

**Annex A to AMC/GM Part 147 - Module 2 Physics**

<b>CASA module Examinations subjects</b>	<b>CASA mech basics exams equavelant</b>	<b>CASA avionic basics exams equavelant</b>
<b>Module 2 Physics (B1 &amp; B2)</b>		
<b>2.1 Matter</b>		
Nature of matter: the chemical elements, structure of atoms, molecules;	Nil	Nil
Chemical compounds;	Nil	Nil
States: solid, liquid and gaseous;	Nil	Nil
Changes between states.	Nil	Nil
<b>2.2 Mechanics</b>		
<b>2.2.1 Statics</b>		
Forces, moments and couples, representation as vectors;	Nil	Nil
Centre of gravity;	Nil	Nil
Elements of theory of stress, strain and elasticity: tension, compression, shear and torsion;	Nil	Nil
Nature and properties of solid, fluid and gas;	Nil	Nil
Pressure and buoyancy in liquids (barometers).	Nil	Nil
<b>2.2.2 Kinetics</b>		
Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity);	Nil	Nil
Rotational movement: uniform circular motion (centrifugal and centripetal forces);	Nil	Nil
Periodic motion: pendular movement;	Nil	Nil
Simple theory of vibration, harmonics and resonance;	Nil	Nil
Velocity ratio, mechanical advantage and efficiency.	Nil	Nil
<b>2.2.3 Dynamics</b>		
<b>(a)</b>		
Mass;	Nil	Nil
Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency;	Nil	Nil
<b>(b)</b>		
Momentum, conservation of momentum;	Nil	Nil
Impulse;	Nil	Nil
Gyroscopic principles;	Nil	Nil
Friction: nature and effects, coefficient of friction (rolling resistance).	Nil	Nil
<b>2.2.4 Fluid dynamics</b>		
<b>(a)</b>		
Specific gravity and density;	Nil	Nil
<b>(b)</b>		
Viscosity, fluid resistance, effects of streamlining;	Nil	Nil
Effects of compressibility on fluids;	Nil	Nil
Static, dynamic and total pressure: Bernoulli's Theorem, venturi.	Nil	Nil
<b>2.3 Thermodynamics</b>		
<b>(a)</b>		

Temperature: thermometers and temperature scales: Celsius, Fahrenheit and Kelvin, heat definition;	Nil	Nil
<b>(b)</b>		
Heat capacity, specific heat;	Nil	Nil
Heat transfer: convection, radiation and conduction;	Nil	Nil
Volumetric expansion;	Nil	Nil
First and second law of thermodynamics;	Nil	Nil
Gases: ideal gases laws, specific heat at constant volume and constant pressure, work done by expanding gas;	Nil	Nil
Isothermal, adiabatic expansion and compression, engine cycles, constant volume and constant pressure, refrigerators and heat pumps;	Nil	Nil
Latent heats of fusion and evaporation, thermal energy, heat of combustion.	Nil	Nil
<b>2.4 Optics (light)</b>		
Nature of light, speed of light;	Nil	Nil
Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses;	Nil	Nil
Fiberoptics.	Nil	Nil
<b>2.5 Wave motion and sound</b>		
Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves;	Nil	Nil
Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect.	Nil	Nil