



## **I. Course Overview:**

Upon successful completion of this course, the students should be able to understand the basic design of airports and their layouts. Students should be able to identify with the planning of airport design, airport master plans, and airport interaction with the community. The student should have a basic understanding of new airport construction and design as well as modifications and expansion to existing airport facilities, based on passenger demand growth of aviation with the population.

## **II. Units:**

### **Unit 1. Overview of Airport Design/Current Growth Trends in Aviation**

#### General Outcome:

1.0 The students should be able to obtain a basic knowledge of airport design and how it relates to the growth of aviation, including a historical perspective.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Describe basic airport design criteria.
- 1.2 List some of the funding methods available to airport operators.
- 1.3 Identify the need for airport development.
- 1.4 Discuss the historical development of airports and their designs.
- 1.5 Identify why the same design does not work at all airports.
- 1.6 Define some of the aircraft characteristics that affect airport design.
- 1.7 Identify the Airport Layout Plan.

## Unit 2. Determining Airport Capacity

### General Outcome:

2.0 The students should be able to achieve a basic understanding of the factors that lead to airport capacity, what airport capacity is, and variables that participate in designing runways to handle capacity, terminal facilities and roadway systems demand, including future projections.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Apply a basic understanding of runway and taxiway hourly capacity components.
- 2.2 Identify airport annual service volumes.
- 2.3 Relate a basic understanding of hourly capacity of gates.
- 2.4 Recount a basic understanding of single runways operations/parallel runway operations, intersection runway operations.
- 2.5 Discuss the impact of prominent weather conditions.
- 2.6 Define passenger flow characteristics and terminal building design.
- 2.7 Explain roadway accesses systems and volume.
- 2.8 Define aircraft fleet mixes.
- 2.9 Discuss ground transportation characteristics and methods of travel.

### Unit 3. The Airport Master Plan

#### General Outcome:

3.0 The students should be able to understand the Airport Master Plan as a guideline for the future of airport development in order to satisfy the demands of the aviation community.

#### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Identify what the Airport Master Plan is and what it is developed for.
- 3.2 Recognize the planning aspects of the Master Plan.
- 3.3 Define the need for updating the Master Plan.
- 3.4 Identify the development of Airport Master Plans and the role of the Airport Consultant.
- 3.5 Explain what goes into the master plan and how it is carried out.

## Unit 4. The Airport and the Community

### General Outcome:

4.0 The students should be able to understand how airports relate to the general community and population.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Recognize the community point of view.
- 4.2 Identify environmental impacts of airport development.
- 4.3 Explain the importance of noise compatibility.
- 4.4 Identify the advantages that airports provide to the community.
- 4.5 Discuss the establishment of action groups and the importance of involving the community in airport design.

## Unit 5. Development of Runways and Taxiways

### General Outcome:

5.0 The students should be able to recognize the construction and layout of runways and taxiways, including why the paved surfaces are designed the way they are.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Explain runway and taxiway construction based on intended use and aircraft fleet mix.
- 5.2 Identify the different Airplane Design Groups and Aircraft Approach Categories.
- 5.3 Detail the requirements for runway lengths and widths.
- 5.4 Recognize the requirements for taxiway widths.
- 5.5 Apply runway and taxiway safety areas and the purpose of safety areas.
- 5.6 Identify and have a basic understanding of the obstacle free zone and obstacle free area.
- 5.7 Identify taxiways and taxi lanes.
- 5.8 Identify Advisory Circular 150.5300-13 and some of the major components.
- 5.9 Identify and understand airport lighting systems/winter operations.
- 5.10 Distinguish the basic runway and taxiway marking and sign systems.
- 5.11 Identify reasons for runway and taxiway rehabilitation and basic criteria.

## Unit 6. Design of Airport Terminal Buildings

### General Outcome:

6.0 The students should be able to understand passenger flow characteristics and the facilities required in airport terminal facilities.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 6.1 Identify some of the services available to passengers.
- 6.2 Explain the general flow of departing passengers and the general flow of arriving passengers.
- 6.3 Describe the impact of the American with Disabilities Act on terminal facility design.
- 6.4 Distinguish the design of terminal buildings based on geographical location, demographics, and culture.
- 6.5 Identify the importance of contractual services and compliance.
- 6.6 Discuss the design and capacity of aircraft loading bridges.

## Unit 7. Airport Parking

### General Outcome:

7.0 The students should be able to understand airport parking design and challenges.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 7.1 Explain the design of parking facilities based on current and forecasted demand.
- 7.2 Explain the design of parking facilities in conjunction with terminal facility layout.
- 7.3 Identify different parking facilities for different intended uses (long terms/short term/economy).
- 7.4 Identify revenues generated from parking operations.
- 7.5 Identify and understand the concepts of revenue control.
- 7.6 Identify the impacts of ADA on parking access and operations.

## Unit 8. Airfield/Terminal Expansion

### General Outcome:

8.0 The students should be able to identify the requirements for expansion of airfield facilities based on changes in usage, demand, capacity, and deterioration, in conjunction with the Airport Master Plan.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

8.1 Recognize the changes and trends in the aviation industry and community that require airports to plan and make modifications to facilities.

8.2 Identify some of the facilities that may require expansion or renovation based on capacity and demand.

8.3 Identify some of the challenges to renovation of existing facilities.

8.4 Define and identify the NOTAM (Notices to Airmen) system.

## Unit 9. Airport Roadway Access

### General Outcome:

9.0 The students should be able to better understand airport access systems and how they relate to airport capacity and design. Additionally, students should be able to identify transportation methods used at airports.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 9.1 Describe various access methods to and from airport terminal facilities.
- 9.2 Identify the many methods of transportation available to passengers.
- 9.3 Identify the difficulties of the vehicle mix on the ground transportation system.
- 9.4 Identify the best methods of access based on forecasted capacity.
- 9.5 Explain the requirements for future planning of airport access.
- 9.6 Identify methods of traffic control.
- 9.7 Explain the importance of smooth traffic flow and its impact on other airport operations.
- 9.8 Detail contractual service unique to ground transportation applications.

General Outcome:

10.0 The students should be able to understand the changes and trends in air cargo and the need for additional air cargo facilities.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

10.1 Explain the explosive and expected continued growth of air cargo.

10.2 Identify the need for air cargo facilities and services unique to cargo operations.

10.3 Recognize the role air cargo plays in the air carrier arena.

10.4 Identify the impact of air cargo on airport design.

10.5 Identify hazardous cargo and its impact on the airport.

## Unit 11. Environmental Impacts

### General Outcome:

11.0 The students should be able to understand the environmental impacts posed by airports.

### Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 11.1 Identify the role of the EPA and local environmental agencies.
- 11.2 Identify the possible hazard to the environment (fuel, exhaust, noise, wildlife displacement, drainage and run-off; hazardous materials).
- 11.3 Identify methods of prevention and countermeasures.
- 11.4 Describe and understand the results of environmental accidents.
- 11.5 Identify environmental friendly trends in the use of airport services and materials.
- 11.6 Discuss the impact of materials during winter operations.
- 11.7 Describe the effects of birds on and near airports.
- 11.8 Identify airports as areas popular for wildlife including endangered species.
- 11.9 Define the purpose of the environmental impact study before construction on or near airports.