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

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External	Internal	Total
BT-1301	**Engineering Mathematics-II**	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 & Session – Max Marks: Nil	Assignment / Quiz/Attendance - Max. Marks: Nil

Pre-Requisite	Fundamental knowledge of 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

Text Book/References Books/ Websites:

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

Suggested List of Laboratory Practical (Expandable): Nil

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		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External**	**Internal**	**Total**
MET-1302	**Applied Thermodynamics**	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	Nil
Course Outcome	1. Ability to understand the basic concept of heat and temperature and its properties.
	2. Students will able to define the ideal gas and state the ideal gas relation.
	3. Students will be able to solve the problems of steam Turbine and Boilers.

Unit	Contents (Theory)	Marks Weightage
I	**Fundamental Concepts & Definitions:** microscopic& macroscopic, introduction of engineering thermodynamic Systems, Characteristics of system boundary and control surface, Thermodynamic properties, Thermodynamic state, point, path and process, quasi-static process, cyclic and non-cyclic; processes; Thermodynamic equilibrium, Zeroth law of thermodynamics, Temperature; concepts, scales.	14
II	**Work and Heat:** Mechanics, definition & their limitations, sign convention. Displacement work; as a part of a system boundary, as a whole of a system boundary, expressions for displacement work in various processes through p-v diagrams. Shaft work; Heat Transfer; definition, units and sign convention, Heat transfer in various processes through p-v diagrams. Numerical.	14
III	**Law of Thermodynamics:** First Law of Thermodynamics: Joules experiments, equivalence of heat and work. Statement of the First law of thermodynamics, extension of the First law to non - cyclic processes, energy, energy as a property, modes of energy, Specific heat, enthalpy at constant volume, constant pressure, steady state-unsteady flow energy equation. Numerical, Second Law of Thermodynamics: Heat Pump, Heat Engines, Refrigerator, Thermal Reservoir, schematic representation and efficiency, coefficients of performance. Limitations of first law of thermodynamics, Kelvin - Planck statement; PMM I and PMM II, Clausius statement, Equivalence of the two statements; Reversible and irreversible processes; factors that make a process irreversible, reversible heat engines, Carnot cycle, Carnot principles. Numericals	14
IV	**Entropy:** Clausius inequality; Statement, proof, application to a reversible cycle. Entropy, change of entropy, principle of increase in entropy, entropy as a quantitative test for irreversibility, Available and unavailable energy. **Pure Substances:** T-S, H-S and P-V diagrams, triple point and critical points. Sub cooled liquid, saturated liquid, mixture of saturated liquid and vapour, saturated vapour and superheated vapour states of pure substance with water as example. PVT diagram, Enthalpy of change of phase (Latent heat). Dryness fraction, representation of various processes of steam on these diagrams. Steam tables and its use. Separating and throttling calorimeter	14
V	**Thermodynamic Relationships:** Helmholtz and Gibbs functions, isothermal compressibility, Differential relations of internal energy, Maxwell's Relation, T-ds equations, Clapeyron equation, Joule Thomson's coefficients.	14

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Equation of state: Ideal gas equation of state, Real gas deviation with ideal gas, limitations of ideal gas equation, Vander waals equation, Evaluation of its Constants, Limitations of the equation.

Text Book/References Books/ Websites:

1. A.Venkatesh; Basic Engineering Thermodynamics; Universities Press.
2. P.K.Nag ; Basic and Applied Thermodynamics 2nd Ed.; Tata McGraw Hill Pub.
3. Arora and Domkundwar ; Thermodynamics; Dhanpat Prakashan
4. J.B.Jones and G.A.Hawkins ; Engineering Thermodynamics; John Wiley and Sons.
5. G.J.Van Wylen and R.E.Sonntag; Fundamentals of Classical Thermodynamics; Wiley Eastern.
6. Y.V.C.Rao; An Introduction to Thermodynamcis; Wiley Eastern.
7. B.K Venkanna, Swati B. Wadavadagi ; Basic Thermodynamics, PHI, New Delhi.

Suggested List of Laboratory Experiments :-(Expandable):

1. Study of Convergent / Divergent Nozzles.
2. To determine the flow rate using convergent nozzle.
3. Study of Cochran boiler
4. Study of Babcock and Wilcox Boiler
5. Numerical on vapour processes and ideal gas processes (minimum two problems on each)
6. Study of fuel pump
7. Study fuel injector
8. Study of Carburetor
9. Study of steam turbine.
10. To Study the Rankine Cycler Power Plant
11. Study of the processes of Heat Engine
12. To investigate the first law and Second law of thermodynamic using heat Engine

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		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
MET-1303	**Mechanics of Materials**	3	1	1			Min: 40 (D Grade)			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	Nil
Course Outcome	1. Apply knowledge of stress distributions to calculate stresses in structures under combined loading.
	2. Develop an understanding of normal and shear stress and strain.
	3. Ability to calculate stress and angular deflection of Torsionally-loaded structures.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction :** Mechanical Properties of Materials, Behavior of Materials Under Tension, Compression, Bending, Shear; Ductile and Brittle Materials& their Failure under Tension, Stress-Strain Diagram, Hooke's Law, Modulus of Elasticity, Stresses in the Components Subjected to axial Multi-loads, Deformation under Axial Loading, Analysis of Simple Structures, Stepped Rods, Members in Series and Parallel, Elastic and Plastic Behavior of Materials, Poisson's Ratio, Bulk Modulus, Shear Strain, Relation Among Elastic Constants, Residual Stress, Temperature Stresses, Factor of Safety.	**14**
II	**Principal Stresses and Strain:** Transformation of Stresses, Principal Stresses, Normal And Shear Stress, Torsion & Axial Loads, Mohr's Circle and its Application to Two and Three Dimensional Analysis, Principal Strains , Strain Energy. **Thin cylindrical shells:** hoop or circumferential stress, longitudinal stress, maximum shear stress, change in dimensions of thin cylindrical shell due to internal fluid pressure, thin cylindrical shell with hemispherical ends, spherical shells.	**14**
III	**Shear Force & Bending Moment:** Types of Beam & Support, Theory of Simple Bending, Bending Equation, Traverse Shear Stress Distribution in Circular, Hollow Circular, I &T Section, Shear Force And BM Diagram, Pure Bending, point of contra- flexure. **Deflection Of Beam:** Relation Between Slope, Deflection and Radius of Curvature, Solution of Beam Deflection (simply supported beam only), Problem by Macaulay's Method, Moment Area Method.	**14**
IV	**Torsion:** Deformation in Circular Shaft, Angle of Twist, Shafts Angular Deflection, Hollow and Stepped Circular Shaft. **Springs:** Types of spring, analysis of close coiled and open coiled helical springs, leaf spring, springs in series and parallel.	**14**
V	**Theories of Failures:** Maximum Normal Stress & Shear Stress Theory; Maximum Normal And Shear Strain Energy Theory; Maximum Distortion Energy Theory; Application of Theories to Different Materials And Loading Conditions **Columns and Struts:** Stability of Structures, Euler's Formula for Columns With Different End Conditions, and Rankin's Formula.	**14**

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Text Book/References Books/ Websites
1. Andrew Pytel, Fedrinand L.Singer; Strength of Material; Addison Wesley Longman Inc.
2. G.H.Ruder; Strength of Material; ELBS with Macmillan third edition.
3. B.K.Sarkar, Strength of Material ; Tata McGraw hill New Delhi.
4. Dr. R. K.Bansal; A Text Book strength of Material; Laxmi Publication New Delhi.
5. S Ramamrutham, Strength of Material; Dhanpat Rai & Publication New Delhi.
6. R.S.Khurmi; Strength of Material; S.Chand Company Ltd. Delhi.

Suggested List of Laboratory Experiments (Expandable):-
1. Study and demonstration of Universal Testing Machine & its attachments.
2. Drawing sheet on shear force & bending Moment diagrams for a given loading (At least four problems.).
3. Tension Test on mild steel, Aluminium & compression test on cast iron on UTM.
4. Direct Shear Test of mild steel on Universal Testing Machine.
5. Brinell Hardness Test on Mild Steel.
6. Rockwell hardness Test on Hardened Steel.
7. Izod & Charpy - Impact tests of a standard specimen.
8. Torsion Test on Mild steel bar.

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Subject Code	Subject Title	Credit			Theory			Practical		
MET-1304	**Material Science**	**L**	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
		3	1	1			Min: 40 (D Grade)			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	Nil
Course Outcome	1. Classify the materials and suggest testing methodologies for the characterization of different categories of materials.
	2. Understand the basic properties that characterize the behavior of materials.
	3. Select appropriate type of material for specific applications and engineering practice.

Unit	Contents (Theory)	Marks Weightage
I	**Structure of Materials:** and crystallization, electronic structure of atoms, Crystalline structure of solid: Concept of unit cell and space lattice, correlation of crystal structure , miller indices , defects in crystal, point line and surface, defects, Dislocations edge and core, burgers vectors, slip plane, ,material properties, super conductivity yielding and strain hardening. Baushinger effect, grain boundaries, grain growth, effect of grain size on properties of metals.	**14**
II	**Phase Diagrams:** Theory of alloying, phases in metals and alloys, solid solution, solidification of pure metals and alloys, ordered and disordered, substitution and interstitial solution. Hume Rothery's rules of substitution solid solution Phase diagrams of monotectic, eutectic, eutectoid, peritectic and peritectoid & other systems. Mechanical properties, binary equilibrium diagram, phase rule, lever rule.	**14**
III	**Heat treatment and surface treatment;** Introduction, purpose of heat treatment, effects of heat treatment on properties of materials, allotropy of iron, iron carbon phase diagram, T.T.T. diagrams, continuous cooling curves, classification, annealing normalizing, hardening, spheriodizing, tempering transformation during tempering austempering martempering, precipitation hardening, case carburizing, nitriding, cyaniding, carbonitriding, induction hardening, flame hardening, and hardenability.	**14**
IV	**Ceramics:** Introduction, nature, types & properties, mechanical behavior of ceramics, glass; their types properties& uses, abrasives, insulators, refractory; their properties & classifications, uses; refractory materials.	**14**
V	**Polymers:** Classifications & applications, molecular structure, polymerization, copolymers, cross linking of polymers deformation &behaviors of polymers, visco-elasticity	**14**

Text Book/References Books/ Websites:

1. K. Hazra Choudhury, Material Science & Processes.
2. O. P. Khanna, A Textbook of Material Science and Metallurgy.
3. William D Callister Jr, Material Science and Engineering, John Wiley and Sons, New York.
4. Raghavan V, Material Science and Engineering – A First Course, Prentice Hall of India, New Delhi.
5. Nayak S.P.,Metallurgy for engineering.
6. R.K.Jain , Production Technology, Khanna Publishers.

Suggested List of Laboratory Experiments:- (Expandable):

1. To study crystal structures of a given specimen.
2. To study crystal imperfections in a given specimen.
3. To study microstructures of metals/ alloys.
4. To study heat treatment processes (hardening and tempering) of steel specimen.
5. To study microstructure of heat-treated steel.
6. To study the creep behavior of a given specimen.
7. To study the mechanism of chemical corrosion and its protection.
8. To study the properties of various types of plastics.
9. To study Bravais lattices with the help of models.
10. To study crystal structures and crystals imperfections using ball models.

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

Duration of Theory (Externals): 4 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	Engineering Drawing.
Course Outcome	1. Student should be able to Use IS convention of representing various machine components.
	2. Interpret drawings and the assembly of a given set of details of machine components.
	3. Know the significance & use of tolerances of size, forms & positions.

Unit	Content (Theory)	Marks Weightage
I	**Drawing conventions**: drawing and dimensioning IS codes, Conventional representation of surface finish, Roughness number symbol, Symbols of Machine elements and welded joints. **Limits, Fits and Tolerances:** Nominal size and basic dimensions, Definitions, Basis of fit or limit system, Systems of specifying tolerances, Designation of holes, Shafts and fits, Commonly used holes and shafts. **Fasteners:** Drawings of various views of Screw threads, metric and BSW threads, Square thread and multi-start threads. Nut bolts, Washers, Setscrew, Locknuts and foundation bolts. **Riveted joints:** Forms and proportions of river heads, Different views of different types of riveted Lap and Butt joints.	14
II	**Drawings of various views (Sectioning) of Machine Elements:** Cotter joint, Knuckle joint, Muff and Flange coupling. Shaft bearing: Solid and bush bearing, Plummer block, Footstep bearing. **Pipe joint:** Flanged joint, Socket and Spigot joint.	14
III	**Assembly Machine Drawing:** Basic concept, plotting technique, assembly and blow up of parts, bill of materials, product data; Cotter and Knuckle joints, pedestal and footstep bearings, crosshead, stuffing box, IC engines parts - piston and connecting rods; lathe parts.	28
IV	**Basic design concepts**, design process, stages/phases in design, flowchart, problem formulation, design considerations (strength, manufacturing, maintenance, environment, economics and safety); design for recycle and reuse, Design and safety factors for steady and variable loads, impact and fatigue considerations, reliability and optimization, standardization in design. Introduction to Compute Aided Drafting software for 2D and 3D Modelling.	14

Text Book/References Books/ Websites:

1. N.D.Bhatt; Mechanical Drawing; Dhanpat Prakashan.
2. P.S.Gill; Mechanical Drawing; P.S.Gill S.K. Kataria & Sons.
3. K.L. Narayana, P. Kannaiah, k.V. Reddy; Machine Drawing; New Age Publications.
4. R.K.Dhawan ; Mechanical Drawing; S. Chand Publication.

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Suggested List of Laboratory Experiments:- (Expandable):

Prepare drawing sheets on following topics.
1. Types of line, and Dimensioning System.
2. Sheet of Tolerance Symbols, Positioning, Surface Finishing and Welding Symbols.
3. Use first angle method of projection, Orthographic projects (One Sheet containing atleast two problems and atleast four problems for home assignment).
4. Sectioning views: projects (One Sheet containing atleast two problems and atleast four problems for home assignment).
5. Conventional Representation as per SP – 46 (1988) - one sheet.
6. Details to Assembly: Draw sheets covering assembly drawing and its details for given machine parts.
7. One sheet of Gear terminology and construction of involutes gear profile.
8. Pipe fitting and pipe layout: C.I. and PVC.
9. Two problems on assembly drawings using any CAD Package.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total	External (35)	Internal (15)	Total (50)
BT-1306	C++ Programming	-	-	1			Nil			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: 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 concepts 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.
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	External (Nil)	Internal (Nil)	Total	External (Nil)	Internal (50)	Total (50)
BT-1307	**Professional Skills**	-	-	1			**Nil**			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	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.
   a) Your past experiences,
   b) Achievements,
   c) Failures,
   d) Feedback from others etc.

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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	External (Nil)	Internal (Nil)	Total	External (35)	Internal (15)	Total (50)
MET-1308	Mechanical Engineering Software Lab-I	-	-	1			Nil			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	Basic knowledge of software.
Course Outcome	1. Increase ability to communicate with people.
	2. Learn to sketch and take field dimensions.
	3. Learn to take data and transform it into graphic drawings.

Unit	Contents (Theory)	Marks Weightage
I	**Introduction to CAD** Introduction to Computer Aided Drafting software for 2D and 3D Modeling, benefit, software's basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array. • Practicing commands under Draw and Dimension Menu • Practicing commands under Modify Menu. • Practicing commands under Tool Menu. • Practicing commands under Format Menu. Practicing commands under Express Menu.	50

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):
Students should draw at least ten work sheets of machines parts by using AutoCAD command.

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