Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING AND EXAMINATION

BE (ELECTRICAL& ELECTRONICS ENGINEERING) III Semester

Sr. No.	Board of Study	Subject Code	Subject	Period per week			Scheme of Exam			Total Marks	Credit L+ (T+P) / 2
				L	T	P	Theory / Practical				
							ESE	CT	TA		
1	Applied Mathematics	325351(14)	Mathematics -III	4	1	-	80	20	20	120	5
2	Applied Mathematics	325352(14)	Numerical Analysis	3	1		80	20	20	120	4
3	Electrical & Electronics Engg.	325353(25)	Basic Electronics	3	1		80	20	20	120	4
4	Electrical & Electronics Engg.	325354(25)	Electric Circuits	4	-		80	20	20	120	4
5	Electrical Engg.	325355(24)	Electrical Power Generation	3	1	-	80	20	20	120	4
6	Electrical Engg.	325356(24)	Electrical Machines-I	3	1		80	20	20	120	4
7	Electrical & Electronics Engg.	325361(25)	Electrical Machines Lab-I			3	40		20	60	2
8	Electrical & Electronics Engg.	325362(25)	Basic Electronics Lab			3	40		20	60	2
9	Electrical & Electronics Engg.	325363(25)	Electric Circuits Lab			3	40		20	60	2
10	Electrical & Electronics Engg.	325364(25)	Programming with C Lab			3	40		20	60	2
11	Humanities	325365(46)	Value Education			2			40	40	1
12	Electrical & Electronics Engg.		Library			1					
			Total	**20**	**5**	**15**	**640**	**120**	**240**	**1000**	**34**

L: Lecture, T: Tutorial, P: Practical, ESE: End Semester Exam, CT: Class Test, TA: Teachers Assessment
Note: Duration of all theory papers will be of Three Hours.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Mathematics – III**	Code:	**325351(14)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Tests:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
ESE Duration:	**Three Hours**	**Maximum Marks: 80**	**Minimum Marks: 28**

Course Objectives:

1. To make the students understand that Fourier series analysis is powerful methods where the formulas are integrals and to have knowledge of expanding periodic functions that explore variety of applications of Fourier series.
2. To provide knowledge of Laplace transform of elementary functions including its properties and applications to solve ordinary differential equations.
3. To have thorough knowledge of partial differential equations which arise in mathematical descriptions of situations in engineering.
4. To provide a sound background of complex analysis to perform thorough investigation of major theorems of complex analysis and to apply these ideas to a wide range of problems those include the evaluation of both complex line integrals and real integrals.
5. Know the concepts of Z-transforms, its definition, region of convergence and apply its most frequently occurring properties.

UNIT- I Fourier series: Euler's Formula, Functions having points of discontinuity, Change of interval, Even & Odd functions, half range series, Harmonic analysis.

UNIT-II Laplace transform : Definition, Transform of elementary functions, Properties of Laplace transform, Transform of derivatives & integrals, Multiplication by tn, Division by t, Evaluation of integrals, Inverse Laplace Transform, Convolution theorem, Unit step function, Unit impulse function, Periodic function, Application to solution of ordinary differential equations.

UNIT- III **Partial differential equation:** Formation, Solution by direct integration method, Linear equation of first order, Homogeneous linear equation with constant coefficients, Non-homogeneous linear equations, Method of separation of variables.

UNIT-IV **Complex variables**: Derivative, Cauchy-Riemann equations, Analytic functions, Harmonic functions, Flow problems, Complex integration, Cauchy theorem, Cauchy integral formula, Taylor& Laurent series, Singularity, Residue and Evaluation of real definite integrals.

UNIT-V **Z-transform:** Definition, Properties, Initial value & final value theorems, Inverse Z-transform, Convolution theorem, Partial fraction, Residue method & Applications to solution of difference equations.

Text Books:

1. "Higher Engg. Mathematics", Dr. B.S. Grewal– Khanna Publishers.
2. "Advanced Engg. Mathematics" , Erwin Kreyszig – John Wiley & Sons.

Reference Books:

1. "Advanced Engg. Mathematics", R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. "Applied Mathematics", P.N.Wartikar& J.N. Wartikar. Vol-II Pune VidyarthiGrihaPrakashan,Pune.
3. "Applied Mathematics for Engineers & Physicists", Louis A. Pipes- TMH.

Course outcomes: After studying the contents of the syllabus in detail the3 students will be able to:

1. Define Fourier series including half-range series , harmonic analysis and variety of applications
2. Define (mathematically) unit step unit impulse, Laplace transform its properties, inverse and applications to solve ordinary differential equations.
3. Solve difficult problems using theorems of complex analysis and apply residue theorem to evaluate real integrals.
4. Form and solve by direct integration methods linear equations of first order including homogenous and non homogenous, linear equations and also method of separation of variables.
5. Know the definition of Z-transform; calculate Z-transform of some elementary signals, convolution product, formulation of corresponding convolution theorem and its applications to solve difference equations.'

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Numerical Analysis**	Code:	**325352(14)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Tests:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
ESE Duration:	**Three Hours**	**Maximum Marks: 80**	**Minimum Marks: 28**

Course Objectives:

1. Student will learn various types of Numerical Solution.
2. Student will learn how to obtain Numerical Solution of Algebraic and Transcendental Equations.
3. Student will understand Numerical Differentiation and Integration.
4. Student should understand the curve fitting method.

UNIT- I **NUMERICAL SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:** Bisection Method, Regula-Falsi Method, Newton-Raphson Method, Secant Method, Birge-Vieta Method, Bairstow's Method.

UNIT-II **NUMERICAL SOLUTIONS OF SIMULTANEOUS LINEAR EQUATIONS:** Direct Methods: Gauss Elimination, Gauss-Jordan &Crout'sTriangularisationMethod. Iterative Methods: Jacobi's, Gauss-Siedal& Successive Over Relaxation Method.

UNIT- III **NUMERICAL DIFFERENTIATION AND INTEGRATION :**Finite Differences, Derivatives using Forward, Backward and Central Difference Formulae, Newton-Cote's quadrature formula, Trapezoidal rule, Simpson's rules, Weddle's rule.

UNIT-IV **NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS:** Picards Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Range-Kutta Methods, Predictor-corrector Methods, Milne's Method, Adams-Bashforth Method.

UNIT-V **CURVE FITTING AND METHOD OF LEAST SQUARES:** Method of Least Squares, Fitting of a Straight Line, Parabola, Curves of the form $y = ab^x$ and $y = ax^b$.

Text Books:

1. Numerical Methods in Engineering and Science by Dr. B.S. Grewal, Khanna Publishers.
2. Numerical Methods for Scientific and Engineering Computation by M .K. Jain, S. R. K. Iyengar& R. K. Jain, Wiley Eastern Limited

Reference Books:

1. Numerical Methods and Applications,E. Ward Cheney , David R Kincaid, Cengage Learning India Edition.
2. Numerical Methods, by Noble ben, New York, International Publications New York 1964.
3. Numerical Methods for Scientists and Engineersby K. Shankar Rao,Prentice Hall of India.
4. Numerical Methods with C++ Programming, by Somasundaram&Chandrasekaran, Prentice Hall of India.
5. Numerical Methods, by S. S. Shastry, Prentice Hall Inc. India 1998.

Course outcomes:

1. Students will be able to give solution of algebraic, transcendental equations and simultaneous linear equations
2. Students will be aware with Numerical Analysis.
3. Students will be able to solve the Ordinary Differential Equations.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Basic Electronics**	Code:	**325353(25)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Tests:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
ESE Duration:	**Three Hours**	**Maximum Marks: 80**	**Minimum Marks: 28**

Course Objectives:

1. To understand the basic concept electronics devices their property, behavior and application.as.
2. To understand the concept of waves shaping circuit and constant power supply.
3. To understand the concept of solid state rectifiers.
4. Application of transistor as an amplifier and switch.
5. To learn the concept of positive and negative feedback in amplifier.
6. Gain experience in the designing of an electronics circuit.

UNIT- I Introduction: Transport Phenomena in semiconductor, Formation of P-N Junction, Properties of P-N Junction, P-N Junction Diodes; Semiconductor Diodes, V-I Characteristics, Effect of Temperature on V-I Characteristics, Ideal Diode, Diode equation, Diode Resistance, Diode Capacitance: Transition and Diffusion Capacitance.

UNIT-II **Rectifying circuits and DC Power Supplies**: Load line analysis of diode circuit, Half wave rectifier: Voltage regulation, Ripple factor, ratio of rectification, Transformer Utilization factor. Full wave rectifier, Bridge rectifier, **Filter circuits for power supply**: Inductor filter, Capacitor filter, LC filter, Multiple LC filter, CLC or filter. **Zener diode**: Break down mechanism, Characteristics, Specifications, Voltage regulator circuit using zener diode.

UNIT- III **Transistor:** Introduction, Construction, Types: npn and pnp, Current components. Transistor as an amplifier, Transistor Characteristics, Transistor Circuit Configuration: Common Base (CB) Configuration, Common Emitter (CE) Configuration, Common Collector Configuration (CC), Early Effect. Ebers-Moll Model, Maximum Voltage ratings.

UNIT-IV **Field Effect Transistor (FET):** Introduction, Construction, Operation, V-I Characteristics, Transfer Characteristics, Drain Characteristics, Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Introduction, Construction, Operation and characteristics, Depletion MOSFET, Enhancement MOSFET.

UNIT-V **Passive Clipper and Clamper Circuits:** classification of series and parallel clipper and clamper circuits, biased and unbiased clipper and clamper circuits, R-C low pass and high pass circuits.

Oscillator: Sinusoidal oscillator, phase shift oscillators, Wien Bridge oscillator, Resonant circuit oscillators: General form of Oscillator Configuration- LC Colpitts and LC Hartley, Crystal oscillator. (Elementary treatment of BJT based oscillators only)

Text Books:

1. Integrated Electronics: Analog & Digital Circuit Systems – Jacob Millman&Halkias, TMH.
2. Electronic Devices and Circuit Theory – Boylestad&Nashelsky, 8th Ed. PHI.

Reference Books:

1. "Electronic Devices & Circuit Analysis" – K. Lal Kishore, BS Publications
2. "Principle of electronics devices" - Flyod, Pearson Publication.
3. "Electronic Devices & Circuits"; I.J.Nagrath, PHI publications
4. "Electronic Devices & Circuits" – Allen Mottershead, PHI Learning.

Course outcomes:

1. Student can predict and design rectifiers and filters as per circuit requirement.

2. Learn to design transistor biasing circuit and calculating its stability.
3. Student can apply the concept of feedback in amplifier circuit.
4. Learn to design oscillator of desired frequency.
5. Gain experience in the problem finding and trouble shooting in electronics circuitsconsisting of diodes and transistors.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Electric Circuits**	Code:	**325354(25)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Tests:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
ESE Duration:	**Three Hours**	**Maximum Marks: 80**	**Minimum Marks: 28**

Course Objectives:

1. To provide knowledge of Basic Electric Circuit Concepts.
2. To provide the concept of conversion of electrical circuits to graphs for determination of current and voltages.
3. To provide Knowledge of various theorems and its applications to circuits.
4. To give the knowledge of analysis of network reduction and calculation of various parameters.
5. To know the basic concepts of coupled circuits and network performance under resonance condition.
6. To provide knowledge of threephase balanced and unbalanced Poly phase Circuits and measurement of three phase power.
7. To provide the concept of non-sinusoidal waveforms and its impact on electrical circuits

UNIT- I **Development of Circuit Concepts:** The relationship of field and circuit concept for parameters of circuit elements, active and passive elements: resistance, inductance and capacitance, voltage and current sources, duality of simple circuit, normalizing factor, **Network topology**: graph, tree, branch link, tie-set, cut-set, incidence matrix, loop and nodal analysis, equilibrium equations (conductively coupled circuit only).

UNIT-II **Network Solution And Reduction:** Solution of network equation of determination method of network reductions, nodal analysis, mesh analysis, super node, super mesh, star-delta transformation, Superposition theorem, Reciprocity theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Millman's theorem (independent & dependent sources).

UNIT- III **Magnetic coupled circuits and Resonance:** Electrostatic and electromagnetic coupling, self-inductance, mutual inductance, coupling coefficient, complete network solution with conductive and inductive coupling, Series and parallel resonance, quality factor, bandwidth, selectivity, half power frequencies, locus diagram of simple series and parallel circuits.

UNIT-IV **Poly Phase Circuits:** Examples of two, three, four-loop circuits in poly phase circuit and their solutions, unbalanced poly phase circuits, determination of phase sequence, star/delta connections, and power measurement in poly phase circuits.

UNIT-V **Non-sinusoidal Ideal Wave Forms:** Common non-sinusoidal waveforms, Fourier series, analytical evaluation of Fourier coefficients, exponential form of Fourier series, frequency spectra of periodic waveforms, effective value and equivalent power factor, solution of circuits with non sinusoidal currents and voltages, harmonic resonance in single phase circuits.

Text Books:

1. "Fundamentals of Electric Circuits" Alexander &Sadiku, TMH Publications.

2. "Electrical Circuits and networks", K. Sureshkumar, Pearson Education/, First Edition

Reference Books:

1. "Circuit Analysis Theory and Practice", Allan H. Robbins and Wilhelm C. Miller, Cengage Learning.
2. "Electric Circuit Analysis", Hayt, Kemmerly, Durbin, TMH Publications
3. "Engineering Network Analysis and Filter Design", Gopal G. Bhise, Prem R. Chandra, Durgesh C. Kulshreshtha, Umesh Publications.
4. "Network Analysis & Synthesis", D. Roy Choudhary, New Age International publications.

Course outcomes:

1. Students will learn about the different types of electrical sources and networks
2. Students will have knowledge of converting a electrical circuit into graph and will be able to analyze the circuit graphically.
3. Student will analyse circuits with ideal, independent, and controlled voltage and current sources
4. Student will be able to find out current through or voltage across any branch of a given Electrical network using theorems.
5. Students will learn about series and parallel resonance conditions in series and parallel circuits and its impact on network voltage and current magnitudes.
6. Students will have knowledge of balanced and unbalanced poly phase circuits.
7. Students will be able to analyze the behavior of non-sinusoidal waveforms

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical &Electronics**	Semester:	**III**
Subject:	**Electrical Power Generation**	Code:	**325355(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Tests:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
ESE Duration:	**Three Hours**	**Maximum Marks: 80**	**Minimum Marks: 28**

Course Objectives:

1. To provide the students with a broad understanding of predictions of different load demands of the consumers.
2. Student will understand the layout diagrams of power system by drawing the typical load curves
3. To provide the students with a broad understanding of electricity generation.
4. Students will understand the operation and major components ofelectric generating plants.
5. Students will have a basic understanding of conversion of coal, oil, gas ,nuclear, hydro, solar, geothermal, etc. energy to electrical energy.

UNIT- I **Introduction:** Sources of energy, comparison of sources of energy, Growth of power generation in India, need for non-conventional energy sources

Prediction of Load: Definition of connected load, maximum load, maximum demand, demand factor, load factor, diversity factor, plant capacity factor, plant utilization factor, load duration curve, mass curve. Calculation based on above factors.

UNIT-II Thermal Power generation : Main parts and working of thermal power station, main features of boilers, steam turbines, Auxiliaries, coal preparation , Ash Handling and layout of thermal power station.

UNIT- III **Hydro Power Stations:** Hydrology, hydrographs, flow duration & mass curve, main types of dams, turbines & generators, pumped storage plant.

Nuclear power Generation: Principles of nuclear power generation, main parts of nuclear power plants, types of reactors, nuclear waste hazards & disposal.

UNIT-IV **Solar Energy:** solar radiation, solar collectors , conversion of solar energy in to electrical energy , solar water heater ,solar hydrogen energy cycle.

Wind energy: wind power plants: principles of wind power generation , wind turbine operation & control.

UNIT-V **MHD Generation:** principle of MHD generation, MHD cycles & working fluids, open cycles & closed cycle MHD system, merits &demerits.

Other methods of power generation: Tidal power generation ocean Thermal energy, geothermal power generation, Biomass applications in power generation, use of different types of generation for base loads/peak loads.

Text Books:

1. Generation of electrical energy by BR Gupta, S. Chand Publications.
2. Generation & Economic consideration by JB Gupta,SKkataria publications
3. Nonconventional Energy Sources by G D Rai, Khanna Publications

Reference Books:

1. A Course in Electrical Power by JB Gupta, S K Kataria Publications.
2. A Course in Electrical Power by Chakravoarty,Soni Gupta, Bhatnagar – DhanpatRai Publications.
3. Elements of Power Station Design by M.V.Deshpande, PHI publications.

Course outcomes:

1. Students must apply both mathematics and chemistry to understand and solve problems in this course.
2. Students perform design type analyses and solve engineering problems.
3. There are many aspects of contemporary issues addressed in this course, especially with regard to power plant environmental and sitting issues.
4. Students will able to generate economic dispatch between generating units.
5. Students will have a basic understanding of conversion of coal, oil, gas, nuclear, hydro, solar, geothermal, etc. energy to electrical energy.
6. An ability to apply a multi-disciplinary approach to conceive, plan, design, and implementsolutions to electrical engineering problems in the field of energy and sustainability.
7. Successfully apply advanced concepts of electrical power engineering to the analysis, design and development of electric systems, components, equipments or applications to meet desired needs of society professionally and ethically.
8. Use advanced techniques, skills, and modern scientific and engineering software tools for professional practice

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Electrical Machines I**	Code:	**325356(24)**
Total Theory Periods:	**40**	Total Tutorial Periods:	**10**
Class Tests:	**Two (Minimum)**	Assignments:	**Two (Minimum)**
ESE Duration:	**Three Hours**	**Maximum Marks: 80**	**Minimum Marks: 28**

Course Objectives:

The objective of this course is to expose the studentson basic knowledge of construction and working of various transformers their equivalent circuit, parameter determination and applications. This course also provides the knowledge of direct current electrical machines, its operational constraints, starting mechanisms, conventional speed control methods, various tests and applications.

UNIT- I Single Phase Transformer: Introduction, Constructional features of a transformer, core and shell type, working principle of a transformer, EMF equation, Ideal transformer, Actual transformer on no-load and on load, phasor diagram (no load, lagging and leading power factor), Equivalent circuit, per unit representation, Voltage regulation of a transformer, Losses in a transformer, Open circuit and short circuit test, Efficiency, condition for maximum efficiency.

UNIT-II Single Phase Transformer and Auto-transformer:Back-to-Back test, power and distribution transformer, All-day efficiency, Polarity test, separation of losses, auto-transformer, its equivalent circuit and phasor diagram, its comparison with two winding transformer, conversion from auto- transformer to two winding transformer and vice versa, Parallel operation of single-phase transformer (equal and unequal voltage ratios), excitation phenomenon in transformers.

UNIT- III **Three Phase Transformer:** Three-phase transformers, constructional details (three and five limb), Bank of three single phase units, three phase single unit transformer, different connections and vector groups, calculation of efficiency and regulation, Parallel operation of three-phase transformer, Scott connection, open delta, Equivalent circuit of three winding transformer and its parameter determination (elementary only).

UNIT-IV **DC Machine –I**:Electromagnetic principle of DC machine, BLV and BLI concept, constructional details, production of voltage and torque, classification of DC machine, armature reaction and its effect, methods to reduce armature reaction, commutation, methods of improving commutation, effect of brush shift, Operating characteristics of DC separately excited, series and shunt (condition of self excitation, critical speed and critical resistance) generator.

UNIT-V **DC Machine –II:**Electrical and mechanical characteristics of DC motor, starters for shunt motors- two point, three point and four point starter, speed control of DC motors- armature and field control method, losses in DC machines, efficiency and condition for maximum efficiency, Testing of DC machines- Swinburne's test and Regenerative test(Study only).

Text Books:

1. Nagrath& Kothari, "Electric Machines", TMH Publications,
2. B. R, Gupta, "Electrical machines", New Age International
3. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers

Reference Books:

1. J. B. Gupta, "Theory & Performance of Electrical Machines", S. K. Kataria& Sons
2. AshfaqHussain, "Electric Machines", DhanpatRai Publication
3. SamarjeetGhosh, "Electrical Machines", PHI Publications
4. P.K. Mukherjee & S. Chakravarti "Electric Machines", DhanpatRai Publication,

Course outcomes:

1. Understand the fundamentals and working of transformers
2. Draw the equivalent circuit diagrams of various transformers
3. Analyse the load profile, voltage regulations and efficiency under various operating conditions
4. Understand the working principle and construction of direct current machines
5. Understand the needs and requirements of various types of d.c. machine operations like starting, speed control, tests etc.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Electrical Machines-I Lab**	Code:	**325361(25)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

List of Experiments: *(At leastTen experiments are to be performed by each student)*

1. To determine the equivalent circuit parameters of a single phase transformer.
2. To determine the voltage regulation of a single phase transformer operating at lagging and upf condition.
3. To determine the efficiency of a single phase transformer under different loading condition
4. To perform the tests required for parallel operation of transformers.
5. To perform parallel operation of two single phase transformer.
6. To study the voltage/current ratios for different types of three phase transformer connection.
7. To perform Back to Back test on two single phase transformer.
8. To perform 3- phase to 2- phase conversion (Scott connection)

9. To study the various routine tests performed on three phase transformers as per IS code.
10. To determine the armature & field winding resistance of D.C machine by voltmeter/ammeter method.
11. To determine the magnetization or Open circuit characteristics of a D.C machine
12. To perform load test on D.C shunt generator.
13. To perform Swinburne's test a D.C machine & calculate its efficiency at full load operating condition.
14. To study three point and four point motor starters and observe its impact on the motor staring current.
15. Speed control of D.C shunt motor by (a) Varying field current with armature voltage kept constant; (b) Varying armature voltage with field current kept constant.
16. To study the reversal of D.C shunts motor.

Equipment/Machines/Instruments/Tools/Software Required:

Single Phase Transformer, Three Phase Transformer, Three Phase Auto Transformer, DC Shunt Generator Set, DC Shunt Motor, DC series Motor, Ammeters (AC & DC), Voltmeter (AC & DC), Wattmeter, Tachometer

Recommended Book:

Laboratory courses in electrical engineering by S.G. Tarnekar& P.K. Kharbanda

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Basic Electronics Laboratory**	Code:	**325362(25)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

List of Experiments: *(At leastTen experiments are to be performed by each student)*

1. To study the operation of CRO and DSO (Digital oscilloscope).
2. To draw the characteristics of a semi-conductor diode and to find cut-in voltage, reverse resistance, static resistance and dynamic resistance.
3. To draw the characteristics of a zener diode.
4. To design a half wave rectifier and to determine its efficiency and ripple factor.
5. To design a-full wave rectifier and determine the ripple factor and efficiency with & without filter.
6. To design and analysis of biased and unbiased Clamper circuit.
7. To design and analyze biased and unbiased series Clipper.
8. To design and analyze biased and unbiased parallel Clipper.
9. To draw the characteristics of CB configuration of a transistor amplifier.
10. To draw the characteristics of CC configuration of a transistor amplifier.
11. To design a Zener regulator circuit and to find the regulation characteristics.
12. To draw the load line of a transistor amplifier under CE configuration.
13. To draw the characteristics of FET
14. To study Wein Bridge Oscillator & R-C phase shift oscillator.
15. To design the positive voltage regulator.

Equipment/Machines/Instruments/Tools/Software Required:

Circuit components, Breadboard, Hook-up wire, Power supply, CRO, DSO,Function generator

Recommended Book:

Laboratory Manual for Electronic Devices and Circuits, 4th Ed., David

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Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Electric Circuits Laboratory**	Code:	**325363(25)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

List of Experiments: *(At leastTen experiments are to be performed by each student)*

1. To plot voltage vs resistance characteristics of Incandescent lamp.
2. To calculate the value of resistor using color coding and verify it through measurement.
3. To study the different functions of a Analog/Digital multimeter
4. To verify Superposition theorem for DC/AC Circuits.
5. To verify Thevenins theorem for DC/AC Circuits.
6. To verify Norton's theorem for DC/AC Circuits.
7. To verify Reciprocity theorem for DC/AC Circuits.
8. To verify Millman's theorem for DC/AC Circuits.
9. To connect a tube light and study its min. operating voltage, nature of current, power and power factor.
10. To Measure Q Factor of Series RLC Circuit
11. To Measure Q Factor of Parallel RLC Circuit
12. To verify the voltage and current relation in star and delta connected three phase system.
13. To verify the effect of three phase unbalanced star connected system.
14. To measure three phase power using Two-watt meter method.

Equipment/Machines/Instruments/Tools/Software Required:

Voltmeter, ammeter, Wattmeter, Power factor meter, Resistors, Capacitors, Lamp load, DC supply, Three-phase autotransformer, Multimeter, Simulation tools like MATLAB,PSIM, MULTISIM

Recommended Book:

1. Experiments in basic electrical engineering, S.K.Bhattacharya.
2. Basic shop practical, Mehta & Gupta
3. Practical in electrical engineering, Dr. N.K.Jain

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Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Programming with C Laboratory**	Code:	**325364(25)**
Total Lab Periods:	**36**	Batch Size:	**30**
Maximum Marks:	**40**	Minimum Marks:	**20**

List of Experiments: *(At leastTen experiments are to be performed by each student)*

1. WAP to convert temperature Celsius into Fahrenheit.
2. Two numbers are input through the keyboard into two locations C and D. Write a program to interchange the contents of C and D.
3. The distance between two cities (in km.) is input through the keyboard. Write a program to convert and print this distance in meters, feet, inches and centimeters.
4. If a five-digit number is input through the keyboard, write a program to reverse the number.
5. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 80,000.
6. Any integer is input through the keyboard. Write a program to find out whether it is an odd number or even number.
7. Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not.
8. If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is isosceles, equilateral, scalene or right angled triangle.
9. WAP to find roots of a quadratic equation by using if else condition.
10. WAP to find the smallest out of three numbers,using nested if else.
11. WAP to detect entered number is even or odd using goto statement.
12. WAP to count number of digit present in any number entered by user, using goto.
13. WAP to reverser the number using goto.
14. WAP to provide multiple functions such as 1. Multiplication 2. Division 3. Remainder
15. WAP to detect even or odd using nested switch statement.
16. WAP to print first 10 number starting 1 together with their squares.
17. WAP to print Character A to Z with is ASCII value.
18. WAP to print all even number from 1 to n.{ n input by user}
19. WAP to count number 1 to 50 that not divisible by 2,3,5.
20. WAP to find the number in between 7 to 100 which is exactly divisible by 4 and if divided by 5 and 6 remainder obtain should be 3;
21. WAP to print perfect square from 1 to 100.
22. WAP to detect largest number out of 10 numbers and display it.

23. WAP print entered 10 numbers in ascending order.

Recommended Book:

1. Programming in C++ by Balaguruswami, TMH.
2. Let us C, Kanetkar.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program:	**Bachelor of Engineering**		
Branch:	**Electrical & Electronics**	Semester:	**III**
Subject:	**Value Education**	Code:	**325365(46)**
No. Of Periods:	**2 Periods/Week**	Total Tutorial Periods:	**NIL**
Maximum Marks:	**40**	**Minimum Marks:**	**24**

Course Objectives:

1. This course is designed to provide the importance of education with why, what & how.
2. To impart students with an understanding of fundamental humanitarian viewpoint and its outcomes.
3. To provide the knowledge about whole existence and its impact on values.
4. To bring the awareness about life long exercise so that they can fulfill their responsibility towards themselves, the family, the society, the planet.

UNIT- I **Aim of Education and Necessity for Value Education:** Education in values/wisdom/etc and education in traits/technologies/etc as the two fundamental strands of education; Answer to the frequently asked questions such as “Why to do studies”, “What studies to do in overall”, “How to do studies in a proper way”, “How to think systematically and talk systematically”

UNIT-II **Humanitarian Viewpoint and Basic Human Objective:** Meaning and concept of happiness, Need for a fundamental viewpoint to judge things in all cases of human concerns, Proposal of the natural path of humanitarian coexistentialism; Consciousness development and its expression; Fundamental want of sustainable happiness in human being; Understanding the distinct activities and needs of self (I) and body in human being; Fundamental goal of human being; Sustainable-solution in individual (At the place of delusion); Sustainable-prosperity in family (At the place of poverty); Sustainable-cooperation in society (At the place of competition); Sustainable-coexistence in planet (At the place of struggle)

UNIT- III **Elements of Holistic and Systematic Perspective:** Need for study of fundamental information categories to develop holistic perspective; Particular-time actions and general-time laws; Need for fundamental information sequence to develop systematic perspective, Some examples for systematic study sequence

UNIT-IV **Elements of Society-friendly and Environment-friendly Goals:** Elements of Knowledge of whole existence; Elements of Knowledge of human being; Elements of fundamental Values and Wisdom; Value spectrum with reference to general relationships and particular relationships of the objects in nature; Elements of History and Contemporarity used to set current goals; Elements of Sciences and Techniques to formulate methods to achieve goals; Elements of Motoricity and Mattericity to make actions to execute the methods

UNIT-V **Lifelong Exercise for All-round Sustainability:** Collecting information for sustainability issues; Motivating people towards sustainable life-style; Ability to identify and develop appropriate technologies and management patterns for society-friendly and environment-friendly systems for production /protection/ utilization/ experimentation ; Ability to establish and execute the fundamental five-fold system in order to ensure sustainable peace-and-prosperity worldwide.

Text Books:

Value Education for Consciousness Development by Dr P B Deshmukh, Radha K Iyer, and Deepak K Kaushik (2nd Edition, 2012, ISBN: 978-81-924034-0-3)

Reference Books:

1. International Research Handbook on Values Education and Student Wellbeing by Terence Lovat, Ron Toomey, Neville Clement (Eds.), Springer 2010, ISBN: 978-90481-86747
2. Values Education and Lifelong Learning: Principles, Policies, Programmes by David N Aspin and Judith D Chapman (Eds.); Springer 2007, ISBN: 978-1-4020-6183-7
3. Fundamentals of Ethics for Scientists and Engineers by E G Seebaur and Robert L Berry, 2000, Oxford University Press