

## SYLLABUS FOR THE POST OF SENIOR INSTRUCTOR



### SUBJECTS: MECHANICAL ENGINEERING

- 1. ENGINEERING MECHANICS AND STRENGTH OF MATERIALS:**  
SYSTEM OF FORCES, CENTRE OF GRAVITY AND MOMENT OF INERTIA, FRICTION, SIMPLE MACHINE, RECTILINEAR MOTION, CURVILINEAR MOTION, SIMPLE STRESS AND STRAIN, SHEAR FORCE AND BENDING MOMENT, STRESS DUE TO BENDING, TORSION, COLUMN AND STRUT.
- 2. FLUID MECHANICS:**  
PROPERTIES OF FLUID, MEASUREMENT PRESSURE, STATIC PRESSURE, FUNDAMENTALS OF FLUID FLOW, FLOW MEASUREMENT, FLOW THROUGH PIPES, FLOW THROUGH OPEN CHANNELS, HYDRAULIC TURBINES, HYDRAULIC PUMPS AND HYDRAULIC DEVICES.
- 3. THEORY OF MACHINE:**  
SIMPLE MECHANISM, TRANSMISSION OF POWER AND MOTION, FLUCTUATION OF ENERGY, BALANCING, CLUTCHES, BRAKES AND DYNAMOMETERS
- 4. ENGINEERING DRAWING:**  
GEOMETRICAL CONSTRUCTION, SCALE, ORTHOGRAPHIC PROJECTION, PROJECTION OF POINTS, LINES, PLANES AND SOLIDS, ISOMETRIC PROJECTION, RIVETED JOINTS.
- 5. THERMODYNAMICS:**  
PROPERTIES OF GASES, LAW OF THERMODYNAMICS, THERMODYNAMIC PROCESSES, AIR CYCLE, VAPOURS, FUELS, TRANSFER OF HEAT.
- 6. HEAT POWER ENGINEERING:**  
STEAM BOILERS, RECIPROCATING STEAM ENGINE, STEAM TURBINE, CONDENSERS, STEAM POWER PLANTS, NUCLEAR POWER PLANT.
- 7. MANUFACTURING TECHNOLOGY:**  
METAL CUTTING PROCESS, ADVANCED WELDING PROCESSES, PRESS WORK, POWDER METALLURGY, CUTTING FLUIDS AND COOLANTS.
- 8. ADVANCE WORKSHOP PRACTICE:**  
SHOP TASKS: LATHE, LATHE ACCESSORIES, LATHE TOOLS, METAL CUTTING AND CUTTING TOOLS
- 9. MACHINE TOOLS:**  
DRILLING MACHINES, SHAPER, MILLING MACHINE, NUMERICAL CONTROL (NC) AND COMPUTER NUMERICAL CONTROL (CNC) MACHINES, NON-CONVENTIONAL MACHINING METHODS.
- 10. PRODUCTION TECHNOLOGY:**  
HEAT TREATMENT, MOULDING AND CASTING, FORGING AND MECHANICAL WORKING, JOINING PROCESSES, METAL CLEANING AND PROTECTIVE SURFACE TREATMENT.

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