ACADEMIC PLAN FOR THIRD SEMESTER (For Academic Year 2014-15)

Subject: **ANALOG ELECTRONICS-I** Subject Code**: ETEC-203**

Total Teaching Weeks in Semester: 14 Total Lectures: 42 Total Tutorials: 14

Sl. No.	Topics To Be Covered	Total Lectures	Total Tutorials
	First Term		
1	Review of diode and BJT	2	
	Bias stabilization:		
2	Need for stabilization, Bias stability with respect to variations in in I_{co}, V_{BE} & β, thermal Stability.	2	1
3	Stabilization factors, fixed Bias, emitter bias, self-bias, Bias compensation techniques.	2	1
	Small signal amplifiers:		
4	CB, CE, CC configurations, hybrid model for transistor at low frequencies, comparisons of different configurations	2	
5	RC coupled amplifiers, mid band model, gain & impedance	1	1
6	Emitter follower, Darlington pair (derive voltage gain, current gain, input and output impedances)	2	
7	Hybrid-model at high frequencies (π model)	1	1
	Multistage Amplifiers:		
8	Cascade and Cascode amplifiers	2	
9	Calculations of gain, impedance and bandwidth	1	
10	Design of multistage amplifiers	2	1
	Second Term		
	Feedback Amplifiers:		
11	Feedback concept, Classification of Feedback amplifiers, Properties of negative Feedback amplifiers	2	1
12	Impedance considerations in different configurations.	2	1
13	Analysis of feedback Amplifiers	2	1
	Field Effect Transistor:		
14	Introduction, Classification, FET characteristics, Operating point, Biasing	2	
15	FET small signal Model, enhancement & Depletion type MOSFETS, MESFET,	2	1
16	FET Amplifier configurations (CD, CG and CS)	1	
17	Introduction to UJT, SCR, Triac and Diac (working, construction, characteristics and application),	3	1
18	UJT relaxation oscillator.	1	

	Power Amplifiers:		
19	Power dissipations in transistors, Amplifiers Classification, (Class-A, Class-B, Class-C, Class-AB)	2	
20	Efficiency analysis of Power Amplifiers	2	1
	Third Term		
	Power Amplifiers (Continued):		
21	Push-pull and complementary Push-pull amplifiers	2	
22	Cross over distortion and harmonic distortion in push pull amplifier	2	1
23	Tuned amplifiers (single, double & stagger tuned amplifier)	2	1

LESSON PLAN FOR COMPUTER GRAPHICS & MULTIMEDIA SEMESTER III (2014-2015)

Class: CSE/IT **Paper Code: ETCS-211**
Paper Name: Computer Graphics & Multimedia **Credits : 4**
Total Lecture Classes Available: 40

First Term Syllabus

S. No	Contents	Hours
1.	Introduction, Application Areas, Interactive and Non-Interactive Graphics, Components of Interactive Graphics System. Overview of Input and Output Devices-Keyboard, mouse, joystick, scanner, stylus, light pen, Vector display, Raster Scan CRT display, Random Scan CRT display.	3
2.	Line Drawing Algorithms- DDA and Bresenham's Line drawing Algorithm	2
3.	Circle Drawing Algorithms- Bresnham's and Mid-Point Circle Drawing Algorithm	3
4.	Homogenous Co-ordinate System for 2D and 3D, Need of Homogenous Co-ordinate System, Various 2D and 3D Transformations like translation, rotation, scaling, reflection and shearing	4
5.	Clipping, Line Clipping Algorithm- Cohen Sutherland Clipping Algorithm	2
6.	Curves and Surfaces- Curved Surfaces, polygonal approximation	1
7.	Bezier Curve, properties of Bezier curve, 4 point and 5-point Bezier curves using Berstein polynomial, conditions for the smooth joining of the curve segments B-Spline curves- cubic B-spline curves using uniform knot vectors, testing first and second order continuities.	3

Second Term Syllabus

S. No	Contents	Hours
1.	Define Projection, Types of Projection- Perspective and Parallel projection. Define the term vanishing point. Hierarchy of Perspective Projection-One-point, Two-point and Three- point projection from point O on z-axis, computing the	5

	location of vanishing point. Hierarchy of Parallel Projection- Oblique Projection on XY-plane and Isometric Projection.	
2.	Illumination Model for diffused Reflection, Ambient light, Specular Reflection model, Reflection Vector	1
3.	Shading models - Flat shading , Gourard shading and Phong shading Model	2
4.	Overview of multimedia: Classification, basic concepts of sound/audio MIDI: devices, messages, software. Authoring tools, Video and Animation : controlling animation, display and transmission of animation	5
5.	Data compression: storage space, coding requirements, basic compression techniques- Huffman code, Lempel - Ziv	5

Third Term Syllabus

S. No	Contents	Hours
1.	JPEG: Image preparation, Lossy sequential DCT, Expanded Lossy DCT, Lossless mode, Hierachial mode	3
2.	MPEG, Media synchronization, media integration, production standards.	1

LESSON PLAN FOR IT-III SEMESTER (2014-2015)

SUBJECT: FOUNDATION OF COMPUTER SCIENCE — Subject Code: ETCS-203

Total Lecture Classes Available: 39 — L T C: 3 1 4

Total Teaching Weeks in Semester: 15 Weeks — Total Tutorial Classes: 16

S. No.	Topics to be Covered	Lectures	Tutorials
	FIRST TERM		
1	Formal Logic: Proposition, Symbolic Representation	1	
2	Logical Entailment Theory of Inferences and Tautologies	2	1
3	Predicates, Quantifiers,	1	1
4	Theory of Inferences for Predicate Calculus, Resolution	3	1
5	Techniques for Theorem Proving: Direct Proof, Proof by Contraposition, Proof by Contradiction	2	1
6	Principle of Mathematical Induction, Principle of Complete Induction	1	1
7	Overview of Sets and Set Operations	2	
8	Permutation and Combination	1	
9	Principle of Inclusion, Exclusion (with proof) and Pigeonhole principle (with proof)	1	
10	Relation, Operation and Representation of a Relation, Equivalence Relation	2	1
	SECOND TERM		
11	POSET, Hasse Diagrams, extremal Elements	2	1
12	Lattices	2	1
13	Composition of Function, Inverse, Binary and n-ary Operations	2	
14	Solution Methods for Linear and Non-linear First-Order Recurrence Relations with Constant Coefficients	3	2
15	Graph Theory: Terminology	1	
16	Isomorphic Graphs, Euler's Formula (proof)	1	
17	Chromatic Number of a Graph, Five Color Theorem(with proof)	1	
18	Euler &Hamiltonian Paths	1	1
19	Groups, Symmetry, Subgroups, Normal Subgroups, Cyclic group, Permutation Group	3	1
	THIRD TERM		
20	Cayles's Theorem(without proof), Cosets Lagrange's Theorem(with roof)	2	1
21	Homomorphism, Isomorphism, Automorphism	1	
22	Rings, Boolean Function, Boolean Expression	2	2
23	Representation & Minimization of Boolean Function	2	1

Text Books:

[T1] Norman L. Biggs**, "**Discrete Mathematics", Oxford, second edition.

[T2] Keneth H. Rosen, "Discrete Mathematics and Its Applications", TMH, seventh edition.

Reference Books:

[R1] Kolman, Busby & Ross, "Discrete Mathematical Structures", PHI, 1996.

[R2] C.L. Liu, "Elements of Discrete Mathematics", TMH, 2000.

[R3] J. P. Trembly& P. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill, 1997.

ACADEMIC PLAN FOR 3rd - SEMESTER MAE (2014-15)

SUBJECT: MATERIAL SCIENCE & METALLURGY **Paper Code: ETME-207**

Total Teaching weeks in Semester: 14 weeks

L	T	C
3	0	3

Total Lecture Classes available : 42 **Total Tutorial Classes available** : 00

Unit	**FIRST TERM – TEACHING 6 WEEKS**	**Hrs.**
I	Structure of Metal: - Types of Unit Cells, BCC, FCC & HCP, Packing factors. X-ray diffraction, calculations of density of metals like Aluminum, Copper etc, and Miller indices.	3
	Defects in Crystals, point, line and surface defects.	1
	Relations between structure and mechanical properties.	1
	Diffusion Mechanism, Steady & non-steady state Diffusion, Factors affecting diffusion	1
I	Deformation: - Dislocation theory of plastic deformation by slip, deformation by twining, strain hardening and yield point phenomena.	3
	Effect of cold working and hot working on the mechanical properties.	1
	Recovery, re-crystallization and grain growth.	1
II	Failures & Creep:- Types of fractures, Ductile & Brittle Fracture, brittle failure at low temperature, Ductile to brittle transition temp., Fatigue	3
	Three stage creep curve, factors affecting creep curve, effect of material variables on creep curve.	2
	Basic consideration for the selection of material at high & Low temperature service.	2
	SECOND TERM-TEACHING 6 WEEKS	
II	Solidification:- Solidification of metals and alloys, phases in metal system, inter-metallic compounds.	1
	Phase diagram solid solution, eutectic, eutetoid and peritectic system inter metallic compounds	3
	Iron carbon phase diagram	2
	Time-temperature transformation diagram, Effect of alloying element on T-T diagram, S- N curve	2
III	Heat Treatment:- Definition, principles and purpose of heat treatment of plain carbon steels, annealing and normalizing, hardening and tempering, hardenability: Determination and jominy & quench Test, isothermal treatment	4
	Case hardening, carburizing, nitriding, carbonitriding, cyaniding, flame and induction hardening.	2
	Precipitation hardening of aluminium alloys.	1
IV	Materials:- Plan carbon steels, types, impurities and their effects, application of plain carbon steels.	1
	Effects of alloying elements (Ni, Cr, T, Si, Mn, V, Mo), composition, properties and uses of spring steel, wear resistant steel, high-speed steel and stainless steels	2
	IS standard codes for steels	1
	THIRD TERM – TEACHING 2 WEEKS Corrosion: - Types of corrosion, Galvanic cell, rusting of iron, methods for prevention against corrosion.	2
	Fiber Reinforced Composites:- General characteristic, Application, Introduction to Fibers- glass, carbon, Kevlar 49 fibers.	1
	Matrix – Polymeric, Metallic – Ceramic Matrix, Coupling agents and filters	2

Text Books:-

1. **V. Raghavan, "Material Science & Engineering", Prentice Hall India Ltd., 2001.**
2. **Raymond A Higging, "Engineering Metalurgy Part 1", Prentice Hall India, New Delhi, 1998.**
3. **Sideny H. Avner, "Introduction To physical Metallurgy", Tata McGraw-Hill, New Delhi, 1997.**
4. **Callister "Materials Science and Engineering": An Introduction, 6th Edition**

Reference Books:

1 **Degarmo E. Paul et.al, "Materials & Processes in Manufacture", Prentice Hall India, New Delhi, 2001.**
2 **L. Krishna Reddi, "Principles of Engineering Metallurgy", New Age Publication, New Delhi, 2001.**
3 **Buduisky et al, "Engineering Materials & Properties", Prentice Hall India, New Delhi, 2004.**

ACADEMIC PLAN FOR B.TECH (CIVIL) III SEMESTER 2014-15

Sub: Numerical Analysis and Statistical Techniques

Sub Code: ETMA-203

Total Teaching Weeks (in Semester): 14

L	T	C
↓	↓	↓
3	1	4

S.No.	Topics	Subtopics	Lectures	Tutorials
		Ist Term		
1	Statistical Techniques	Conditional Probability and Baye's Theorem	2	
2		Discrete and Continuous Probability distributions	1	
3		Expectation, Moments and M.G.F.	1	
4		Skewness and Kurtosis	1	
5		Binomial Distribution and Poisson Distribution	1	
6		Normal Distribution	1	
7		Least square method for linear and parabolic curves	2	
8		Correlation Coefficient and Rank Correlation	2	
9		Line of regressions and their properties	1	
10	Numerical Analysis	Bisection Method	1	
11		Regula-Falsi Method	1	
12		Newton Raphson Method	1	
13		Gauss Jacobi's Iteration Method	1	
14		Gauss Seidal's Iteration Method	1	
		IInd Term		
15	Statistical Techniques	ANOVA	3	
16		Sampling: Testing of Hypothesis & Level of Significance	2	
17		Sampling distribution of Mean and Variance	1	
18		Chi Square Distribution	1	
19		Student's T- Distribution and F-Distribution	2	
20		Fisher's Z- Distribution	1	
21	Numerical Analysis	Forward, backward and central differences	2	
22		Newton's Interpolation Method	1	
23		Stirling's Central difference Interpolation Method	1	
24		Divided difference and Interpolation Methods	1	
25		Lagrange's Interpolation Method	1	
26		Numerical Differentiation and Applications	1	
		IIIrd Term		
27		Numerical Integration: Newton-Cote's Quadrature rule	1	
28		Trapezoidal rule	1	

29	Numerical Analysis	Simpson's one-third and three-eighth rule	2	
30		Picards Method, Taylor's Method	1	
31		Euler's Method, Modified Euler's Method	2	
32		Runge-Kutta Method upto fourth order	1	

Suggested Readings:

Text Books:

[1] R.K. Jain and S.R.K. Iyengar," Numerical methods for Scientific and Engineering Computation", New Age.
[2] N.M. Kapoor, "Fundamentals of Mathematical Statistics", Pitambar Publications.

Reference Books:

[1] E. kresyzig," Advance Engineering Mathematics", Wiley publications
[2] P. B. Patil and U. P. Verma, " Numerical Computational Methods", Narosa
[3] Partial Differential Equations "Schaum's Outline Series", McGraw Hill.
[4] Michael Greenberg, "Advance Engineering mathematics", Pearson.
[5] Schaum's Outline on Fourier Analysis with Applications to Boundary Value Problem, TMH
[6] B.S. Grewal., "Numerical Methods in Engg. And Science", Khanna Publications.
[7] Miller and Freund, "Probability and statistics for Engineers", PHI
[8] Gupta and Kapoor, "Fundamentals of Mathematical Statistics" Sultan Chand and Sons.

LECTURE PLAN
SIGNALS AND SYSTEMS

Paper Code: ETEC-211 **L T C**
Paper: Signals and Systems **3 1 4**

Objective: This is the first course for representation of various types of electronic signals and LTI systems. Applications of Fourier series, understanding of Fourier transforms and sampling of various signals. Analysis of various systems using the Z transforms, Laplace transforms.

S. No.	Topic	No. of Hours
1	**UNIT- I** **Continuous And Discrete Time Signals:** Definition of signal**,** Classification of Signals: Periodic and Aperiodic, Even and Odd, Energy and Power signals**,** Deterministic and Random signals**.**	2
2	**Singular Functions**: Unit impulse, unit step, unit ramp, complex and exponential, parabolic, Signum, Sinc etc. Properties of unit impulse in continuous and discrete domain, properties of basic functions w.r.t. orthogonality.	2
3	**Transformation in independent variable of signals**: Time scaling, Time shifting, Amplitude scaling. Representation of signals in terms of singular function and orthogonal functions.	1
4	**Systems:** Definition of system, types of systems: Linear and nonlinear, static and dynamic, causal and non-causal, time variant and invariant, invertible and non-invertible, stable and non-stable. System described by differential equation and difference equation.	3
5	**LTI System:** Properties of LTI System, impulse response, convolution and its properties in continuous and discrete domain with proof. Linear convolution in continuous and discrete domain using graphical method, using general formula and matrix method.	4
6	**UNIT- II** **Fourier series:** Need and application of Fourier series.	1
7	Fourier series representation of continuous time and discrete time signals using exponential method and trigonometric method. Magnitude and Phase spectrum of signals.	4
8	**Fourier Transform:** Introduction, Properties of the Continuous time and discrete time Fourier Transform.	3
9	Magnitude and Phase representations of frequency response of LTI systems Analysis and characterization of LTI systems using Differential Equations and Difference equation.	3
10	**UNIT- III** **Magnitude- Phase Representation of Frequency Response of LTI System:** Linear phase, concept of phase delay and group delay. All pass system.	4
11	**Laplace Transform:** Properties of Laplace transform, concept of ROC and its properties. Computation of impulse response & transfer function using Laplace transform.	4
12	Inverse-Laplace transforms. Computation of impulse response, total response (zero state and zero input response) & transfer function using Laplace transform**.**	3
	Class Test syllabus from S.No.1-12 to be held from 13/10/2014 to 17/10/2014	
13	**UNIT- IV** **Sampling:** Sampling of low pass signals, ideal sampling, Aliasing effect, Nyquist rate, reconstruction of signal. Sampling of discrete time signals**.**	2
14	**Z Transform:** Region of convergence – properties of ROC, Properties of Z-transform.	3

15	**Inverse Z-transform** using contour integration - Residue theorem, Power series expansion and partial fraction expansion.	**2**
16	Relationship between Z-transform, Fourier transform and Laplace transform. Computation of impulse response, total response (Zero state and Zero input response) & Transfer function using Z-Transform. Stability of discrete-time LTI System	**3**

Text Books:

[T1] AlanV.Oppenheim, Alan S.Willsky, S.Hamid Nawab, "Signals & Systems", 2nd edition, Pearson Education, 1997.

[T2**]** Simon Haykin and Barry Van Veen, "Signals and Systems", John Wiley, 1999.

Reference Books:

[R1] M.J.Roberts, "Signals and Systems Analysis using Transform Method and MATLAB", TMH 2003.

[R2] Tarun kumar rawat "signals and systems ", Oxford University Press, Incorporated, 2010

[R3] A. Anand kumar, "signals and systems" 3rd edition , PHI

[R4] Ramesh Babu and R.Anandanatrajan ,"Signals and system", 4th edition Sci Tech ,2013

[R5] Moman .H. Hays, "Digital Signal Processing", Schaum's outlines, Tata McGraw-Hill2004.

[R6] John G.Proakis and Dimitris G.Manolakis, "Digital Signal Processing, Principles, Algorithms and Applications", 3rd edition. PHI, 2000.

ACADEMIC PLAN FOR III SEMESTER MAE (2014-15)

SUB: STRENGTH OF MATERIAL **Sub. Code: ETME-207**

Total Teaching weeks in Semester: 14 weeks

L	T	C
3	1	4

Total Lecture Classes available : 42 **Total Tutorial Classes available** : 14

S.No	TOPICS TO BE COVERED	TOTAL NO. OF	
	Teaching 6 Weeks TERM-I	Lectures	Tutorial
	Simple Stress & Strain	L-8	T-2
1	Introduction to subject, Concept of Normal and Tangential stresses and strain, Stress strain diagram for mild steel, Hook's law		
2	Volumetric stress and strain Introduction to various elastic constants, Poisson's ratio		
3	Complementary shear stress and strain, Simple stress in stepped bars of carrying axial load, Simple stress in tapered bars of various cross section carrying axial load.		
4	Stress in composite bars carrying axial loads, Extension of a bar due to its own weight. Analysis of bar of uniform strength, Thermal stress in simple bar and composite bars. (Numerical)		
	Principle stress:		
5	Introduction to Principle stresses and strain	L-4	T-2
6	Analytical method for determining stresses on oblique section, Graphical method: Mohr's Circle.		
	Strain Energy		
7	Introduction, Resilience and Strain Energy, Determination of stress due to gradually applied, suddenly load and Impact Load	L-5	T-2
8	Strain energy stored due shear stress, Castigliano's theorem, Theories of failures		
9	**Teaching 6 Weeks TERM-II**		
	Shear Force and Bending Moments		
10	Introduction to various Beams, and loads	L-3	T-1
11	Shear force and bending moment diagram for Simply supported Beams, Cantilevers Beams Overhanging Beams and under various types of loads(Point load, UDL, and UVL)		
	Simple Bending		
12	Assumptions, Expression for bending stress, Concept of neutral axis, and moment of Resilience.	L-4	T-2
13	Distribution of bending stresses across the section for different cross sections. (symmetrical and symmetrical sections)		
14	Beams of uniform strength, Stresses in beams and cantilever due to eccentric loads, Shear stress in beams		
	Slope & Deflection of beams		
15	General Expression of slope and deflection in beams	L-4	T-2
16	Slope & deflection of cantilever beams, supported beams and overhanging beams by macaulay's method, moment area method, principle of superposition.		
	Columns		
17	Combined direct and bending stresses in short columns, Euler's equation for all four types of columns.	L-4	
18	Limitation of Euler's equation, Rankine Gordon equation		
	Torsion		
19	Expression of Torsion formula, Determination of Stress and strain in pure Torsion of solid circular and hollow shaft.	L-3	T-1
20	Torsion in Composite shaft, Strength of a shaft and Torsional rigidity,		
21	Power transmitted by solid circular and hollow shaft, Strain energy stored due to torsion		
	Teaching 2 Weeks TERM-III		
	Spring		
22	Closed coil springs subjected to axial load, axial twist	L-3	
23	Introduction to leaf spring		T-1
	Cylinders		
24	Thin and thick cylinders, Lame's theorem, Compound cylinders	L-3	T-1
25	Spherical Vessels		

Text Books:

- Sadhu Singh, "Strength of Materials", Khanna Publishers, New Delhi, 2000
- Hibbler R.C., "Mechanics of Materials", Prentice Hall, New Delhi, 1994.
- R.K. Bansal, Strength of Materials", Laxmi Publication, New Delhi, 2001
- Ryder G.H., "Strength of Materials", Macmillan, Delhi, 2003

Academic Plan for 3rd Semester 2014

Branch: CSE, ECE **Subject: Switching Theory and Logic Design**

Subject Code: ETEC-205 **Credits: 4**

Total Lecture Classes available: 44 **Total Teaching Weeks in Semester: 14 weeks**

S. No.	Topics to be covered	No. of Lectures
	First Term	
1	Boolean algebra-postulates and Theorems, De Morgan's theorem	1
2	Switching functions-Canonical Forms-Simplification of Switching Functions-Karnaugh Map	2
3	Quine Mc-Clusky Methods	1
4	Review of basic gates-Universal gates, Adder, subtractor	1
5	serial adder Parallel adder-carry propagate adder, carry look ahead adder, carry save adder	2
6	Comparators, Parity Generators, Decoder and Encoder	2
7	Multiplexor and De-Multiplexer	1
8	ALU,PAL and PAL	1
9	TTL and CMOS logic Families and their characteristics	2
10	Brief Introduction to RAM and ROM	1
11	Decimal, Binary, Octal and Hexadecimal Number systems	1
12	Codes-BCD, Gray Code Excess-3 code, ASCII,EBCDIC	1
13	Conversion between various codes	2
14	Latches and Flip flops-SR,D,T and MS-JK Flip flops, Asynchronous Inputs	2
	Second Term	
15	Design of Synchronous and Asynchronous Counters-Binary, BCD, Decade and Up-down Counter	2
16	Shift Register and Types	1
17	Ring counter and Johnson Counter	1
18	State Table, State Equations and State Diagrams	2
19	State Reduction and state assignment, Design of clocked Sequential Circuits using State Equations	2
20	FSM capabilities and Limitations ,Mealy and Moore model	2
21	Minimization of completely specified and incompletely specified sequential machines	2
22	Partition Techniques and Merger Chart Methods, concept of minimal cover table	2
23	ASM charts, Synthesis of output and next state function	2
24	Data path control path partition –based design	2
	Third Term	
25	Fault models for combinational and sequential circuits	2
26	Fault Detection in combinational circuits, homing experiment	2
27	Distinguishing experiments, machine identification and fault detection experiments in sequential circuits.	2

ACADEMIC PLAN FOR 3rd - SEMESTER MAE (2014-15)

SUBJECT: THERMAL SCIENCE **Paper Code: ETME-203**

Total Teaching weeks in Semester: 14 weeks

L	T	C
3	1	4

Total Lecture Classes available : 34 **Total Tutorial Classes available** : 10

Unit	**FIRST TERM**	**Hrs.**
I	**Basic concepts**: Introduction to the Basic definitions of Engineering Thermodynamics. Thermodynamic systems : Closed, Open and Isolated systems. Microscopic and Macroscopic view.	1
	Intensive and Extensive properties. Zeroth law of Thermodynamics. Phase, State, Process, Cycle.	1
	Point functions and Path functions, Gas Laws and Equation of State, Various Quasistatic processes, pdV Work and Heat.	2
	Numerical on Displacement Work, Other types of work transfers.	1
I	**First Law of Thermodynamics:** Introduction to First Law of Thermodynamics, Internal energy. Non flow processes, p-*v* diagrams.	1
	Concept of Flow work, Enthalpy. Analysis of steady flow and unsteady flow processes and their applications. Throttling process.	2
I	**IInd Law of Thermodynamics:** Limitations of Ist law and necessity of IInd Law of Thermodynamics.	1
	Numericals on Ist law of thermodynamics for closed system, application of Ist law of thermodynamics for flow process.	1
	Kelvin Planck statement and Claussius statement, Reversible and Irreversible processes. Carnot cycle, Reversed Carnot cycle.	2
	Numericals on Heat pump, Heat Engine and Refrigerator.	1
	Carnot's Theorem, Clausius inequality. Entropy	1
	Change in Entropy during various processes and representations on t-s diagrams, Entropy principle, Entropy Generation.	2
	Numericals on Clausius Inequality, Entropy, Entropy Generation.	2
	SECOND TERM	
II	**Availability and Irreversibility** : High grade and low grade energy. Available and unavailable energy. Dead state.	1
	Loss of available energy due to Heat transfer through a Finite temperature difference.	1
	Availability. Reversible work and Irreversibility.	1
	Numericals on Availability, Reversible work and Irreversibility.	1
	Availability in non flow systems and steady flow systems. Second law efficiency.	2
	Thermodynamic Property Relations:. Maxwell Relations. Clapeyron Equation.	1
	Numericals on T-dS equations, Maxwell Relations, Clapeyron Equation.	1
II	**Properties of a Pure Substance:** Phase equilibrium of a pure substance on t-*v* diagram. Normal boiling point of a Pure substance.	2
	Saturation states. Compressed liquid. p-v & p-t diagram of a pure substance.	1
	Saturated steam, Dry and saturated steam, Superheated steam.	1
	Different processes of vapour on p-v and t-s diagrams. Measurement of Dryness fraction.	2
	Numericals on properties of steam, Use of Steam tables and Mollier diagram.	1
III	**Vapour Power Cycles :** Carnot cycle. Simple Rankine cycle.	1
	Effect of various parameters on the efficiency of Rankine cycle. Reheat and Regenerative cycles.	2
	Numericals on Carnot cycle, Rankine cycle.	1
	THIRD TERM	
IV	**Gas Power Cycles:** Carnot cycle, Otto cycle, Diesel cycle, Dual cycle, Stirling cycle, and Ericsson cycle.	2
	Gas Power Cycles with their numericals.	1
	Gas Turbines: Brayton cycle, Thermal refinements.	1
	Performance of Gas turbines, Combined cycle.	2
	Principles of Jet Propulsion. Turbojet and Turbo-prop engines, Rocket engines.	1

Text Books:

[T1] P.K. Nag, "Engineering Thermodynamics", 5th edition McGraw Hill

[T2] Y. A. Cengel & M. A Boles "Thermodynamics- An Engineering Approach ", 7th edition Tata McGraw Hill

ACADEMIC PLAN FOR SEMESTER-III (for 2014-15)

SUBJECT : **Electrical Machines** **Subject Code: ETME – 209**

Total Lecture Available: 41

Total Teaching Weeks in Semester: 15 **Total Tutorial Classes : 0**

S.No.	TOPICS TO BE COVERED	Total No. of Lecture
FIRST TERM		
UNIT-I	**D.C. Machines**	
1	Constructional features of D.C. Machine	1
2	Working principle of D.C. Generator, e.m.f. equation & voltage build up phenomenon in D.C. Generator	1
3	Armature reaction, commutation and methods of improving commutation	1
4	Characteristics and Applications of D.C. Generator	1
5	Working principle of D.C. motor and concept of back emf, torque equation, power & losses in D.C. Motor	1
6	Various characteristics and application of D.C. Motor	2
7	Starting of D.C. Motor & Different starter	1
8	Speed control of D.C. Motor	2
UNIT-II	**A.C. Machines**	
9	Constructional features & concept of revolving magnetic field	2
10	Working principle of 3-ϕ I.M., relation between slip, frequency, e.m.f. current and power factor	1
11	Torque slip characteristic and effect of change in rotor resistance and supply voltage	1
12	Relation between torque, starting torque and maximum torque, power flow in 3-ϕ I.M.	1
13	Induction motor, equivalent circuit & phasors	1
14	No load & blocked rotor test on 3-ϕ I.M. & performance calculation	1
SECOND TERM		
15	Starting of 3-ϕ I.M. & various starters (stator impedance start, D.O.L. star-delta, Auto-transformer, Roter Resistance)	2
16	Speed control of 3-ϕ I.M. & Applications of 3-ϕ I.M.	2
UNIT-III	**Synchronous Machine**	
17	Constructional features of 3-ϕ synchronous machine, advantage of short pitched and distributed winding & E.M.F. equation	2
18	Armature reaction in alternator, phasor diagram and equivalent circuits of synchronous machine	2
19	Voltage regulation, determination of voltage regulation using E.M.F. Method	1
20	Determination of voltage regulation using M.M.F. and Z.P.F. Method	2
21	Power flow equation in synchronous machine	1
22	Working principle of synchronous motor & Method used for self starting	1
23	Effect of increase of load keeping excitation constant & effect of increase in excitation at constant load	1
24	V curve, synchronous condenser and Application of 3-ϕ synchronous machine	1
UNIT-IV	**Single phase induction motor**	
25	Concept of double revolving field theory & torque speed characteristic	1

	of single phase induction motor	
26	Equivalent circuit of 1-ϕ I.M. & performance analysis	1
THIRD TERM		
27	Different types of single phase induction motor, characteristics and typical applications	2
28	Construction, working principle & application of stepper motor	1
29	Different types of stepper motor and their control	1
30	Construction, working and application of servo motor	1
31	Construction, working and application of hysterisis motor	1
32	AC series motor & universal motor	1

Coordinator : Electrical Machines – Mr. Sheersh Garg (MAIT) - 8802349540

ACADEMIC PLAN FOR SEMESTER-III (for 2014-15)

SUBJECT : **Circuits & Systems** **Total Lecture Available: 42**
Subject Code: ETEE – 207
Total Teaching Weeks in Semester: 15

S.No.	TOPICS TO BE COVERED	Total No. of Lectures
FIRST TERM		
UNIT-I	**(Signals & Systems)**	
1	Introduction of the subject, role and importance of Circuits in Engineering and distinction between Steady State Analysis & Transient Analysis of Circuits with emphasis on R, L, C.	1
2	Introduction to signals : Continuous-time & Discrete-time Periodic & a periodic, Power & Energy Signals.	1
3	Impulse, Step, Ramp Signals & Signal Synthesis using these waveforms, introducing the properties of Time-shifting, Magnitude Scaling, etc.	2
4	Systems classification, LTI Systems & their properties	2
5	Introduction to Laplace Transform, Inverse Transform & their properties	2
6	Periodic Waveforms : Synthesis and Laplace Transform for Periodic & other complex waveforms.	2
UNIT-II	**(Transient Analysis)**	
7	Dynamic Circuits having Inductors & Capacitors governed by First order and Second order Differential Equations.	1
8	Basic properties exhibited by Time-Invariant Capacitors & Inductors : Memory, Continuity, Lossless Properties	1
9	First-order Differential Equation, Second order Differential Equation and their solution by Classical Method	1
10	Classical method of solution: Transient Analysis of Circuits with R, L, C.	3
11	Transient Response of Series & Parallel R-L, R-C & R-L-C Circuits for D.C. Excitations (using Laplace Transform)	2
	Total Lectures = 18, Tutorials = 5	
SECOND TERM		
12	Transient Response of Circuits by Laplace – Transformed Circuit approach to impulse, step, ramp, sinusoidal & exponential signals	4
UNIT-III	**(Graph Theory & Two-Port Networks)**	
13	Graph theory : Concept of Oriented Planar Graphs for Circuits with Independent Voltage & Current Sources, Resistance, Capacitance & Self-Inductance.	1
14	Incidence Matrix, Tie-Set Matrix & Cut-Set Matrix	1
15	Solution of Circuits by Nodal Method & Loop Method of Graph Theory	2
16	Introduction of Two-Port Networks, Various parameters and their inter-conversion	2
17	Inter-connections of two port networks	1
18	Open-circuit & short circuit Impedances, Image Impedances and their inter-relation	1
19	Network Functions, their properties and concept of Transform Impedances	1
20	Network Synthesis : Hurwitz Polynomial and Properties	1
UNIT-IV	**(Network Synthesis and Passive Filters)**	
21	Positive Real Functions & Properties, Testing a function to be p.r.f.	1
22	Synthesis of One-port Networks with two kinds of elements : LC, RC & RL in Foster's-I & II Form and in Cauer's I & II Form	3
	Total Lectures = 18, Tutorials = 5	
THIRD TERM		
23	Introduction of Passive Filters, their properties & classification as LPF, HPF, BPF	2

	& Band Reject Filters	
24	Frequency Response & Characteristic Impedance of the LPF, HPF, BPF & Band Reject prototype section	3
	Total Lectures = 5 Tutorials = 2	

Coordinator : Circuit & Systems Mr. U.K. Jha (MAIT) - 9811014746; 9654379393

ACADEMIC PLAN FOR SEMESTER-III (for 2014-15)

SUBJECT: **Materials in Electrical Systems** **Subject Code: ETEE – 205**

Total Lecture Available: 42

Total Teaching Weeks in Semester: 15

S.No.	TOPICS TO BE COVERED	Total No. of Lectures
FIRST TERM		
UNIT-I		
1	Energy band diagram of conductors, semi-conductors & insulators	1
2	Conductivity & Resistivity, factors affecting the resistivity	2
3	Classification of conducting materials	1
4	Electrical, Mechanical & thermal properties and applications of low resistance material like copper, aluminium, steel, silver, gold, platinum, brass and bronze.	2
5	Electrical, mechanical and thermal properties and applications of high resistance materials like maganin, constantan, nichrome, mercury, tungsten and carbon.	2
6	Introduction of Super Conductors	2
UNIT-II		
7	Classification of insulating materials	1
8	Electrical, Physical, thermal, chemical, mechanical properties of insulating materials	2
9	Thermoplastic materials	2
10	Natural insulating materials	1
SECOND TERM		
11	Gaseous and liquid insulating materials	2
12	Ceramics and synthetic insulating materials	2
UNIT-III		
13	Introduction and classification of magnetic materials	1
14	Permeability, B-H curve	1
15	Magnetic saturation, hysteresis loop	1
16	Coercive force and residual magnetism	1
17	Concept of eddy current and hysteresis loss	1
18	Curie temperature, magnetostriction effect	2
19	Soft and hard magnetic materials	1
20	Ferro and ferri magnetic materials	1
21	Special purpose materials	1
UNIT-IV		
22	Properties and applications of materials used in electrical systems like thermocouples, bimetallic	2
THIRD TERM		
23	Properties and applications of materials used in electrical systems like fusing and soldering	2
24	Introduction to different types of materials used in electromagnetic systems	1
25	Introduction to different types of materials used in electro mechanical systems	1
26	Introduction to different types of materials used in resistors	1
27	Introduction to different types of materials used in capacitors	1
28	Introduction to different types of materials used in inductors	1
29	Introduction to different types of materials used in special semiconductors used in electrical engineering	1

Coordinator **(**Materials in Electrical Systems) ; Ms. Neelam Kassarwani(MAIT) – 9968967735