Figure / Diagrams to practice		
Unit 1: Energy resources and Prime movers	FLAT PLATE COLLECTOR (Solar Water Heater)	
	Concentrating type	
	4 stroke SI engines : Suction stroke, Compression Stroke, Expansion/working/power Stroke, Exhaust Stroke	Each stroke – engine diagram and P- V plot
	4 stroke CI engines : Suction stroke, Compression Stroke, Expansion/working/power Stroke, Exhaust Stroke	Each stroke – engine diagram and P- V plot
	Battery Electric Vehicle Architecture	
	Series HEV Architecture	
	Parallel HEV Architecture	
	Plug-in HEV Architecture	
Steam turbine	IMPULSE TURBINE (De Laval turbine)	P – V plot, steam flow figure
	REACTION TURBINE- Parson's turbine	
Water turbine	Impulse Turbine or PELTON WHEEL	
	FRANCIS TURBINE	
Gas turbine	Open loop gas turbine	
	Closed loop gas turbine	
Wind turbine	Horizontal axis and Vertical axis wind turbine	
Unit 2: Engineering Materials	Composites : particulate, flake, and fibers	
	Tensile test specimen	
	Stress strain curve typical	
	Stress strain diagram for ductile material Aluminum or Copper	
	Brittle material Stress strain curve	
	Elasticity , Plasticity , Toughness, Resilience property	
Unit 3: Motion and Power Transmission	Kinematic link : Reciprocating steam engine	
	Sliding pair, Turning pair, Rolling pair, Screw pair, Spherical pair, Lower pair, Higher pair, Completely constrained motion, Incompletely constrained motion, Successfully constrained motion	
	Kinematic Chain : Four bar chain	
	Beam engine (crank and lever mechanism}	

Inversion of a Four-bar chain	Coupling rod of a locomotive (Double crank mechanism)	
Inversions of Single Slider Crank Chain	Pendulum pump or Bull engine.	
	Oscillating cylinder engine.	
	Rotary internal combustion engine or Gnome engine	
	Different types of belts	
	Open Belt drive	
	Cross Belt drive	
	Stepped (Cone) pulley drives	
	Jockey Pulley	
	Different types of chains	
Gear drives	*Spur gear, Helical Gears, Double Helical/Herringbone gear, Bevel gear, Hypoid gear, Worm gear, Rack and Pinion*	
	Gear Terminology	
	Simple gear train	
	Compound gear train	
	Reverted Gear Train	
	Epicyclic Gear Train	
	Planetary gear train	
Unit 4: Manufacturing processes and Fasteners	Sand casting, flow chart	
	Pattern allowances	
	Types of Pattern : *Solid pattern, Split attern , Match plate pattern, Cope and drag pattern , Loose-piece pattern, Sweep pattern,*	
	Casting Defects : Shift or Mismatch , Swell, Blowholes , Drop , Metal Penetration, Pinholes, Shrinkage Cavity, Hot Tears or Hot Cracks, Cold Shut , Misrun ,	
	Metal Forming : Rolling,Forging, Extrusion, Drawing, Deep drawing	
	Arc welding (Metal arc)	
	Gas Welding ,	
	Gas flames	

Resistance Welding	Spot welding, Seam welding Soldering Procedure	
	Brazing	
	External thread, Internal thread	
	Thread terminology	
	Bolt terminology	
	Stud terminology	
	Riveting, Lap Joint, Butt joint	
Unit 5: Machining and Robotics		
	Lathe working principle	
	Specifications of Lathe	
	Lathe Operations: Turning, Facing, Thread cutting, Taper turning,	
	3 jaw chuck, 4 jaw chuck	
Drilling:	types- reaming, counter boring, boring, counter sinking, tapping, spot facing	
Milling	Up milling, Down milling	
	Horizontal milling	
	Vertical milling	
	Slab milling, slotting, Side milling, Straddle milling, Form milling, Angular milling, Profile milling, Pocket milling, Surface contouring.	
	Horizontal Machining Centre HMC	
Robotics	Robot	
	Robot joints	
	Robot configurations	
Automation	Control System: Open loop	
	And Feedback control system	