

## AT139 : Technically Advanced Aircraft

### General Information

Author:	<ul style="list-style-type: none"><li>Curtis G Potter</li></ul>
Course Code (CB01) :	AT139
Course Title (CB02) :	Technically Advanced Aircraft
Department:	AT
Proposal Start:	Spring 2025
TOP Code (CB03) :	(0950.10) Aviation Airframe Mechanics
CIP Code:	(47.0607) Airframe Mechanics and Aircraft Maintenance Technology/Technician.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000550700
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 139 introduces the student pilot to advanced avionics systems incorporated into an aircraft's cockpit. This course prepares the pilot to operate Global Positioning System (GPS) navigation systems as well as the latest integrated flight systems known as "glass cockpits". It covers the variety of information provided by these advanced navigation and communication systems as well as proper procedures in the event of their failure.
Justification:	Mandatory Revision
Academic Career:	<ul style="list-style-type: none"><li>Credit</li></ul>
Mode of Delivery:	
Author:	Curtis G Potter
Course Family:	

### Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none"><li>Aeronautics</li></ul>
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.

Variable Credit Course

#### Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience

Education Status (CB10)

### Weekly Student Hours

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

### Course Student Hours

<b>Course Duration (Weeks)</b>	18
<b>Hours per unit divisor</b>	0
<b>Course In-Class (Contact) Hours</b>	
Lecture	54
Laboratory	0
Studio	0

**Total** 54

**Course Out-of-Class Hours**

Lecture	108
Laboratory	0
Studio	0
<b>Total</b>	<b>108</b>

**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.
- Develop the skills of navigation, including radio, pilotage, and dead-reckoning.

---

**OR**

**Advisory**

Possession of a private pilot's certificate

---

**Entry Standards**

Entry Standards

**Course Limitations**

Cross Listed or Equivalent Course

## Specifications

### Methods of Instruction

Methods of Instruction                      Lecture

Methods of Instruction                      Discussion

Methods of Instruction                      Multimedia

Methods of Instruction                      Guest Speakers

Methods of Instruction                      Presentations

### Out of Class Assignments

- Reading assignments
- Website view and review (e.g. Garmin tutorial, FAA publications or videos)
- Airport field trip

### Methods of Evaluation

### Rationale

Exam/Quiz/Test

Written examinations

Activity (answering journal prompt, group activity)

Problem-solving exercises

Activity (answering journal prompt, group activity)

Student demonstrations (e.g. simulated cockpit communications, avionics functions)

Exam/Quiz/Test

Final exam

### Textbook Rationale

This is the latest edition

### Textbooks

Author	Title	Publisher	Date	ISBN
Federal Aviation Administration	Advanced Avionics Handbook: FAA-H-8083-6.	New York: Skyhorse Publishing	2014	978-1-61608-533-9

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

<b>Description</b>	Advanced Avionics Handbook: FAA-H-8083-6
<b>Author</b>	Federal Aviation Administration
<b>Citation</b>	No value
<b>Online Resource(s)</b>	No value

### Materials Fee

No value

## Learning Outcomes and Objectives

### Course Objectives

Interpret the information provided by advanced avionics systems.

Utilize aircraft automation including flight management systems (FMS) and auto-pilots.

Integrate the increased awareness provided by these systems as well as how the same systems can pose pitfalls.

Explain the importance of decisions about potential hazards, such as terrain and weather.

Relate how these systems can sometimes have a negative effect on pilot risk-taking behavior.

### SLOs

**Explain the use of aircraft automation equipment including flight management systems ("FMS") and autopilots.**

Expected Outcome Performance: 70.0

*ILOs* Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or  
 Core methodologies to solve unique problems.  
*ILOs*

**Evaluate the advantages and disadvantages of using advanced avionics systems in flight.**

Expected Outcome Performance: 70.0

*ILOs* Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions;  
 Core cultivate creativity that leads to innovative ideas.  
*ILOs*

**Compare and contrast traditional and advanced avionics systems and instruments.**

Expected Outcome Performance: 70.0

*ILOs* Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions;  
 Core cultivate creativity that leads to innovative ideas.  
*ILOs*

## Additional SLO Information

**Does this proposal include revisions that might improve student attainment of course learning outcomes?**

No

**Is this proposal submitted in response to learning outcomes assessment data?**

No

**If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.**

No Value

**SLO Evidence**

No Value

## Course Content

### Lecture Content

#### **Introduction to Technically Advanced Aircraft (5 hours)**

- Selection and operation of Advanced Avionics Systems

#### **Electronic Flight Instruments (5 hours)**

- Primary Flight Display (PFD)
- Enhancements to primary flight instruments
- Failure of the PFD

#### **Area Navigation Basics (3 hours)**

- The Area Navigation (RNAV) Concept
- System hardware
- Simulators for learning and practice

#### **Flight Planning (5 hours)**

- Routes, waypoints, and airways
- Route discontinuity

#### **Fuel, Time and Distance data (3 hours)**

- Verifying distances
- Groundspeed and estimated time of arrival (ETA)
- Fuel calculations

#### **Route Modification (3 hours)**

- Adding and deleting waypoints
- Proceeding direct to any waypoint
- Risks of Direct-To routes
- Selecting an instrument approach
- Descent calculations and procedures

#### **Intercepting courses (3 hours)**

- Intercept and tracking of courses
- Holding patterns
- Flying arcs

#### **Approaches (3 hours)**

- Lateral/Vertical Navigation (LNAV/VNAV)
- Precision and non-precision approaches
- Course reversals
- Missed Approaches

#### **Ground-Based Navigation (3 hours)**

- Configuring flight management systems for ground-based navigation
- Tuning and identifying
- Precision and non-precision approaches using ground-based navigation

#### **Automated Flight Control for Lateral Navigation (3 hours)**

- How to use an Autopilot
- Flight director description and use

#### **Automated Flight Control for Vertical Navigation (3 hours)**

- Climbs and descents
- Flight level change (FLC)

- Altitude alerting systems

#### **Automated Flight Control During Approach (Coupled Approaches) (3 hours)**

- Instrument landing systems (ILS)
- Lateral Navigation with vertical guidance (LNAV/VANV)

#### **Information Systems and the Moving Map (3 hours)**

- Multi-Function Displays (MFD)
- Features and use of the moving map
- Common errors: using moving map as a navigation instrument

#### **Information Systems, Terrain Awareness (3 hours)**

- Terrain display
- Synthetic vision
- Terrain Awareness Systems: TAWS A and TAWS B
- Deactivating terrain warning

#### **Information Systems, Weather (3 hours)**

- Cockpit weather systems
- Onboard equipment: Radar and Lightning detectors and weather sensors

#### **Information Systems, Other (3 hours)**

- Onboard and ground-based traffic sensors and data
- Responding to traffic alerts
- Electronic charts and checklists
- Engine Information and Crew Alerting System (EICAS)

**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.

No

### **GCC Major Requirements**

No Value

### **GCC General Education Graduation Requirements**

No Value

### **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 liaison?

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