Mechanical Engineering:

Degree Standard

UNIT I
APPLIED MECHANICS AND STRENGTH OF MATERIALS
Statics of particle - Resolution of forces - Supports and reactions - Moments of Inertia - Velocity and acceleration of particles - Newton's secondlaw - Direct stress and Strain - Hook's Law - Poission Ratio - Bending Moment and Shearing forces - Bending Stresses in Beams - Torsion of shafts.

UNIT II
THERMODYNAMICS
Energy - Work - heat properties - States - Processes energy equation - work and PV diagrams - Laws of thermodynamics (I & II Law) - Thermodynamics cycles (Otto, Diesel and Brayton) - Gas Laws - perfect gas relationships - principle of refrigeration - refrigeration cycles - simple vapour compression system - psychrometric chart - simple air conditioning processes.

UNIT III
FLUID MECHANICS AND TURBOMACHINERY
Classification of fluids - fluid properties - Ideal fluid flow - Rotational, irrotational flow - Bernoulli's equation - flow through pipes - pipes in series and parallel - Laminar and Turbulent flow - concept of Reynold's number, machnumber - definition and classification of turbo machines equation for energy transfer - Centrifugal fans, blowers and compressors, axial flow fans and compressors - axial turbine stages - hydraulic turbines - Pelton wheel, Francis and Kaplan turbine.

UNIT IV
IC ENGINES AND POWER PLANT ENGINEERING
Engine classification - working of S. I. Engine, C.I. engine, two stroke engine, four stroke engines, engine performances - Indicated power, brake power - specific fuel consumption, thermal efficiency - steam power cycles - Layout and location of steam, diesel, nuclear, hydro-electric and gas turbine power plants - pollution and environmental problems.

UNIT V
GAS DYNAMICS AND JET PROPULSION
Energy equation for flow process - velocity of sound mach number - effect of mach number on compressibility - Isentropic flow with variable area, Fanno flow and Rayleigh flow - Aircraft propulsion - Jet engines - energy flow - thrust power and propultive efficiency - performances of jet engine and rocket engines - solid and liquid propellant rockets - comparison of various propulsion systems.

UNIT VI
THEORY OF MACHINES
Kinematics of mechanisms - link pair - inversions of mechanism four bar chain - slider crank mechanisms - motion and inertia - gyroscope - friction - Laws of solid friction - clutches and bearings - Belt, rope, chain drives, toothed gears - gear trains - lubrication and lubricants - flywheel and governors - balancing of rotating masses - critical speed of rotating shafts - mechanical vibration - damping with forced vibrations (Single degree)

UNIT VII
DESIGN OF MACHINE ELEMENTS WITH CAD
Design of welded joints - Design of flange coupling - Helical and leaf springs - Design of journal and thrust bearings - Design and selection of flat belts - Design of spur, helical, worm and wolm, wheel and bevel gears - elements of CAD system - Geometric modeling - stress analysis, kinematic analysis and dynamic analysis.

UNIT VIII
PRODUCTION AND MACHINING PROCESSES
Metal forming processes - forging, drawing and rolling - Metal casting processes - sand casting, gravity die casting - Metal cutting tools - tool materials and geometry of tools - jig and fixtures - maching tools - lathe, milling, drilling, grinding, processes, finishing processes - honing, lapping, super finishing processes - Gears and gear manufacturing - NC and CNC, FMS - CIM and Robotics.

UNIT IX
METROLOGY AND INSTRUMENTATION
Elements of measurement systems, range, span, sensitivity, accuracy, precision and repeatability of instrument - errors in measurement system - measurement of pressure, temperature, speed, strain and force (load cells) precision instruments slip gauges, comparators, Interchangability, limit gauges - measurement of surface finish - measurement of screw thread, gear tooth.

UNIT X
QUALITY CONTROL AND INDUSTRIAL ENGINEERING
Statistical quality control - control charts and acceptance sampling - work study techniques - basic procedure - production planning and control - inventory control - plant layout and material handling - linear programming PERT and CPM.