

The major parts of aircraft are explained below,

a) Wings

b) Fuselage

c) Power unit

d) Undercarriage

e) Control surfaces

a) Wings

- The wings also known as foils.
- The wing provides the majority of the lift an airplane requires for flight.
- The airflow over the wings is what generates most of the lifting force necessary for flight.
- Its shape is specifically designed for the aircraft to which it is attached.
- Most of the aircraft, the interior of the wing is also used to store the fuel required to power the engines.

b) Fuselage

- The fuselage is one of the major aircraft components with its long hollow tube that's also known as the body of the airplane.
- This holds the passengers along with cargo safely inside.
- This area includes the cockpit, so the pilots are in the front of the fuselage.
- Despite there being different types of fuselages, they all connect the major parts of an airplane together.

c) Power Plant

- This includes the engine and the propeller.
- The engine itself is a complicated system comprised of many smaller parts like cylinders, fans, and pistons.
- Together, these aircraft engine parts work to generate the power or thrust of an aircraft.

d) Undercarriage

- Landing gear is the undercarriage of an aircraft
- It may be used for either takeoff or landing.
- The landing gear includes shock absorbers for a smooth landing and takeoff as well as the wheels on the plane.

e) Control surfaces

- The control surfaces on a fixed-wing aircraft include: ailerons, elevators, and the rudder.
- The Ailerons are attached to the trailing edge of both wings and when moved, rotate the aircraft around the longitudinal axis.
- The Elevator is attached to the trailing edge of the horizontal stabilizer. When it is moved, it alters aircraft pitch, which is the attitude about the horizontal or lateral axis.
- The Rudder is hinged to the trailing edge of the vertical stabilizer. When the rudder changes position, the aircraft rotates about the vertical axis

Aircraft Manufacturers

The major aircraft manufactures are explained below,

f) Airbus

g) Boeing
h) Bombardier
i) Embraer
j) Tupoloev

a) Airbus

- Airbus is one of the world's leading aircraft manufacturers fulfilling about half or more of the orders for airliners with more than 100 seats.
- Airbus is based in Europe with its headquarters in Toulouse, France and has 12 sites in Europe located in France, Germany, Spain and UK.
- Airbus also has three subsidiaries in the USA, Japan and China.
- They employ about 52,000 people from 85 nationalities who speak among them over 20 different languages.
- Airbus currently have a product line-up of 14 jet aircraft types which range from 100 to 525 seats.
- There has been more than 9,200 aircraft ordered throughout the world as the Airbus aircraft family is recognized for its comfort, economics and versatility .

b) Boeing

- Boeing is one of the other main aerospace companies and are the largest manufacturer of commercial jetliners and military aircraft combined.
- Boeing also design and manufactures rotorcraft, electronic and defense systems, missiles, satellites, launch vehicles and advanced information and communication systems.
- Boeing is based in USA with its headquarters located in Chicago.
- They employ more than 158,000 people across the United States and in 70 countries, making them one of the most diverse, talented and innovative workforces anywhere in the world.
- The main commercial product that Boeing manufacturers are the 737, 747, 767 and 777 families of airplanes and the Boeing Business Jet, with nearly 12,000 commercial jetliners in service worldwide (about 75 percent of the world fleet)

c) Bombardier

- Bombardier is a global transportation company that is present in over 60 countries on 5 continents.
- They operate two businesses: Aerospace and Rail Transportation.
- Bombardier Aerospace is the world's third largest civil aircraft manufacturer and are leaders in the design and manufacture of innovative aviation products and services for the business, regional and amphibious aircraft markets.
- Their headquarters are in Montréal, Canada and they employ over 32,500 people worldwide.
- It's high-performance aircraft and services are seen in a number of different markets including:
    - Business aircraft - Learjet, Challenger and Global aircraft families;
    - Commercial aircraft - new CSeries program, CRJ Series and Q-Series aircraft families;
    - Amphibious aircraft - Bombardier 415 and Bombardier 415 MP aircraft; Jet travel solutions - Flexjet;
    - Specialized aircraft solutions - Bombardier aircraft modified for special missions;
    - Aircraft services and training - aircraft parts, maintenance, comprehensive training, technical support and publications, and online services.

d) <u>Embraer</u>

- Embraer has become one of the main aircraft manufacturers in the world by focusing on specific market segments with high growth potential in commercial, defense, and executive aviation.
- Embraer is based in São José dos Campos, Brazil and currently employ more than 17,237 people of which 87.7% are based in Brazil.
- Embraer continues to lead the industry with its innovative regional and commercial jet product lines.
- Since 1996, Embraer has produced and delivered more than 1000 ERJs to more than 37 airlines in 24 countries.
- The three markets that Embraer manufacture aircraft for include:

- Commercial Aviation - EMB 120; ERJ 135; ERJ 140; ERJ 145; ERJ 145 XR; EMBRAER 170; EMBRAER 175; EMBRAER 190 and EMBRAER 195.
- Defense Systems - Super Tucano; EMB 145 AEW&C; EMB MULTI INTEL; EMB 145 MP and Legacy 600.
- Executive Aviation - Lineage 1000; Legacy 600; Legacy 500; Legacy 450; Phenom 300 and Phenom 100.

e) Tupoloev

- Tupolev is a Russian aerospace and defence company, headquartered in Moscow, Russia and is officially known as Public Stock Company (PSC) Tupolev.
- PSC Tupolev develop, manufacture and overhaul both civil and military aerospace products such as aircraft and weapons systems.
- They are also actively developing missile and naval aviation technologies, with more than 18,000 Tupolev aircraft produced for the USSR and the Eastern Bloc.
- Many of the designs that PSC Tupoley have come up with over the years have been dead-ends or experimental aircraft although they also developed a number of production series aircraft which may have runs up to 4,500 as in the Tu-2.
- The designs go back to the early piston-powered aircraft; experimental airplanes; Bombers and other military types; Interceptors; airliners/transport; unmanned aircraft and planned aircraft.

International Regulations and Conventions

❖ In 1944, when the World War II was in closing stages, 54 countries came to the Conference in Chicago, USA to talk about the future of international aviation.

- The conference resulted in the signing of the Convention on International Civil Aviation, commonly known as the Chicago Convention.
- The Chicago Convention established the rules under which international aviation operates.
- It also established the International Civil Aviation Organization (ICAO), the United Nations organisation responsible for fostering the planning and development of international air transport (ICAO).
- The Chicago Convention determined that no scheduled international air service may be operated over or into the territory of a contracting state without their permission.
- Over the following years, ICAO developed a series of traffic rights, known as Freedoms of the Air.
- Since using planes within the borders of a single country does not make any economic sense it became necessary for countries to come up with a way of expanding their operating areas.
- This situation led to several agreements between countries which were in form of bilateral air service agreements between two countries.
- One of the first air service agreements after World War II was the Bermuda Agreement.
- This agreement was signed by the United States of America and the United Kingdom in 1946.
- Features of Bermuda agreement became models for the many of such agreements that were to follow.

Bilateral Agreements

"Bilateral agreements facilitate the reciprocal airworthiness certification of civil aeronautical products imported/exported between two signatory countries."

- A bilateral air service agreement is concluded between two contracting countries and liberalizes commercial civil aviation services between those countries.

- The bilateral air services agreements allow to the designated airlines of those countries to operate commercial flight that covers the transport of passengers and cargoes between that two countries.
- Also they normally regulate frequency and capacity of air services between countries, pricing and other commercial aspects.

Multilateral Agreements

- Bilateral air service agreements later expanded into multilateral air service agreements.

"A multilateral air services agreement is the same as bilateral air service agreement, the only difference is that it involves more than two contracting states".

These agreements later led to another form of agreement known as open skies agreement.

Open Skies

- **Open Skies** refers to bilateral or multilateral agreements between states in order to liberalize the airline industry and minimize governmental interventions.
- Chicago Convention held in 1944 was aimed to developed the civil aviation industry and introduced nine *freedoms of the air*.

Freedoms of the air

1. The freedom to fly over the territory of a foreign country without landing
2. The freedom to land in the territory of a foreign country for non-traffic purpose; That is refueling, emergency landing etc
3. The freedom to carry passengers from home country to a foreign country for commercial purpose.
4. The freedom to carry passengers from a foreign country to home country for commercial purposes

5. The freedom to carry passengers between two foreign countries for commercial purposes
6. The freedom to carry passengers between two foreign countries via home country for commercial purpose
7. The freedom to operate an aircraft originated from and destined to a foreign country.
8. The freedom to operate an aircraft, which originated from or destined to home country, between two domestic airports in a foreign country
9. The freedom to operate an aircraft between two foreign points.

International Conventions

1. Chicago Convention

- The **Convention on International Civil Aviation**, also known as the **Chicago Convention**,
- It established the International Civil Aviation Organization (ICAO), a specialized agency of the UN charged with coordinating international air travel.
- The Convention establishes rules of airspace, aircraft registration and safety, security, and sustainability, and details the rights of the signatories in relation to air travel.
- The Convention also contains provisions pertaining to taxation.
- The document was signed on December 7, 1944, in Chicago by 52 signatory states.
- It received the requisite 26th ratification on March 5, 1947, and went into effect on 4th April 1947(same date that ICAO came into being).
- The Convention has since been revised eight times (in 1959, 1963, 1969, 1975, 1980, 1997, 2000 and 2006).
- As of March 2019, the Chicago Convention had 193 state parties, which includes all member states of the United Nations except Liechtenstein.
- The Cook Islands is a party to the Convention although it is not a member of the UN.

2. Warsaw Convention

- The Convention for the Unification of certain rules relating to international carriage by air, commonly known as the Warsaw Convention
- It is an international convention which regulates liability for international carriage of persons, luggage, or goods performed by aircraft for reward.
- Originally signed in 1929 in Warsaw
- It was amended in 1955 at The Hague, Netherlands, and in 1971 in Guatemala City, Guatemala.
- There are five chapters:
  - Chapter I – Definitions
  - Chapter II – Documents of Carriage; Luggage and Passenger Ticket
  - Chapter III – Liability of the Carrier
  - Chapter IV – Provisions Relating to Combined Carriage
  - Chapter V – General and Final Provisions

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MODULE 2

HISTORY OF AVIATION INDUSTRY

- In November 27th 1783, when Montgolfier Brothers for the first time successfully commuted manned ascent inside Hot air Balloon at Annonay, France.
- Some of the drawings portrayed by Leonardo Da Vinci in the 14th century are still there, which tells stories about the history of aviation.

- The Wright Brothers invented the first successful airplane in 17thDecember 1903, which took a small flight that time but a great leap for future.
- As a result a number of planes were used during the World War I and got better day by day over the course of time for the decades.
- Airships were also known for air travel but airplanes completely took over, as they got huge popularity among other modes of air travel.
- When people started to realize that they could travel quickly to far off cities or countries or across the globe, they started preferring to travel frequently by air mode.

Early aviation

- Designed in 5th Century BC Kites were perhaps the first forms of aircrafts.
- In the 16th century, a great contribution in the history of aviation by given by Leonardo Da Vinci who have produced airscrew and parachute.
- He studied the bird's flight and that gave him idea to develop airscrew and parachute, which later proved to be the tremendously important contributions in the history of aviation.

The 19th Century

- As the air travel gained popularity and people started undertaking travel through air.
- A large number of aircraft manufacturing units came in to existence and started manufacturing of airplanes.
- Airplanes got much attention which gliders and balloons were unable to gather prior.
- Aviation Industry made its mark as soon as it started to transport not only the travelers but also used to transfer cargo, airmails and weapons etc.
- One such invention during this period was the birth of Wright Company.
- The company formed after their four years of research and design efforts.
- They proved to be a successful effort on 17th December 1903 when they undertook the first powered flight with a 120-foot, 12 second long flight.

Origin of Wright Company:

- Right after the first successful test run of airplane (heavier-than-air) made by the Wright Brothers near Kitty Hawk, in North Carolina which flew up to the height of 120 feet in 12 seconds the commercialization of airplanes get started.
- The Wright brothers then established their own commercial aviation company named The Wright Company on 22nd November 1909.
- The first official cargo flight took place on 7th November 1910 in USA, which carried 200 pounds of silk.
- They used Wright Model B plane, which was manufactured by Wright Company owned by Orville Wright and Wilbur Wright (Wright Brothers).
- After the death of Wilbur Wright in 1912 the business gets destabilized however Orville Wright managed to produce 120 planes before the year 1915.
- At present Curtiss-Wright Corporation is consolidated to Wright Company, they also produced a large number of aircraft during World War II and still facing some controversies due to defective engines.

Globalization of Aviation Industry

- After 1915 the aviation sector started expanding at a very fast pace.
- The aviation has started to become a common affair as most of the countries
- They have started to focus on aviation sector and started showing interest in aviation related affairs.
- An amazing development was witnessed in this sector between the years 1919 and 1926.
- This era is known for its record-breaking development in the aviation.
- The first round the world flight was made in the year 1924 from 6th April to 28th September 1924.
- Another historic development in this sector took place in 1925 when Kelly Air Mail act was passed by US congress.
- This enabled the post office department to contract with air transport operators.

Development of Fighter Jets during World Wars

- Aviation industry was not emerged well before World War I

- But with a significant increase in production of propulsion engine and powerful motors the speed of the aircraft doubled up to 130 miles per hour.
- Bigger Engines resulted into bigger power, which made it possible to build larger aircrafts.
- Now soldiers were able to carry heavy weapons with essential items.
- World War II totally changed the face of aviation industry.
- During World War II USA only had 300 aircrafts but after Hitler marched his army into Poland the US aircraft manufacturers manufactured 50,000 planes in a year.
- Before World War II aircrafts were used to carry ammunitions and bombs etc.
- Now they could lift troops and keep supply running back and forth, since then every country is rushing for fighter jets.
- Even most of the ex-military planes used during World Wars were later used by private airlines to transport cargo as well as passengers.
    - Large Planes like B-29and Avro Lancaster was converted from bomber plane to commercial plane in 1960's.
    - Avro Lancaster was built by Avro which is a UK based company merged into Hawker Siddeley and later acquired by British Aerospace.
    - B-29 manufactured by Boeing, which is an US based company, produced 17,964 planes till December 31st 2016.
    - Douglas DC-3 is another revolutionary US Air Force Plane, which was later, converted in to commercial plane.
    - It came into existence in the year1935.
    - These planes are still popular in the present days because of their speed, long-range travel and short runway takeoff.

First Commercial Plane

- St. Petersburg-Tampa Airboat Line was the first passenger commercial airline service.

- It started its operations on 1st January 1914 between St. Petersburg to Tampa.
- Right after that people started to access air travel services
- Commercialization of aviation industry not only supported tourism sector but also helping to boost other sectors too.
- It has also shown a prompt growth in nation's economy thereby providing quickest transport services now days for people and for cargo as well.

Airline Deregulation

It is the process of removing government-imposed entry and price restrictions on airlines affecting, in particular, the carriers permitted to serve specific routes.

Effects of Deregulation

In the wake of deregulation, airlines have adopted new strategies and consumers are experiencing a new market

1) **Hub and spoke**
   - Airlines quickly moved to a hub-and-spoke system.
   - Whereby an airline selected an airport, the hub, as the destination point for flights from a number of origination cities, the spokes.
   - Because the size of the planes used varied according to the travel on that spoke
   - Since hubs allowed passenger travel to be consolidated in "transfer stations", capacity utilization increased.
2) **Price**
   - Base ticket prices have declined steadily since deregulation.
3) **Service quality**
   - The quality of airline service can be measured in many different ways, including the number of aircraft departures, the total number of miles flown, seating comfort, punctuality of service, other programs and services, and various frills or amenities
4) **Competition between carriers**

- A major goal of airline deregulation was to increase competition between airline carriers, leading to price decreases
- Competition was based less on price and more on non-price determinants (e.g. legroom, seat quality, in-flight amenities, flight frequencies)
- As a result of deregulation, barriers to entry into the airlines industry for a potential new airline decreased significantly, resulting in many new airlines entering the market, thus increasing competition

Open sky policy

- Open sky refers to "an agreement between two countries to allow any number of airlines to fly from either of them without any restriction on number of flights, number of destinations, number of seats, price and so on".
- Its primary objectives are:
  - To liberalize the rules for international aviation markets and minimizes government intervention-the provisions apply to passenger, all cargo and combination air transportation and encompass both scheduled and charter services;
  - To adjust the regime under which military and other state-based flights may be permitted

India's current Open Sky agreements

- Currently, India has open sky agreements with US without restriction.
- Further, it has such agreement with some restrictions wit UK' a limited open-sky with ASEAN and bilateral agreements with more than 100 countries.
- There is no restriction on number of flights, seats or destinations to / from United States.
- India has open-sky with UK with restriction on frequencies with respects to flights to and from Mumbai and Delhi.
- For some tourist destinations of ASEAN, India has limited open sky policy.
- India has also entered into bilateral agreements with more than 100 countries over landing points, traffic rights, seasons, capacity etc.

Mergers & Acqusitions in Aviation Sector

- Mergers and acquisitions (M&A) are strategic decisions taken for maximization of a company's growth by enhancing its production and marketing operations.
- They are being used in a wide array of fields in order to gain strength, expand the customer base, cut competition or enter into a new market or product segment.

International Civil Aviation Organization (ICAO)

- The ICAO is a specialized agency of the United Nations (UN)
- Established by States in 1944 to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).
- It was established in order to codify the principles and techniques of international air navigation.
- ICAO also aims at fostering the planning and development of international air transport to ensure safe and orderly growth.
- Headquartered in Montreal, Quebec, Canada.
- ICAO was created with a vision to 'achieve the sustainable growth of the global civil aviation systems.
- ICAO's primary mission is 'to serve as the global forum of States for international civil aviation'.
- ICAO also develops policies and Standards, undertakes compliance audits, performs studies and analyses, provides assistance and builds aviation capacity through many other activities and the cooperation of its Member States and stakeholders.
- Presently, there are 191 ICAO members, consisting of 190 of the 193 UN members

History and Origin

- Formerly established as International Commission for Air Navigation (ICAN), which was established in the year 1903.
- ICAN continued to function until the year 1945.
- In the year 1944, Convention on International Civil Aviation was held in Chicago in which 54 countries signed and agreed to establish Provisional International Civil Aviation Organization (PICAO).
- As per the agreement PICAO began operating on 6 June 1945, replacing ICAN.
- In the 1947, ICAO became a permanent agency of the United Nation.

Role / Objectives of ICAO

ICAO has laid down the following objectives that guide the functions of ICAO.

a) Safety:
   - ✓ ICAO's primary role in aviation industry is to enhance global civil aviation safety by effectively implementing the Global Aviation Safety Plan (GASP).

b) Air Navigation Capacity and Efficiency:
   - ✓ ICAO, in order to increase the capacity and improve the efficiency of the global civil aviation system, strives to promote upgrading the air navigation and aerodrome infrastructure and developing new procedures to optimize aviation system performance worldwide.

c) Security & Facilitation:
   - ✓ ICAO functions to enhance aviation security, facilitation and other matters related border security.

d) Economic Development of Air Transport:
   - ✓ ICAO plays an important role in fostering the development of a sound and economically-viable civil aviation system by 'harmonizing the air transport framework focused on economic policies and supporting activities.

e) Environmental Protection:
   - ✓ ICAO seeks to minimize the adverse environmental effects of civil aviation activities by implementing policies and regulations for the aviation industry that

are 'consistent with the ICAO and UN system environmental protection policies and practices'.

Membership

- Membership of ICAO is open to virtually every country in the world.
- As of March 2016, ICAO members had 191 members, consisting of 190 of the 193 UN members.

Organization Structure of ICAO

a) The Assembly
   - The organization structure of ICAO comprises of two important organs namely, ICAO has The Assembly - sovereign body and a governing body – The Council.
   - The Assembly comprised of all Member States of ICAO and meets at least once in every three years and is convened by the Council.
   - The assembly has various powers such as,
     - To elect the Member States to be represented on the Council;
     - To examine and take appropriate action on the reports of the Council and decide any matter reported to it by the Council;
     - To approve the budgets of the Organization

b) The Council
   - The council of ICAO is a permanent body responsible to the Assembly and is composed of 36 Contracting States elected by the Assembly for a three-year term.
   - The council is headed by a Council President who is appointed for a three year term.
   - The council has numerous functions. Notable among them are,
     - To submit annual reports to the Assembly;

- To carry out the directions of the Assembly; and discharge the duties and obligations which are laid on it by the Convention on International Civil Aviation (Chicago, 1944).
- To administers the finances of ICAO;
- To appoint and define the duties of the Air Transport Committee, as well as the Committee on Joint Support of Air Navigation Services, the Finance Committee, the Committee on Unlawful Interference, the Technical Cooperation Committee and the Human Resources Committee.
- To appoint the Members of the Air Navigation Commission and it elects the members of the Edward Warner Award Committee

c) The Air Navigation Commission

- ❖ The Air Navigation Commission (ANC) is composed of nineteen member countries
- ❖ That are selected on the basis of suitable qualifications and experience in the science and practice of aeronautics, as directed by the Convention on International Civil Aviation (Chicago Convention).
- ❖ The Commission's role is to consider and recommend Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) for adoption or approval by the ICAO Council.

d) The Secretary

- ❖ The Secretariat of the ICAO is headed by the Secretary General who is appointed for a three year term.
- ❖ The Secretariat consists of five bureaus:
  - i. The Air Navigation Bureau,
  - ii. The Air Transport Bureau,
  - iii. The Technical Co-operation Bureau,
  - iv. The Legal Affairs and External Relations Bureau, and
  - v. The Bureau of Administration and Services.

Role of AAI and DGCA

Airport Authority of India (AAI)

- AAI is one of the most important Aviation Regulatory Authorities of India
- It is entrusted with the responsibility of managing airports and airspace in the country.
- The AAI, under the Ministry of Civil Aviation, since its inception has strived towards creating, upgrading, maintaining and managing civil aviation infrastructure in India.
- The Headquarters of AAI is located in New Delhi

Origin and History

- AAI was constituted in the year 2015 by an Act of Parliament.
- AAI was creating after merging two other erstwhile authorities namely, National Airports Authority and International Airports Authority of India to become a consolidated and single entity.
- AAI was established with the single most objective and responsibility of creating, upgrading, maintaining and managing Civil Aviation infrastructure both on the ground and air space in the country.
- AAI manages a total of 125 Airports in metros and non-metro cities of India. Which include,
    - 11 International Airports
    - 08 Customs Airports
    - 81 Domestic Airports
    - 25 Civil Enclaves at Defence Airfields
- AAI also provides Air Traffic Management Services (ATMS) over entire Indian Air Space and adjoining oceanic areas with ground installations at all Airports and 25 other locations to ensure safety of Aircraft operations.

Functions of AAI

- ❖ The primary functions of AAI include construction, modification & management of passenger terminals, development & management of cargo terminals, development & maintenance of apron infrastructure including runways, parallel taxiways, apron etc.
- ❖ AAI provides provision of communication, air navigation and air surveillance which includes provision of DVOR / DME, ILS, ATC radars, visual aids etc.
- ❖ AAI's service includes provisions of air traffic services, provision of passenger facilities and related amenities at its terminals thereby ensuring safe and secure operations of aircraft, passenger and cargo in the country.

The functions of AAI can be listed as below,

- ➢ Designing, Development, Operation and Maintenance of international and domestic airports and civil enclaves.
- ➢ Control and Management of the Indian airspace of India, extending beyond the territorial space if the country as accepted by ICAO.
- ➢ Construction, Modification and Management of passenger terminals in Metros and non-metro cities.
- ➢ Development and Management of cargo terminals at international and domestic airports of the country.
- ➢ Provision of passenger facilities and information system at the passenger terminals at all airports.
- ➢ Expansion and strengthening of aviation operation area, viz. Runways, Aprons, Taxiway etc.
- ➢ Provision of aviation communication and navigation aids, viz. ILS, DVOR, DME, Radar etc.

Role of AAI in Indian Aviation

a) Air Navigation Services:

- In an effort to modernize Air Traffic Control (ATC) infrastructure and air navigation and bring them to international standards for seamless navigation across state and regional boundaries.

- AAI constantly upgrades its satellite based Communication, Navigation, Surveillance (CNS) and Air Traffic Management.
- AAI is being exposed to the latest technology, modern practices & procedures being adopted to improve the overall performance of Airports and Air Navigation Services.

b) IT Implementation:

- AAI website provides a host of useful information of interest to the public in general and passengers in particular, about the organization besides domestic and international flight schedules etc.

c) HRD Training:

- AAI has a number of training establishments, viz.
  - National Institute of Aviation Management and Research (NIAMAR) in Delhi,
  - Civil Aviation Training College (CATC) in Allahabad,
  - Fire Training Centers at Delhi & Kolkata for in-house training of its engineers,
  - Air Traffic Controllers,
  - Rescue & Fire Fighting personnel etc.
- These institutions of AAI are members of ICAO TRAINER programme under which they share Standard Training Packages (STP) from a central pool for imparting training on various subjects.

d) Revenue:

- AAI generates its revenue from landing/parking fees.
- They generate revenue from fees collected by providing CNS & ATC services to aircraft over the Indian airspace.

e) Privatization of Airports:

- The Government of India, in the year 2006, handed over Delhi and Mumbai airports to private companies for the purpose of modernization in under revenue sharing agreement to the GMR Group and GVK group respectively.
- The Nagpur Airport was transferred to the Maharashtra State owned MADC.

- AAI has been jointly working with GMR and GVK in the maintenance and upkeep.

f) International Projects undertaken by AAI:

- The AAI from time to time offers and involves in various consultancy and development projects with countries such as Libya, Algeria, Yemen, Maldives, Nauru, Mauritius and Tanzania.
- AAI also deputes trained personnel for operation, maintenance and management of airports in these countries.

Organization and Governance Structure

- AAI is headed the Chairman and the Director General of Civil Aviation an Ex- officio reports to the Chairman of AAI.
- Two Joint Secretaries from the Ministry of Civil Aviation also members of the Board of AAI.
- The AAI governing board also comprises of other experts from respective fields who occupy whole-time and part-time positions.

Directorate General of Civil Aviation (DGCA)

- The Directorate General of Civil Aviation (DGCA) established under the Ministry of Civil Aviation, is a regulatory body in the field of Civil Aviation.
- DGCA is primarily responsible for ensuring safety in aviation.
- DGCA is the body responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety, and airworthiness standards.
- DGCA's regulatory functions are in line with the International Civil Aviation Organization (ICAO).
- This regulatory body was established with a larger vision of 'endeavoring to promote safe and efficient Air Transportation through regulation and proactive safety oversight system'.
- The Headquarters of DGCA is located in Delhi

- It has 14 Regional Airworthiness Offices (RAO) in Delhi, Mumbai, Chennai, Kolkata, Bangalore, Hyderabad, Kochi, Bhopal, Lucknow, Patna, Bhubaneswar, Kanpur, Guwahati and Patiala.
- It also has 5 Regional Air Safety Offices (RASO) located in Delhi, Mumbai, Chennai, Kolkata and Hyderabad.
- It has a Regional Research and Development Office located in Bangalore and a Gliding Centre at Pune.

Functions and Areas of Operation

The functional areas of DGCA as described below:

1) Registration of civil aircraft;
2) Formulation of standards of airworthiness for civil aircraft registered in India and grant of certificates of airworthiness to such aircraft;
3) Licensing of pilots, aircraft maintenance engineers and flight engineers, and conducting examinations and checks for that purpose;
4) Licensing of air traffic controllers;
5) Certification of aerodromes and CNS/ATM facilities;
6) Maintaining a check on the proficiency of flight crew, and also of other operational personnel such as flight dispatchers and cabin crew;
7) Granting of Air Operator's Certificates to Indian carriers and regulation of air transport services operating to/from/within/over India by Indian and foreign operators, including clearance of scheduled and non- scheduled flights of such operators;
8) Conducting investigation into incidents and serious incidents involving aircraft up to 2250 kg AUW and taking accident prevention measures including formulation of implementation of Safety Aviation Management Programmes;
9) Supervision of the institutes/clubs/schools engaged in flying training including simulator training, AME training or any other training related with aviation, with a view to ensuring a high quality of training;
10) Granting approval to aircraft maintenance, repair and manufacturing organizations and their continued oversight;

11) Keeping a check on aircraft noise and engine emissions in accordance with ICAO Annex 16 and collaborating with the environmental authorities in this matter, if required;
12) Approving training programmes of operators for carriage of dangerous goods, issuing authorizations for carriage of dangerous goods, etc.

Organization and Governance Structure

The Director General heads the DGCA and heads 11 departments of the DGCA. These departments are:

1. Administration Directorate
2. Aerodrome Standards Directorate
3. Air Safety Directorate
4. Air Transport Directorate
5. Airworthiness Directorate
6. Flight Standards Directorate
7. Information & Regulation Directorate
8. Aircraft Engineering Directorate
9. Directorate Of Flying Training
10. Medical Section
11. Directorate of Training & Licensing

Importance of DGCA in Indian Aviation

- DGCA plays a pivotal role in the sustainability and development of the aviation industry in India.
- DGCA, entrusted with the responsibility of implementing air safety regulations of ICAO, has relentlessly strived to make flying easier and safer for both passenger and cargo.

- DGCA through its various departments looks into crucial matters related to civil aviation such as safety, economic regulation, grievance resolution, environmental concerns and accident investigation.
- DGCA also regulates of airside works to ensure safe guarding of aerodrome and aircraft operations.

Role of DGCA in Indian Aviation

DGCA plays crucial role in the below listed operational area of aviation,

a. Aircraft certifications for airworthiness and licenses for airline schedules.

b. Approval for Foreign Airline Operations in India

c. Aerodromes Licences & Renewal

d. Licences for Pilots – Commercial, Private, Student & Glider

e. Airspace and Air Traffic Management

f. Approval and Scheduling of flights

g. Training and Other related services

International Air Transport Organization (IATA)

- IATA is a trade association whose members are of airlines around the world.
- It was established in the year 1945 with a mission 'to be the force for value creation and innovation driving a safe, secure and profitable air transport industry that sustainably connects and enriches our world.
- IATA's headquarters is located in Montreal, Canada.
- IATA has been instrumental in formulating global aviation policies and standards, and further has been constantly supporting member airlines in various activities.
- Over 265 airlines in over 117 countries are members of IATA, carrying 83% of the world's air traffic.
- IATA membership is open to both cargo and passenger airlines.

History and Origin

- IATA was established in Havana, Cuba on the 19th April 1945.
- Its aim to foster 'inter-airline cooperation in promoting safe, reliable, secure and economical air services - for the benefit of the world's consumers.
- In the year 1945, at its inception, IATA was founded with 57 members from 31 nations.
- Today IATA some of the leading and largest passenger and cargo airlines of the world are its members.
- Global aviation industry has grown manifold since the inception of IATA.

Role & Mission of IATA

- IATA was founded with the mission to promote and support global aviation.
- The 3 important missions that guide IATA are as below:
  a) Representing the Airline Industry by improving 'understanding of the air transport industry among decision makers and increase awareness of the benefits that aviation brings to national and global economies.
  b) Leading the Airline Industry by developing 'global commercial standards upon which the air transport industry is built.
  c) Serving the Airline Industry by helping 'airlines to operate safely, securely, efficiently, and economically under clearly defined rules.
- The role of IATA in aviation is wide ranging which can be highlighted in the below discussed priority areas:
  i. Increasing Safety and Security for passengers, crew and cargo, and also for the aircrafts.
  ii. To enable Payment and Distribution Transformation.
  iii. To reduce charges, fees and taxes to make flying accessible to all.
  iv. Implement practices globally to remove existing regulatory restrictions for Fast Travel solutions.
  v. Improving the Regulatory and Legal Environment in order to foster the growth of aviation industry.
  vi. Promoting Sustainable Aviation Fuel Projects in order to mitigate ecological issues associated with aviation.

vii. Monitor and maintain high levels of membership satisfaction in order to represent lead and serve the global aviation industry better.

Functions of IATA

- IATA was formed with the below discussed objectives:
  a) To promote safe, regular and economical air transport for the benefit of the people of the world.
  b) To promote means for collaboration among air transport enterprises engaged directly or indirectly in international air transport service.
  c) To cooperate with ICAO and other international organisations.

Membership

- Membership of IATA is open to all airlines operating scheduled and non-scheduled air services that maintain an IATA Operational Safety Audit (IOSA) registration.
- The members of IATA enjoy various benefits and advantages such as,
  - International recognition,
  - Networking opportunities with various international airlines and agencies,
  - Reduced cost in various transactions and settlements,
  - Platform for training and other services

Organization and Governance Structure

- IATA has 54 offices in 53 countries and it represents close to 265 airlines from 117 countries.
- Flights by IATA member airlines represent over 83% of total traffic globally.
- The IATA regions are divided into 5 regions namely,
  a) Africa and Middle East
  b) Europe
  c) China and North Asia
  d) Asia Pacific
  e) The Americas

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MODULE 3

Airport

- Airport, also called air terminal, aerodrome, or airfield, site and installation for the takeoff and landing of aircraft.
- An airport usually has paved runways and maintenance facilities and serves as a terminal for passengers and cargo.

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Definition

A place where a aircraft can land and take off ,usually equipped with hangars , facilities for refueling and repair , various accommodations ·for passengers , etc .

Functions of Airport

An airport essentially works as a facilitator and its functions vary as per its size. However, looking at the various functions of an airport we can broadly group them in three categories:

a) Essential operational services
   - This include maintenance of runways, terminals, hangers, buildings, air traffic control system, telecommunications, security, fire and ambulance services.
   - Different countries have different rules in providing these services depending on the nature of government control over the airport authority.
   - In India, till now all these facilities are provided and controlled by government through various agencies.

b) Traffic handling services
   - This include provision of loading and unloading of baggage, delivery of baggage through conveyor belts at the lounge, processing of passengers and providing required services to the passengers.
   - Here also difference exists among airports in different countries.
   - For example in many European countries these services are provided by airlines or special handling agents.
   - In India these services are provided by the airport authorities.

c) Commercial activities.

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- This include shops, duty free shops, restaurants, bars, car-hire booths, offices of travel agencies and airlines, tourist information center, foreign currency exchange facility and other services for customers.
- Generally, either in the terminal building or in its vicinity these facilities are available.
- These facilities and services may be provided by airport authorities or by any public/private body.

Socio-Economic Situations

Social Impact of Air Transportation

a) Air transport contributes to sustainable development:

- Air transport makes a major contribution to sustainable development by supporting and promoting international tourism.
- Tourism helps reduce poverty by generating economic growth, providing employment opportunities, increasing tax collection, and by fostering the development and conservation of protected areas and the environment.
- In effect, protecting the environment attracts tourism and the development of the tourism industry, which in turn makes it possible to finance the protection of nature and cultural heritage, thereby increasing the benefits of protected areas to the country.
- It can also increase the sense of ownership and responsibility for natural resources, among local communities.

b) Air transport provides access to remote areas:

- Air transport provides access to remote areas where other transport modes are limited, thus opening them up to contact with other communities, and providing a means for the delivery of essential supplies.
- Many essential services such as hospitals, education, post, etc. would not be available for people in such locations, without the presence of air services.

c) Air transport delivers humanitarian aid:

- Air services play an essential role in humanitarian assistance to countries facing natural disasters, famine and war – through cargo deliveries, refugee transfers or the evacuation of people trapped by natural disasters.
- They are particularly important in situations where access is a problem.
- Natural disasters often mean that whole communities are cut off. Humanitarian assistance in such circumstances can be delivered rapidly to those in need through the use of airports and air services.
- Air transport also plays a vital role in the rapid delivery of medical supplies and organs for transplantation worldwide.

d) Air transport contributes to consumer welfare:

- Travel and tourism provide substantial consumer welfare and social benefits by increasing understanding of different cultures and nationalities which facilitates closer international integration; improving living standards by widening choice.
- Cheaper and more frequent access to air travel has increased the range of potential holiday destinations.
- The large number of overseas visitors has also helped widen the range of leisure and cultural activities available in many countries.

Economic Impact of Air Transportation

a) Direct impacts:

- These cover employment and activity within the air transport industry including airline and airport operations, aircraft maintenance, air traffic control and regulation, and activities directly serving air passengers, such as check-in, baggage-handling, on-site retail and catering facilities.
- Direct impacts also include the activities of the aerospace manufacturers selling aircraft and components to airlines and related businesses.
- Of the 5 million direct jobs generated by the air transport industry worldwide, 4.3 million people are employed by the airlines and airports globally, contributing around US$ 330 billion of GDP to the global economy in 2004.

b) Indirect impacts:

- These include employment and activities of suppliers to the air transport industry, for example, jobs linked to aviation fuel suppliers; construction companies that build additional facilities; the manufacture of goods sold in airport retail outlets, and a wide variety of activities in the business services sector (call centers, IT, accountancy, etc.).
- 5.8 million Indirect jobs are supported through purchases of goods and services by companies in the air transport industry.
- The contribution of the indirect jobs to global GDP is US$ 375 billion.

c) Induced impacts:

- These include spending by those directly or indirectly employed in the air transport industry that supports jobs in industries such as retail outlets, companies producing consumer goods and a range of service industries (e.g. banks, restaurants, etc.).
- 2.7 million induced jobs are supported through employees in the air transport industry (whether direct or indirect) using their income to purchase goods and services for their own consumption.
- This includes jobs in retail and a range of service industries.
- The induced contribution to global GDP is US$ 175 billion (2004 estimation).

d) Catalytic impacts:

- The air transport industry's most important economic contribution is through its impact on the performance of other industries and as a facilitator of their growth.
- It affects the performance of the world economy, improving the efficiency of other industries across the whole spectrum of economic activity – referred to as catalytic benefits.
- 15.5 million Jobs are the result of catalytic impact. According to 2004 estimation of the catalytic contribution to global GDP is US$ 2135 billion.

Revenue Sources of Airports

- Airport revenues and airport commercial activities are among the areas where this development is most felt.
- Over time, the airport operators went through changes in their commercial activities, with the increase in aeronautical revenues and non-aeronautical revenues, and at the same time proportional change was observed as well.
- That income can be divided into two components:
  a) Aeronautical
  b) Non-aeronautical.

a) Main sources of Aeronautical Revenue at an airport

- Aeronautical Revenue means revenue from all regulated charges levied at the Airport.
- It comprises the majority of airport income, and includes airline terminal space rentals, airline landing fees, and usage fees for terminals, gates, services and passenger counts.
- Airlines act as airport tenants, paying rent for counter and gate space, training facilities, storage facilities, hangars, offices and maintenance facilities.
- They additionally pay for landing and parking fees, and to hold a lease on ticket counter and gate space to occupy an exclusive area.

b) Main sources of non-aeronautical revenue at an airport

The ICAO highlights in its report the following main sources of non-aeronautical revenue at an international airport:

- Fuel supply for aircrafts
- Catering (restaurants, cafeterias,vending machines, etc.)
- Airport shops affiliated with the local tax and duty-free regime that is dedicated to retail sales
- Banks and currency exchange offices
- Provision of food for consumption on board the aircraft

- Taxi and other transport services between the air facilities and nearby towns
- Car rental
- Parking
- Advertising at the airport
- Petrol stations for cars
- Hairdressers
- Vending machines for non-food items
- Areas of consolidation of loads and dispatch of goods

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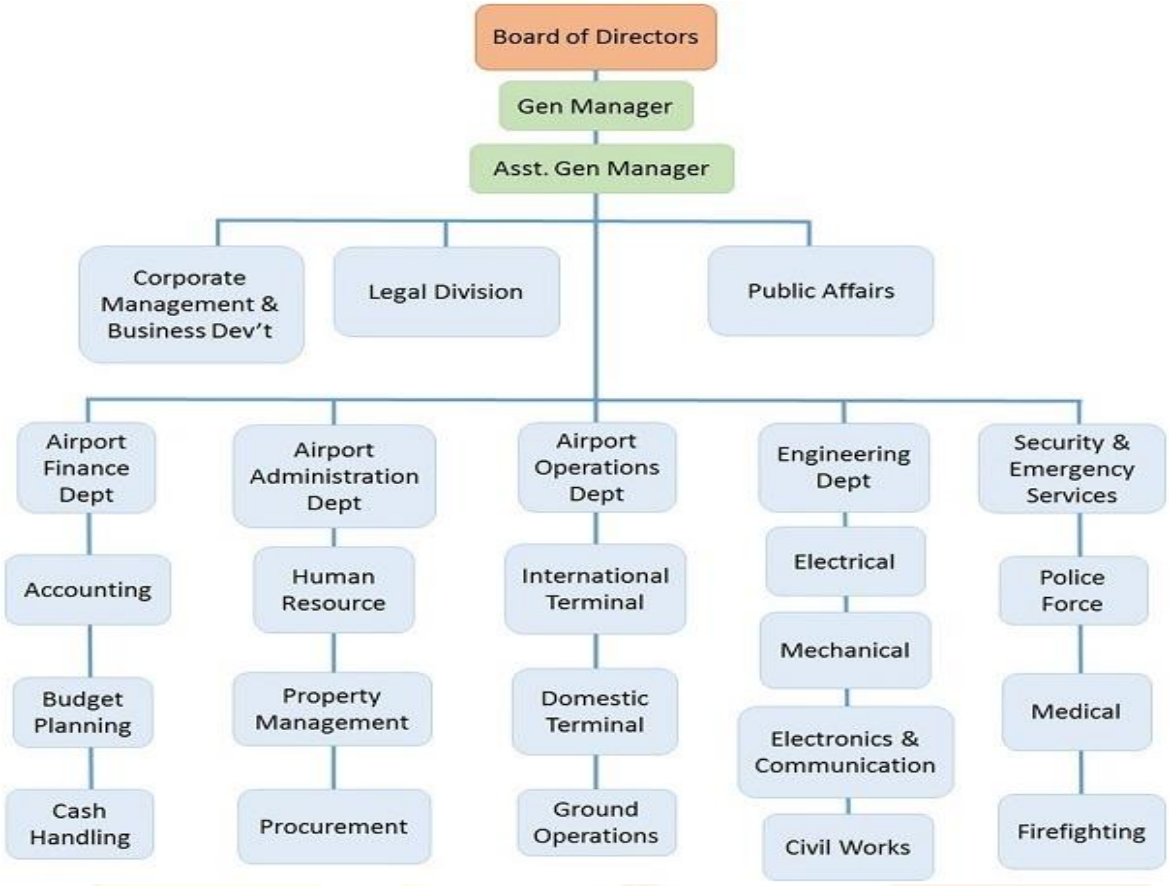
Airport ownership and operation

- Most of the world's large airports are owned by local, regional, or national government bodies who then lease the airport to private corporations who oversee the airport's operation.
- In India GMR Group operates, through joint ventures, Indira Gandhi International Airport and Rajiv Gandhi International Airport. Bengaluru International Airport and Chhatrapati Shivaji International Airport are controlled by GVK Group.
- The rest of India's airports are managed by the Airports Authority of India.
- Each airports are classified into one of the following six ownership/governance types:
  i. Government agency or department operating an airport;
  ii. Mixed private-government ownership with private sector owning a majority share;
  iii. Mixed government-private ownership with government owning a majority share;
  iv. Government ownership but contracted out to an airport authority under a long term lease;
  v. Multi-level governments form an authority to own/operate airports in the region;
  vi. 100% government corporation ownership/operation;

Organizational structure of an Airport



Airside various parts and facilities

An airport is mainly divided into two areas −

a) Airside Area
b) Landside Area

a) Airside Area

It is the area beyond landside area inside the airport. It includes runways, taxiways, and ramps.

- ❖ Runway
  - An area where aircraft takes off and lands.
  - It is made of soft grass, asphalt, or concrete.

- It has white markings, which help the pilot during take-off and landing.
- It also has lamps on the sides to guide the pilot during night.
- The vehicles other than the aircrafts are strictly prohibited to enter this area of the airport.

❖ Ramp

- Also called Apron.
- This area is used for parking the aircrafts.
- It can be accessed for boarding and alighting the aircraft.
- The airline staff or ground duty staff can access this area.

❖ Taxiway

- It is a path on the airport that connects the ramp to the runway.

b) Landside Area

It is the area in the airport terminal and the area towards city. It has access to the city roads and it contains parking area as well as public transport area.

❖ Terminal

- It is a part of airport building that where travelers come to board their flight or arrive from a flight.
- There are security checking, baggage checking, amenities, and waiting areas at the terminal.

❖ Parking

- This area is outside but adjacent to the terminal where vehicles can be parked on chargeable basis.

Most of the airports around the world are owned by local, regional, or national government bodies. According to the Aircraft Rules, 1937, the airports other than government airports are permitted to be owned by Indian citizens, or Indian companies or corporations registered and having their principal place of business as India. In India, some airports are owned by the state governments, private companies, or even individual citizens

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MODULE 4

Airport Operations

Airport operations encompass all of the processes involved in an airport to ensure passenger experience runs as smoothly as possible. This includes airport customer service, gateway operators, and more. An airport operation is a very diverse industry with a plethora of opportunities to be explored. There are four main segments of airport operations.

a) Landside operations,
b) Airside operations,
c) Billing and invoicing,
d) Information management.

a) Landside operations

- These are aimed at serving passengers and maintenance of terminal buildings, parking facilities, and vehicular traffic circular drives.
- Passenger operations include baggage handling and tagging.
- Terminal operations comprise resource allocation and staff management.
- Those who work in landside operations have a customer-serviced role overseeing the terminals, concourses, roadways, and properties surrounding the airport.
- They also conduct the day-to-day operations inside the terminals and parking decks. Like airside, landside deals with safety and security operations. **Terminal operations** fall under this category.

b) Airside operations

- This includes aircraft landing and navigation, airport traffic management, runway management, and ground handling safety.

- Those who work airside operations oversee the airfield, ramps, safety, and security of the airport.

- This department works to make sure the entire airside environment runs as efficiently as possible. This includes:

  - Coordinating responses to airside incidents, accidents, emergencies.
  - Allocation of aircraft parking and aircraft escorts.
  - Conducting runway and taxiway inspections.
  - Policing airside driving.
  - Vehicle escorts for companies and contractors requiring airside access.
  - Day-to-day management of wildlife to reduce the risk of bird interference on aircraft.

c) Billing and invoicing operations

- It covers aeronautical and non-aeronautical revenue.

- Ledger or accounting systems contain information regarding airport finances: flight bills, handling invoices, cash, sales within the airport (points-of-sales), staff payrolls, etc.

d) Information management

- This relates to the collection and distribution of daily flight information, storing of seasonal and arrival/departure information, as well as the connection with airlines.

Ground Handling

In aviation, the term "ground handling" refers to the wide range of services provided to facilitate an aircraft flight or aircraft ground repositioning, preparation for and upon conclusion of a flight which will include both customer service and ramp service functions.

a) Customer Service Functions:

- Airline or airport customer service involves providing support to airline/airport customers before a flight, during a flight, and after a flight.
- Typical duties can involve assistance with bookings/reservations, processing boarding passes, and managing check-ins.
- Customer Service Functions include:
  - **Ticketing.**

    Although most passengers will arrive at the airport with tickets in hand, there are provisions at most terminals for on-the-spot purchase
  - **Check-in.**

    Electronic check-in kiosks have become prevalent in most major airports. However, there will still be customer service agents to assist passengers with the check-in process, to verify documentation, to tag and process their checked baggage and to ensure that cabin baggage conforms to regulated size, weight and content
  - **Baggage collection.**

    Provisions will be available, usually at a secondary location, for the acceptance of baggage items
  - **Baggage Sorting.**

    Bags will be electronically or manually sorted by flight and either loaded into Unit Load Devices (ULD) or placed on baggage trolleys in preparation for aircraft loading
  - **Lobby Management.**

    Passenger service agents will ensure that the appropriate numbers of check-in desks are available, staffed and have the appropriate identification signage as well as directing and controlling the flow of passengers in an orderly and efficient manner.

- **Irregular Operations.**

  Customer Service Agents will be available to accommodate Irregular Operations requirements such as rebooking passengers who have missed connections or providing meal and accommodation vouchers, or alternate transportation arrangements, in the event of delay or cancellation of flights

- **Special Needs Handling.**

  Customer service agents will make arrangements for wheelchairs or other transport to the departure gate for mobility impaired passengers and will process, safeguard and supervise any unaccompanied minors (UMs) from check-in to aircraft boarding and from aircraft deplaning to release to a parent or other authorised person

- **Gate Assignment.**

  In coordination with the airport authority, aircraft gates will be assigned and the gate information relayed to the passengers

- **Lounge Management.**

  Where available, business and first class lounges, available to qualified passengers, will be staffed and provisioned

- **Aircraft Boarding.**

  Ground agents will make appropriate boarding announcements, conduct final passenger screening and document verification and provide a final passenger manifest and customs documentation to the aircraft crew.

- **Aircraft Disembarkation.**

  Ground staff will receive any inbound customs paperwork and accept arriving passengers at the aircraft and facilitate their transfer to the terminal building, dealing as necessary with issues arising from inbound delay or cancellation of connecting flights

- **Baggage Services.**

  Ground agents will assist with lost, misdirected or damaged baggage

b) <u>Ramp Services</u>:

- Airport ramps are typically small, noisy, and congested areas where departing and arriving aircraft are serviced by ramp workers, including baggage handling, catering, and fuelling personnel.

➢ Ramp Services include:

- **Marshalling.**
  - The marshalling process at some aerodromes starts as the aircraft approaches the apron with the provision of a Follow Me Vehicle to guide the aircraft to its assigned parking stand.
  - As the aircraft approaches the stand, the vehicle relinquishes aircraft guidance to either electronic Stand Entry Guidance Systems or ground personnel to direct the aircraft to its final parked position.
  - In many cases, wing walkers will work in conjunction with the marshaller or guidance system by controlling ramp traffic and to helping to mitigate any wing tip clearance hazard.
  - On departure, a marshaller will assist in engine start, confirming that the area around the engine is clear of hazards and watching for indications of an engine fire.
  - Should a fire occur, the marshaller will advise the crew by interphone or by using Emergency Hand Signals.
  - Wing walkers will also be provided when the aircraft is to be pushed off stand
- **Chocking and Connection/Disconnection of Ground Services.**
  - Once the aircraft is on-stand, wheel chocks will be inserted and external services such as passenger bridge(s) or boarding stairs, ground electrical service and ground air conditioning units will be positioned or connected as required.
  - As the departure time approaches, these items will be disconnected and removed as directed by the flight crew
- **Baggage and Freight Handling.**
  - Baggage and freight on the inbound aircraft will be off-loaded using whatever specialised equipment necessary (such as baggage belts, split loaders and fork trucks) and the outbound bags and freight will be loaded on the aircraft.
  - Care must be taken to ensure that Loading of Aircraft with Cargo is accomplished in accordance with the load planner's loading instructions and that Dangerous Goods are correctly handled.
- **Aircraft Towing.**

Movement of an aircraft to or from a maintenance facility, a remote parking stand or from one gate to another will be accomplished on an "as required" basis.

- **Refuelling.**

  Aircraft will be refuelled to the requirements of the outbound flight as specified by the Pilot in Command or, in his absence, by the dispatcher. Specific protocols are in place in the event that refuelling is to be accomplished with passengers remaining on board

- **Toilet and Water Servicing.**

  Toilet waste holding tanks will be emptied and serviced as required. Potable water tanks will be refilled

- **Aircraft Cleaning.**
  - The cabin, lavatories and galley counter surfaces will be cleaned.
  - Garbage containers will be emptied and the contents removed from the aircraft.
  - Toilets will be restocked.
  - Passenger comfort items such as pillows and blankets will be replaced as required and, where applicable, newspapers will be brought on board

- **Catering.**
  - The catering trolleys and oven inserts from the inbound flight will be removed and the catering for the outbound flight boarded.
  - Galley and bar stock will be replenished

- **Provision of Documents.**

  Prior to departure, the flight crew will be provided with the appropriate documentation inclusive of a fuel uplift receipt, the completed Aircraft Load and Trim form or, if the crew completes their own Load and Trim, the certified Loading Instruction Form (LIF), freight manifests and the appropriate notifications for any dangerous goods.

Deplaning and boarding

- **Deplaning** means to leave an aircraft or disembark from an airplane
- **Boarding** refers to the moment when you board the aircraft. Once check-in is finished, remember to allow sufficient time to clear checkpoints (passport control and/or security).

Turn around operations

- The turnaround time (TAT) of an aircraft is defined as the time that passes from when an aircraft lands until it takes off again for a new flight.
- To complete a turnaround phase efficiently, it is necessary to carry out several actions simultaneously. The following steps must be completed before an aircraft can fly again.

a) Aeroplane taxiing into its parking position

After landing, the aeroplane should move to its assigned parking position. Once there, it will be immobilised and marked off with safety cones by the operators in charge of ground handling.

b) Disembarkation of passengers and crew

Passengers will then leave the aircraft through the established doors (normally through just one of them) to access the gateway or buses that will take them to the terminal.

c) Cabin cleaning

As the passengers leave the aircraft through one of the doors, the professionals in charge of cleaning the cabin will enter through the other to remove rubbish, sanitise the bathrooms and replace the consumables.

d) Loading and ramp handling

At this point, the operators in charge of loading and ramp handling come into action. Baggage and goods will be unloaded and transported to the respective baggage carousel and warehouses.

e) Airline and aeroplane inspection and SOPM

The Standard Operating Procedures Manual (SOPM) of the aircraft manufacturer and the airline itself determines the safety technical check routine to be followed during the turnaround time to verify that the aircraft is in good condition to fly.

f) Airplane refuelling

The aircraft's tanks must also be filled with the necessary fuel to ensure that it arrives safely to its next destination.

g) Catering

Meanwhile, the catering service will provide food and beverages for passengers on the new route.

h) Loading of suitcases and goods

After the aircraft hold has been emptied, the handling agents re-fill it with baggage and cargo for the next flight.

i) Passenger boarding

One of the last operations of turnaround time will be the boarding of passengers. While the handling service has been completing all of the previous tasks, the crew and pilots have had to focus on confirming the route details and the number of passengers, as well as carrying out their own security checks inside the aircraft.

j) Towing the aeroplane to the start of the runway

Finally and often helped by a push-back trailer, the aeroplane will abandon its parking position and prepare to commence the taxiing manoeuvre in order to access the take-off runway.

Refueling

- Refueling takes place once the arriving passengers have vacated the aircraft, and before the departing passengers board.
- Once parked, Trucks Park under the wing of the aircraft.
- The fuel-tanks are pretty much always situated in the wings of the aircraft.
- Before refueling, look at the fuel gauges and estimate how many gallons of fuel will be required.
- This will help to assure that you leave with the desired amount of fuel on board.

Power supply of Aircraft

Electric Power Generation

- An airplane contains two major electrical circuits and one alternate circuit.
- The two circuits, one on each side of the aircraft, are linked to a generator.
- It is this generator that produces electricity, using the mechanical energy supplied by one of the engines. This is what we call electric power generation.

Electric Power Distribution

- The electricity produced by the generators is transported to the "electrical cores" by thick cables known as "feeders."
- These cores, which take the form of electrical cabinets or boxes, receive the electricity produced by the generators

Interconnection

- 260-amp direct- and alternating-current contactors supply both the primary distribution system (35-50 amps) and the secondary distribution system (3-15 amps).
- The electricity is then transmitted to the plane's equipment, this time via quite large-diameter distribution cables or smaller electrical harnesses.

Conversion

- The onboard generators supply an alternating voltage of 115/230 volts (similar to that of a domestic electrical appliance) while the onboard control units require a direct voltage of 28 volts (comparable to that available in a car).
- A converter reduces the alternating voltage of the 115/230-volt generators to achieve an alternating voltage of 28 volts, and a transformer/rectifier then rectifies that to a 28-volt direct voltage.

Alternate Power Source

- The generators are not the only means of electricity production on a plane.

- The APU (Auxiliary Power Unit), generally located at the rear of the aircraft, also produces energy to power the various onboard systems when the plane is on the ground, as well as supplying the energy necessary to start the engines.
- The RAT (Ram Air Turbine), a small turbine connected to an alternator, provides a further source of emergency power should generation from the engines stop working.
- If the primary and secondary energy sources fail, the RAT must produce the power necessary for the aircraft's vital systems (flight control, related hydraulic circuits and critical flight instruments).

Rescue and firefighting

- **Aircraft rescue and firefighting** (**ARFF**) is a type of firefighting that involves the emergency response, mitigation, evacuation, and rescue of passengers oversight by an arm of their individual national governments or voluntarily under standards of the International Civil Aviation Organization and crew of aircraft involved in aviation accidents and incidents.

Airports with scheduled passenger flights are obliged to have firefighters and firefighting apparatus on location ready for duty any time aircraft operate. Airports may have regulatory

WINTER OPERATION

- Winter snow and ice can have a major impact on airport operations.
- Aircraft may have to be deciding prior to departure and runways have to be cleared or treated, while the work of ground staff may be impacted and refueling affected.
- Working closely with meteorologists during a significant weather event can help airports and airlines prepare and plan.
- Forecasts often include the likelihood of snow five-days in advance and 24 hours before can detail the exact timings of snowfall, how long it will last and how heavily it is expected to be.

- A timely, accurate forecast can mean snow clearance vehicles and crews are prepared and a schedule for snow clearance organised.The Met Office provides a colour-coded anti-icing and de-icing alert up to five days ahead of difficult weather, which can help aircraft complete their planned flying programme, help ensure stock and staff management is well-planned and reduce the environmental impacts of de-icing fluids by improving understanding of when treatment is *not* required.

Safety and Security in Aviation

The airport security systems and staff together work towards the safety of the airport, the aircraft, and also the safety of the passengers. To manage the airport as well as the aircraft security, the following measures are employed:

- Aircraft and airport employees are trained on security and safety issues, as well as crisis handling procedures.
- Aircrafts are equipped with emergency exit way and procedures for passengers.
- Airport areas are monitored by Closed Circuit TV cameras.
- A dedicated team of trained police force is employed for airport and aircraft safety.
- The security staff takes the help of sniffer dogs to detect any unclaimed object lying around the airport.
- The airports are equipped with fire-fighting alarm and fire-extinguishing systems.
- Sensitive airside areas in airports, such as ramps and operational spaces, are restricted from the general public.
- Every traveler who arrives at the airport needs to enter into the airport only from the Departure entry. The traveler can go in further only after showing a valid journey ticket, an identity proof, and a passport if required.
- Non-passengers need to obtain a gate pass and face security checking to enter the secure area of the airport.
- Traveler check-in baggage and handbags are strictly screened through X-ray machines.
- Travelers are screened by metal detectors before they board. But they can be subjected to later screening if required.
- Travelers are not permitted to enter the cockpit area of the aircraft.
- The food joints at the airport use containers and glasses made of plastic instead of• those made of glass as they can be used as weapons

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MODULE 5

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Passenger handling

- It means supporting passenger procedures and flight operations hospitably and professionally.
- We provide passenger handling services at airports, such as customer service at counters and lounges, flight support for managing plane flight operations, etc.
- Passenger Services respond to a full spectrum of premium passenger needs, including
    - Porterage
    - Trolley management
    - Check-in Services
    - Special care for Passengers with Reduced Mobility (PRM)
    - Unaccompanied minors
    - Buggies and strollers
    - Transfer desk Services
    - Baggage control on departure and arrivals
    - Baggage delivery services
    - Passenger documentation
    - Flight control
    - Special needs of VVIP and executive charter passengers
    - Lost and Found Services
    - Flight control & editing
    - Boarding Gate Services
    - Handling INAD passengers
    - Crew Check-in
    - Crew clearance services

Departure Procedures

1) Airport Procedure

If you use online check-in, there is no need to go to the check-in counter.

2) Checking in baggage

Please proceed to the baggage counter to check in your baggage.

Fragile luggage checked in will be given a special tag or sticker.

3) Security Check

Baggage will need to be checked at the security checkpoint.

There may be long lines depending on the airport and time of day, so please proceed to the security checkpoint with adequate time to spare.

4) Immigration

You must present your travel documents. Immigration is completed at this step

5) Boarding and Disembarking

Information is provided beforehand via announcements for smoother boarding and disembarkation.

6) Immigration

You must present your travel documents to proceed with immigration.

Necessary documents may differ by the country. Please check in advance.

7) Baggage Claim

Pick up your baggage after passengers flying in First Class/Business Class/Premium Economy.

Check-in Formalities

- It is the process whereby passengers are accepted by an airline at the airport prior to travel.
- The airlines typically use service counters found at airports.
- The check-in is normally handled by an airline itself or a handling agent working on behalf of an airline.
- Passengers usually hand over any baggage that they do not wish or are not allowed to carry in to the aircraft's cabin and receive a boarding pass before they can proceed to board their aircraft.

Steps

1. Find the appropriate check-in gate (point) for your flight.
2. Have your documents ready – passport (or national ID), online reservation booking number (code), or a paper copy of your ticket (if you have one).
3. At the check-in desk, you will be asked to present the documents listed above, and you can hand over checked baggage which will be weighed and then sent to be loaded onto the plane.
4. After presenting your documents and checking your baggage, you will receive a boarding pass which enables you to board the plane.
5. Once the check-in procedure is completed you should proceed to the appropriate gate, where each passenger undergoes a security check.
6. During the security check, passengers must place objects like keys, telephones, belts, electrical equipment, as well as coats, jackets, and scarves in the baskets provided and put them on the conveyer belt.
7. After the security check, you can proceed to the appropriate gate, where you will then board the plane. The boarding time is indicated on your boarding pass. At boarding time, airport staff will make an announcement informing passengers they may board the plane.

Free baggage allowance

- The baggage allowance is the amount of checked baggage or hand/carry-on luggage the company will allow per passenger.
- There may be limits on the amount that is allowed free of charge, and hard limits on the amount that is allowed.
- The limits vary per airline and depend on the class, elite status, type of ticket, flight origin and destination.
- If a flight is booked together with another flight it may also have different limits (e.g. if another flight on the same ticket is a long-haul flight).
- The exact baggage conditions are mentioned in the ticket information online.

Types of Baggage

- On aircraft, there are two types of baggage, which are treated differently:
  a) Checked baggage
  b) Hand/carry-on luggage.
- For both types, transportation companies have rules on the weight and size.
  a) Checked baggage
    - It is stored in the aircraft hold; usually the weight is the limiting factor.
    - All checked items are generally weighed by the airline during check-in, and if they exceed the limit, the passenger is informed by the airline.
    - To avoid any fees, the passenger often must switch some of the items found in the suitcase to another suitcase, or else carry it on.
  b) Hand/carry-on luggage.
    - Carry-on luggage is judged primarily by size.
    - Bags are measured by dimension or in total linear measurement (length + width + height).
    - However, there may also be other restrictions on the types of belongings that can be carried on the plane.
    - Only 01 piece of hand baggage having maximum weight of 8 Kg is permitted.

Excess Baggage Allowance

- Excess baggage is the amount of baggage that is in excess of the free allowance in size, number, or weight permitted for the journey.
- At the carrier's discretion, this may be carried at an extra charge, but no guarantee is made and it may have to be sent as freight instead.
- Some airlines impose excess baggage embargoes on certain (usually smaller) routes, indicating that they will accept no (or very little) excess baggage.

Baggage Pooling

- The pooling refers to people that check in two bags and put 20kg in one and 10kg in another.
- Even though that does not exceed the total weight allowance for two bags, it is nevertheless prohibited as each bag can weigh no more than 15kg.

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