

Non-Teaching Staff Recruitment

(Advertisement No. IITT/STAFFREC/01/2025 dated 14-07-2025)

Syllabus - Junior Technician (Centre of Excellence)

1. Basic Manufacturing

- Machining operations: turning, drilling, milling, grinding
- Cutting tools, tool wear, welding, forming, and casting processes
- Safety practices in mechanical/electrical laboratories

2. Engineering Drawing & CAD/CAM

- Orthographic, isometric, and sectional views, dimensioning, tolerances, and fits
- Basic 2D/3D part modeling and simple assemblies
- Bill of Materials (BOM) preparation and digital manufacturing documentation
- CNC basics: interpreting G-codes
- Fundamentals of 3D printing workflow

3. Mechanical Engineering Fundamentals

- Fundamentals of engineering mechanics: statics & dynamics
- Stress, strain, and elastic constants; bending and torsion of shafts and beams
- Thermodynamics & fluids: pressure, flow through pipes, and modes of heat transfer

4. Electrical Circuits & Networks

- Circuit elements, KVL/KCL laws, and network theorems
- Sinusoidal steady-state analysis, phasor diagrams, resonance
- Star-delta transformation, balanced three-phase circuits
- Complex power, power factor, and time/frequency domain analysis

5. Analog & Digital Electronics

- **Analog:** Diode circuits (clipping, clamping, rectifiers), BJT/MOSFET amplifiers, op-amp circuits (amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers, oscillators)
- **Digital:** Number systems (binary, hexadecimal), Boolean algebra, logic gates, combinational circuits (multiplexers, decoders), ADCs, DACs

6. Instruments, Sensors & Testing

- Mechanical measuring instruments: Vernier callipers, micrometer, dial gauge
- Material testing: Tensile, hardness, and impact tests
- Sensors for force, displacement, vibration, etc.
- Basics of Data Acquisition (DAQ) systems and signal visualization

7. Numerical Modeling and Simulation

- Meshing/discretization fundamentals
- Basics of FEM/CFD tools for mechanical systems
- Simple electrical circuit simulation tools

8. Quantitative Aptitude and Reasoning

Selection Criteria:

- Level-I : Objective Based Test (Level-I is a screening test to call a reasonable number of candidates for the Level-II & Level-III tests.)
- Level-II : Descriptive Test
- Level-III : Skill/Trade Test

Note: All the tests will be conducted based on the above-mentioned syllabus. Equal weightage shall be given to Level-I and Level-II tests for the purpose of preparing the merit list. The Level-III test will be qualifying in nature (Pass/Fail).