

## MINIMUM CORE SUBJECT AREAS: ENERGY ENGINEERING

AREA	SUBJECTS / DESCRIPTION	RECOMMENDED CONTACT HOURS
<b>A minimum of 5 out of the 9 areas below, with a recommended total number of contact hours of 200.</b>		
<b>1. Fluid Mechanics</b>	- potential flow, laminar flow, turbulence flow, internal flow, etc.	
<b>2. Heat Transfer</b>	- conduction, convection, radiation, heat exchangers	
<b>3. Thermodynamics</b>	- first law of thermodynamics, second law of thermodynamics, Carnot cycle, Rankine Cycle, refrigeration cycle, etc.	
<b>4. Energy Conversion and Storage</b>	- thermal storage, phase change materials, battery, supercapacitor, fuel cell, flywheel, pumped hydroelectric storage, etc.	
<b>5. Renewable Energy</b>	- solar thermal energy, photovoltaic cell, wind power, tidal energy, wave energy, geothermal energy, biomass energy, etc.	
<b>6. Building Energy</b>	- heating, ventilating and air conditioning (HVAC), heat pump, lighting, lifts and escalators, electrical power quality, energy audit, etc.	
<b>7. Power Engineering</b>	- thermal power plants, turbines, nuclear power, electric power transmission, etc.	
<b>8. Engineering Control</b>	- dynamic modelling techniques, integrative modelling techniques, numerical simulation, energy systems, etc.	
<b>9. Electrical Circuits</b>	- Kirchhoff's laws, Thevenin's theorem, DC circuits, AC circuits, transfer functions, Laplace transform, etc.	