AT122 : Meteorology

General Information

Author:	• Curtis G Potter
Course Code (CB01) :	AT122
Course Title (CB02) :	Meteorology
Department:	AT
Proposal Start:	Fall 2024
TOP Code (CB03) :	(3020.20) Piloting
CIP Code:	(49.0102) Airline/Commercial/Professional Pilot and Flight Crew.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000224198
Curriculum Committee Approval Date:	05/22/2024
Board of Trustees Approval Date:	07/16/2024
Last Cyclical Review Date:	05/22/2024
Course Description and Course Note:	AT 122 presents the basic principles of meteorology with emphasis placed on the physical laws that operate in the atmosphere, particularly as they affect aircraft flight. Weather maps, reports, and forecasts and their interpretation are stressed.
Justification:	Mandatory Revision
Academic Career:	• Credit
Mode of Delivery:	
Author:	Curtis G Potter
Course Family:	

Academic Senate Discipline

Primary Discipline:	• Aviation (Flight, navigation, ground school, air traffic control)
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☑ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

• Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to CSU only

Transferability Status

Approved

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	108
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	3	6
Laboratory Hours	0	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	
Lecture	54
Laboratory	0
Studio	0
Total	54
Course Out-of-Class Hours	
Lecture	108
Laboratory	0
Studio	0
Total	108

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

AT120 - Private Pilot Ground School

Objectives

- Apply Federal Aviation Regulations to flight.
- Perform tasks of enroute communication procedures.
- Demonstrate knowledge of weather theory.
- Evaluate aviation weather information.

Entry Standards

Entry Standards

Course Limitations

Cross Listed or Equivalent Course

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Multimedia
Methods of Instruction	Collaborative Learning

Methods of Instruction	Demonstrations
Methods of Instruction	Guest Speakers

Out of Class Assignments

- Reading
- Prepare a research presentation using online aviation weather resources

Methods of Evaluation	Rationale
Exam/Quiz/Test	Multiple choice quizzes
Exam/Quiz/Test	Multiple choice mid-term exam
Presentation (group or individual)	In class group presentation
Presentation (group or individual)	Presentation of a research project using a real time weather briefing for the purpose of making a “go, no-go” decision
Exam/Quiz/Test	Multiple choice final exam

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
FAA	Aviation Weather Handbook	Aviation Supplies & Academics, Inc.	2022	978-1-64425-296-3

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Explain the composition, properties, layers, and levels of the earth’s atmosphere.

Compare and contrast the types of weather briefings and their sources.

Describe the formation and stages of thunderstorms and the hazards they present for pilots.

Evaluate actual weather reports and forecasts to determine if safe flight is possible.

identify the weather conditions consistent with stable and unstable airmasses.

SLOs

Describe the earth's atmosphere. Expected Outcome Performance: 70.0

ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
ILOs General Education	examine causality or associations between or among variables of the natural world

Explain the causes of different types of weather conditions. Expected Outcome Performance: 70.0

ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
ILOs General Education	examine causality or associations between or among variables of the natural world

Review and interpret weather reports and forecasts. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
ILOs General Education	analyze, interpret, and present research evidence
	apply reasoning to evaluate hypotheses and theories
	examine causality or associations between or among variables of the natural world
AT Aviation Administration - A.S. Degree Major	demonstrate the skills required to establish and manage airport operations.
AT Aviation Administration - Certificate	demonstrate the skills required to establish and manage airport operations.

Identify potential weather-related hazards related to safe flight. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
AT Aviation Administration - A.S. Degree Major	demonstrate the skills required to establish and manage airport operations.
AT Aviation Administration - Certificate	demonstrate the skills required to establish and manage airport operations.

ILOs General Education	examine causality or associations between or among variables of the natural world

Course Content

Lecture Content

Basic Concepts (6 hours)
- Atmospheric layers and levels
- Atmospheric composition
- Physical properties of the atmosphere
- Atmospheric pressure
- Weather and the atmosphere
- International Standard Atmosphere

Temperature (2 hours)
- Temperature scales
- Lapse rates
- Transport of heat
- World temperatures

Pressure (3 hours)
- Standards and scales
- Charting atmospheric pressure
- Isobars and pressure systems
- Effect of altitude
- Pressure gradient force
- Altimeters
- World pressure

Density (3 hours)
- Air density changes due to altitude
- Air density changes due to temperature
- Methods for calculating density altitude
- Changes in aircraft performance

Moisture (3 hours)
- Water vapor
- Humidity
- Dew point
- Saturation
- Distribution of water vapor
- Changes in state
- Heat exchange
- Precipitation

Stability (5 hours)
- Atmospheric stability
- Adiabatic lapse rates (dry and saturated)
- Stability of dry air
- Stability of saturated air
- Vertical motion and convection
- Effects of stability on weather
- Effects of stability on safety of flight

Atmospheric Circulation (3 hours)
- Local wind patterns
- Global wind patterns
- Coriolis force
- Friction force
- The jet stream
- Cyclones and hurricanes

Airmass Weather (3 hours)
- Air masses `
- Fronts
- Source regions
- Designations of air masses
- Elements of air mass weather

Frontal Weather (2 hours)

- Frontal characteristics
- Stationary fronts
- Warm fronts
- Cold fronts
- Wave development
- Occlusion
- Fronts aloft
- Instability lines and squall lines
- Average world frontal zones

Thunderstorms (4 hours)

- Conditional instability
- Lifting action
- Moisture
- Types of thunderstorms
    - Frontal thunderstorm
    - Air mass thunderstorm
    - Severe thunderstorms `
- Stages of thunderstorms
    - Cumulus stage
    - Mature stage
    - Dissipating stage
- Vertical development
- Drafts and gusts
- Lightning
- Microbursts
- Surface phenomena
- Freezing level and structural icing
- Embedded thunderstorms

Fog (2 hours)

- Definition
- Saturation of air
- Temperature-dewpoint spread
- Fog types
- Fog types that require wind
- Fog vs. mist

Aviation Weather Hazards (6 hours)

- Wind shear
    - Definition
    - Causes
    - Reporting
- Turbulence
    - Definition
    - Causes
    - Reporting
- Icing
    - Induction icing
    - Structural icing
        - Types of structural icing
- The icing environment
- Pilot response and reporting
- Additional weather hazards
    - Volcanic ash
    - Atmospheric electricity
    - White-out
    - Runway hazards

Aviation Weather Resources (12 hours)

- The forecasting process
- Graphic weather products
- Printed forecasts
- Printed reports
- Weather information sources
- Weather briefings
    - Outlook briefing
    - Standard briefing
    - Abbreviated briefing
- Official sources
- Weather evaluation for flight

- In-flight weather evaluation

Total hours: 54

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

Yes

GCC Major Requirements

No Value

GCC General Education Graduation Requirements

Natural Sciences

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

Yes

If yes, who is your departmental library liason?

Adina Lerner (Technology & Aviation, Visual & Performing Arts)

Did you contact the DEIA liaison?

Yes

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value