



Modernizing the Mechanic ACS

*A Competency-Aligned, Instructional
Coherent Framework for Aviation
Maintenance Training*

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March 12, 2026

What is the ACS?



- The FAA certification standard that defines the knowledge, risk management, and skill requirements for certificated mechanics.
- Incorporated by reference in 14 CFR part 65 and part 147, making it regulatory and subject to rulemaking for revision.
- Part 147 schools must align their curriculum with the ACS, meaning it functions as a training standard.
- The FAA also aligns knowledge, oral, and practical testing to the ACS, making it the foundation for mechanic certification testing.

Know

Consider

Do

II. Airframe	
Subject L. Ice and Rain Control Systems	
Objective	<i>The following knowledge, risk management, and skill elements are required for aircraft ice and rain control systems.</i>
Knowledge	<i>The applicant demonstrates understanding of:</i>
AM.II.L.K1	Aircraft icing causes/effects.
AM.II.L.K2	Ice detection systems.
AM.II.L.K3	Aircraft and powerplant anti-ice systems and components.
AM.II.L.K4	De-ice systems and components.
AM.II.L.K5	Wiper blade, chemical, and pneumatic bleed air rain control systems.
AM.II.L.K6	Anti-icing and de-icing system maintenance.
AM.II.L.K7	Environmental conditions that degrade vision.
Risk Management	<i>The applicant demonstrates the ability to identify, assess, and mitigate risks associated with:</i>
AM.II.L.R1	System testing or maintenance.
AM.II.L.R2	Storage and handling of deicing fluids.
AM.II.L.B3	Selection and use of cleaning materials for heated windshields.
Skills	<i>The applicant demonstrates the ability to:</i>
AM.II.L.S1	Inspect and operationally check pitot-static anti-ice system.
AM.II.L.S2	Inspect and operationally check deicer boot.
AM.II.L.S3	Clean a pneumatic deicer boot.
AM.II.L.S4	Troubleshoot an electrically-heated pitot system.
AM.II.L.S5	Inspect thermal anti-ice systems.
AM.II.L.S6	Inspect and operationally check an electrically-heated windshield.
AM.II.L.S7	Locate and explain the procedures for inspecting an electrically-operated windshield wiper system.
AM.II.L.S8	Locate and explain the procedures for replacing blades on a windshield wiper system.
AM.II.L.S9	Locate and explain the procedures for inspecting a pneumatic rain removal system.

What is the ACS?



Changes: Regulations, Policies, Procedures, Feedback

The diagram illustrates four key components of the ACS, each represented by a box with an image and text:

- Standards:** Image of the FAA-S-ACS-1 Aviation Mechanic General, Airframe, Powerplant Airman Certification Standards cover. Text: "ACS codes enable continuous alignment".
- Guidance:** Image of the Aviation Maintenance Technician Handbook-General. Text: "Rules, H-series handbooks, Advisory Circulars, other FAA information sources".
- Testing:** Image of a satellite network over a globe. Text: "Knowledge exam questions are meaningful, relevant, aligned with standards and guidance. Oral and practical tests are more focused and more efficient.".
- Change Management:** Image of the Airman Testing website interface. Text: "Awareness, Desire, Knowledge, Ability, Reinforcement via disciplined change management plan with associated communications strategy".

ACS codes
Standards

Combined certification standards for knowledge, risk management, and skill

enable continuous alignment
Guidance

Rules, H-series handbooks, Advisory Circulars, other FAA information sources

Testing

Knowledge exam, oral and practical tests for issuance of certificate or rating

Change Management

Awareness, Desire, Knowledge, Ability, Reinforcement via disciplined change management plan with associated communications strategy

Alignment as appropriate with other Certificates / Ratings

History



- Developed over a five-year period by the FAA-Industry ACS Working Group
- Originally published in March 2022 alongside the new part 147
- Created from a combination of the legacy Practical Test Standards (PTS) and the previous part 147 curriculum requirements
- Intended to be reviewed and revised regularly to keep pace with evolving industry needs

ACS Working Groups



- FAA working group was “decommissioned” in summer 2025
- ATEC working group created to continue work on ACS rev 01
- Built upon Airlines for America formal ACS revision recommendation submitted to the FAA in November 2024
- ATEC working group made up of representatives of part 147 programs, industry, fellow trade associations, and DMEs



The Current Objective

- Submit ACS Rev 01 recommendation to FAA in April
- Secure broad industry support of recommendation
- Following submission, draft recommendation for FAA handbooks/resources to align with recommendation



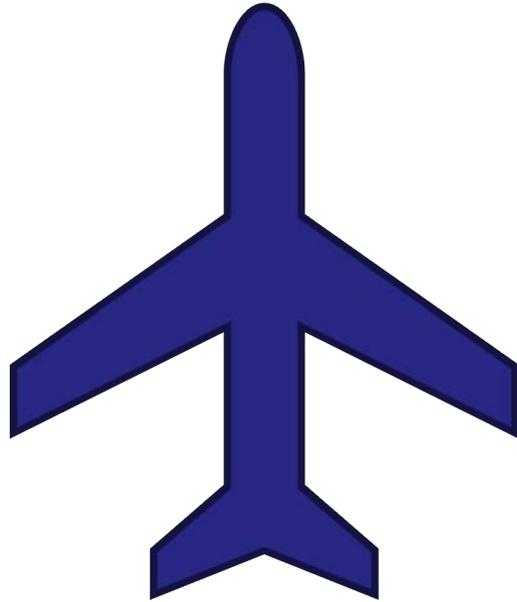
Current Status

- Under part 147, schools are still required to align their curriculums to the current mechanic ACS.
- ATEC is preparing a *proposal* for submission to the FAA—it will require further collaboration with stakeholders, review and revision by FAA, and formal rulemaking before training programs are required to align curriculum to the new standard.
- Once the recommendation is submitted, it could be years before it's promulgated, and even then, we expect a generous effective date to allow schools to prepare.

ATEC Mechanic ACS Working Group

- Made up of subject matter experts
- Structured project-management approach
- Defined project requirements
- Meet weekly to conduct SME review and validation
- Maintain change traceability documentation
- Monitored for scope, quality, and alignment throughout

Evidence Base for the Revisions



Grounded in Data, Guidance, and Expertise

Clemson University's NASA study findings

Industry workforce studies and readiness analyses

FAA CBTA guidance

Airlines for America Maintenance Training Network input

SME consensus

What the Research Revealed

Need for clearer expectations for new mechanics

Desire for stronger troubleshooting and systems thinking

Need for consistency across schools and DMEs

Need for alignment with global competency models

What We Found



- Weak verbs (“understand,” “demonstrate”) + loss of performance levels → leads to unclear depth of knowledge
- Inconsistent risk phrasing → unsure what matters
- Subjects organized without organizational logic → harder to use as a standard
- Schools align curriculum with ACS → fragmented teaching
- DMEs interpret items differently → inconsistent certifications
- ACS doesn’t support systems thinking → unprepared Mechanics

Our Vision: Clarity, Traceability, and Workforce Readiness



- Embed CBT principles across all subjects*
- Integrate Bloom's Taxonomy verbs for measurable competencies
- Align ACS subjects with ATA codes for system logic, auditability, and industry alignment
- Frame performance skills using real-world scenarios

*Federal Aviation Administration. (2019). Competency-Based Training and Assessment (CBTA) [Conference presentation]. Royal Aeronautical Society, London.



What We Have Accomplished

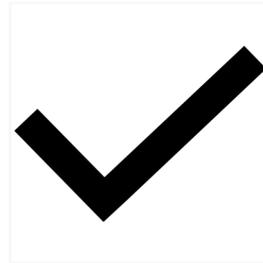
- Reviewed every knowledge, risk, and skill item within every subject
- Incorporated recommendations from the Airlines for America's Maintenance Training Network at varying degrees of cognitive and psychomotor levels for entry-level mechanics
- Addressed findings in Clemson-ATEC NASA funded study
- A fully updated and aligned ACS and documented justification of all changes
- Drafted guidance material to reference for future revisions, including definitions of terms and style guide

What this Means for Your School



- No changes to curriculum requirements until changes are promulgated
- Skills now include restored performance criteria
- General section expanded to support system-based Airframe & Powerplant
- New and revised knowledge, risk, and skill elements
- Curriculums will need to be updated to reflect the clarified expectations
- Clearer expectations support stronger, more consistent training

Knowledge Learning Objectives – Bloom’s Verbs



Measurable verbs

Clear Expectations

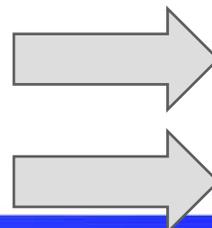
Consistent Assessment

From vague → measurable:

THE APPLICANT DEMONSTRATES
UNDERSTANDING OF:

“Electrostatic discharge.”

“Inoperative equipment”



THE APPLICANT WILL BE ABLE TO:

“Explain ESD hazards and their effects on sensitive components.”

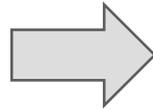
“Explain regulatory requirements for inoperative equipment.”

Modernized Risk Elements

The applicant demonstrates the ability to identify, assess, and mitigate risks associated with:

Old:

Ground operation.
Propeller maintenance and inspections.



New:

Unsafe acts when working around propellers.
Improper or incomplete propeller maintenance and inspections.

We identify the hazard — not the mitigation. This preserves performance-based assessment while giving instructors and DMEs clarity.

Skill Improvements

Skills Reorganized for System Logic

Moved to their appropriate system-specific subjects

Duplicates removed

Knowledge-only “skills” deleted

Phrasing clarified

Why it matters:

More intuitive for instructor guidance

More consistent for DMEs

Better alignment with ATA chapters and industry practice

Knowledge, Risk, Skill Alignment



I. GENERAL	
SUBJECT: B. AIRCRAFT WEIGHT & BALANCE	
COMPETENCY	<i>Demonstrates the ability to apply weight and balance principles by determining aircraft weight, center of gravity, and required corrections using approved data, safe practices, and regulatory standards to ensure stability, controllability, and structural integrity.</i>

KNOWLEDGE ID #	KNOWLEDGE [OBSERVABLE BEHAVIORS]	BLOOM'S LEVEL	SKILL ID #	SKILLS [TASK DEMONSTRATIONS]	SKILL GAP ANALYSIS	RISK ID #	RISKS	RISK GAP ANALYSIS
WB.K.001	Define standard weight and balance terminology.	Remember	—	(No direct skill task)	✗ Knowledge-only outcome	WB.R.003 WB.R.004	CG out-of-limits effects; Excess weight effects	✓ Terminology supports correct interpretation of limits and effects.
WB.K.002	Describe the purpose of weight and balance and factors that influence it.	Understand	—	(No direct skill task)	✗ Knowledge-only outcome	WB.R.003 WB.R.004	CG and weight-related aerodynamic/structural risks	✓ Conceptual understanding mitigates misloading risks.
WB.K.003	Perform aircraft weighing procedures using approved methods and safety practices.	Apply	WB.S.001	Perform aircraft weighing procedures using manufacturer instructions.	✓ Direct skill alignment	WB.R.001 WB.R.002 WB.R.003	Improper lifting; unsafe weighing; incorrect scale setup	✓ Strong alignment — weighing procedures directly mitigate these risks.
WB.K.004	Calculate arms, moments, moment indexes, and CG.	Apply	WB.S.003	Perform weight and balance calculations for a given aircraft.	✓ Strong skill alignment	WB.R.003 WB.R.004	CG out-of-limits; excess weight effects	✓ Direct mitigation — correct calculations prevent out-of-limits conditions.

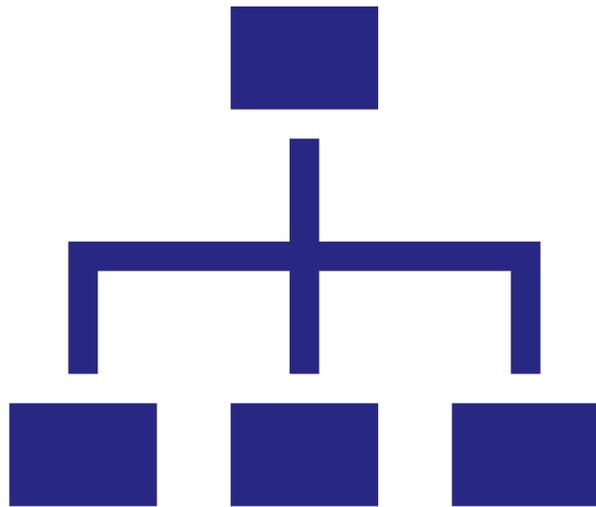
Subject-Level Objectives Revised

All subject-level objective statements have been replaced with meaningful subject competency statement(s).

Old Objective: “The following knowledge, risk management, and skill elements are required for [fill in subject title] as it relates to aircraft maintenance.”

New Competency: “Apply weight and balance principles by determining aircraft weight, center of gravity, and required corrections using approved data, safe practices, and regulatory standards to ensure stability, controllability, and structural integrity.”

Subjects Reordered



Revised into a structured pedagogical (learning and system-aligned)

Why this matters

Reduces cognitive load

Mirrors how technicians learn and work

Supports consistent national training

Subject-Level Reordered - General



	Proposed Order	Current Order	Subject Title
Cognitive Foundations	1.	New	Competency Domains for Aircraft Mechanics
	2.	H.	Mathematics
	3.	J.	Physics for Aviation
Tools & Materials	4.	New	Hand Tools and Measuring Devices
	5.	E.	Aircraft Materials, Hardware, and Processes
	6.	D.	Fluid Lines and Fittings
Systems Literacy	7.	A.	Electrical Principles and Practices
	8.	New	Aircraft Instrumentation
	9.	B.	Aircraft Drawings
Operational Readiness	10.	C.	Weight and Balance
	11.	F.	Safety, Ground Operations and Servicing
	12.	G.	Cleaning and Corrosion Control
Human Performance & Regulatory Foundations	13.	L.	Human Factors
	14.	I.	Regulations, Maintenance Forms, Records, and Publications
	15.	K.	Inspection and Troubleshooting Concepts and Techniques

Subject-Level Reordered - Airframe



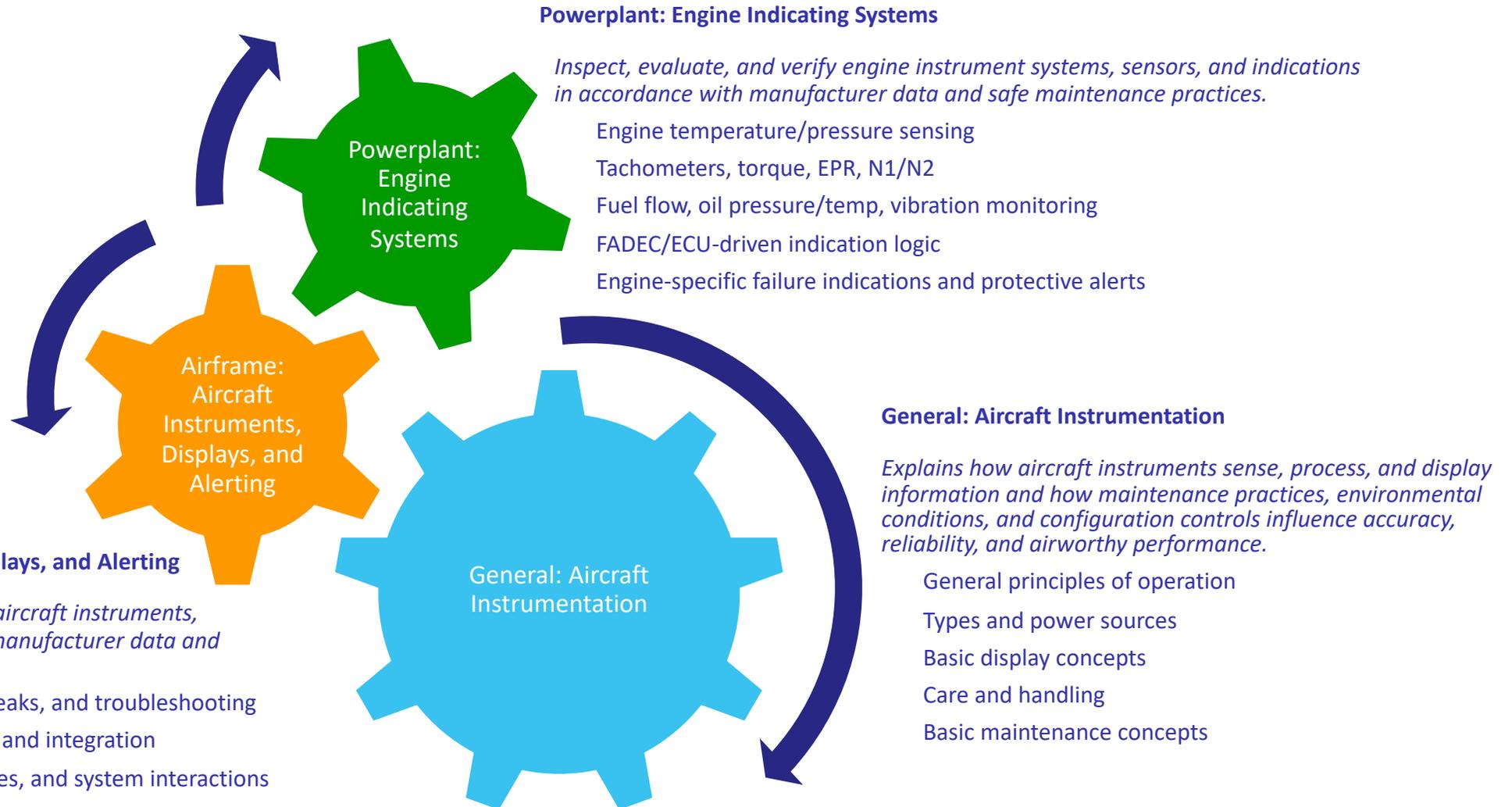
	Proposed Order	Current Order	Subject Title
Structures	1.	A.	Metallic Structures
	2.	B.	Non-Metallic Structures
	3.	New	Aircraft Painting and Finishing
	4.	New	Windows
Mechanical	5.	C.	Flight Controls
	6.	E.	Landing Gear Systems
Fluid Power	7.	F.	Hydraulic Systems
	8.	New	Pneumatic Systems
	9.	J.	Aircraft Fuel Systems
Environmental / Protection	10.	O.	Water and Waste
	11.	G.	Air Conditioning
	12.	L.	Ice and Raing Control Systems
	13.	M.	Airframe Fire Protection Systems
	14.	New	Oxygen Systems
Electrical / Avionics	15.	K.	Aircraft Electrical Systems
	16.	H.	Flight Instruments, Displays, and Alerting Systems
	17.	I.	Communication Systems
	18.	New	Navigation Systems
Specialized	19.	N.	Rotorcraft Systems
	--	D.	Airframe Inspection

Subject-Level Reordered - Powerplant



	Proposed Order	Current Order	Subject Title
Engine Types with their specific support systems	1.	A.	Reciprocating Engines <ol style="list-style-type: none"> 1. Core Knowledge and Skills 2. Induction & Fuel Metering Systems 3. Cooling Systems 4. Exhaust Systems
			Turbine Engines <ol style="list-style-type: none"> 1. Core Knowledge & Skills 2. Air Systems 3. Fuel & Fuel Metering 4. Exhaust & Reverser Systems
Support Systems			Lubrication Systems
			Engine Electrical Systems
			Ignition & Starting Systems
Indication			Engine Instruments
Protection			Engine Fire Protection Systems
Propellers			Propellers
	--	I, J, K, and L	Engine Fuel & Fuel Metering, Reciprocating Engine Induction and Cooling Systems, Turbine Engine Air Systems, and Engine Exhaust and Reverser Systems
	--	C.	Engine Inspection

Scaffolding Across General → Airframe → Powerplant



Introducing Competency Domains

Provide a unifying interpretive framework across all ACS subjects and reinforce the behaviors identified as essential for technical personnel:

- Technical Task Performance
- Troubleshooting & Technical Decision-Making
- Safety & Risk Management in Maintenance
- Human Factors & Situational Awareness
- Use of Approved Data and Procedures
- Regulatory and Airworthiness Responsibility
- Professionalism and Ethical Responsibility
- Quality, Error Management, and Continuous Improvement
- Use of Tools, Equipment, and Digital Systems
- Task Planning and Work Management
- Communication & Coordination

Competency Domains: Why They Matter

- Support workforce readiness
- Reinforce safety-critical behaviors
- Provide consistent interpretation across schools and DMEs
- Align FAA certification with global CBTA standards

How Competency Domains Fit Into the ACS

- Unify the ACS without changing certification
- Do not add requirements
- Are not assessed directly
- Provide the interpretive framework for all ACS items
- They help instructors, schools, and examiners understand the intent behind knowledge, risk, and skill items

How to Use the Competency Domains in Your Curriculum

Competency Domains Guide How Students Learn and Perform

- *Provide the **core behaviors and thinking skills** expected of every AMT*
- *Help instructors connect **knowledge, risks, and skills** to real maintenance practice*
- *Support consistent **lesson planning, lab design, and assessment***
- *Ensure students develop both **technical ability** and **professional judgment***
- *Strengthen alignment across subjects by giving schools a **common performance language***

What Competency Domains Look Like in Practice

Technical Task Performance → How students *do* the work

Troubleshooting & Technical Decision-Making → How they *think* through problems

Safety & Risk Management → How they *manage hazards*

Human Factors & Situational Awareness → How they *avoid errors*

Use of Approved Data & Procedures → How they *follow the right information*

Regulatory & Airworthiness Responsibility → How they *ensure compliance*

Professionalism & Ethical Responsibility → How they *behave as technicians*

Quality & Error Management → How they *verify and correct work*

Tools, Equipment & Digital Systems → How they *use technology safely*

Task Planning & Work Management → How they *organize and control work*

Communication & Coordination → How they *work with others*

Benefits to Stakeholders



FAA

Stronger national consistency
Clearer, more defensible standards
Alignment with ICAO CBTA



Industry

Better workforce readiness



Examiners

Fewer gray areas
Clearer expectations
More consistent interpretation



Training Organizations

Easier curriculum alignment
Clearer cognitive and performance targets



Applicants

Reduced ambiguity
Clearer path to success

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