1. Title	Physics II (Mechanics Repair and Maintenance)
2. Code	EMAMBG302A
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	3
6. Competency	Performance Requirement
	6.1 Knowledge ♦ Able to understand the Matter • Nature of matter : the chemical elements, structure of atoms, molecules. • Chemical compounds. • States: solid, liquid and gaseous. • Changes between states. ♦ Able to understand the Mechanics • Statics ‣ Forces, moments and couples, representation as vectors. ‣ Centre of gravity. ‣ Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion. ‣ Nature and properties of solid, fluid and gas. ‣ Pressure and buoyancy in liquids (barometers).

	• Kinetics ‣ Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity). ‣ Rotational movement: uniform circular motion (centrifugal/centripetal forces). ‣ Periodic motion: pendular movement. ‣ Simple theory of vibration, harmonics and resonance. ‣ Velocity ratio, mechanical advantage and efficiency. • Dynamics ‣ Mass. ‣ Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency. ‣ Momentum, conservation of momentum. ‣ Impulse. ‣ Gyroscopic principles. ‣ Friction: nature and effects, coefficient of friction (rolling resistance). • Fluid dynamic ‣ Specific gravity and density. ‣ Viscosity, fluid resistance, effects of streamlining. effects of compressibility on fluids. ‣ Static, dynamic and total pressure: Bernoulli's Theorem, venturi.

	♦ Able to understand the Thermodynamics • Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin. • Heat definition. • Heat capacity, specific heat. • Heat transfer: convection, radiation and conduction. • Volumetric expansion. • First and second law of thermodynamics. • Gases: ideal gases laws. specific heat at constant volume and constant pressure, work done by expanding gas. • Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps. • Latent heats of fusion and evaporation, thermal energy, heat of combustion. ♦ Able to understand the Optics (Light) • Nature of light. speed of light. • Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses. • Fibre optics. ♦ Able to understand the Wave Motion and Sound • Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves. • Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.

	6.2 Theoretical and practical aspects	♦ Able to apply the following knowledge in the aircraft maintenance. • Mechanics • Thermodynamics • Optics (Light) • Wave Motion and Sound
	6.3 Professional approach	♦ Able to understand the principal elements of the subjects. ♦ Able to understand the general knowledge of the theoretical and practical aspects of the following subjects. • Mechanics • Thermodynamics • Optics (Light) • Wave Motion and Sound ♦ Able to apply the knowledge in the aircraft maintenance task.
7. Assessment Criteria	The integral outcomes requirement of this UoC are: (i) Able to understand the theoretical fundamentals of the subjects. (ii) Able to give a general description of the subjects using, as appropriate, typical examples. (iii) Able to use mathematical formulae in conjunction with physical laws describing the subjects. (iv) Able to read and understand sketches, drawings and schematics describing the subjects. (v) Able to apply the knowledge relating to mechanics repair and maintenance in a practical manner using detailed procedures.	
8. Remarks	Ref: HKAR-66 Module 2: Physics	