

1. Title	Gas turbine engine I
2. Code	EMAMAG402A
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	4
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 gas turbine engine fundamentals</li> <li>◆ Able to understand the inlet</li> <li>◆ Able to understand the compressors</li> <li>◆ Able to understand the combustion section</li> <li>◆ Able to understand the turbine section</li> <li>◆ Able to understand the exhaust</li> <li>◆ Able to understand the lubricants and fuels <ul style="list-style-type: none"> <li>• Properties and specifications.</li> <li>• Fuel additives.</li> <li>• Safety precautions.</li> </ul> </li> <li>◆ Able to understand the lubrication systems <ul style="list-style-type: none"> <li>• System operation/lay-out and components.</li> </ul> </li> <li>◆ Able to understand the fuel systems <ul style="list-style-type: none"> <li>• Operation of engine control and fuel metering systems including electronic engine control (FADEC).</li> <li>• Systems lay-out and components.</li> </ul> </li> </ul>

- ◆ Able to understand the air systems
  - Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.
- ◆ Able to understand the starting and ignition systems
  - Operation of engine start systems and components.
  - Ignition systems and components.
  - Maintenance safety requirements.
- ◆ Able to understand the engine indication systems
  - Exhaust Gas Temperature/Interstage Turbine Temperature.
  - Engine Thrust indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems.
  - Oil pressure and temperature.
  - Fuel pressure and flow.
  - Engine speed.
  - Vibration measurement and indication.
  - Torque.
  - Power.
- ◆ Able to understand the turbo-prop engines
  - Gas coupled/free turbine and gear coupled turbines.
  - Reduction gears.
  - Integrated engine and propeller controls.
  - Overspeed safety devices.
- ◆ Able to understand the turbo-shaft engines
  - Arrangements, drive systems, reduction gearing, couplings, control systems.

	<ul style="list-style-type: none"> <li>◆ Able to understand the auxiliary power units (APUs) <ul style="list-style-type: none"> <li>• Purpose, operation, protective systems.</li> </ul> </li> <li>◆ Able to understand the powerplant installation <ul style="list-style-type: none"> <li>• Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.</li> </ul> </li> <li>◆ Able to understand the fire protection systems <ul style="list-style-type: none"> <li>• Operation of detection and extinguishing system.</li> </ul> </li> <li>◆ Able to understand the engine monitoring and ground operation <ul style="list-style-type: none"> <li>• Procedures for starting and ground run-up.</li> <li>• Interpretation of engine power output and parameters.</li> <li>• Trend (including oil analysis, vibration and boroscope) monitoring.</li> <li>• Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer.</li> <li>• Compressor washing / cleaning.</li> <li>• Foreign Object Damage.</li> </ul> </li> </ul>
6.2	<p>Theoretical and practical aspects</p> <ul style="list-style-type: none"> <li>◆ Able to apply the following knowledge in the aircraft maintenance. <ul style="list-style-type: none"> <li>• Inlet</li> <li>• Turbine Section</li> </ul> </li> </ul>

	<p>6.3 Professional approach</p> <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>• Inlet</li> <li>• Turbine Section</li> </ul> </li> <li>◆ Able to apply the knowledge in the aircraft maintenance task.</li> </ul>
7. Assessment Criteria	<p>The integral outcomes requirement of this UoC are:</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>
8. Remarks	Ref: HKAR-66 Module 15: Gas turbine engine