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Programme: **Bachelor of Technology** **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)	External	Internal	Total
BT-1301	Engineering Mathematics-II	3	1	-	External (70)	Internal (30)	Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 20	Assignment/Quiz/Attendance - Max. Marks: 10
Practical Internal Max Marks: Nil	Lab work & Session – Max Marks: Nil	Assignment / Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	Fundamental knowledge of basic mathematics such as Algebra and Trigonometry.
Course Outcome	1. Experience mathematics outside of your regular course work.
	2. Use knowledge and skills necessary for immediate employment or acceptance into a graduate program.
	3. Maintain a core of mathematical and technical knowledge that is adaptable to changing technologies and provides a solid foundation for future learning.

Unit	Contents (Theory)	Marks Weightage
I	**Fourier Series:** Introduction of Fourier series, Fourier series for Discontinues Functions, Fourier series for even and odd function, half range sine and cosine series and Fourier transform.	**14**
II	**Laplace Transformations :** Introduction of Laplace Transform of elementary functions, Properties of Laplace transform ,Change of scale property, shifting property, Laplace transform of the derivative, Inverse Laplace transform and its properties, Convolution theorem and Applications of Laplace Transformation to solve the ordinary differential equations	**14**
III	**Second Order Linear Differential Equations With Variable Coefficients:** Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter, Solution by Series Method.	**14**
IV	**Linear & Non Linear Partial Differential Equations of First Order :** Formulation of partial differential equations, solution of equation by direct integration, Lagrange's Linear equation,Non linear partial differential equation and Charpit's method, Linear homogeneous and Non-homogeneous partial differential equation of second and higher order with constant coefficients.	**14**
V	**Vector Calculus :** Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, Unit Normal vector and directional derivative, physical interpretation of divergence and curl, line integral, surface integral and volume integral, Green's Stroke's and Gauss divergence theorem.	**14**

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Text Book/References Books/ Websites

1. D.C. Aggarwal "Engg. Mathematics – II"
2. Higher Engineering Mathematics by BS Grewal, Khanna Publication
3. Mathematics for Engineers by S.Arumungam, SCITECH Publications
4. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
5. Advance Engineering Mathematics by D.G.Guffy
6. Engineering Mathematics by S S Sastri. P.H.I.
7. Advanced Engineering Mathematics by Peter V.O'Neil, Thomson Learning
8. Higher Engineering Mathematics by John Bird, Elsevier

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Suggested List of Laboratory Practical (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
EET-1302	Electrical Engineering Material	3	1	-			Min: 40 (D Grade)	Nil	Nil	Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two mid Semester Test –Max Marks:-20	Assignment/Quiz/Attendance- Max. Marks:- 10
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks:-Nil	Assignment / Quiz/Attendance - Max. Marks:- Nil

Pre-Requisite	Knowledge of the basic electrical terminologies.
Course Outcome	1. Analyze the behaviour and structure of various elements.
	2. Knowledge about the disadvantages of present day materials and their remedies.
	3. Knowledge of the Material used in industry, their strengths and drawbacks.

Unit	Contents (Theory)	Marks Weightage
I	**Conducting Material:** Classification and main properties, High receptivity alloy: Constant Manganin, Nichrome, Electrochemical properties of copper, Aluminum, steel tungsten, Molybdenum, Platinum, Tantalum, Niobium, Mercury, Nickel, Titanium, Carbon, Lead, thermal, thermocouple, materials, specific resistance, conductance, variation of resistance with temperature, super conductors.	**14**
II	**Semi Conductor Materials:** General conception, variation of electrical conductivity, Elements having semiconductor properties, general application, hall effect, energy levels, conduction in semiconductors, Intrinsic conduction, impurity conduction, P and N type impurities, electrical change, Neutrality, Drift, Mobility current flow in semi conductors P-N junction formation by alloying, Biasing (forward and reverse) of P-n junction, Reverse separation current, Zener effect, Junction, capacitance, hall defects and hall coefficient.	**14**
III	**Magnetic Materials:** Details of magnetic materials, reduction Between B, H and μ, soft and hard magnetic materials. Di-magnetic, Para magnetic and Ferromagnetic materials, electrical sheet steel, cast iron. Permanent magnetic materials. Dynamic and static hysteresis loop. Hysteresis loss, eddy current loss, Magnetization, magnetic susceptibility, coercive force, core temperature, rectangular hysteresis loop, Magnet rest square loop core materials, iron silicon, Iron alloys.	**14**
IV	**Insulating Materials:** General Electrical Mechanical and chemical properties of insulating materials, Electrical characteristics volume and surface resistivity complex permittivity loss and dielectric loss equivalent circuits of an imperfect dielectric polarization and polarisability classification of dielectric.	**14**
V	**Mechanical Properties:** Classification of insulating materials on the basis of temperature rise. General properties of transformer oil, commonly used varnishes, solidifying insulating materials, resins, bituminous waxes, drying oils, Fibrous insulating materials, wood, paper and cardboard, insulating textiles, varnished adhesive tapes, inorganic fibrous material and other insulating materials, such as mica, ceramic, bakelite, ebonite, glass, PVC, rubber, other plastic molded materials.	**14**

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Text Book/References Books/ Websites

1. TTTI Madras; "Electrical Engineering Materials"; TMH Publication.
2. S P Seth; A Course In Electrical Engineering Material, Dhanpat Rai Publication.
3. Kortisky; Electrical Engineering Materials: Indulkar and S. Thruvengadem; S.Chand Publication.

Suggested List of Laboratory Experiments :- (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
EET-1303	Electrical Machine - I	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks:-20	Assignment/Quiz/Attendance- Max. Marks:-10
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks:-10	Assignment / Quiz/Attendance - Max. Marks:-05

Pre-Requisite	Knowledge about the basic electrical circuits and basic electrical machines.
Course Outcome	1. Become Familiar with the curricular structure of Single Phase Transformer.
	2. Acquire knowledge about various types of DC Machines - Generator, Motor etc.
	3. Acquire knowledge about various basic principals involved in Electrical Machines.

Unit	Contents (Theory)	Marks Weightage
I	**Transformer-I:** Working principle, E.M.F Equation, construction, phasor diagrams, equivalent circuit, voltage regulation, losses in transformer, efficiency, tests: open circuit and short circuit, load, Sumpner's test, Condition for maximum efficiency and regulation, Power and distribution transformer, all day efficiency, Excitation phenomenon, Autotransformer: working, advantages, its equivalent circuit and phasor diagram, Harmonics.	**14**
II	**Transformer-II:** Three phase transformer: its construction, groups and connections, their working and applications; Phase conversion: 3 to 6 phase and 3 to 2 phase conversions Scott connection; Parallel operation of Transformers: application, advantages, requirement and load sharing; Tap changers, cooling, conservator and breather. Pulse and high frequency transformers, Switching currents in transformers, Harmonics.	**14**
III	**DC generators:** Principle, Construction, Types of DC generators, E.M.F Equation, lap & wave windings, Armature reaction, commutation, methods of improving commutations, Demagnetizing and cross magnetizing mmf, interlopes, characteristics, parallel operation.	**14**
IV	**DC Motors:** Principle, back emf, types, production of torque, armature reaction & interlopes, Characteristics of shunt, series & compound motor, Harmonics.	**14**
V	**DC motor:** starting. Speed Control of DC Motor: Armature voltage and field current control methods, Ward Leonard method. Braking, losses and efficiency, direct & indirect test, Swinburne's test, Hopkinson's Test, field & retardation test, single-phase series motor.	**14**

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Programme: **Bachelor of Technology** **Semester –III**

Text Book/References Books/ Websites

1. M. G. Say; "Alternating Current Machines"; (5th Ed.) ELBS, 1986.
2. V.Del Toro; "Electrical Machines & Power Systems"; 1985, Prentice-Hall, Inc., Englewood Cliffs.
3. V.Del Toro; "Electromechanical Devices for Energy Conversion & Control Systems", PHI Pvt.Ltd. 1975.
4. Nagrath and Kothari, "Electrical Machines", (TMH).
5. Langs dorf ; "A.C. Machines"; (McGraw-Hill).
6. Dr.P.S.Bimbhra ; "Electrical Machines"; (Khanna).
7. Ashfaq Hussain; "Electrical Machines" (Dhanpat Rai).

Suggested List of Laboratory Experiments :- (Expandable):

1. To perform O.C. and S.C. test on a 1-phase transformer and to determine the parameters of its equivalent circuit its voltage regulation and efficiency.
2. To perform back-to-back test on two identical 1-phase transformers and find their efficiency & parameters of the equivalent circuit.
3. To perform OC & SC test on a 3-phase transformer & find its efficiency and parameters of its equivalent circuit.
4. To determine the efficiency and voltage regulation of a single phase transformer by direct loading.
5. Speed control of D.C. shunt motor by:

(a) Field current control method & plot the curve for speed vs. field current.
(b) Armature voltage control method & plot the curve for speed vs. armature voltage.

6. Speed control of a D.C. Motor by Ward Leonard method and to plot the curve for speed vs. applied armature voltage.
7. To determine the efficiency of D.C. Shunt motor by loss summation (Swinburne's) method.
8. To determine the efficiency of two identical D.C. Machine by Hopkinson's regenerative test.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
EET-1304	Electrical Measurement & Instrumentation	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks:-20	Assignment/Quiz/Attendance- Max. Marks:-10
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks:-10	Assignment / Quiz/Attendance Max. Marks:-05

Pre-Requisite	Knowledge about the measuring instruments and their basic operation.
Course Outcome	1. Classification of measuring instruments and types of error.
	2. Measurement of resistance and importance of earth resistance.
	3. Measurement of inductance and capacitance, construction of frequency meter.

Unit	Contents (Theory)	Marks Weightage
I	**Measurement** and error, Accuracy and precision, sensitivity resolution, Error & Error analysis, Effect of temperature, Internal friction, Stray field, Hysteresis and Frequency variation & method of minimizing them, Loading effects, due to shunt connected and series connected instruments, calibration curve, Testing & calibration of instruments. **Galvanometers** – Theory & operation of ballistic galvanometer, D'arsonal galvanometer, Galvanometer motion & damping, Sensitivity, Flux meter, Vibration galvanometer, Spot deflection galvanometer. Definition of analog & digital instruments, Classification of analog instruments, their operating principle, Operating force, Types of supports, Damping, Controlling.	**14**
II	**Different types of Ammeter & Voltmeter:** – PMMC, MI, Electrodynamometer, Hotwire, Electrostatic, Induction, Rectifier, Ferro dynamic & Electro-thermic, Expression for control & deflection torque, their advantages, disadvantages & error, Extension of range of instruments using shunt & multiplier.	**14**
III	**Instrument Transformers** Potential and current transformers, ratio and phase angle errors, testing of instrument transformers, Difference Between CT and PT, errors and reduction of errors. **Measurement of power:** Power in AC and DC Circuit, Electrodynamometer type of wattmeter, Construction, theory, operation & error, Low power factor & UPF wattmeter, Double element and three element dynamometer wattmeter, Measurement of power in three phase circuit, one, two & three wattmeter method, Measurement of reactive power by single wattmeter, Measurement of power using CTs & PTs.	**14**
IV	**Measurement of Energy** Single phase induction type energy meter- construction & operation- driving and braking torques- errors & compensations- Testing by phantom loading and using R.S.S. Meter- Three phase energy meter- Tri-vector meter- Maximum demand meter, Ampere hour meter. Potentiometer- DC potentiometer standardization- Lab type Crampon's potentiometer, application of DC potentiometer, AC polar type and coordinate type potentiometer, their construction and Applications.	**14**

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V	**Miscellaneous Instruments & Measurements:** Power factor meter, Single phase and three phase Electro- dynamometer type & moving iron type. **Frequency meter**- Vibrating reed, Resonance type & Weston type, Synchronoscope, Ohmmeter- series & stunt type, Multi-meter, Megger & Ratio meter. **Resistance Measurement**- Classification of low, medium & high resistance- Voltmeter, Ammeter, Wheatstone Bridge, Kelvin's double bridge & loss of charge methods for resistance measurement, Earth resistance measurement. **Magnetic Measurement**- B-H Curve, Hysterisis Loop determination, Power loss in sheet metal- Lloyd Fischer square for measurement of power loss.	**14**

Text Book/References Books/ Websites

1. E W Golding & F C Widdis; Electrical Measurement & Measuring Instruments; Wheeler Pub.
2. A.K. Sawhney; Electrical & Electronic Measurements & Instrument; Dhanpat Rai & Sons Pub.
3. Buckingham & Price; Electrical Measurements; Prentice Hall.

Suggested List of Laboratory Experiments :- (Expandable):

1. Study working and applications of Meggar, Tong-tester, P.F. Meter and Phase Shifter.
2. Measure power and power factor in 3-phase load by two-wattmeter method and One wattmeter method.
3. Calibrate a voltmeter using Crompton potentiometer.
4. Measure low resistance by Crompton potentiometer.
5. Measure Low resistance by Kelvin's double bridge.
6. Measure earth resistance using fall of potential method.
7. Calibrate a single-phase energy meter by phantom loading at different power factors.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
EET-1305	Circuit Theory	3	1	1	External (70)	Internal (30)	Min: 40 (D Grade)	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks:-20	Assignment/Quiz/Attendance- Max. Marks:-10
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks:-10	Assignment / Quiz/Attendance - Max. Marks:-05

Pre-Requisite	Knowledge of Electrical Elements and circuits.
Course Outcome	1. Ability to understand the mathematical problems of Electrical circuit.
	2. Acquire knowledge about various types of theorems and basic laws.
	3. Acquire knowledge about various types of circuits.

Unit	Contents (Theory)	Marks Weightage
I	**Basic Circuits Analysis:** Ohm's Law – Kirchhoff's laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits – Phasor Diagram – Power, Power Factor and Energy.	**14**
II	**Network Reduction And Network Theorems for DC and AC Circuits**: Network reduction: voltage and current division, source transformation, star delta conversion. Thevenin's, Norton Theorem, Superposition Theorem, Maximum power transfer theorem, Reciprocity Theorem.	**14**
III	**Resonance and Coupled Circuits: -** Series and parallel resonance – their frequency response – Quality factor and Bandwidth – Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.	**14**
IV	**Transient Response for DC Circuits:-**Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input – Characterization of two port networks in terms of Z, Y and H parameters.	**14**
V	**Three Phase Circuits: -** Three phases balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & un balanced – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.	**14**

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Text Book/References Books/ Websites

1. William H. Hayt Jr & Jack E. Kemmerly and Steven M. Durbin; "Engineering Circuits Analysis"; Tata McGraw Hill publishers, 6 th edition, New Delhi, 2003.
2. Joseph A. Edminister, Mahmood Nahri; "Electric circuits", Schaum's series; Tata McGraw-Hill, New Delhi, 2001.
3. Paranjothi SR; "Electric Circuits Analysis"; New Age International Ltd., New Delhi, (1996).
4. Sudhakar A and Shyam Mohan SP; "Circuits and Network Analysis and Synthesis";Tata McGraw Hill, (2007).
5. Chakrabati A;"Circuits Theory (Analysis and synthesis); Dhanpath Rai & Sons, New Delhi, (1999).
6. Charles K. Alexander, Mathew N.O. Sadiku; "Fundamentals of Electric Circuits"; Second Edition, McGraw Hill, (2003).

Suggested List of Laboratory Experiments :- (Expandable):

1. To verify Kirchhoff's Voltage Law and Kirchhoff's Current Law in a Passive Resistive Network.
2. To determine and verify Thevenin's and Norton's theorem.
3. To determine and verify Maximum Power Theorem.
4. To calculate and verify 'Z' parameters of two-port network.
5. To calculate and verify 'Y' parameters of two-port network.
6. To calculate and verify 'ABCD' parameters of two-port network.
7. To calculate and verify 'H' parameters of two-port network.
8. Design a RLC resonance circuit & verify the transient response for different values of R, L & C.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
BT-1306	C++ Programming	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks:-15	Assignment/Quiz/Attendance- Max. Marks:-15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks:-10	Assignment / Quiz/Attendance- Max. Marks:-05

Pre-Requisite	Students have basic knowledge of programming.
Course Outcome	1. An understanding of the concepts of inheritance and polymorphism.
	2. An understanding basic concept of C++ programming.
	3. An ability to incorporate exception handling in object-oriented programs.

Unit	Contents (Theory)	Marks Weightage
I	**C++ Basics:** Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Strings, Structures, conditional statement, control structure, switch-case, break, go to statements.**OOPS :**Introduction to OOPS, differences Between OOP and Procedure Oriented Programming, Overview of OOP principles.**Function & Classes:**Scope of variables, Parameter passing, Default arguments, inline function, Recursive function, Dynamic memory allocation and reallocation, operators-new and delete, Preprocessor directives,**Classes:**Class Definition, Class Structure, Class Scope,object, Friends to a class, Static class members,Constructors and Destructors, Dynamic creation and destruction of objects, Data Abstraction.**Inheritance:** Inheritance,Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class member.**Polymorphism:**Function overloading, Operator Overloading , Virtual Function Polymorphism: Static and Dynamic binding, Base and Derived class virtual functions, Pure virtual functions, Abstract classes, C++ Exception Handling and File Handling, Comparison of C++ with C, Java and C#.	**50**

Text Book/References Books/Websites

1. E. Balaguruswamy; Object Oriented programming with C++; TMH, 2001.
2. Yashwant Kanitkar; Let us C++ .
3. Radha Ganesan; "Object Oriented Programming with C++"; Scitech Publication PVT.LTD. Chennai.
4. Padam Gulwani & Anshuman Sharma;Elementary Concepts of Computer Design and Hardware.

Suggested List of Laboratory Experiments :- (Expandable):

1. Program to print any Message.
2. Program for Conditional Statements, Looping Statements and Switch Case.
3. Program to implement Arrays, Strings and Pointers.
4. Program to implement Functions and Dynamic Memory Allocation.
5. Program to implement Class and Objects.

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6. Program to implement Friend Functions and Constructors.
7. Program for Inheritance.
8. Program for Polymorphism.
9. Program for File Handling.
10. Program for Exception Handling.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total (100)			Total (50)
BT-1307	Professional Skills	-	-	1	External (Nil)	Internal (Nil)	Nil	External (Nil)	Internal (50)	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test –Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 50	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/ Attendance Max. Marks: 50

Pre-Requisite	**Nil**
Course Outcome	1. Able to solve problems ask in the competitive exams.

Unit	Contents (Theory)	Marks Weightage
I	**Social Skills:** Society, Social Structure, Develop Sympathy And Empathy. **SWOT Analysis**: – Concept, How to make use of SWOT.	**50**
II	**Inter personal Relation:** Sources of conflict, Resolution of conflict; Ways to enhance interpersonal relations.	
III	**Quantitative Aptitude:** Percentages/Profit & Loss, Time and Work, Simple and Compound Interest, Series and Progression.	
IV	**Reasoning :** Puzzles and Seating Arrangement, Data Sufficiency, Coding-decoding, Blood Relation, Order and Ranking, Alpha Numeric Symbol Series, Logical Reasoning:	
V	**English**: free quizzes related to Synonyms, Antonyms, One Word Substitution, Idioms and Phrases, Spelling Correction; Fill in the Blanks and Common Errors in English.	

Text Book/References Books/ Websites

1. Allen Pease; Body Language; Sudha Publications Pvt. Ltd.
2. E.H. Mc Grath , S.J. Pretice ;Basic Managerial Skills for All ;Hall of India, Pvt Ltd.
3. R.S. Aggarwal; Quantitative Aptitude for Competitive Examinations.
4. Arihant Publications; Fast Track Objective Arithmetic.
5. R S Aggarwal; Verbal and Nonverbal Reasoning.
6. M K Pandey; Analytical Reasoning.
7. SP Bakshi; Objective General English.
8. Neetu singh; Plinth to paramount English.
9. https://www.playquiz2win.com/engquizmenu.html
10. https://www.sawaal.com

Suggested List of Laboratory Experiments :- (Expandable):

1. SWOT analysis: - Analyze yourself with respect to your strength and weaknesses, opportunities and threats. Following points will be useful for doing SWOT.

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a) Your past experiences,
b) Achievements,
c) Failures,
d) Feedback from others etc.

2. Undergo a test on reading skill/memory skill administered by your teacher.
3. Form a group of 5-10 students and do works for social cause e.g. tree plantation, blood donation, environment protection, camps on awareness like importance of cleanliness in slump area, social activities, like giving cloths to poor etc. (One activity per group).
4. Students should solve various problems and quiz on the above mention topics, and prepare a assignment.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P			Total			Total (50)
EET-1308	Electrical Workshop	-	-	1	External (Nil)	Internal (Nil)	Nil	External (35)	Internal (15)	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test –Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment / Quiz/ Attendance Max. Marks: 05

Pre-Requisite	Knowledge of the basic electrical engineering.
Course Outcome	1. Introduction various electrical equipments, their ratings and practical application.
	2. Analysis of the various electrical equipment connection and their operation.
	3. Observation of Electrical wiring in the campus to understand the electrical wiring.

Unit	Contents (Theory)	Marks Weightage
I	Miscellaneous Electrical Workshop Processes Acquaintance with the average tools and equipments used for electrical workshop. Soldering wire jointing of different types, Making of Extension board containing two 5A and one one 15A plug-points, Soldering electrical elements with the necessary switches micro-switches and extension terminals.	**50**
II	House Wiring Processes Wiring of different lamp control, stair casing circuits, Cleat wiring and conduit wiring. Assembly and interchange wiring of fluorescent tube light, Connection of table and ceiling fans with regulators, Earth resistance measurement and earthling processes.	
III	Distribution Boards Processes to make a distribution board containing at least two switches, one fan regulator and one 5A plug point energy meter with main switch.	
IV	Fault detection and repair of domestic electric installation, Fault detection and its repair in institution's workshop installations, To make a single phase main distribution board with five outgoing circuits for light and fan load including main switch and fuses (only internal connections), Wiring and testing of alarm and indicating relays, indicating lights etc.	
V	Dismantling, repairing, assembling and testing of domestic appliance like electric iron, room heater, electric toaster, water heater, electric kettle, electric oven, ceiling fan, Table Fan, regulators, alarm bell, Coil winding for small transformers or alarm bell, Assembling small transformer cores from the given lamination plates. Assembling small battery charger.	

Text Book/References Books/ Websites

1. Hajara Choudhary ; "Electrical workshop"; TMH.
2. R P Singh ; "Electrical Workshop"; IK International.
3. Frank Thornton addy man ; "My Electrical Workshop"; The wireless press ltd.

Suggested List of Laboratory Experiments :- (Expandable):Nil