

1. Title	Materials and hardware I
2. Code	EMAMAG338A
3. Range	The knowledge is needed for a wide range of aircraft repair and maintenance works, e.g. applicable to aircrafts, analysis, machineries, airworthiness, airframes, avionics, materials, tests, documentation, safety, health and tools etc.
4. Level	3
5. Credit	2
6. Competency	<p style="text-align: center;"><u>Performance Requirement</u></p> <p>6.1 Knowledge</p> <ul style="list-style-type: none"> <li>◆ Able to understand the Aircraft Materials - Ferrous <ul style="list-style-type: none"> <li>• Characteristics, properties and identification of common alloy steels used in aircraft.</li> <li>• Heat treatment and application of alloys steels.</li> </ul> </li> <li>◆ Able to understand the Aircraft Materials – Non-ferrous <ul style="list-style-type: none"> <li>• Characteristics, properties and identification of common non-ferrous materials used in aircraft.</li> <li>• Heat treatment and application of nonferrous materials.</li> </ul> </li> <li>◆ Able to understand the Aircraft Materials – Composite and Non-metallic <ul style="list-style-type: none"> <li>• Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft.</li> <li>• Sealants and bonding agents.</li> <li>• The detection of defects in composite material.</li> </ul> </li> </ul>

- Repair of composite material.
- ◆ Able to understand the corrosion
- ◆ Able to understand the Fasteners
  - Screw threads
  - Bolts, studs and screws
  - Locking devices
  - Aircraft rivets
- ◆ Able to understand the Pipes and Unions
  - Identification of, and types of rigid and flexible pipes and their connectors used in aircraft.
  - Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.
- ◆ Able to understand the Springs
  - Types of springs, materials, characteristics and applications.
- ◆ Able to understand the Bearings
  - Purpose of bearings, loads, material, construction.
  - Types of bearings and their application.
- ◆ Able to understand the Transmissions
  - Gear types and their application.
  - Gear ratios, reduction and multiplication gear
  - systems, driven and driving gears, idler gears,
  - mesh patterns.
  - Belts and pulleys, chains and sprockets.
- ◆ Able to understand the Control Cables
  - Types of cables.
  - End fittings, turnbuckles and compensation devices.
  - Pulleys and cable system components.
  - Bowden cables.
  - Aircraft flexible control systems.

		<ul style="list-style-type: none"> <li>◆ Able to understand the Electrical Cables and Connectors <ul style="list-style-type: none"> <li>• Cable types, construction and characteristics.</li> <li>• High tension and co-axial cables.</li> <li>• Crimping.</li> <li>• Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.</li> </ul> </li> </ul>
6.2	Theoretical and practical aspects	<ul style="list-style-type: none"> <li>◆ Able to apply the following knowledge in the aircraft maintenance. <ul style="list-style-type: none"> <li>• Corrosion</li> <li>• Fasteners</li> <li>• Pipes and Unions</li> </ul> </li> </ul>
6.3	Professional approach	<ul style="list-style-type: none"> <li>◆ Able to understand the principal elements of the subjects.</li> <li>◆ Able to understand the general knowledge of the theoretical and practical aspects of the following subjects. <ul style="list-style-type: none"> <li>• Corrosion</li> <li>• Fasteners</li> <li>• Pipes and Unions</li> </ul> </li> <li>◆ Able to apply the knowledge in the aircraft maintenance task.</li> </ul>

<p>7. Assessment Criteria</p>	<p>The integral outcome requirement of this UoC is:</p> <ul style="list-style-type: none"> <li>(i) Able to understand the theoretical fundamentals of the subjects.</li> <li>(ii) Able to give a general description of the subjects using, as appropriate, typical examples.</li> <li>(iii) Able to use mathematical formulae in conjunction with physical laws describing the subjects.</li> <li>(iv) Able to read and understand sketches, drawings and schematics describing the subjects.</li> <li>(v) Able to apply the knowledge in a practical manner using detailed procedures.</li> </ul>
<p>8. Remarks</p>	<p>Ref: HKAR-66 Module 6: Materials and Hardware.</p>