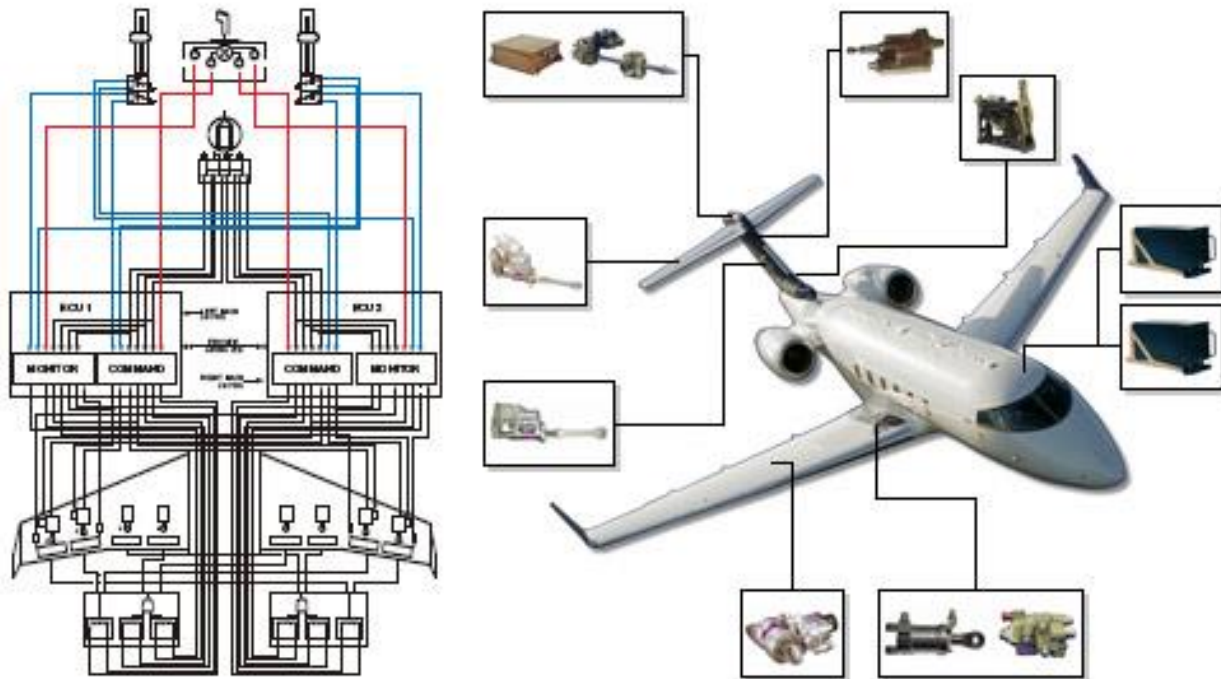


## AE 273 – Aircraft Subsystems

**Instructor Info**

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**Prerequisite**

Graduate standing or instructor consent.

**Textbook**

Roskam, Jan, Airplane Design III - IV  
Part III: Layout Design of Cockpit, Fuselage, Wing and Empennage  
Part IV: Layout Design of Landing Gear and Systems

**Description**

Aircraft subsystem analysis and design: flight controls; avionics and electrical systems; cabin systems; landing gear and other mechanical systems; systems safety analysis.

**Goals**

Develop an understanding of aircraft subsystems operation, analysis, design, and safety as well as how the various systems interact with each other.

**AE 273 – Aircraft Subsystems****Student Learning Objectives**

Students completing AE273 should be able to analyze and design the following subsystems for various types of aircraft:

1. Flight control systems.
2. Avionics and electrical systems.
3. Cabin systems.
4. Landing gear systems.
5. Mechanical systems.
- ...as well as...*
6. Analyze system safety for the above subsystems.

<b>Grading:</b>	Design Reports	60%
	Two Oral Reports	40%

100 – 97% A+; 96 – 93% A; 92 – 90% A-; 89 – 85% B+; 84 – 80% B; 79 – 76% B-; 75 – 72% C+; 71 – 68% C; 67 – 64% C-; 63 – 53% D; 52% and below below F.

**Approximate Weekly Schedule**

<u>Week</u>	<u>Topics</u>
01	Flight controls, design of mechanical systems for the generation of required vehicle level aerodynamic forces
02	Flight controls: human powered systems: control surface forces, system mechanical advantage and energy methods; control surface feel.
03	Flight controls: hydraulically or electrically powered systems: hydraulic actuator design, function, and behavior; hydraulic and electrical actuator response models; design issues
04	Flight controls: trim systems, drag, and high lift devices
05.	Avionics and electrical systems: flight sensors; air data; inertial reference systems; health monitoring; navigation.
06	Avionics and electrical systems: propulsion control mechanisms; EICAS
07	Avionics and electrical systems: Complex hardware, flight control computers and remote electronic units; autoflight systems
08	Avionics and electrical systems: EWIS; other service items (weather radar, radio altimeters, etc).
09.	Cabin systems: environmental control systems; pressure, temperature, special needs, etc.
10.	Landing gear and mechanical systems: landing gear design principles; loading
11.	Landing gear and mechanical systems: dynamic characteristics; design requirements
12.	Other mechanical systems: thrust reversing systems; brakes; doors; miscellaneous controls
13.	Systems safety analysis: system safety concepts
14.	Systems safety analysis: functional hazard assessments
15.	Systems safety analysis: fault tree analyses
16.	Systems safety analysis: interaction of systems and structures