

1. Computer Science & Engineering:

SYLLABUS will be of CS/IT GATE 2022

2. Energy Science & Technology:

Energy Sources, Fuel and Combustion, Energy Conversion and Storage System, Introduction to the Energy materials and Fundamentals of Energy Devices, Energy Audit And Management, Bio Energy Engineering, Hydrogen Energy, Electric Vehicles Technology, Wind Energy Conversion Systems, Nuclear Reactor Theory, Overview of Material Characterization Techniques, Environmental Engineering And Pollution Control, Process Modelling and Simulation in Energy Systems, Thermal Engineering, Energy Audit and Management, Solar Energy Engineering, Waste Management for Energy Generation Technologies, Environmental Impact Assessment and Economic Analysis of Energy Technologies, Instrumentation, Nuclear, Batteries & Fuel Cells, Electrochemistry and Super capacitor, Wind Energy Engineering, Thin Film Technology and Applications, Nuclear Materials, Instrumentation in Energy Systems, Computational Heat Transfer, Power Plant and Electrical Energy Technology, Renewable Power Generation Sources, Energy Systems Modelling and Analysis.

3. Manufacturing Technology & Automation:

Material Science including composite materials, Strength of Material, Manufacturing Technology, Metal removal Processes, Theory of Metal Forming, Conventional and unconventional manufacturing processes, Additive Manufacturing, Advanced Foundry and welding technology, Machine tool control and condition monitoring, Surface Engineering, MEMS, NEMS, Production of Gears and Screws, Friction, wear and lubrication, Precision Engineering, Fluid Mechanics and machinery, Theory of machines and design of machine elements, Materials handling and management, Industrial management, Production planning and control, Time and motion study, Total Quality management, Pneumatics and control, Computer Assisted Manufacturing, Computer Aided Design, Computer Integrated Manufacturing, Flexible Manufacturing System, Finite Element Method, Automobile Engineering, Operation Research, Design Planning and Control of Production Systems, Supply Chain Management, Project Management, Inspection and Testing in Manufacturing, Automation and Robotics, Automation and control, Tool Engineering, Refrigeration and Air conditioning, Simulation and modelling.

4. Nanotechnology:

Introduction to material science, Crystal structure and Types of bonding, Energy bands in metals, insulators and semiconductors, electrical and thermal properties of materials, metals, ceramics, polymers, composites and nanomaterials, basics of Electrochemistry, diamagnetism, ferromagnetism, para-magnetism ferrimagnetism and anti-ferrimagnetism, Op-amp, NAND, NOR and XOR gate, simple combinational circuits, Diode and BJT its principles and applications, principles of communication, amplitude and frequency modulation, matrix Algebra, vector

algebra and calculus and linear differential equations, strength of materials, heat transfer and fluid mechanics, principles of quantum mechanics, Heisenberg's uncertainty principle and wave particle duality.

5. Mechatronics:

Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.

Machining and Machine Tool Operations: Mechanics of machining; basic machine tools.

Metrology and Inspection: Limits, fits and tolerances;

Heat-Transfer: Modes of heat transfer; Machine Design: Design for static and dynamic loading;

Mechatronics Systems, Actuators, Drives, PLCs.

Number representations: binary, integer and floating-point- numbers. Data converters: sample and hold circuits, ADCs and DACs. Basic control system components; Feedback principle; Transfer function; Block diagram representation; Signal flow graph; Transient and steady-state analysis of LTI systems.

Resistive-, capacitive-, inductive-, piezoelectric-, Hall effect sensors and associated signal conditioning circuits; transducers for industrial instrumentation