TECHNO INDIA UNIVERSITY
WESTBENGAL

EM 4, Sector V, Salt Lake, Kolkata-700091, West Bengal, India
Phone: +91 9836544416/17/18/19, Fax: +91 33 2357 1097

4-Year Bachelor of Technology (B.Tech.) Curriculum and Syllabus for Electrical Engineering (EE)
Third Semester

Course Structure

Course Code	Course Title	Contact Hrs. / Week			Credit
		L	T	P	
Theory					
TIU-UEN-T201	Career Advancement &Skill Development	2	1	0	3
TIU-UMA-T201	Mathematics III	3	1	0	4
TIU-UMB-T201	Environmental Science	2	0	0	2
TIU-UEE-T203	Electromagnetic Field Theory	3	1	0	4
TIU-UEE-T205	Electrical Circuit Theory	3	1	0	4
TIU-UMA-T203	Probability & Statistics	3	0	0	3
Practical					
TIU-UCS-L205	Mathematics III (Numerical Methods) Lab	0	0	3	2
TIU-UEE-L205	Electrical Circuit Theory Lab	0	0	3	2
Sessional					
TIU-UES-S299	Entrepreneurship Skill Development	0	0	2	2
Total Credits					26

Detailed Syllabus

Career Advancement & Skill Development
TIU-UEN-T201
LTP: 2-1-0
Credits: 3

The detailed syllabus to be provided by the Department of Humanities

Mathematics III
TIU-UMA-T201
LTP: 3-1-0
Credits: 4

The detailed syllabus to be provided by the Department of Mathematics

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Environmental Science
TIU-UMB-T201
LTP: 2-0-0
Credits: 2

The detailed syllabus to be provided by the Department of Chemistryand Microbiology Dept.

Electromagnetic Field Theory
TIU-UEE-T203
LTP: 3-1-0
Credits: 4

Electric vector field and scalar potential field, Relation between electric field intensity and potential, Gauss's integral law for electric displacement field, electric dipole fields,
Electric polarization, and its relation to the permittivity of dielectric media, Physical interpretation of gradient, divergence theorem, Gauss's law in differential form, Poisson's and Laplace's equations, These equations in cartesian, cylindrical and spherical coordinates, Matching boundary conditions at the interface of different dielectric media,
Electric stress and mechanical force in charged conductors, Energy stored in electric field, Solution of Laplace's equation by separation of variables method, Capacitance of coaxial cables and two wire transmission lines and related electric fields, Numerical analysis of electric fields by solving Laplace's equation, Iterative methods, Finite elements method , etc.. Uniqueness theorem and Method of Images for the solution of electric fields.
Magnetic field intensity, Lorentz force, Motoring and generating principles, Physical interpretation of curl and stoke's theorem, Ampere's law in both integral and differential forms, Scalar and Vector magnetic potential and deduction of Biot-Savart's law and its application for different current configuration, Boundary conditions, Solution of field problem by image method, Self and mutual inductance, Inductance of coaxial cable and two wire transmission lines, Energy in magnetic field, Force due to magnetic field in magnetic medium. Faraday's Law of electromagnetic induction,Maxwell's field equations, Displacement current density and continuity equation, Electromagnetic wave equations in loss-free andloss pronemedia, Plane and polarized waves and their propagation as solutions of wave equation,propagation,attenuation and phase shift constants of Travelling waves,intrinsic impedances, Poynting's vector, Poynting'stheorem,Power flow through electromagnetic media, Elements of wave guide and radiating systems (antenna), Diffusion equation for eddy currents and skin effect.

Recommended Textbooks

- Engineering Electromagnetics: Hayt and Buck, McGraw Hill
- Electromagnetics: Edminister, McGraw Hill

Electrical Circuit Theory
TIU-UEE-T205
LTP: 3-1-0
Credits: 4

Laplace Transform -- Concept of complex frequency, transform of standard periodic and non-periodic waveforms. Independent and dependent sources and equivalence of sources. Circuit elements and their transformed equivalents, treatment of mutual couplings. Transient and steady state response of RL, RC, LC and RLC circuits in transient with or without stored energy – solutions in t & s domains. Concept of natural frequency and damping. Sketching

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transient response, determination of peak values. Practical applications. Loop and node variable analysis of transformed circuits. Applications of network theorems in steady state & transient domains. Graph of network: Concept of tree branch, tree link, tie set and cut set. Various incidence matrices and their properties, loop currents and node-pair potentials, formulation of equilibrium equations on the loop and node basis. Network functions, driving point and transferfunctions, two port networks, impedance and admittance parameters, transmission and inverse transmission parameters, hybrid and inverse hybrid parameters. Series, parallel and cascade connections of two port networks. Elements of realisabilityand synthesis of one port network.

Recommended Textbooks

- Network Analysis: M.E.Van Valkenburg, PHI
- Engineering Circuit Analysis: W.H.Hayt, J.E.Kenmerly, S.M.Durbin, McGraw Hill
- Network Analysis and Synthesis: Bhattacharya and Singh, Pearson

Probability & Statistics:
TIU-UMA-T203
LTP: 3-0-0
Credits: 3

The detailed syllabus to be provided by the Department of Mathematics