Basaveshwar Engineering College (Autonomous), Bagalkot

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Scheme & Syllabus of Teaching and Evaluation for B.E Electrical and Electronics Engineering

Semester-3 **CAY 2021-22 (175 Credits 2020-21 admitted batch)**

Sl.	SubCode	Subject	C	Hrs/ Week			Exam Marks		
				L	T	P	CIE	SEE	Total
01	UMA3XXC	Numerical Techniques and Integral Transforms	3	3	0	0	50	50	100
02	UEE361C	Network Analysis	4	3	2	0	50	50	100
03	UEE362C	Electrical Machines - I	3	3	0	0	50	50	100
04	UEE363C	Analog and Digital Electronics	4	4	0	0	50	50	100
05	UEE364C	Electrical and Electronic Measurements	3	3	0	0	50	50	100
06	UEE365C	Field Theory	4	3	2	0	50	50	100
07	UEE371L	Network Analysis Laboratory	1	0	0	2	50	50	100
08	UEE372L	Electrical machines – I Laboratory	1	0	0	2	50	50	100
09	UEE373L	Analog, Digital and Measurement Laboratory	1	0	0	2	50	50	100
10	UMA330M	Bridge Course Mathematics-I*	0	3	0	0	50	50	100
11	UBT133M	Environmental Studies**	0	2	0	0	50	50	100
Total			24	24	04	06	550	550	1100

*Bridge Course Mathematics-I	:	is a mandatory subject only for students admitted to 3rd Semester through lateral entry scheme (Diploma quota). Passing the subject is compulsory, however marks will not be considered for awarding grade/class. A PP/NP grade will be awarded for passing/not passing the subject.
**Environmental Studies	:	is amandatory subject for lateral entry students. Question Paper will be of Objective type. Students have to pass the subject compulsorily, however marks will not be considered for awarding Grade / Class / Rank.

Numerical Techniques and Integral Transforms	
Subject Code: UEE3XXC	**Credits: 03**
Contact Hours: 03 (3L - 0T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I

Numerical Analysis-I: (10L- Hours)

Introduction to root finding problems, Bisection Method, Newton-Raphson method. Finite differences, forward and backward difference operators (no derivations on relations between operators) Newton-Gregory forward and backward interpolation formulae. (Without proof), Lagrange's and Newton's divided difference interpolation formulae (without proof).

Unit-II

Numerical Analysis-II: (10L- Hours)

Numerical differentiation using Newton's forward and backward formulae-problems. Trapezoidal rule, Simpson's one third rule, Simpson's three eighth rule and Weddle's rule (no derivation of any formulae)-problems. Euler's and Modified Euler's method, Runge-Kutta 4^{th} order method.

Unit-III

Fourier series: (10L- Hours)

Periodic functions, Conditions for Fourier series expansions, Fourier series expansion of continuous and functions having finite number of discontinuities, even and odd functions. Half-range series, practical harmonic analysis.

Unit-IV

Fourier transforms and z-transforms: (10L- Hours)

Infinite Fourier transforms and inverse Fourier transforms- simple properties, Fourier sine and Fourier cosine transforms, Inverse Fourier sine and cosine transforms. Z-transforms-definition, standard forms, linearity property, damping rule, shifting rule-problems

References:

1. Numerical Methods for Engineers by Steven C Chapra & Raymond P Canale.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, New Delhi.
3. Advanced Engineering Mathematics By H. K. Das, S. Chand & company Ltd. Ram Nagar, New Delhi.
4. Advanced Engineering Mathematics by E Kreyszig (John Wiley & Sons)

Course Outcomes:-

1. The ability to solve engineering problems using non-linear equations and interpolation techniques.
2. The ability to solve problems using numerical differention and numerical integration.
3. Be capable to perform numerical solutions of ordinary differential equations.
4. Fourier analysis provides a set of mathematical tools which enable the engineer to break down a wave into its various frequency components. It is then possible predict the effect of a particular waveform.
5. It is essential to understand the basic concepts of Fourier transforms and z –transforms, to solve ode, pde and difference equations.

Network Analysis	
SubjectCode:UEE361C	**Credits:04**
Contact Hours:04(3L - 2T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I

Mesh and Node Analysis: (5L-4T Hours)

Practical source transformation, network reduction using star delta transformation, Loop and node analysis with linearly dependent and independent source for DC and AC networks. Concept of super node and super mesh- Numerical Problems

Network Topology: (5L-2T Hours)

Graph of network, concept of tree and co-tree, incidence matrix, Tie-set & cut-set schedules, Formulation of equilibrium equations in matrix form, solution of resistive network, Principles of duality- Numerical Problems

Unit-II

Network Theorems-I: (5L-4T Hours)

Superposition, Reciprocity, and Millman's theorems- Numerical Problems

Network Theorems-II: (5L-4T Hours)

Thevenin's, Norton's and Maximum power transfer theorems- Numerical Problems

Unit-III

Resonant Circuits: (4L-2T Hours)

Series and parallel resonance, frequency-response of series and parallel circuits, Q-factor, Bandwidth-Numerical Problems

Transient behaviour and initial conditions: (5L-4T Hours)

Behaviour of circuit element under switching condition and their representation, evaluation of initial and final conditions in RL, RC, and RLC circuits for AC and DC excitation- Numerical Problems

Unit-IV

Laplace Transformations and Applications: (5L-4T Hours)

Step, Ramp and Impulse functions and their Laplace transformation, Waveform synthesis and Laplace transformation initial value theorem and final value theorem, transformed network and their solution- Numerical Problems

Two port network parameters: (5L-2T Hours)

Short Circuit admittance parameters, open circuit impedance parameters, transmission parameters, hybrid parameters, relationship between parameters sets- Numerical Problems

Course outcomes:

After completion of the course, the students shall be able to:

1. Students shall be able to list different types of electric circuits and active & passive elements and recall the statements of network theorems
2. Students shall be able to demonstrate source transformation, star-delta conversion, mesh & node analysis, network topology concepts and Laplace transforms in electric circuits
3. Students shall be able to solve eclectic circuits by applying network theorems and Laplace transforms
4. Students shall be able to analyze behavior of R, L & C elements in the electric circuits, their frequency response and determine resonance related parameters
5. Students shall be able to determine and establish the relation between the various parameters in electric circuits
6. Students shall be able to build expressions for mesh currents and node voltages by employing the network topology for solving large power system networks.

Electrical Machines - 1	
Subject Code: UEE362C	Credits:04
Contact Hours: 03 (3L - 0T - 0P)	Assessment: CIE 50 and SEE 50

Unit-I: (10 Hrs)

Single Phase Transformer: Constructional details and EMF equation, Phasor diagrams, Calculation of equivalent circuit parameters by OC and SC tests, Transformer ratings and per unit (p.u.) scaling, Losses & efficiency, all day efficiency, voltage regulation, polarity test and Sumpner's test.

Auto Transformer: Construction, working principle, saving of copper and applications

Unit-II (10 Hrs)

Three Phase Transformers

Types, three phase transformer connections: star-star, star-delta, delta-star, delta-delta, open delta, Choice of connections: bank of single phase transformers for three phase operations, Labeling of three phase transformer terminals, phase shift between primary and secondary voltages and vector groups, Harmonics in transformer, Suppression of harmonics by tertiary winding.

Parallel operation of Transformer

Need for parallel operation, conditions to be satisfied for parallel operation and load sharing

Unit-III (10Hrs)

Introduction to principles of electromechanical Energy Conversion.

DC Generator: Construction of DC machines, types of windings, emf equation, types of excitations, no load and load characteristics, armature reaction and its effect, demagnetizing and cross magnetizing AT/pole, compensating winding, commutation, inter poles, application of DC generators

DC Motors: Principle of Operation & concept of back EMF, torque equation, characteristics and application of D.C. motors

Unit-IV (09 Hrs)

Starting, Speed control and Braking of DC Motors: Necessity of starters, resistance starters (excluding 3 & 4 point starter), Speed control by Flux & armature control, Ward Leonard method, Electrical braking of DC motors.

Testing of D.C Motors: Losses in DC. Machine, Efficiency, direct load test on DC machine, Swinburne's test, Hopkinson's test, retardation test, Field's test on DC. Series motors.

References:

1. I J Nagarath and DP Kothari, "Electrical machines", 4th - Edition, TMH, New Delhi
2. Ashfaq Hussain, "Electrical Machines", Dhanpat Rai & Co. Publications, 3rd Edition, 2017
3. P.S. Bhimra, "Electrical machinery", Khanna publishers, 7th Edition 2018
4. B. L. theraja "Electrical technology Vol II, S. Chand Publications, 2018

Analog and Digital Electronics	
Subject Code: UEE363C	**Credits: 04**
Contact Hours: 04 (4L - 0T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I

Diode Circuits: (8L-Hours)

Introduction, clipping circuits, Clipping at two independent levels, Clamping Circuits, Comparators, Full wave rectifier with C filter

Transistor Biasing : (**5L -Hours)**

Introduction, Operating point, DC load line, Bias stability, voltage divider bias, Derivation of stability factors, Bias compensation.

Unit-II

BJT Low Frequency Analysis : (4L-Hours)

Introduction, two port devices. Hybrid model, transistor hybrid model. h - Parameters, Analysis of transistor amplifier circuit using h- parameters
(CE amplifier only)

Multistage Amplifiers& Power Amplifier : (4L- Hours)

Introduction, Classification of Amplifiers, , Frequency response of R-C coupled amplifier, Class A large signals amplifier, Transformer coupled power amplifier, Class B (Push pull) amplifiers

Field Effect Transistor: (5L- Hours)

Introduction, construction & characteristics of JFETs, transfer characteristics, Important relationships, Depletion &Enhancement type MOSFETs

Unit-III

Number system & Combinational Logic : (5L-Hours)

Number system Definition of combinational logic, canonical forms, Karnaugh maps - 3 and 4 variables, incompletely specified functions (Don't Care terms), simplifying minterm and maxterm equations

Minimization Techniques: (5L- Hours)

Quine- McClusky minimization technique, Quine- McClusky using Don't Care terms, Map entered variables

Analysis and Design of Combinational Logic : **(3L-Hours)**

Adders and subtractors, Cascading full adders, look ahead carry adders, binary comparators, Codes &Code converter.

Unit-IV

Analysis and Design of Combinational Logic : **(5L-Hours)**

Decoders -BCD Decoders, encoders. Digital multiplexers, multiplexers as Boolean function generators.

Sequential Circuits 1 : (4L-Hours)

Basic bistable element, latches, SR latch, Application of SR latch, gated D latch, Master - Slave SR flip - flops (pulse-triggered flip-flops). Master slave JK flip -flop. Conversion of flip-flop from one type to another

Sequential Circuits 2 : **(4L- Hours)**

Characteristic equations, registers, counters - binary ripple counters, synchronous binary counters, counter based on shift registers, design of synchronous counters, design of synchronous mod-6 counter using clocked D, T, JK and SR flip- flops

References:

1. Boylestead and Nashelesky, "Electronic Devices and Circuit theory" 11th edition, Pearson, 2013.

2. Jacob Millman and Christos C. Halkias, "Integrated Electronics", TMH, 2010.
3. Albert Malvino and David J Bates, "Electronic Principles", 8th edition, TMH, 2016.
4. David A. Bell, "Electronic Devices and Circuits", 5th edition, Oxford University Press, 2008.
5. S.Samuel, Mahadevaswamy and V. Nattarasu, "Electronic Circuits", 2nd edition, Sanguine Technical Publishers, 2012.
6. John M Yarbrough, "Digital Logic Application and Design", Cengage Learning India Pvt, Ltd, 2006.
7. Donald D Givone, "Digital Principles and Design", Tata McGraw Hill, 2003.

Course outcomes:

After completion of the course, the students shall be able to:

1. Student shall be able to analyze and explain different types of clipping, clamping and full wave rectifier circuits, and drive expressions for efficiency and ripple factors.
2. Students shall be able to explain different types of biasing circuits, single stage and multistage amplifier, analyze hybrid model and derive h - Parameters.
3. Student shall be able to explain JFET & MOSFET construction and characteristics and drive important relation
4. Student shall be able to simplify boolean algebra equations by using K. map and Quine Mcclusky and MEV techniques.
5. Student shall be able to design combinational circuits like Code converters adders, comparators, decoders, mux etc.
6. Student shall be able to design Flip-Flop, sequential circuit Registers and Counters.

Electrical and Electronics Measurements	
Subject Code: UEE364C	**Credits: 03**
Contact Hours: 03 (3L - 0T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I

Measurement of Resistance Inductance and Capacitance: (10L- Hours)

Measurement of medium resistance: Wheatstone bridge - Sensitivity of WS bridge, Galvanometer current, Limitations; Measurement of low resistance: Different Methods of measuring low resistance, Kelvin's Double bridge; AC Bridges: General equilibrium equations of AC bridges; Measurement of Self Inductance – Types of bridges for measurement of self inductance, Maxwell's Inductance bridge, Maxwell's Inductance Capacitance Bridge, Anderson's bridge; Measurement of Capacitance: Types of bridges for measurement of capacitance, De Sauty's bridge, Schering Bridge; Errors in bridge circuits, Sources and Detectors.

Unit-II

Measuring Instruments: (5L- Hours)

Introduction; Types of Instruments; Permanent Magnet Moving Coil Instrument(PMMC) – Torque equation; Moving Iron Instruments(MI) – Torque equation; Electrodynamometer Type Instruments – Torque equation,; Thermocouple Instruments – Principle of operation, Construction, Advantages and Disadvantages.

Measurement of Power and Related Parameters : (5L- Hours)

Dynamometer Type Wattmeter, Low Power Factor Wattmeter; Induction Type Single Phase Energy meter – Construction, Theory; Dynamometer Type Single Phase Power Factor meter – Construction and Operation; Weston Frequency meter.

Unit-III

Extension of Instrument ranges: (10L- Hours)

Introduction; Shunts and Multipliers for AC Ammeter and Voltmeter respectively; Instrument Transformers: Advantages of Instrument Transformers, Ratios of Instrument Transformers, ratio Correction Factor, Burden on Instrument Transformer; Current Transformer(CT) – Theory of CT, Errors in CT's, Design features if CT's; Potential Transformer(PT) – Differences between CT and PT, Theory of PT.

Unit-IV

Sensors and transducers: (10L- Hours)

Definition and meaning of sensors and transducers, Difference between sensors and transducers, Classification (Types) of transducers: Mechanical/Electrical, Active/Passive, Analog/Digital, Modulating/Self balancing, Examples and advantages of electrical transducers. Resistive transducers: Potentiometers, RTD, Thermistor, Magneto-resistor (Principle, construction, working and application for each type). Capacitive transducers: Absolute and differential type, applications. Inductive transducers: Synchronous, Linear variable differential transformer (LVDT) ((Principle, construction, working and application). Self generating (Active) transducers: Piezoelectric, Pyroelectric, Thermocouple (Principle, construction, working and application for each type). Sensor/transducer based instrumentation system: Generalized block diagram representation, Typical examples related to electrical field.

References:

1. Golding & Widdies, Pitman, "Electrical Measurements and Measuring

Instruments", 5th edition, D.R & Son's, New Delhi.
2. John P Beately, "Principles of Measurement Systems", 3rd edition, Pearson Education, 2006.
3. Ramon P. Areny, John G. Webster, "Sensors and Signal Conditioning", 2nd Edition, Wiley India Private Ltd.
4. A. K. Sawhney, "Electrical & Electronic Measurements and Instrumentation", 19th edition, Dhanpat Rai & Son's, New Delhi, 2011.
5. Cooper D and A. D. Helfrick, "Modern Electronic Instrumentation and Measurement Techniques", PHI.
6. Ian R. Sinclair, "Sensors and Transducers", 3rd Edition, Newnes Publication.

Course outcomes:

After completion of the course, the students shall be able to:

1. Students shall be able to **list & define** various parameters and features of different types of electrical & electronic measuring instruments/devices, sensors & transducers.
2. Students shall be able to **explain** the operation of different types of electrical & electronic measuring instruments/devices, sensors, transducer and their related components.
3. Students shall be able to **experiment with or make use** of different types of electrical & electronic measuring instruments/devices, sensors & transducers.
4. Students shall be able **compare and contrast** the features of different types of electrical & electronic measuring instruments/devices, sensors & transducers.
5. Students shall be able **evaluate/calculate** various parameters related to different types of electrical & electronic measuring instruments/devices, sensors & transducers.
6. Students shall be able **discuss/choose/test** different types of electrical & electronic measuring instruments/devices, sensors & transducers.

Field Theory	
SubjectCode:UEE365C	**Credits:04**
Contact Hours: 04 (3L - 2T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I

Review of Vector Analysis: (L-02 Hours)

Introduction to Scalars and vectors

Coulomb's Law and Electric Field Intensity: (4L-3T Hours)

Experimental law of Coulomb, electric field intensity, field due to continuous volume charge distribution, field of a line charge, field of a sheet charge.

Electric Flux Density, Gauss' Law and Divergence: (4L-3T Hours)

Electric Flux Density, Gauss' Law, Divergence .Maxwell's first equation (Electrostatics), vector operator V and the divergence theorem.

Unit-II

Energy and Potential: (5L-4T Hours)

Energy expended in moving a point charge in an electric filed, the line integral, definition of potential difference and potential. The potential field of a point charge and system of charges, potential gradient, the dipole.

Conductors, Dielectrics and Capacitance: (5L-3T Hours)

Current and current density, Continuity of current, metallic conductors, Conductor properties and Boundary conditions, boundary conditions for perfect Dielectrics, capacitance and examples.

Unit-III

The Steady Magnetic Field: (5L-4T Hours)

Biot-Savart law, Ampere's circuital law, Curl, Stokes' theorem, magnetic flux and flux density.

Magnetic Forces: (5L-3T Hours)

Force on a moving charge and differential current element, Force between differential current elements, Force and torque on a closed circuit.

Unit-IV

Materials and Inductance: (5L-3T Hours)

The nature of magnetic materials, Magnetization and permeability, Magnetic boundary conditions, Magnetic circuit, Potential energy and forces on magnetic materials, Inductance and Mutual Inductance.

Time Varying Fields and Maxwell's Equations: (4L-3T Hours)

Faraday's law, displacement current, Maxwell's equation in point and Integral form, retarded potentials

References:

1. WilliamHHaytJr.andJohnABuck,"EngineeringElectromagnetics**",**17th-edition,TataMcGrawHill,2012.
2. John Karuss and Daniel A Fleisch, "Electromagnetic with Applications"V-editionMcGraw-Hill,1999.
3. Edward C. Jordan and Keith G Balmain, **"**Electromagnetic Waves and Radiating Systems**,"** II- edition, Prentice Hall of India / Pearson Education,1968.Reprint2002.
4. David K Cheng, "Field and Wave Electromagnetic**"** , II-edition, PearsonEducationAsia,-1989,IndianReprint–2015.
5. Matthew N. O. Sadiku, Elements of Electromagnetic, 6th -Edition, OxfordUniversityPress,2000.

Course outcomes:

After completion of the course, the students shall be able to:

1. Students should be able to state concept of gradient, divergence and curl of a vector in various systems
2. Students should be able to illustrate the Gauss' law, potential energy, and divergence in different applications
3. Students should be able to apply different coordinate systems for electromagnetic field computations
4. Students should be able to analyze different coordinate systems in electromagnetic field applications
5. Students should be able to compare and contrast electric field & magnetic field in different applications
6. Students should be able to combine and revise various properties of electromagnetic field applications by multiple methods.

Network Analysis Lab	
SubjectCode:UEE371L	**Credits:01**
Contact Hours:02(0L - 0T - 02)	**Assessment: CIE 50 and SEE 50**

List of Experiments

1. Determination of equivalent resistance in complex electric circuits with star and delta conversions

2. Determination of Average value, rms value, Form factor, Peak factor of sinusoidal wave and square wave

3. Verification of mesh analysis (With all possible combinations of Voltage and Current sources including a supermesh, AC and DC)

4. Verification of node analysis (With all possible combinations of Voltage and Current sources including a super node, AC and DC)

5. Verification of super position theorem (AC and DC, including dependent sources)

6. Verification of reciprocity theorem (AC and DC)

7. Verification of maximum power transfer theorem with both resistive and impedance loads (AC and DC)

8. Verification of Thevenin's and Norton'stheorem (AC and DC, including dependent sources)

9. Verification of Milliman's theorem (AC and DC, including dependent sources)

10. Determination of frequency response for series resonance andparallel resonance circuits

11. Determination of transient response of current in RL and RC circuits with step voltage input

12. Determination of two port network parameters Short Circuit admittance, parameters, open circuit impedance parameters, transmission parameters and hybrid parameters

Electrical Machines – 1 Laboratory	
Subject Code: UEE372L	**Credits: 01**
Contact Hours: 02 (0L - 0T - 2P)	**Assessment: CIE 50 and SEE 50**

List of Experiments

1. Open circuit and short circuit test on single phase transformer and pre-determination of efficiency, regulation for different loads at power factors. Calculations of equivalent circuit parameters of a given transformer.
2. Sumpner's test.
3. Parallel operation of two single phase transformers (dissimilar ratings)
4. Connections of three single phase transformers: star-star, star-delta, delta-delta and delta-star.
5. OCC characteristics of D.C. Shunt generator.
6. Load characteristics of a D.C. generator.
7. Load test on a DC motor- determination of speed-torque and BHP-efficiency characteristics
8. Speed control of DC motor by armature voltage control and flux control.
9. Swinburne’s test.
10. Fields test on series motors

Analog-Digital Electronics and Measurement Laboratory	
Subject Code: UEE373L	**Credits: 01**
Contact Hours: 02(0L-0T2P)	**Assessment: CIE 50 and SEE 50**
List of Experiments	

1. Design and testing of diode clipping and clamping circuits.
2. Design of fixed bias and voltage divider bias circuits for BJT.
3. Design of RC coupled single stage BJT amplifier and determination of the gain, frequency response, input and output impedances.
4. Simplification, realization of Boolean expressions using logic gates /Universal gates.
   (i) Realization of Full adders and Full Subtractors using logic gates
   (ii) Realization of parallel adder/subtractors using 7483 chip
5. MUX / DEMUX-use of 74153, 74139 for arithmetic circuits and code converters
6. Truth table verification of Flip- Flops (i) JK Master slave (ii) T type and (iii) D type
7. Ring counter and Johnson counter.
8. Evaluation of transfer characteristics of Resistance Temperature Detector (RTD) using RTD module.
9. Evaluation of transfer characteristics of Light Dependent Resistor (LDR) using LDR module.
10. Measurement of low resistance using Kelvin's double bridge.

Course Outcomes:

1. Student shall be able to select appropriate components, rig up the circuits and write the conduction procedure for the given experiment/circuit/system.
2. Student shall be able to analyze the circuits from the reading and results obtained from various circuits.
3. Student shall be able to interpret the analysis results obtained and drive inference for the given circuits/systems.

Bridge Course Mathematics

Subject Code: UMA330M	**Credits: 03**
Contact Hours: 03 (3L - 0T - 0P)	**Assessment: CIE 50 and SEE 50**

Differential Calculus: (15L-Hours)

Review of elementary calculus, Polar curves - angle between the radius vector and tangent, angle between two curves, pedal equation. Taylor's and Maclaurin's series expansions for one variable (statements only) without proof. problems

Partial differentiation: Introduction to function of several variables, Partial derivatives; Euler's theorem - problems. Total derivatives-differentiation of composite functions. Jacobians-problems,

Integral Calculus: (15L-Hours)

Evaluation of double and triple integrals. Area bounded by the curve.

Beta and Gamma functions: Definitions, Relation between beta and gamma functions-problems.

Vector Calculus: (15L-Hours)

Vector Differentiation: Scalar and vector fields**.** Gradient, directional derivative; curl and divergence-physical interpretation; solenoidal and irrotational vector fields-problems

References:

1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 43rd Ed., 2015.
2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed.(Reprint), 2016.
3. Thomas' Calculus: Early Transcendentals, Single Variable (13th Edition)
4. **Calculus:** Early Transcendentals James Stewart
5. C.Ray Wylie, Louis C.Barrett : "Advanced Engineering Mathematics", 6th Edition, McGraw-Hill Book Co., New York, 1995.
6. B.V. Ramana: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 2010.
7. Veerarajan T.," Engineering Mathematics for First year", Tata McGraw-Hill, 2008.
8. N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, 7th Ed., 2010.

Course outcomes:

After completion of the course, the students shall be able to:

1. Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
2. Learn the notion of partial differentiation to calculate rates of change of

multivariate functions and solve problems related to composite functions and Jacobians.

3. Apply the concept of multiple integrals and their usage in computing the area and volumes.
4. Apply the knowledge of vector calculus to solve the engineering problems

Question paper pattern for SEE

1. Total of eight questions uniformly covering the entire syllabus.
2. Each question should not have more than four subdivisions.
3. Any five full questions are to be answered

Semester-4 **CAY 2021-22 (175 Credits 2020-21 admitted batch)**

Sl.	SubCode	Subject	C	Hrs/ Week			Exam Marks		
				L	T	P	CIE	SEE	Total
01	UMA4XXC	Statistics and Probability Distributions	3	3	0	0	50	50	100
02	UEE461C	Electrical Machines - II	4	4	0	0	50	50	100
03	UEE462C	Generation Transmission and Distribution	3	3	0	0	50	50	100
04	UEE463C	Control Systems	3	2	2	0	50	50	100
05	UEE464C	Signals and Systems	3	2	2	0	50	50	100
06	UEE465C	Operational Amplifier and Linear IC's	3	3	0	0	50	50	100
07	UEE471L	Electrical Machines – II Laboratory	1	0	0	2	50	50	100
08	UEE472L	Electrical Auto CAD Laboratory	1	0	0	2	50	50	100
09	UEE473L	Operational Amplifier and Linear IC's Laboratary	1	0	0	2	50	50	100
10	UMA430M	Bridge Course Mathematics-II*	0	3	0	0	50	50	100
11	UHS001N	Fundamentals of Quantitative Aptitude & Soft Skills	1	2	0	0	50	50	100
12	UHS226M	Constitution of India**	0	2	0	0	50	50	100
13	UHS488C	Saamskrutika Kannada***	1	2	0	0	50	50	50
		OR							
14	UHS489C	Balake Kannada***	1	2	0	0	50	50	50
Total			24	26	04	06	650	650	1300

*Bridge Course Mathematics –II	:	is a mandatory subject only for students admitted to 4thSemester through lateral entry scheme (Diploma quota). Passing the subject is compulsory, however marks will not be considered for awarding grade /class. A PP/NP grade will be awarded for passing/not passing the subject.
**Constitution of India	:	is a mandatory subject for lateral entry students. Question Paper will be of Objective type. Students have to pass the subject compulsorily, however marks will not be considered for awarding Grade / Class /Rank.
***Saamskrutika Kannada ***Balake Kannada	:	Is for students who speak read and write kannada Is for non-kannada speaking reading and writing

Statistics and Probability Distributions	
Subject Code: UEE4XXC	Credits: 03
Contact Hours: 03 (3L - 0T - 0P)	Assessment: CIE 50 and SEE 50

Unit-I

Statistics: (10 Hrs)

Curve fitting by the method of least squares: $y = a + bx$, $y = ab^x$, $y = a + bx + cx^2$

Correlation, expression for the rank correlation coefficient and regression.

Unit-II

Probability: (10 Hrs)

Probability: addition rule, conditional probability, multiplication rule, Baye's rule. Discrete and continuous random variables-Probability density function, Cumulative distribution function, Problems on expectation and variance

Unit-III

Probability distributions: (10 Hrs)

Binomial distributions Poisson distributions and Normal distributions. Concept of joint probability, Joint probability distributions.

Unit-IV

Markov chains: (10 Hrs)

Markov chains: Introduction, Probability vectors, Stochastic Matrices, Fixed Points and Regular stochastic Matrices, Markov chains, higher transition probabilities, stationary distribution of regular Markov chains and absorbing states.

References:

1. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers, New Delhi.
2. Theory and problems of probability by Seymour Lipschutz (Schaum's Series).
3. Advanced Engineering Mathematics by H. K. Dass
4. Advanced Engineering Mathematics by E Kreyszig (John Wiley & Sons)
5. Probability and stochastic processes by Roy D. Yates and David J. Goodman, wiley India pvt.ltd 2nd edition 2012.
6. Advanced Engineering Mathematics by Peter V. O'Neil.

Course outcomes:

On completion of this course, students are able

1. To apply the least square sense method to construct the specific relation for the given group of data.
2. To understand the concept of probability
3. To apply the concept of probability to find the physical significance of various distribution phenomena.
4. To understand the concepts of probability distributions
5. To apply the concept of Markov Chain for commercial and industry purpose.

Electrical Machines - 2	
Subject Code: UEE461C	**Credits: 04**
Contact Hours: 04 (4L - 0T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I (13 Hrs)

Three Phase Induction Machines

Construction & types of motors, Principle of operation, production of rotating magnetic field, slip, rotor induced emf and it's frequency, power losses in an induction motor, equivalent circuit, torque equation, torque-slip characteristics-motoring generating and braking modes, starting torque, maximum torque, effect of rotor resistances on torque slip - characteristics, power output, no load and blocked rotor test- evaluation of equivalent circuit parameters, circle diagram and obtain it's performance, Cogging and crawling

Unit-II (13 Hrs)

Starting and Speed Control of Three Phase Induction Motors:

Need for starter, DOL, star delta, autotransformer and rotor resistance starters, Calculation of starting torque, double cage and deep bar motors, speed control by rotor resistance, voltage control, V/f control, NEMA classifications.

Synchronous Machines: Construction and types of synchronous Machines, types of field excitation, double layer distributed chorded winding example, emf equation for generator, effect of distribution and chorded coils, effects of harmonics on emf generated, phasor diagram of a Synchronous generator with cylindrical rotor, voltage regulation, calculation of synchronous reactance by emf and mmf methods

Unit-III (13 Hrs)

Parallel operations of alternators: Synchronisation, parallel operation and stability, operation on infinite bus, operating characteristics, power flow equations of Alternators.

Salient pole synchronous machines: Two-reaction model

Synchronous Motors: Principle of operation, methods of starting, phasor diagram, effect of changing excitation, two reaction model, V and inverted V curves of synchronous machines, hunting in synchronous machines, effect of damper windings, synchronous condensers.

Unit-IV (13 Hrs)

Single Phase Induction Motors: Introduction to induction generators, Construction, double field revolving theory, equivalent circuit, starting of single phase motors: Resistance split phase, capacitor start and capacitor run motors, shaded pole motors

Introduction to special purpose machines

References:

1. I J Nagarath and DP Kothari, "Electrical machines", 4th - Edition, TMH, New Delhi
2. Ashfaq Hussain, "Electrical Machines", Dhanpat Rai & Co. Publications, 3rd Edition, 2017
3. P.S. Bhimra, "Electrical machinery", Khanna publishers, 7th Edition 2018
4. P.S. Bhimra, "Generalized theory of Electrical machines", Khanna publishers, 2014
5. M. G. Say, Performance and design of AC machines, CBS publishers.
6. Alexander Langsdorf, "Theory of alternating current machines", TMH, 1999

Generation Transmission and Distribution	
SubjectCode:UEE462C	Credits:03
Contact Hours:03(3L - 0T - 0P)	Assessment: CIE 50 and SEE 50

Unit-I

Electrical Power Generation:03 Hrs

Hydro Power Generation: Site selection, Line diagram representation, Classification, Merits and Demerits.

Thermal Power Generation: Site selection, Line diagram representation, Classification, Merits and Demerits.

Nuclear Power Generation:Site selection, Line diagram representation, Classification, Merits and Demerits.

Basic Aspects of Power Generation: 07 Hrs

Introduction, Load curve and load duration curve. Terms commonly used in system operation: Load factor, Diversity factor, Demand factor, plant capacity factor, plant utilization factor, Installed capacity, reserve capacity, Cold reserve, hot reserve, Spinning reserve, firm power. Effect of diversity factor on cost of generation. Interconnection of power stations, transfer of power. Economic Loading of interconnected stations.

Unit-II

AC Transmission Systems: (08 Hrs)

Typical AC transmission system, Advantages of high voltage transmission. Comparison of conductor material in overhead lines: 3 phase 3 wire system, 3 phase 4 wire system. Components of overhead transmission line: Conductors, Line supports, Insulators – Types, Potential distribution over suspension insulator string, String efficiency, Methods of improving string efficiency. Corona – Factors affecting corona, Imp terms, Methods of reducing corona. Sag in overhead lines- Calculation of sag for equal and unequal supports, Effect of wind and ice loading on sag.

Electrical Parameters of Overhead Transmission Lines: (02 Hrs)

Constants of Transmission line. Inductance of single phase two wire line, Capacitance of single phase two wire line.

Unit-III

Performance of Transmission Lines: (05 Hrs)

Classification of overhead Transmission line. Short Transmission line, Medium Transmission line – End condenser method, Nominal T method, Nominal π method, Long Transmission line. Generalised circuit constants (ABCD) of a transmission line.

Underground Cables: (05 Hrs)

Construction of underground cables, Insulating materials for underground cables, Laying of underground cables. Insulation resistance of single core cable, Capacitance of single core cable, Dielectric stress in a single core cable. Grading of cables: Capacitance grading, Intersheath grading.

Unit-IV

Distribution Systems: (04 Hrs)

Classification of distribution systems. Overhead Vs Underground distribution system. Connection schemes of distribution system. Requirements of a distribution system.

DC Distribution: (04 Hrs)

Types of DC distributors, DC distributor fed at one end- Concentrated loading, Uniform loading. DC distributor fed at both ends - Concentrated loading.

AC Distribution: (02 Hrs)

AC distribution calculation, Methods of solving AC distribution issues.

References:

1. Soni, Gupta and Bhatnagar, “Power System Engineering”, 5th edition,

Dhanapat Rai and Co.(P) Ltd. Publishers, New Delhi, 2016.
2. Mehta V K and Rohit Mehta, " Principals of Power Systems", 4th edition, S Chand and Company Ltd, Publishers, New Delhi, 2015.
3. Gupta J B, "Transmission and Distribution of Electrical power", 9th edition, Sanjeev jumar Kataria Publishers, New Delhi, 2012.
4. Wadhwa C L, "Generation, Distribution and Utilization of Electrical Power", 3rd edition, New age International(p) Ltd., New Delhi, 2012.

Course outcomes:

After completion of the course,

1. Students shall be able to list and define various parameters and features of Electrical power generation, transmission and distribution.
2. Students shall be able to explain different mechanical and electrical parameters related to Electrical power generation, transmission and distribution.
3. Students shall be able to relate/articulate the concepts and theories related to electrical parameters of Electrical power generation, transmission and distribution.
4. Students shall be able to compare and contrast the features of Electrical power generation, transmission and distribution.
5. Students shall be able to evaluate/calculate various parameters related to Electrical power generation, transmission and distribution.
6. Students shall be able to discuss/choose/test issues relating to Electrical power generation, transmission and distribution.

Control System	
Subject Code: UEE463C	**Credits: 03**
Contact Hours: 03 (2L - 2T - 0P)	**Assessment: CIE 50 and SEE 50**

Unit-I

01 Introduction and Transfer function of Systems: L- 06 Hours

Classification of control systems, open loop and closed loop systems, effects of feedback, Mathematical models of physical systems; definition of transfer function, Mechanical systems, Translational systems, Rotational systems, Electrical systems, Analogous systems.

02 Block Diagrams and Signal Flow Graphs: L- 05Hours

Block diagrams (BD), Reduction of BD, Signal Flow graphs (SFG), Drawing block diagram and SFG of simple networks Mason's gain formula, Converting BD into SFG.

Unit-II

03 Time Response of Feed Back Control Systems: L-06 Hours

Standard test signals, Unit step response of First and second order systems, time response specifications, and Time response specifications of second order systems, steady state errors and error constants.

04 Stability Analysis: L- 03 Hours

Concepts of stability, Necessary conditions for Stability, Routh's stability criterion.

Unit-III

05 Root–Locus Techniques: L-03 Hours

Root locus concepts, Construction of root loci.

06 Introduction to State Variable Analysis: **L- 06 Hours**

Concepts of state, state variables and state model, state models for linear continuous time systems, conversion of state model to transfer function and transfer function to state model, solution of state equations,

Unit-IV

07 Frequency Domain Analysis: L- 07 Hours

Introduction, frequency domain specifications, correlation between time and frequency response. Method to draw bode plot, phase margin, gain margin, stability considerations, and experimental determination of transfer functions.

08 Nyquist stability criterion. L- 03 Hours

References:

1. 'Norman S Nise' "Control System Engineering " McGraw Hill,
2. Benjamin C Kuo, "Automatic Control System", VII- Edition, PHI, 2010.
3. Richard C. Dorf Robert H Bishop "Modern Control Systems ",VII- Edition, Addison Wesley.

Course outcomes:

After completion of the course, the students shall be able to:

1. Illustrate the control System concept and its types.
2. Analyze the transfer function modeling of systems and its parameters
3. Explain the concept of time response and order of the system.
4. State the various concept of stability.
5. Compare and contrast the various frequency response plots.
6. Apply the State space modeling and solution of state equations

Signals & Systems	
SubjectCode:UEE464C	Credits:03
Contact Hours:03(2L - 2T - 0P)	Assessment: CIE 50 and SEE 50

Unit-I

Introduction: (13 Hrs)

Definitions of signals and systems, classification of signals, basic operations on signals, Elementary signals, and, properties of systems

Unit-II

Time-domain representation for LTI systems: (13 Hrs)

Convolution, impulse response representation, properties impulse response representation, blocks diagram representations.

Unit-III

Fourier Analysis of periodic and A-periodic signals: (13 Hrs)

Introduction, Properties of continuous-time Fourier series (excluding derivation of defining equations for CTFS), Fourier representation of discrete-time periodic signals, properties of discrete-time Fourier series(DTFS).

Unit-IV

Z-Transforms: (13 Hrs)

Introduction, Z transform, properties of ROC, properties of the Z - transform, inversion of Z -transform, Long division method, Partial fraction expansion method, Transfer function, causality and stability

References:

1. Simon Haykin and BaryVam Veen, "Signals and Systems," John Wiely and Sons, 2nd Edition2014.
2. H P HSU, "Signals and Systems," Schaums Outline, TMH, 2nd Edition2011.
3. Michel J Roberts, "Signals and Systems-Analysis of signals through linear systems" TMH, 2003.
4. Alan V Oppenheim, Alan S.Will sky and S.hamid Nawab, "Signals and Systems," Pearson Education, Indian Reprint, 2nd Edition2013.

Course outcomes:

After completion of the course, the students shall be able to:

1. Students shall be able to classify different types of signals and systems.
2. Students shall be able to list and define different types of elementary signals and systems.
3. Students shall be able to derive the properties of signals and systems, convolution, Fourier series, Fourier transform and Z-transform.
4. Students shall be able to solve convolution sum and integral, CTFS and DTFS.
5. Students shall be able to decide the stability of system in the Z domain for different types of systems.
6. Students shall be able to construct the continuous time and discrete time system using direct form-I and canonical form.

OPERATIONAL AMPLIFIERS AND LINEAR IC'S	
Subject Code: UEE465C	Credits: 03
Contact Hours: 03 (3L-0T-0P)	Assessment: CIE 50 and SEE 50

Unit-I

Op-Amps: L-05 Hours

Block diagram and characteristics of 741 Op-amp, Op-amp as an inverting and non-inverting amplifier, voltage follower, adder, subtractor, integrator and differentiator.

Op-Amps as AC Amplifier: L -05 Hours

Capacitor coupled voltage follower, high Z_{in} capacitor coupled voltage follower, capacitor coupled non- inverting amplifier, high Zin capacitor coupled non - inverting amplifier, capacitor coupled inverting amplifier, setting the upper cut - off frequency, capacitor coupled difference amplifier and use of single polarity supply.

Unit-II

Op-Amps Frequency Response and Compensation: L-05 Hours

Op-amp circuit stability, frequency and phase response, frequency compensating methods, manufacture's recommended compensation, op-amp circuit band width, slew rate effects, stray capacitance effects, load capacitance effects, Z_{in} mod compensation and circuit stability precautions.

Signal Processing circuits: L-05 Hours

Precision half wave & full wave rectifiers, limiting circuits, clamping circuits, peak detectors, sample and hold circuits.

Unit-III

Op-amp Nonlinear circuits: L-05 Hours

Op-amps in switching circuits, zero crossing detectors, inverting Schmitt trigger circuit, non inverting Schmitt circuit. Astable multivibrator and mono-stable multivibrator using 555 timer.

Signal Generator: L-05 Hours

Triangular/Rectangular wave generator, waveform generator design, phase shift oscillator, oscillator amplitude stabilization, Wein bridge oscillator, signal generators output controls.

Unit-IV

Active filters: L- 05 Hours

First and second order high pass and low pass filters, band stop and band pass filters.

D.C Voltage Regulators: L-05 Hours

Voltage regulators basics, voltage follower regulator, adjustable output regulator, LM217 and LM237 integrated circuit voltage regulators.

References

1. David A. Bell, "Operational Amplifier and Linear ICS", 3rd edition, Oxford,2012.
2. Ramakanth A. Gayakwad, "Operational Amplifier and Linear ICS", 4th edition, PHI, 2016.
3. R.F. Coughlin & F.F. Driscoll, "Operational Amplifier and Linear ICS", 6th edition, PHI, 2015.
4. Bruce Carter and Ron Mancini, "OP AMPS for everyone", 4th edition, Elsevier,2013

Course Outcomes

At the end of this course,

1. Student should be able to explain the characteristics ofOp-Amp.
2. Student should be distinguish the operational function of theamplifier.
3. Student should be able to explain about the ACamplifier.
4. Student should be able to define the frequency response ofop-amps.

5. Student should be able to design the application ofop-amp.
6. Student should be able to evaluate the various types of thefilters.

Electrical Machines – 2 Laboratory	
Subject Code: UEE471C	**Credits: 01**
Contact Hours: 02(0L - 0T - 2P)	**Assessment: CIE 50 and SEE 50**

List of Experiments

1. Load test on three phase induction motor and performance evaluation, (torque-speed, BHP-efficiency, slip BHP, etc).
2. No-load and blocked rotor test on three phase induction motor to calculate parameters of equivalent circuit diagram and performance evaluation.
3. No-load and blocked rotor test on three phase induction motor to draw the circle diagram and hence the performance evaluation of given motor.
4. Speed control of three phase slip ring induction motor by rotor resistance.
5. Load test on single phase induction motor and performance evaluation (torque-speed, BHP- efficiency, slip -BHP, etc)
6. Open circuit and short circuit characteristics of three phase alternator
7. Voltage regulation of alternator by EMF, MMF, method.
8. Synchronization of Alternator with infinite bus.
9. V and Inverted V curves of a synchronous motor
10. To determine direct axis (Xd) and quadrature axis (Xq) synchronous reactance of a three phase synchronous machine by slip test

Electrical AutoCAD lab	
Subject Code: UEE672L	**Credits: 01**
Contact Hours: 02(0L - 0T - 2P)	**Assessment: CIE 50 and SEE 50**

List of exercises to Draw and design with CAD
1. Draw Commands- Mirror, Move, copy, offset, rotate, fillet, trim
2. Wiring layout of residential and workshop plan
3. Single Layer 24 Conductor 4 pole progressive Winding with sequence diagram
4. Double Layer 24 Conductor 4 pole DC lap Winding with sequence diagram
5. Double Layer 26 Conductor 4 pole DC lap Winding with sequence diagram
6. 12 slots 24 conductors 3 phase full pitch star connected AC winding
7. Assembly of pole, core and field coil for a isometric pole, core and field coil of a DC machine
8. Assembly of single phase 500 kVA core type transformer
9. Assembly of 50 kW DC generator for a given dimension
10. Rotor of 25 kVA alternator assembly
11. Stator of 25 kVA alternator assembly
12. Rotor of 3 phase induction motor assembly

References

1. A.K. Sawhney, A Course in Electrical Machine Design, Dhanpat Rai & Co. (P) Limited (2016), ISBN-10: 8177001019, ISBN-13: 978-8177001013
2. V. N. Mittle & Arvind Mitttle, Design of Electrical Machines, standard publishers distributors
3. S. F. Devalapur, Electrical Drafting, Eastern Book Promoters

Prerequisites

Students should have basic knowledge of engineering physics and Electrical Machines constructional and operational details

Course Outcomes

At the end of this course

1. Draw layout of residential and workshop plan using commands
2. Write identify the commands and icons on the Auto CAD software
3. Draw the Windings, assembly of machine parts

Operational Amplifier and Linear ICs Lab	
SubjectCode:UEE473L	Credits:01
Contact Hours:02(0L - 0T - 02)	Assessment: CIE 50 and SEE 50

List of Experiments

1. Study of Op-Amp as
    a. Inverting and non inverting amplifier
    b. Integrator and differentiator.
2. Study of Op-Amp as
    c. Voltage follower
    d. Adder and substractor
3. Study of Op-Amp as zero crossing detector
4. Study of Op-Amp as Schmitt trigger
5. Study of Op-Amp as triangular and rectangular wave generator.
6. Design and testing of Op-Amp based RC phase shift oscillator.
7. Design and testing of Op-Amp based RC Wein bridge oscillator.
8. Study of rectifiers using Op-Amp.
9. Design and testing of filters of the first and second order using Op-Amp.
10. Study of Astable multivibrator using Op-Amp.
11. Study of Astable multivibrator using 555 timer

Course Outcomes:

1. Students shall be able to design Op-Amp circuits and analyze simple applications of above circuits.
2. Students shall be able to design Filter circuits and understand the principles of timers and oscillators.
3. Students shall be able to design and analyze rectifier circuits.

Bridge Course Mathematics-II	
SubjectCode:UMA430M	Credits:00
Contact Hours:03(3L - 0T - 0P)	Assessment: CIE 50 and SEE 50

Ordinary differential equations of first order: (15 Hours)

Variable seperable, Homogeneous. Exact form and reducible to exact differential equations. Linear and Bernoulli's equation.

Differential Equations of higher order: Second and higher order linear ODE's with constant coefficients-Inverse differential operator, method of variation of parameters (second order); Cauchy's and Legendre homogeneous equations.

Laplace Transform: (15 Hours)

Introduction, Definition of Laplace Transform, Laplace Transform of Elementary functions, Properties: Shifting, differentiation, Integral and division by t. Periodic function, Heaviside's Unit step function

Inverse Laplace transforms:Properties. Convolution theorem. Solutions of linear differential equations

Partial Differential Equations(PDE's): (10 Hours)

Introduction to PDE : Formation of PDE's by elimination of arbitrary constants and functions. Solution of non-homogeneous PDE by direct integration. Solution of Lagrange's linear PDE, method of separation of variables,

Text Books:

1. B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, 43rd Ed., 2015.
2. E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed.(Reprint), 2016.

Reference books:

3. Thomas' Calculus: Early Transcendentals, Single Variable (13th Edition)
4. Calculus:Early Transcendentals James Stewart
5. C.Ray Wylie, Louis C.Barrett : "Advanced Engineering Mathematics", 6th Edition, McGraw-Hill Book Co., New York, 1995.
6. B.V. Ramana: "Higher Engineering Mathematics" 11th Edition, Tata McGraw-Hill, 2010.
7. Veerarajan T.," Engineering Mathematics for First year", Tata McGraw-Hill, 2008.

Course outcomes:

After completion of the course,

1. Explain various physical models through first and higher order differential equations and solve such linear ordinary differential equations.
2. Apply the Laplace transform techniques to solve differential equations.
3. Understand a variety of partial differential equations and solution by exact methods.
4. solve PDE by direct integration and Solution of Lagrange's linear PDE, method of separation of variables

Constitution of India	
Subject Code: UHS226M	Credits: 00
Contact Hours: 03 (3L - 0T - 0P)	Assessment: CIE 50 and SEE 50

Unit-I

Introduction to Constitution: (07 Hrs)

Meaning and importance of the Constitution, salient features of Indian Constitution. Organic nature of Indian Constitution. Preamble of the Constitution**.** Fundamental rights-meaning and limitations. Directive principles of state policy and Fundamental duties -their enforcementand their relevance.

Unit-II

Union Government: (06 Hrs)

Union Executive- President, Vice-president, Prime Minister, Council of Ministers. Union Legislature- Parliament and Parliamentary proceedings. Union Judiciary-Supreme Court of India –composition and powers and functions.

Unit-III

State and Local Governments: (07 Hrs)

State Executive- Governor, Chief Minister, Council of Ministers. State Legislature-State Legislative Assembly and State Legislative Council. State Judiciary-High court.

Distribution of powers between Centre & States and Central -State relationship.

Local Government-Panchayat raj system with special reference to 73rd and Urban Local Self Govt. with special reference to74th Amendment.

Unit-IV

Election provisions, Emergency provisions And Amendment of the constitution: (06 Hrs)

Election Commission of India-composition, powers and functions and electoral process. Types of emergency-grounds, procedure, duration and effects. Amendment of the constitution- meaning, procedure and limitations.

Textbooks

1. M.V.Pylee, “Introduction to the Constitution of India”,4thEdition,Vikas publication,2005.
2. Durga Das Basu(DDBasu), “Introduction to the constitution of India”,(Student Edition),19thedition,Prentice-Hall EEE, 2008.

Reference Book

3. Merunandan,“Multiple Choice Questions on Constitution of India”, 2ndEdition,Meraga publication,2007.

Course outcomes:

On completion of this course, students are able

1. Understand and explain the significance of Indian Constitution as the fundamental law of the land.
2. Exercise his fundamental rights in proper sense at the same time identifies his Responsibilities in national building.
3. Analyse the Indian political system, the powers and functions of the Union, State and Local Governments in detail.
4. Understand Electoral Process, Emergency provisions and Amendment Procedure.