Aviation Operations Management

8730 36 weeks / 280 hours

Table of Contents

Acknowledgments ......................................................................................................................................... 1
Course Description ........................................................................................................................................ 2
Task Essentials List ....................................................................................................................................... 3
Curriculum Framework ................................................................................................................................. 5
Exploring Professional Basics .................................................................................................................... 5
Exploring Occupations in Airport Operations ............................................................................................ 8
Determining Inspection Responsibilities ........................................................................................................ 9
Responding to Emergencies ......................................................................................................................... 11
Designing an Airport ................................................................................................................................... 13
Exploring the Economics of Aviation Operations ....................................................................................... 17
SOL Correlation by Task ............................................................................................................................. 18
Entrepreneurship Infusion Units .................................................................................................................. 20
Appendix: Credentials, Course Sequences, and Career Cluster Information ............................................. 21

Acknowledgments

The components of this instructional framework were developed by the following curriculum development panelists:

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Course Description

Suggested Grade Level: 9 or 10 or 11

Students explore the aviation industry, acquiring skills in airport operations, air traffic control, and addressing airport-specific concerns. Operators handle time, tasks, and resources effectively while striving for increased safety, efficiency, and profitability. With special emphasis placed on real-world scenarios and problem-solving, students are taught to inspect airfields, handle airport emergencies, design an airport, and control the airport environment in the same way these issues are being addressed in the industry today.
## Task Essentials List

- Tasks/competencies designated by plus icons (+) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (〇) are optional
- Tasks/competencies designated by minus icons (--) are omitted
- Tasks marked with an asterisk (*) are sensitive.

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Legend: ✗Essential 〇Non-essential -License Omitted
Curriculum Framework

Exploring Professional Basics

Task Number 39

Describe the importance of safety in aviation management.

Definition

Description should state that increasing safety is the main goal of management in order to

- meet responsibilities
- limit liabilities.

Process/Skill Questions

- What are the main government agencies that monitor safety practices in the aviation industry?
- What are the main safety responsibilities of airport managers?
- How do managers enforce safety standards on the job?
- What might be the consequences of not following safety guidelines?

Task Number 40

Identify National Transportation Safety Board (NTSB) risk mitigation.

Definition

Identification should include

- conducting online research of standards
- reviewing accident reports
- identifying and summarizing alerts and recommendations
- describing investigative procedures and current investigations.

Process/Skill Questions
• What causes most aviation accidents/incidents?
• How does the NTSB determine the cause of aviation accidents?
• What is the difference between an accident and an incident?

Task Number 41

Identify the activities of the Transportation Security Administration (TSA).

Definition

Identification should include

• passenger and baggage screening
• duration of processing and traffic flow
• spatial needs and obligations of the airport.

Process/Skill Questions

• How are the TSA and airport police similar/different?
• What responsibilities does the TSA have beyond its obligations to the security checkpoint?
• Other than the TSA, who is responsible for airport security?

Task Number 42

Identify airport and runway markings and diagrams.

Definition

Identification should include citing the markings and diagrams from the following references:

• International Civil Aviation Organization (ICAO)
• Federal Aviation Regulations (FAR)
• Aeronautical Information Manual (AIM)
• Federal Aviation Administration (FAA)

Process/Skill Questions
• What are the potential consequences of misinterpreting airport markings?
• Why are airport markings created by the ICAO?

Task Number 43

Communicate instructions, using the aviation (phonetic) alphabet.

Definition

Communication should adhere to standard radio phraseology, according to the ICAO.

Process/Skill Questions

• When and why should one use standard radio phraseology?
• What are some of the key differences between proper and improper radio communication?
• How do control tower staff communicate with aircraft whose crew members speak a different language?

Task Number 44

Identify factors that influence the financial health and stability of an area within the aviation industry.

Definition

Identification should be made by

• performing market research
• describing the labor need/outlook
• citing current events from media sources.

Process/Skill Questions

• Where can one find current financial data for the aviation industry?
• How do political, meteorological, terrorism, and economic forces influence the aviation industry?
• What is the economic outlook for the aviation industry?
• What is the labor forecast (i.e., expectation of need) for the aviation industry?

Task Number 45

Research the economic impact of an airport.

Definition

Research could include an analysis of the following factors:

• Jobs and growth expectations  
• Air traffic  
• Available real estate  
• Accessibility/infrastructure  
• Environmental impact

Process/Skill Questions

• What are the similarities and differences between an air carrier airport and a general aviation airport?  
• How can an airport contribute to the economic, environmental, social, and political health of a community?  
• How can an airport stimulate economic growth?  
• What are the strengths and weaknesses of your local airport?

Exploring Occupations in Airport Operations

Task Number 46

List the responsibilities of airport operations management.

Definition

List should include

• business responsibilities (e.g., profitability, efficiency, safety)  
• public relations  
• environmental responsibilities (e.g., noise management)  
• maintenance  
• planning and engineering  
• finance and administration.
Process/Skill Questions

- How do the requirements of FAR Part 139 affect the operations of airports serving commercial air carriers?
- How do environmental regulations affect the daily operations of your local airport?
- How does local wildlife affect airport operations and budgets?

Task Number 47

Explain the roles of fixed-base operations (FBOs).

Definition

Explanation should include responsibilities such as

- fueling
- maintenance
- flight school
- charter services
- storage.

Process/Skill Questions

- How do the minimum operating standards guide FBOs?
- How does an airport interact with FBOs?
- What are some of the different services provided by FBOs?
- How are the FBOs at your airport similar/different?

Determining Inspection Responsibilities

Task Number 48

Identify regulations governing aviation operations.

Definition

Identification could include differentiating among regulations, orders, and interpretations, such as

- Code of Federal Regulations (CFRs), including FAR and TSAR
- directives
• advisory circulars (AC)
• FAA interpretations.

Process/Skill Questions

• Why are FAA regulations important for aviation operations?
• What is the difference between a regulation and an order?
• What are some of the consequences of not following FAA regulations?

Task Number 49

Describe the inspection of airfields, buildings, and facilities.

Definition

Description should include following the inspection checklist and an awareness of industry advisories (e.g., Notice to Airmen [NOTAM]) to increase safety.

Process/Skill Questions

• How are airfield inspections performed? What hazards should be identified?
• What are some of the prominent components located on an airfield?
• What are the maintenance requirements for lighting on a runway?

Task Number 50


Definition

Identification should include summarizing the subsections of CFR Part 1542.

Process/Skill Questions

• What are the similarities/differences in the security of a controlled and an uncontrolled airport?
• Who must maintain a current copy of the security plan?
- What are the distinctions among an air operations area (AOA), a security identification display area (SIDA), and a secure area?

**Responding to Emergencies**

**Task Number 51**

**Identify safety regulations affecting airlines.**

**Definition**

Identification should include locating and summarizing the following:

- NTSB Part 830
- OSHA regulations
- FAA Order 5190.6

**Process/Skill Questions**

- What are the differences between an aircraft incident and an aircraft accident?
- What OSHA regulations will one encounter during airline management training?

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**Task Number 52**

**Describe an airline's obligations to train personnel.**

**Definition**

Description should include

- adherence to safety regulations and requirements for flight crew and maintenance personnel
- number of jobs offered vs. the size of the qualified workforce and the skills gap
- rates of attrition and job turnover
- customer satisfaction.

**Process/Skill Questions**

- How does airline training affect aviation safety in the short term and in the long term?
- What are the challenges facing the workforce when it comes to finding adequate numbers of qualified personnel?
Task Number 53

Identify considerations and areas of responsibility for activating an emergency response.

Definition

Identification should include

- considerations (e.g., the severity of the incident)
- areas of responsibility (e.g., airfield police and fire)
- the airport safety plan
- the emergency response plan.

Process/Skill Questions

- How do airports practice and prepare for emergencies?
- What constitutes an airport emergency?
- What entities are responsible for responding to an airport emergency?

Task Number 54

Demonstrate procedures for activating an emergency response to a security issue or natural disaster.

Definition

Demonstration may include

- referencing the emergency response plan
- following Advisory Circular (AC) 150/5200-31
- calling for aircraft rescue and firefighting (ARFF).

Process/Skill Questions

- Where is the airport emergency plan stored, and how is it reviewed?
- What entities are responsible for responding to an airport security threat?
- Which departments are responsible for airport security, and what are their roles?
- What does AC 150/5200-31 help airport operators develop and implement?
Task Number 55

Identify types of natural disasters that might affect airport operations.

Definition

Identification should include

- hurricane
- tornado
- flash flood/flood
- blizzard/snowstorm
- earthquake
- fire
- tsunami
- volcanic eruption.

Process/Skill Questions

- How do airports prepare for and respond to natural disasters?
- How does climate affect natural disaster preparedness?
- How can a natural disaster in one part of the world affect airports all over the world?

Designing an Airport

Task Number 56

Identify the components of airport design.

Definition

Identification should include

- airside design
- landside design
- facilities
- terminals
• airspace
• runways
• taxiways
• apron or gate area
• parking
• transportation needs of passengers and personnel.

Process/Skill Questions

• What is the importance of runway orientation?
• How does airspace class determine the airport design?
• What are the differences in planning and design between small general aviation airports and large commercial service airports?

Task Number 57

Identify considerations that influence airport design.

Definition

Identification should include

• type of terrain
• environmental concerns
• weather patterns
• available acreage, land use
• funding sources.

Process/Skill Questions

• How can one plan for airport expansion? Why might an expansion be necessary?
• What are various quantitative and qualitative forecast methods used in airport planning?
• How does an airport master plan address the evolution and future needs of its customers?

Task Number 58

Interpret plans for airport layout and design.

Definition
Interpretation should include identifying and describing

- terminal facilities
- symbols
- notations
- images
- airport signs, markings, and lights.

**Process/Skill Questions**

- How does the airport's master plan provide a graphic presentation of the development and anticipated land use of the airport?
- How might a surrounding community affect an airport design plan, and vice versa?
- How can maps or overlays of existing airspace help with proposed expansion of the airport?

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**Task Number 59**

**Design the layout of an airport and runway according to given constraints.**

**Definition**

Design should include accounting for

- prevailing wind and wind direction
- size of the airport (available real estate)
- terrain
- volume of traffic and encroachments
- aircraft type and size
- length of the runway.

**Process/Skill Questions**

- What are the prevailing winds in your region?
- How do prevailing weather conditions affect air travel?
- Can you identify some encroachments at your local airport?

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**Task Number 60**
Identify push-back and taxi operations and considerations.

Definition

Identification should include

- traffic
- blind spots
- jet blast
- personnel
- passengers
- baggage
- tow bars, tugs, and ground equipment.

Process/Skill Questions

- How has your airport design accounted for all push-back and taxi operations?
- What are the main safety concerns associated with ground operations?
- What are the most common ground incursions/incidents?

Task Number 61

Analyze arrival and departure times.

Definition

Analysis should include establishing the goal of maximizing aircraft use while identifying

- connection times
- number of aircraft needed
- destination city
- time of year
- weather
- number of available jetways.

Process/Skill Questions

- What factors affect arrival and departure times at high-traffic airports?
- What are the advantages and disadvantages of a hub-and-spoke system?
- What are the benefits and disadvantages of using a single type of aircraft (e.g., Southwest Airlines model)?
- How many hours per day does an aircraft need to fly to maintain profitability?
Task Number 62

Describe the planning process for the construction of an airport facility.

Definition

Description should include the following steps in the process of bidding out the project through a request for proposal (RFP):

- Identify the facility and its use.
- Determine the geographic location.
- Specify facility size/dimensions.
- Consider infrastructure requirements, including parking needs, to make the facility accessible.
- Calculate project costs and budget.

Process/Skill Questions

- Which government agencies/departments must be involved in an airport project?
- How can one design a parking facility with the maximum number of spaces without compromising safety?
- What are typical project timeline and construction milestones for an airport design project?

Exploring the Economics of Aviation Operations

Task Number 63

Identify the factors affecting airline profitability.

Definition

Identification should include

- cost available seat mile (CASM), which includes fuel, labor, insurance, and maintenance
- aircraft type and design decisions
- fleet management
• flight service area
• personnel training.

**Process/Skill Questions**

• What factors/variables do you need to know to calculate CASM for any flight?
• How do airlines determine the types of planes they need for their fleets?
• What tools can one use to compute CASM?
• What factors go into determining the route structure for a given airline?
• What challenges do start-up airlines face in determining route structure?

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**Task Number 64**

**Describe the factors that affect FBO profitability.**

**Definition**

Description should include

• airport lease requirements
• minimum operating standards
• services provided.

**Process/Skill Questions**

• How does an airline know the number and types of planes it needs?
• What factors determine the profitability and viability of an FBO?

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**SOL Correlation by Task**

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History and Social Science: GOVT.15  
Mathematics: PS.1*, PS.2*, PS.4*, PS.8*, PS.9* |
| 44 | Research the economic impact of an airport. | English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8  
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**Entrepreneurship Infusion Units**

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.” Teachers can find the infusion/unit in the course listing.
Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- College and Work Readiness Assessment (CWRA+)
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- National Career Readiness Certificate Assessment
- Professional Communications Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.

- Air Traffic Controller (8734/36 weeks, 280 hours)

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