

TEQIP-III: Assistant Professors Selections (on Contract)

Guidelines to the Candidates

1. Candidates are advised to report at the respective Department at 9.00 am on scheduled interview date
2. Schedule for interviews are placed in our website
3. Candidates are required to bring all original certificates along with photo ID card (Aadhar card like) and show at the time of verification
4. Interviews will start at 10.00 am on scheduled date
5. Interviews are scheduled for two days: i.e., 11-12-2017 and 12-12-2017 in few of the departments. In such cases candidates are advised to plan for two days of stay.
6. Limited accommodation is available at our Hostels / Guest house. Candidates requiring accommodation can send a request to the Prashanth (e mail ID: prashanth@nitw.ac.in). However, there are hotels near the campus.
7. NIT, Warangal is located at 2 kms away from Kazipet railway station and 12 kms away from Warangal railway station and 6 kms away from Hanamkonda bus stand
8. The following are the topics for the presentation at the interview:

Civil Engineering Department

1. Design of RCC structures
2. Design of Steel structures
3. Concrete technology
4. Finite element analysis
5. Design of Superelevation in highways
6. Design of Bituminous Concrete Mix by Marshal Method
7. Design of Rotary Intersection

8. Unit hydrograph method
9. Khosla's theory
10. Soil water plant relationship
11. Muskingum method of flood routing
12. Water Treatment Systems
13. Characteristics of domestic wastewater
14. Estimation of Traffic for Flexible Pavement Design
15. Gradually varied flow in open channels
16. Hydraulic turbines

Electrical Engineering Department

1. Introduction to power system stability
2. Introduction to Load flow studies
3. Introduction to the concepts of control system controllability and observability
4. Operating principle of a silicon controlled Rectifier
5. Causes and avoidance of hunting phenomenon in synchronous machines
6. Introduction to Thevenin's theorem
7. Four quadrant operation of Electrical Drives
8. Introduction to Economic Operation of Power Systems
9. Sinusoidal Pulse work modulation of voltage source Invertors
10. Introduction Maxwell's equation
11. Operation of forward converter
12. Double field revolving theory and introduction to starting methods of

1-Ph induction motor

Mechanical Engineering Department

1. Theories of failure
2. Coriolis component of acceleration
3. Damped and undamped free Vibrations
4. Balancing of reciprocating masses
5. Second law of thermodynamics
6. Knocking in IC engines
7. Vapor absorption refrigeration systems
8. Forced Convective heat transfer
9. P & Q Systems of inventory Control
10. Mechanism of material removal in orthogonal cutting
11. Mechanics of machining
12. Advanced machining processes

Electronics and Communication Engineering Department

1. Electronic Devices and circuits
2. Circuit Design
3. Digital / Analog Communications
4. Micro controllers
5. CMOS VLSI design
6. Micro wave Engineering/ EM Fields
7. RF Circuit Design
8. Signal Processing
9. Digital System Design

10. Instrumentation
11. Wide-band/ Optical communications
12. Smart Systems

Metallurgy and Materials Engineering and Mining Department

1. Extractive Metallurgy (Molten salt electrolysis of Ti extraction/ Advances in Steel Making)
2. Forms of Corrosion and its prevention
3. Powder Metallurgy (Sintering/Different Densification Techniques)
4. Mechanical behaviour of Materials (Tensile Testing/Strengthening Mechanisms / Creep&Fatigue, Fracture)
5. Process Metallurgy (Metal Forming Techniques)
6. Welding Metallurgy
7. Metal Casting/Foundry
8. Physical Metallurgy (Phase diagrams/ Computational Methods)
9. Materials Characterization (Microscopy/XRD/Thermal Analysis)
10. Polymers/Ceramics/Composites
11. Advanced Materials (Nanomaterials, Energy Materials, Smart Materials, Magnetic Materials, Biomaterials)
12. Testing of Materials (Destructive Testing/NDT Techniques)
13. Differential Flotation for sulphides
14. Coal washing techniques.

Chemical Department

1. Fluid Mechanics:

- a) Bernoulli & 39;s Theorem
- b) Boundary layer
- c) Laminar flow & turbulent flow
- d) Terminal Settling velocity
- e) Packed and Fluidized beds

2. Heat Transfer:

- a) Heat Exchangers
- b) Heat transfer by conduction/convection/radiation
- c) Dimensional numbers

3. Mass Transfer:

- a) Absorption
- b) Distillation
- c) Extraction
- d) Leaching
- e) Humidification

4. Thermodynamics

- a) Second law of thermodynamics
- b) PVT behaviour
- c) Concept of entropy
- d) Vapor Liquid Equilibrium
- e) Refrigeration Cycles
- f) Conversion of heat into work

5. Chemical Reaction Engineering

- a) Variables affecting the rate of reaction
- b) Homogenous reactors
- c) Non-elementary reactions
- d) Solid catalysed gas phase reactions
- e) RTD study

6. Process control

- a) First order / Second order systems
- b) Feedback/Feed forward control
- c) PID Controller
- d) Stability of a control system

7. Transport Phenomena

- a) Balance for momentum, heat and mass transfer
- b) Analogy between momentum/heat and Mass transfer

8. Process calculations

- a) General mass/energy balance equations
- b) Mass balances with chemical reactions
- c) Humidity/Saturation
- d) Bubble/Dew points

9. Chemical Technology

10. Process Economics

11. Plant Design

12. Pollution control

Computer Science and Engineering Department

1. CPU Scheduling
2. Divide and Conquer Algorithm Design Technique
3. Sorting Algorithms
4. Database Normalization
5. TCP/IP Protocol Stack
6. Software Design Concepts
7. Object Oriented Principles
8. Phases of a Compiler
9. Direct Memory Access (DMA) method for I/O
10. I/O Device Management
11. Concurrency Control in DBMS
12. Page Replacement Algorithms

Bio-Technology

1. Cell Cycle Regulation
2. Whole Genome Sequencing & Mutagenesis
3. Gene Regulation in Prokaryotes
4. Post Translational Modifications
5. Plant Tissue Culture techniques
6. Sequence Analysis and Sequence Alignment
7. Molecular Modelling and Drug Design
8. Signal transduction
9. Over production of value added chemicals using metabolic engineering
10. Thermodynamics of Microbial Growth

11. Stoichiometry of Microbial Growth and Product Formation
12. Tumor Immunology and Vaccines Development
13. Enzyme Kinetics
14. Fermentation Technology and Process parameters optimization
15. Membrane Separation Techniques
16. Spectroscopy methods for Structure Determination

Physics Department

- 1) Optical Fibers and applications
- 2) Interference of Light
- 3) Resolving Power of Optical Instruments
- 4) Solar Cells
- 5) Light Emitting Diodes
- 6) Superconductivity
- 7) Dielectric Materials
- 8) Nano Materials
- 9) Functional and Smart materials
- 10) Polarized Light and applications
- 11) Black Body Radiation
- 12) Band Theory of Solids

Chemistry Department

1. Electrochemistry - Galvanic cells, Secondary and Fuel cells
2. Ion selective electrodes and applications
3. Amperometric and Potentiometric biosensors

4. Electrochemical corrosion and its prevention
5. Coordination chemistry
6. Molecular orbital theory
7. Chemical thermodynamics
8. Syntheses of nanomaterials and applications
9. Organic spectroscopy
10. UV-Vis and IR Spectroscopy
11. Organic reactions
12. Photochemistry
13. Nano-Chemistry

Mathematics

1. Linear Algebra (UG)
2. Advanced Calculus (UG),
3. Ordinary Differential Equations (UG),
4. Fourier Analysis (UG),
5. Numerical Analysis (UG),
6. Partial Differential Equations (PG),
7. Fluid Dynamics (PG),
8. Optimization Techniques (PG),
9. Statistics (PG),
10. Finite Difference Methods and Finite Element Methods (PG),
11. Theoretical Computer Science (PG),
12. Complex Analysis (PG).

Humanities

1. Role of English in improving communication profile of engineering students
2. Using literature in the UG classroom to teach language skills
3. Enhancing employability skills of engineers through collaborative learning
4. Enhancing communication skills in the ESL classroom through social networking sites
5. Enhancing communication skills through non-digital games and game-based learning
6. Enhancing communication skills of engineering students through GD and debates in language lab.
7. Effective use of English language Communication skills lab for teaching English
8. Promoting critical pedagogy through authentic materials
9. Strategies for developing oral communication skills of engineering students
10. Teaching effective writing skills to students through online courses/methods
11. Teaching reading skills through newspapers
12. Soft skills for engineers