I B.TECH-II SEMESTER

DIFFERENTIAL EQUATIONS AND VECTORCALCULUS

(Common to All Branches)

Subject Code: 23BS2T01

L	T	P	C
3	0	0	3

Course Objectives:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them in to advanced level by handling various real-world applications.

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Solve the differential equations related to various engineering fields.
CO2: Identify solution methods for partial differential equations that model physical processes.
CO3: Interpret the physical meaning of different operators such as gradient, Curl and divergence.

CO4: Estimate the work done against a field, circulation and flux using vector calculus.

UNITI Differential Equations of First Order and First Degree

Linear differential equations – Bernoulli's equations- Exact equations and equations reducible to exact form. Applications: Orthogonal Trajectories Newton's Law of cooling – Law of natural growth and decay

UNITII Linear differential equations of higher order (Constant Coefficients)

Definitions, homogenous and non-homogenous, complimentary function, Particular integral, General solution, Wronskian, Method of variation of parameters,

Simultaneous linear equations, Applications to L-C-R Circuit problems.

UNITIII Partial Differential Equations

Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equations using Lagrange's method. Homogeneous Linear Partial differential equations with constant coefficients - Non homogeneous terms of the type e^{ax+by}, $\sin(ax+by)$, $\cos(ax+by)$

UNITIV Vector differentiation

Scalar and vector point functions, vector operator Del, Del applies to scalar point functions - Gradient, Directional derivative, del applied to vector point functions-Divergence and Curl, Solenoidal, Irrotational vectors, Scalar Potential Function - Vector identities.

UNITV Vector Integration

Line integral- circulation – work done, surface integral-flux, Green's theorem in the plane (with out proof), Stoke's theorem (with out proof), volume integral, Divergence theorem (with out proof) and related problems.

Text books:

1. **Higher Engineering Mathematics**, B.S.Grewal, KhannaPublishers,2017,44thEdition
2. **Advanced Engineering Mathematics**, Erwin Kreyszig, John Wiley & Sons, 2018,10thEdition.

Reference Books:

1. **Thomas Calculus**, George B.Thomas, Maurice D.Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
2. **Advanced Engineering Mathematics**, Dennis G.Zill and Warren S.Wright, Jones and Bartlett, 2018.

3. **Advanced Modern Engineering Mathematics**, Glyn James, Pearson publishers, 2018, 5th Edition.
4. **Advanced Engineering Mathematics**, R.K.Jain and S.R.K.Iyengar, Alpha Science International Ltd., 2021 5thEdition (9th reprint).
5. **Higher Engineering Mathematics**, B.V.Ramana, McGraw HillEducation,2017

ENGINEERING CHEMISTRY

(Common to Civil, Chemical and Mechanical Engineering)

Course code : 23BS2T04 (CE,ME)

Course Objectives:

- To familiarize engineering chemistry and its applications

To impart the concept of soft and hard waters, softening methods of hard water

To train the students on the principles and applications of electrochemistry, polymers, surface chemistry, and cement

Course Outcomes: At the end of the course, the students will be able to

Demonstrate the corrosion prevention methods and factors affecting corrosion.

- Explain the preparation, properties, and applications of thermoplastics & thermosetting, elastomers & conducting polymers.

Explain calorific values, octane number, refining of petroleum and cracking of oils.

- Explain the setting and hardening of cement.

Summarize the concepts of colloids, micelle and nanomaterials.

UNIT I Water Technology 12 Hours

Soft and hardwater, Estimation of hardness of water by EDTA Method,Estimation of dissolved Oxygen - Boiler troubles –Priming, foaming**,** scale and sludge, Caustic embrittlement, Industrial water treatment – Specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards, Ion-exchange processes - desalination of brackish water, Reverse osmosis (RO) and electrodialysis.

UNIT II Electrochemistry and Applications 12 Hours

Electrodes –electrochemical cell, Nernst equation, cell potential calculations.

Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad),and lithium ion batteries- working principle of the batteries including cell reactions; Fuel cells-Basic Concepts, the principle and working of hydrogen-oxygen Fuel cell.Corrosion: Introduction to corrosion, electrochemical theory of corrosion, differential aeration cell corrosion, galvanic corrosion, metal oxide formation by dry electrochemical corrosion, Pilling Bedworth ratios and uses, Factors affecting the corrosion**,** cathodic protection,and anodic protection, electroplating and electro less plating (Nickel and Copper).

UNIT III Polymers and Fuel Chemistry 12 Hours

Introduction to polymers, functionality of monomers, Mechanism of chain growth, step growth polymerization.

Thermoplastics and Thermo-setting plastics-: Preparation, properties and applications of poly styrene. PVC Nylon 6,6 and Bakelite.

Elastomers – Preparation, properties and applications of Buna S, Buna N, Thiokol rubbers.

Fuels – Types of fuels, calorific value of fuels, numerical problems based on calorific value; Analysis of coal (Proximate and Ultimate analysis), Liquid Fuels, refining of petroleum, Octane and Cetane number- alternative fuels- propane, methanol, ethanol and bio fuel-bio diesel.

UNIT IV Modern Engineering Materials 12 Hours

Composites- Definition, Constituents, Classification- Particle, Fibre and Structural reinforced composites, properties and Engineering applications

Refractories- Classification, Properties, Factors affecting the refractory materials and Applications.

Lubricants- Classification, Functions of lubricants, Mechanism, Properties of lubricating oils – Viscosity, Viscosity Index, Flash point, Fire point, Cloud point, saponification and Applications.

Building materials- Portland Cement, constituents, Setting and Hardening of cement.

UNIT V Surface Chemistry and Nanomaterials 12 Hours

Introduction to surface chemistry, colloids, nanometals and nanometal oxides, micelle formation, synthesis of colloids (Braggs Method), chemical and biological methods of preparation of nanometals and metal oxides, stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Longmuir), BET equation (no derivation) applications of colloids and nanomaterials – catalysis, medicine, sensors, etc.

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference Books:

1. H.F.W. Taylor, Cement Chemistry, 2/e, Thomas Telford Publications, 1997.
2. D.J. Shaw, Introduction to Colloids and Surface Chemistry, Butterworth-Heineman,1992.

BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to All branches of Engineering

I YEAR I SEM	**Course Code:23ES1T01** **(*for CSE & Allied Branches)*** **Course Code: 23ES2T01** **(*for CE, EEE, ME & ECE Branches)***	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

BASIC CIVIL AND MECHANICAL ENGINEERING
(Common to All branches of Engineering)

PART A: BASIC CIVIL ENGINEERING

Course Objectives:

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation'seconomy.
- Get familiarized with the importance of quality, conveyance and storage of water.

Introduction to basic civil engineering materials and construction techniques

course Outcomes: On completion of the course, the student should be able to:

CO1: Understand various sub-divisions of Civil Engineering and to appreciate their role inensuring better society.

CO2: Know the concepts of surveying and to understand the measurement of distances, anglesand levels through surveying.

CO3: Realize the importance of Transportation in nation's economy and the engineeringmeasures related to

Transportation.

CO4: Understand the importance of Water Storage and Conveyance Structures so that the socialresponsibilities of water conservation will be appreciated.

CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledgeon prefabricated technology.

UNIT I

Basics of Civil Engineering: Role of Civil Engineers in Society- Introduction to Civil Engineering Construction Materials-Cement - Aggregate - Bricks- Cement concrete- Steel- Bitumen-Building Planning & Construction Techniques-Introduction to Prefabricated Construction Techniques

UNIT II

Geotechnical Engineering: Introduction to Properties of soils- Permeability &Seepage- Shear strength-Compaction and Consolidation-Soil exploration-Shallow and Deep Foundations

Structural Engineering: Introduction to Different types of structures-Framed structures- Arches-Suspension bridges-Trusses, Reinforced Concrete Structures-Steel Structures-

Design philosophies-Prestressed concrete structures- Surveying: Introduction to Objectives of Surveying-Horizontal Measurements- AngularMeasurements- Bearings- Levelling- Instruments used for levelling -Contour mapping

UNIT III

Transportation Engineering Importance of Transportation in Nation's economic development-Introduction to Types of Highway Pavements- Flexible Pavements and Rigid Pavements - Simple Differences. Basics of Harbour, Tunnel, Airport, and Railway Engineering.

Water Resources and Environmental Engineering: Introduction to Sources of water- Hydrology–Rainwater Harvesting-Water Storage and Conveyance Structures.

Introduction to Qualityof water- Specifications- Treatment-Sewage-Disposal

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications(India) Pvt.Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers.2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, FirstEdition.

Reference Books:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers2019. FifthEdition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, KhannaPublishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, KhannaPublishers, Delhi 2023. 38th Edition.

4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan,Nemchand andBrothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART B: BASIC MECHANICAL ENGINEERING

Course Objectives: The students after completing the course are expected to

COB1: Get familiarize with the scope and importance of Mechanical Engineering in different sectors & industries.

COB2: Explain different engineering materials and different manufacturing processes.

COB3: Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

course Outcomes On completion of the course, the student should be able to

CO1: Understand the different manufacturing processes.

CO2: Explain the basics of thermal engineering and its applications.

CO3: Describe the working of different mechanical power transmission systems and power plants.

CO4: Describe the basics of robotics and its applications

UNIT I

UNIT I Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society-Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. Engineering Materials - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart materials

UNIT II

Thermal Engineering – Basic Laws of Thermodynamics, working principle of Boilers, Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles: Air Refrigeration and Vapour Compression Refrigeration-Working Principles only. Introduction to Pumps and Compressors (Basics, Classification and Applications only), IC engines, 2-Stroke and 4-Stroke engines, SI/CI Engines, Components of Electric and Hybrid Vehicles. Power plants – working principle of Steam, Diesel, Hydro, Nuclear and Combined Cycle power plants (Layout, Working)

UNIT III.

Manufacturing Processes: Principles of Casting, Forming, joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing.

Mechanical Power Transmission - Belt Drives, Chain, Rope drives, Gear Drives and their applications. Introduction to Robotics - Joints & links, configurations, and applications of robotics

(NOTE: The subject covers only the basic principles of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the fundamentals of the subject)

Textbooks:

1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

2. A Tear book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

Reference Books:

1. AppuuKuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

2. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications

3. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

4. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

I YEAR II SEM	Course Code : 23CE2T01	L	T	P	C
		3	0	0	3

ENGINEERING MECHANICS

(Common to CE & ME)

UNIT I

Introduction to Engineering Mechanics– Basic Concepts. Scope and Applications

Systems of Forces: Coplanar Concurrent Forces– Components in Space–Resultant–Moment of Force and its Application – Couples and Resultant of Force Systems.

Friction: Introduction**,** limiting friction and impending motion, Coulomb's laws of dry friction, coefficient of friction

UNIT II

Equilibrium of Systems of Forces: Free Body Diagrams, Lami's Theorm, Equations of Equilibrium of Coplanar Systems, Graphical method for the equilibrium, Triangle law of forces, converse of the law of polygon of forces condition of equilibrium, Equations of Equilibrium for Spatial System of forces, Numerical examples on spatial system of forces.

UNIT III

Centroid: Centroids of simple figures (from basic principles)–Centroids of Composite Figures.

Centre of Gravity: Centre of gravity of simple body (from basic principles), Centre of gravity of composite bodies, Pappus theorems.

Area Moments of Inertia: Definition– Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia.

Mass Moment of Inertia: Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia, Mass Moment of Inertia of composite bodies.

UNIT IV

Rectilinear and Curvilinear motion of a particle: Kinematics and Kinetics –D'Alembert's Principle - Work Energy method and applications to particle motion-Impulse Momentum method.

UNIT V

Rigid body Motion: Kinematics and Kinetics of translation, Rotation about fixed axis and plane motion, Work Energy method and Impulse Momentum method.

Text Books:

1. Engineering Mechanics, S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., , McGraw Hill Education 2017. 5th Edition.
2. Engineering Mechanics, P.C.Dumir- S.Sengupta and Srinivas V veeravalli , University press. 2020. First Edition.
3. A Textbook of Engineering Mechanics, S.S Bhavikatti. New age international publications 2018. 4th Edition.

Reference Books:

1. Engineering Mechanics, Statics and Dynamics, Rogers and M A. Nelson., McGraw Hill Education. 2017. First Edition.
2. Engineering Mechanics, Statics and Dynamics, I.H. Shames., PHI, 2002. 4th Edition.
3. Engineering Mechanics, Volume-I: Statics, Volume-II: Dynamics, J. L. Meriam and L. G. Kraige., John Wiley, 2008. 6th Edition.
4. Introduction to Statics and Dynamics, Basudev Battachatia, Oxford University Press, 2014. Second Edition
5. Engineering Mechanics: Statics and Dynamics, Hibbeler R.C., Pearson Education, Inc., New Delhi, 2022, 14th Edition

I YEAR I SEM / I YEAR II SEM	**Course Code : 23ES1T03** (*for CSE & Allied Branches)* **Course Code : 23ES2T03** (*for CE, EEE, ME & ECE Branches)*	**L**	**T**	**P**	**C**
		1	**0**	**4**	**3**

ENGINEERING GRAPHICS

UNIT I

Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions and constructing regular polygons by general methods only.

Curves: construction of ellipse, parabola and hyperbola by general method only, Cycloids, Involutes, Normal and tangent to Curves.

Scales: Plain scales, diagonal scales

UNIT II

Orthographic Projections: Reference plane, importance of reference lines or Plane, Projections of a point situated in any one of the four quadrants.

Projections of Straight Lines: Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane, inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes

Projections of Planes: regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.

UNIT III

Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane and Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.

UNIT IV

Basic Concept of Sections of Solids: Sections of Solids in simple positions (Cone, Prism, Pyramid)

Development of Surfaces: Methods of Development: Parallel line development and radial line development. Development of a cube, prism, cylinder, pyramid and cone.

UNIT V

Conversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.

Computer graphics: Creating 2D & 3D drawings of objects including PCB and Transformations using Auto CAD (**Not for end examination**).

Text Books:

1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

Reference Books:

1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc, 2009.
3. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill, 2017.

ENGINEERING CHEMISTRY LAB

(Common to Civil, Chemical and Mechanical Engineering**)**

Course code:23BS2L03 (CE, ME)

Course Objectives:

To Verify the fundamental concepts with experiments

Cours Outcomes: At the end of the course, the students will be able to

Determine the cell constant and conductance of solutions.

- Prepare advanced polymer materials.
- Determine the physical properties like surface tension, adsorption and viscosity.
- Estimate the Iron and Calcium in cement.
- Calculatethe hardness of water.

List of Experiments:

Determination of Hardness of a groundwater sample.

1. Estimation of Dissolved Oxygen by Winkler's method
2. Determination of Strength of an acid in Pb-Acid battery
3. Preparation of a polymer (Bakelite)
4. Determination of percentage of Iron in Cement sample by colorimetry
5. Estimation of Calcium in port land Cement
6. Preparation of nanomaterials by precipitation method.
7. Adsorption of acetic acid by charcoal
8. Determination of percentage Moisture content in a coal sample
9. Determination of Viscosity of lubricating oil by Redwood Viscometer 1
10. Determination of Viscosity of lubricating oil by Redwood Viscometer 2
11. Determination of Calorific value of gases by Junker's gas Calorimeter
12. Determination of $KMnO_4$ using standard oxalic acid solution.

14.Determination of alkalinity of a sample containing $Na_2CO_3$and $NaHCO_3$

15. Determination of copper using standard K2Cr2O7 Solution.

16.To determine the available chlorine in bleaching powder.

Reference:

- "Vogel's Quantitative Chemical Analysis 6th Edition 6th Edition" Pearson Publications by J. Mendham, R.C.Denney, J.D.Barnes and B. Sivasankar

I YEAR I SEM / I YEAR II SEM	**Course Code : 23ES1L02** **(***for CSE & Allied Branches)* **Course Code : 23ES2L02** **(***for CE, EEE, ME & ECE Branches)*	**L**	**T**	**P**	**C**
		0	**0**	**3**	**1.5**

ENGINEERING WORKSHOP

(Common to All branches of Engineering)

1. Demonstration: Safety practices and precautions to be observed in workshop.

2. Wood Working: Familiarity with different types of woods and tools used in wood working and make following joints:

a) Half – Lap joint b) Mortise and Tenon joint and c) Corner Dovetail joint or Bridle joint

3. Sheet Metal Working: Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal jobs from GI sheets:

a) Tapered tray b) Elbow pipe c) Brazing

4. Fitting: Familiarity with different types of tools used in fitting and do the following fitting exercises:

a) V-fit b) Semi-circular fit c) Bicycle tyre puncture and change of two-wheeler tyre.

5. Electrical Wiring: Familiarity with different types of basic electrical circuits and make the following connections:

a) Parallel and series b) Two-way switch c) Godown lighting d) Tube Light e) Soldering of wires

6. Foundry Trade: Demonstration and practice on Moulding tools and processes, Preparation of Green Sand Moulds for given Pattern.

7. Welding Shop: Demonstration and practice on Arc Welding and Gas welding. Preparation of Lap joint and Butt joint.

8. Plumbing: Demonstration and practice of Plumbing tools, Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters

Text Books:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019.

2. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.

3. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.

3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22

		0	**0**	**2**	**1**

IT WORKSHOP

(CE/EEE/ME/ECE)

Course Objectives:

- To introduce the internal parts of a computer, peripherals, I/O ports, connecting cables
- To demonstrate configuring the system as Dual boot both Windows and other Operating Systems Viz. Linux, BOSS
- To teach basic command line interface commands on Linux.
- To teach the usage of Internet for productivity and self-paced life-long learning
- To introduce Compression, Multimedia and Antivirus tools and Office Tools such as Word processors, Spread sheets and Presentation tools

Course Outcomes:

CO1: Perform Hardware troubleshooting.
CO2: Understand Hardware components and inter dependencies.
CO3: Safeguard computer systems from viruses/worms.
CO4: Document/ Presentation preparation. CO5: Perform calculations using spreadsheets

PC Hardware & Software Installation

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Task 3: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Task 4: Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot (VMWare) with both Windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Task 5: Every student should install BOSS on the computer. The system should be configured as dual boot (VMWare) with both Windows and BOSS. Lab instructors should verify the installation and follow it up with a Viva

Internet & World Wide Web

Task1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE

for applets should be configured.

Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

LaTeX and WORD

Task 1 – Word Orientation: The mentor needs to give an overview of La TeX and Microsoft (MS) office or equivalent (FOSS) tool word: Importance of La TeX and MS office or equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using La TeXand word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

Task 2: Using La TeX and Word to create a project certificate. Features to be covered:- Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both La TeX and Word.

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task 4: Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

EXCEL

Excel Orientation: The mentor needs to tell the importance of MS office or equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered: Gridlines, Format Cells, Summation, auto fill, Formatting Text

Task 2: Calculating GPA -. Features to be covered:- Cell Referencing, Formulae in excel – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function,

LOOKUP/VLOOKUP

Task 3: Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

POWER POINT

Task 1: Students will be working on basic power point utilities and tools which help them create basic power point presentations. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in PowerPoint.

Task 2: Interactive presentations - Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Task 3: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), and Inserting – Background, textures, Design Templates, Hidden slides.

AI TOOLS – ChatGPT

Task 1: Prompt Engineering: Experiment with different types of prompts to see how the model responds. Try asking questions, starting conversations, or even providing incomplete sentences to see how the model completes them.

- Ex: Prompt: "You are a knowledgeable AI. Please answer the following question: What is the capital of France?"

Task 2: Creative Writing: Use the model as a writing assistant. Provide the beginning of a story or a description of a scene, and let the model generate the rest of the content. This can be a fun way to brainstorm creative ideas

Ex: Prompt: "In a world where gravity suddenly stopped working, people started floating upwards.

Write a story about how society adapted to this new reality."

Task 3: Language Translation: Experiment with translation tasks by providing a sentence in one language and asking the model to translate it into another language. Compare the output to see how accurate and fluent the translations are.

Ex:Prompt: "Translate the following English sentence to French: 'Hello, how are you doing today?'"

Text Books:

Reference Books:

1. Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003

2. The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech, 2013, 3rd edition

3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education, 2012,

2nd edition

Reference Books:

4. PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft)

5. LaTeX Companion, Leslie Lamport, PHI/Pearson.

6. IT Essentials PC Hardware and Software Companion Guide, David Anfins on and Ken Quamme. – CISCO Press, Pearson Education, 3rd edition

7. IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3rd edition

I YEAR I SEM	Course Code : 23CE2L01	L	T	P	C
		0	0	3	1.5

Course Title: ENGINEERING MECHANICS & BUILDING PRACTICES LAB

Course Objectives: The students completing the course are expected to

- Verify the Law of Parallelogram of Forces and Lami's theorem.
- Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.
- Understand the layout of a building, concepts of Non-Destructive Testing and different Alternative Materials.

Course Outcomes: On completion of the course, the student should be able to:

CO1: Evaluate the coefficient of friction between two different surfaces and between the inclined plane and the roller.

CO2: Verify Law of Parallelogram of forces and Law of Moment using force polygon and bell crank lever.

CO3: Determine the Centre of gravity different configurations and

CO4: Understand the Quality Testing and Assessment Procedures and principles of Non-Destructive Testing.

CO5: Exposure to safety practices in the construction industry.

Students have to perform any 10 of the following Experiments:

1. To study various types of tools used in construction.
2. Forces in Pin Jointed Trusses
3. Experimental Proof of Lami's Theorem
4. Verification of Law of Parallelogram of Forces.
5. Determination of Center of Gravity of different shaped Plane Lamina.
6. Determination of coefficient of Static and Rolling Friction.
7. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever
8. Study of Alternative Materials like M-sand, Fly ash, Sea Sand etc.
9. Field-Visit to understand the Quality Testing - report.
10. Safety Practices in Construction industry
11. Demonstration of Non-Destructive Testing - using Rebound Hammer & UPV
12. Study of Plumbing in buildings.

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NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

(Common to All branches of Engineering)

23BS1L05((CSE,AIDS,AIML,CSE(AIML))

23BS2L05 (CE,EEE,MEC,ECE)

Course Objectives:

The objective of introducing this course is to impart discipline, character, fraternity, teamwork,social consciousness among the students and engaging them in selfless service.

Course Outcomes: After completion of the course the students will be able to

CO1: Understand the importance of discipline, character and service motto.

CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.

CO3: Explore human relationships by analyzing social problems.

CO4: Determine to extend their help for the fellow beings and downtrodden people.

CO5: Develop leadership skills and civic responsibilities.

UNIT I Orientation

General Orientation on NSS/NCC/ Scouts & Guides/Community Service activities, careerguidance.

Activities:

i) Conducting –ice breaking sessions-expectations from the course-knowing personaltalents and skills
ii) Conducting orientations programs for the students –future plans-activities-releasingroad map etc.
iii) Displaying success stories-motivational biopics- award winning movies on societalissues etc.
iv) Conducting talent show in singing patriotic songs-paintings- any other contribution.

UNIT II Nature & CareActivities:

i) Best out of waste competition.
ii) Poster and signs making competition to spread environmental awareness.
iii) Recycling and environmental pollution article writing competition.
iv) Organising Zero-waste day.
v) Digital Environmental awareness activity via various social media platforms.
vi) Virtual demonstration of different eco-friendly approaches for sustainable living.
vii) Write a summary on any book related to environmental issues.

UNIT III Community ServiceActivities:

i) Conducting One Day Special Camp in a village contacting village-area leaders- Survey in the village, identification of problems- helping them to solve via media- authorities-experts-etc.

ii) Conducting awareness programs on Health-related issues such as General Health,Mental health, Spiritual Health, HIV/AIDS,
iii) Conducting consumer Awareness. Explaining various legal provisions etc.
iv) Women Empowerment Programmes- Sexual Abuse, Adolescent Health and PopulationEducation.
v) Any other programmes in collaboration with local charities, NGOs etc.

Reference Books:

1. Nirmalya Kumar Sinha & Surajit Majumder, *A Text Book of National Service Scheme* Vol;.I, Vidya Kutir Publication, 2021 (ISBN 978-81-952368-8-6)
2. *Red Book - National Cadet Corps* – Standing Instructions Vol I & II, DirectorateGeneral of NCC, Ministry of Defence, New Delhi
3. Davis M. L. and Cornwell D. A., "Introduction to Environmental Engineering",McGraw Hill, New York 4/e 2008
4. Masters G. M., Joseph K. and Nagendran R. "Introduction to EnvironmentalEngineering and Science", Pearson Education, New Delhi. 2/e 2007
5. Ram Ahuja. *Social Problems in India*, Rawat Publications, New Delhi.

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities.
2. Institutes are required to provide instructor to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totalling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting vivavoce on the subject.

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