

NATIONAL INSTITUTE OF TECHNOLOGY CALICUT
TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME PHASE III
SELECTION OF ASSISTANT PROFESSORS(CONTRACT)

Ref: NITC/TEQIP-III/AP(C)/2017

Date: 27.11.2017

SUGGESTED TOPICS FOR PRESENTATION

English

- Differences between Technical and General Communication
- Methods and Measures to Overcome Barriers to Communication
- Role of Persuasion and Negotiation in Communication
- E-mail and Etiquettes
- Techniques for Effective Reading
- Active and Passive Voice in Technical reports
- How to handle Visual and Graphics in Documents
- Rule of Memo writing
- Non Verbal Communication
- Role and Importance of Active Listening in Communication
- Strategies for Improving Oral Communication
- Presentation Skills
- Group Dynamics and Behaviour
- How to write Minutes of the Meeting
- How to Implement Transitions in a Document

Chemistry

- Chemical Bonding
- Molecular Orbitals
- Radiation with matter
- Spectroscopy: General aspects
- Bonding in Metal Complexes
- Crystal Field Theory
- Aromaticity & Antiaromaticity
- Liquid Crystals
- Corrosion
- Thermal Analysis
- Chromatography
- Homogeneous Catalysis
- Heterogeneous Catalysis
- Enzyme Catalysis
- Jablonski Diagram
- Fuel Cells

Physics

- Michelson–Morley Experiment
- Lorentz Transformation
- Mass- Energy Relation
- Dual nature of matter
- Phase and group velocities
- Particle in a Box
- Harmonic oscillator

Einstein coefficients and Laser emission
Ferromagnetism and Ferrimagnetism
Packing factor for different crystal structures
Electromagnetic induction
Ray propagation in optical fiber – Numerical aperture

Mathematics

Sequences and Series
Ordinary Differential Equations
Partial Differential Equations
Integral Transforms
Matrices
Line, Surface and Volume Integrals
Complex Integration
Real Analysis
Fourier Analysis
Linear Algebra
Vector Calculus

Chemical Engineering

Process Control
Transport Phenomena
Optimization
Computational Fluid Dynamics
Multiphase Flow
Modelling & Simulation
Computer Aided Design
Petroleum Refining & Petrochemicals
Chemical Process Equipment Design
Mathematical Methods in Chemical Engineering
Operations Research

BioTech Engineering

Membrane transport proteins and their mechanism of action
Cell cycle and cell division
Biosynthesis and degradation of aminoacids along with its regulation
Kinetics of cell growth and product formation in continuous cultivation
Design of batch and continuous sterilization along with sterilization chart
Replication and transcription of DNA in eukaryotes and prokaryotes
Regulation of gene expression in prokaryotes
Autoimmune disorders
Models for non-ideal reactors
Plant and cell tissue culture techniques and their applications

Civil Engineering

Shear Force and Bending Moment
Limit state design
Hydrographs
Open channel flow
Bearing capacity of soils
Consolidation of soil

Design of highway curves
Flexible pavements
Biological treatment processes
Environmental Impact assessment
Critical Path Method in Construction management
Indeterminate analysis of structures

Computer Science & Engineering

Discrete Structures
Computer Organization & Architecture
Data Structures
Analysis of Algorithms
Theory of Computation
Database Management Systems
Operating Systems
Compiler Design
Computer Networks
Software Engineering
Artificial Intelligence

Information Technology

Big Data Analytics
Cryptography/ Network Security
Digital Communication
Internet of Things
Information Theory and Coding
Database Management Systems
Operating Systems
Compiler Design
Computer Networks
Information Theory and Coding

Electrical Engineering/Electrical & Electronics Engineering

Self & Mutual Inductance
Characteristic Impedance and wave propagation
Frequency response of Unbalanced transformers
Symmetrical Components
Active filters
Armature reaction
Differential amplifiers
EMI
Energy Efficient motor
Norton's equivalent circuit
Serial Communications
State space models
Sampling process
Stability of a system
Parallel operation of alternators
Direct Torque control methods
V & Inverted V curves
Under voltage & sag

Electrical Measurements

Electronics & Instrumentation

Active filters
Differential amplifiers
EMI
Serial Communications
Sampling process
Electrical Measurements
Transducers
A/D Conversion
Digital Measuring Instruments
Digital Communication
Electronic Display

Biomedical Engineering

Bioelectric signals(Physiology)
Biomed recorders
Imaging Systems(XRay, CT, Nuclear Medical systems)
Therapeutic equipment
Drug delivery systems
Biomaterials
Prosthetics
Telemedicine
Biosignal and bioimage processing
Microcontroller based systems
Gait analysis
Biofeedback systems
Biomems
Physiological control systems

Electronics/ Electronics & Telecommunication Engineering

Signal Theory and Transforms
Random Processes
Digital Integrated Circuits
Analog Integrated Circuits
Digital Communication
Information Theory and Coding
Wireless Communications
Electromagnetic Theory and Microwave Engineering
Computer Communication/Switching
Logic Design and Microprocessors

Automobile Engineering

Electronic Fuel Injection
Catalytic Converter
Anti-lock Braking System
Variable Valve Timing system
Limited slip Differential
Power Steering
Independent Suspension System

Bendix drive Starting System
Distributor-less Ignition System
Variable Geometry Turbocharger

Mechanical Engineering

Heat Transfer
Gas Dynamics
Machine Tools
Machine Design
Internal Combustion Engines
Mechanics of Fluids
Mechanics of Solids
Mechanics of machinery
Dynamics of Machinery
Fluid Machinery
Material Science

Production Engineering

Solid Mechanics
Material Science & Machinery
Production Technology
Machine Tools
Metal Casting & Joining
Jigs & Fixtures
Theory of Metal Cutting
Metrology
Industrial Engineering
Production Management
Computer Aided Design & Manufacturing

TEQIP COORDINATOR

Note: Above topics are to be taken as indicative and not as binding. Objective is to suggest the likely topics in each area. Candidates may prepare the presentation as if they are going to teach the subject and plan the lesson so as to make the class effective. Learn to avoid long introductions, mannerisms, etc. and use best strategies to motivate the learner.