

Subject Description Form

Subject Code	AAE4108
Subject Title	Aircraft Inspection and Testing
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: IC2133 Aircraft Manufacturing and Maintenance Fundamentals
Objectives	To provide students with knowledge of aircraft inspection and application in modern aircraft maintenance.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Acquire good understanding of aircraft inspection and repair techniques; and b. Demonstrate good understanding of inspecting fundamental aircraft components, including mechanics and avionics; and c. Apply their knowledge to handle aircraft material.
Subject Synopsis/ Indicative Syllabus	<p>Disassembly, Inspection, Repair and Assembly Techniques - Types of defects and visual inspection techniques; Corrosion removal, assessment and re-protection. general repair methods, structural repair manual; Ageing, fatigue and corrosion control programmes. Non-destructive inspection techniques including: penetrant, radiographic, eddy current, ultrasonic and boroscope methods. Disassembly and re—assembly techniques. Trouble shooting techniques.</p> <p>Abnormal Events - Inspections following lightning strikes and HIRF penetration. Inspections following abnormal events such as heavy landings and flight through turbulence.</p> <p>Electrical Wiring Interconnection System (EWIS) - Continuity, insulation and bonding techniques and testing; Use of crimp tools: hand and hydraulic operated; Testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing and installation precautions; Identification of wire types, their inspection criteria and damage tolerance; Wiring protection techniques: cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; EWIS installations, inspection, repair, maintenance and cleanliness standards.</p> <p>Riveting - Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.</p> <p>Springs - Types of springs, materials, characteristics and applications; Inspection and testing of springs.</p> <p>Bearings - Purpose of bearings, loads, material, construction; Types of bearings and their application; Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.</p> <p>Transmissions - Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns;</p>

	<p>Belts and pulleys, chains and sprockets; inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.</p> <p>Control Cables - Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems; Swaging of end fittings; Inspection and testing of control cables; Bowden cables; Aircraft flexible control systems.</p> <p>Material handling - Sheet metal: marking out and calculation of bend allowance; sheet metal working, including bending and forming; Inspection of sheet metal work; Composite and non-metallic: Bonding practices; Environmental conditions; Inspection methods.</p> <p>Welding, Brazing, Soldering and Bonding - Soldering methods; Inspection of soldered joints. Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.</p>																							
<p>Teaching/Learning Methodology</p>	<p>Lectures are used to deliver the fundamental knowledge in relation to aircraft inspection and testing (outcomes a to c).</p> <p>Tutorials are used to illustrate the applications of fundamental knowledge to practical situations (outcomes a to c).</p> <table border="1" data-bbox="451 974 1425 1274"> <thead> <tr> <th rowspan="2">Teaching/Learning Methodology</th> <th colspan="3">Intended subject learning outcomes to be covered</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>1. Lecture</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Tutorial</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table>	Teaching/Learning Methodology	Intended subject learning outcomes to be covered			a	b	c	1. Lecture	✓	✓	✓	2. Tutorial	✓	✓	✓								
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<p>Assessment Methods in Alignment with Intended Learning Outcomes</p>	<table border="1" data-bbox="459 1323 1422 1659"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="3">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>1. Assignments / Quizzes</td> <td>50%</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Final examination</td> <td>50%</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Overall Assessment:</p> <p>$0.5 \times \text{End of Subject Examination} + 0.5 \times \text{Continuous Assessment}$</p> <p>Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignments and closed-book quizzes. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus.</p>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			a	b	c	1. Assignments / Quizzes	50%	✓	✓	✓	2. Final examination	50%	✓	✓	✓	Total	100 %			
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Student Study Effort Expected	Class contact:	
	▪ Lectures	26 Hrs.
	▪ Tutorials	13 Hrs.
	Other student study effort:	
	▪ Assignments	20 Hrs.
	▪ Self-study	46 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. “EASA Module 6 B1 Materials and Hardware” by Aircraft Technical Book Co. 2. “EASA Module 7A Maintenance Practices” by Aircraft Technical Book Co. 3. “The Jet Engine 5th Edition” by Rolls Royce 4. “Airline Maintenance and Aircraft Manufacturing: Analyses of Select Issues” by Laura T. Pierson 5. “Introduction to Nondestructive Testing – A Training Guide, Second Edition” by Paul E. Mix 6. “Structural Health Monitoring” by Daniel Balageas, Claus-Peter Fritzen, Alfredo Guemes 	

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