I B.TECH - I SEMESTER

LINEAR ALGEBRA & CALCULUS

(Common to All Branches of Engineering)

Subject code: 23BS1T01   **L   T   P   C**

                                                             3   0   0   3

CourseObjectives:-

- To equip the students with standard concepts and tools at an intermediate to advancedlevel mathematics to develop the confidence and ability among the students to handle various real-world problems and their applications.

CourseOutcomes:-

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

CO1:Develop and use of matrix algebra techniques that are needed by engineers for practical
applications.

CO2:Utilize mean value theorems to real life problems.

CO3: Familiarize with functions of several variables which is useful in
optimization.

CO4:Learn important tools of calculus in higher dimensions.

CO5:Familiarize with double and tripleintegralsof functionsof several variables
in two dimensions using Cartesian and polar coordinates and in three dimensions using
cylindrical and spherical coordinates.

UNITI:- Matrices

Linear Transformation, Rank of a matrix by echelon form, normal form.Cauchy–Binet formulae(withoutproof).InverseofNonsingularmatricesbyGaussJordanmethod,Systemoflineare quations:SolvingsystemofHomogeneous and Non-Homogeneous equations by Gauss elimination method,Gauss Seidel Iteration Method, Electrical Circuits(Application).

UNITII:-Eigen values,Eigen vectors and Orthogonal Transformation

Eigenvalues, Eigenvectors and their properties, Diagonalization of a matrix, Cayley-HamiltonTheorem(withoutproof),findinginverseandpowerofamatrixbyCayley-HamiltonTheorem,QuadraticformsandNatureoftheQuadraticForms,ReductionofQuadraticform tocanonicalformsby Orthogonal Transformation.

UNITIII:- Calculus

MeanValue Theorems:Rolle's Theorem,Lagrange's mean value theorem with their geometrical interpretation, Cauchy's mean value theorem, Taylor's and Maclaurin theorems with remainders(with out proof), Problemson the above theorems.

UNIT IV:- Partial differentiations and Applications(Multi variable calculus)

Functionsofseveralvariables:ContinuityandDifferentiability,Partialderivatives,totalderivatives, chainrule,Taylor'sandMaclaurin'sseriesexpansionoffunctionsoftwovariables.Jacobians,Functi onaldependence,maximaandminimaoffunctionsoftwo variables,methodofLagrangemultipliers.

UNIT V:- Multiple Integrals(Multi variable Calculus)
Double integrals, triple integrals, change of order of integration, change of variables to polar,cylindrical and spherical coordinates. Finding areas (by double integrals) and volumes (by double integrals and tripleintegrals)

Textbooks:-
1. **Higher Engineering Mathematics**,B.S.Grewal,KhannaPublishers,2017, 44th Edition
2. **AdvancedEngineeringMathematics**,ErwinKreyszig,JohnWiley&Sons,2018,10[th]Edition.

ReferenceBooks:-
1. **ThomasCalculus**,GeorgeB.Thomas,MauriceD.WeirandJoelHass,PearsonPublishers,20 18, 14[th]Edition.
2. **AdvancedEngineeringMathematics**,R.K.JainandS.R.K.Iyengar,AlphaScienceInternatio nalLtd.,2021 5[th]Edition(9th reprint).
3. **AdvancedModernEngineeringMathematics**,GlynJames,Pearsonpublishers,2018,5[th]Ed ition.
4. **AdvancedEngineeringMathematics**,MicheaelGreenberg,,Pearsonpublishers,9[th]editio n
5. **HigherEngineeringMathematics**,H.KDas,Er.RajnishVerma,S.ChandPublications,2014,T hird Edition (Reprint 2021)

L T   P C
3 0   0 3

CHEMISTRY
(Common to EEE, ECE, CSE, AIDS,AIML,CSE(AIML))

Course code : 23BS2T04 (EEE,ECE)
            23BS1T04(CSE,AIDS,AIML,CSE(AIML))

Course Objectives:

- To familiarize engineering chemistry and its applications

- To train the students on the principles and applications of electrochemistry and polymers

● To introduce instrumental methods, molecular machines and switches

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

● Compare the materials of construction for battery and electrochemical sensors.

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

● Explain the principles of spectrometry, slc in separation of solid and liquid mixtures.

● Apply the principle of Band diagrams in the application of conductors and semiconductors.

UNIT I Structure and Bonding Models: 12 Hours

Fundamentals of Quantum mechanics, Schrodinger Wave equation, significance of Ψ and Ψ^2, particle in one dimensional box, molecular orbital theory – bonding in homo- and heteronuclear diatomic molecules – energy level diagrams of O2 andCO, etc. π-molecular orbitals of butadiene and benzene, calculation of bond order.

UNIT II Modern Engineering materials   12 Hours

Semiconductors, band diagram in solids, Semiconductor devices (p-n junction diode as rectifier and transistors)
Super conductors-Introduction basic concept, applications.
Supercapacitors: Introduction, Basic Concept-Classification – Applications.
Nano materials: Introduction, classification, properties and applications of Fullerenes, carbon nano tubes and Graphines nanoparticles.

UNIT III Electrochemistry and Applications: 12 Hours

Electrochemical cell, Nernst equation, cell potential calculations and numerical problems, potentiometry-potentiometric titrations (redox titrations), concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations).
Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples
Primary cells – Zinc-air battery, Secondary cells –lithium-ion batteries- working of the batteries including cell reactions; Fuel cells, hydrogen-oxygenfuel cell– working of the cells. Polymer Electrolyte Membrane Fuel cells (PEMFC).

UNIT IV Polymer Chemistry   12 Hours

Introduction to polymers, functionality of monomers, chain growth and step growth polymerization, coordination polymerization, with specific examples and mechanisms of polymer formation.

Plastics –Thermoand Thermosetting plastics, Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres.
Elastomers–Buna-S, Buna-N–preparation, properties and applications.
Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications.Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA).

UNIT V Instrumental Methods and Applications   **12 Hours**

Electromagnetic spectrum. Absorption of radiation: Beer-Lambert's law. UV-Visible Spectroscopy, electronic transition, Instrumentation, IR spectroscopies, fundamental modes and selection rules, Instrumentation.Chromatography-Basic Principle, Classification-HPLC: Principle, Instrumentation and Applications.

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. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007. 2.
J.M.Lehn, Supra Molecular Chemistry, VCH Publications

I YEAR I SEM	**Course Code:23ES1T01** (*for CSE & Allied Branches*)	**L**	**T**	**P**	**C**
	Course Code: 23ES2T01 (*for CE, EEE, ME & ECE Branches*)	**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's economy.
•   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 in ensuring better society.

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

CO3: Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation.

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

CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledge on 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- Angular Measurements- 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, First Edition.

Reference Books:
1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. FifthEdition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, 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.

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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

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

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.

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publications (India) Pvt. Ltd.

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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.

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

I Year - I Semester	Code: 23ES1T04	L	T	P	C
		3	0	0	3

<p align="center">INTRODUCTION TO PROGRAMMING</p>

<p align="center">(CommontoAllbranchesofEngineering)</p>

Course Objectives:

- Tointroducestudentstothefundamentalsofcomputerprogramming.
- Toprovidehands-onexperiencewithcodinganddebugging.
- Tofosterlogicalthinkingandproblem-solvingskillsusing programming.
- Tofamiliarizestudentswithprogrammingconceptssuchasdatatypes,controlstructures,functions, and arrays.
- Toencouragecollaborativelearningandteamworkincoding projects.

Course Outcomes:

A studentafter completionofthecoursewillbeableto

CO1:Understand basics of computers, the concept of algorithm and algorithmic thinking.

CO2:Analyzeaproblemand develop analgorithmto solveit.

CO3:Implement various algorithms using the C programming language.

CO4:Understand more advanced featuresof Clanguage.

CO5:Developproblem-solvingskillsandtheabilitytodebugandoptimizethecode

UNIT-I: Introduction toProgrammingand ProblemSolving:Computer System: History of Computers Introduction to Components of Computer System, compilation andexecution, Program Counter

Basics of a Computer Program-.Programming Languages and History of C, Basics Structure of a Compute Program, Software Development Process:Characteristics Algorithm, Flowchart,PseudoCode, Header file, Errors i compilation time, PrimitiveDataTypes,Formatted I/O's, Format Modifiers.Variable Rules, Keywords, Constants String and Operators. Type Conversions, Priority Table

Problemsolving strategies: Top-down and Bottom-up approach, Time and space complexities.

UNIT -II: Control Structures(Flow of Controls):

Decision Branching Statement (Selection): **Two-way selection**: if, if-else,nested if

Multi-way selection: switch, else-if ladder

Decision Looping Statement (Repetition/Iterative): while (Pretest/Condition-Controlled Loops) and do-while (Posttest) Loops, for loop (CounterControlled) and Unconditional statements, Nested Loops

UNIT-III Arrays & Pointers:

Arrays: Arrays definition and indexing, Types of Arrays

One-Dimensional Arrays: Initialization, declaration and accessing, input and output of array

Two-Dimensional Arrays: Initialization, declaration, accessing, input and output of array

Case Study: Matrices, Larger Dimensional Arrays

Pointers: Concept of a pointer, Initialization of pointer variables and access, Pointe[r] dereferencingandaddressoperators, arraymanipulationusing pointers,Dynamic Memory Managemen[t] functions,pointers to pointers, command line arguments

UNIT-IV: Functions &**Strings**:

Functions: Definition of Function, Categorization of User define functions, Local,Global variables and Actual an[d] Formal parameters, Scope life time variables, pass by value and reference, Recursive function

Case Study: Factorial, Fibonacci Series, Basics of Sorting/and Searching

Strings: Introductionto String**,** String Handling Functions

UNIT-V: UserDefinedData Types&FileHandling:

UserDefinedData Types: Structures: declaration, Initialization, accessing,nested structures, self-referentia[l] structure, structures to array, pointer and functions, Union,typedef and enum

FileHandling: Basics ofFileHandling (only if time is available, otherwise should be done as part of the lab).

Note: ThesyllabusisdesignedwithCLanguageasthefundamentallanguageofimplementation**.**

Text Books:

1. TheCProgrammingLanguage",BrianW.KernighanandDennisM.Ritchie,Prentice-Hall,
Second Edition 2015.

2. Schaum'sOutlineofProgrammingwithC,ByronSGottfried,McGraw-Hill, Second Edition.

3. Problem Solving and Programming in C by RS Salaria, Khanna Book Publishing, Fifth Edition.

Reference Books:

1.ComputingfundamentalsandCProgramming,E Balagurusamy, McGraw-HillEducation.

2. ProgramminginC,RemaTheraja, Oxford,2016,2nd edition

3. C Programming-A Problem Solving Approach, Forouzan, Gilberg, Cengage

4. C Programming- A Beginners Guide by Prof. Mangesh, Dr. D R Shashirag, Prof. Bodapati Narasimha Rao,Prof. B P N Madhu Kumar.

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0 0 2 1

CHEMISTRY LAB
(Common to EEE, ECE, CSE& Allied, IT)

Course code : 23BS2L03 (EEE,ECE)
             23BS1L03(CSE,AIDS,AIML,CAE(AIML))

Course Objectives:

● Verify the fundamental concepts with experiments.

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

● Determine the cell constant and conductance of solutions.

● Prepare advanced polymer Bakelite materials.

● Measure the strength of an acid present in secondary batteries.

● Analyzethe IR spectra of some organic compounds.

List of Experiments:

1. Measurement of 10Dq by spectrophotometric method
2. Conductometrictitration of strong acid vs. strong base
3. Conductometrictitration of weak acid vs. strong base
4. Determination of cell constant and conductance of solutions
5. Potentiometry - determination of redox potentials and emfs
6. Determination of Strength of an acid in Pb-Acid battery
7. Preparation of a Bakelite
8. Verify Lambert-Beer's law
9. Wavelength measurement of sample through UV-Visible Spectroscopy 10. Identification of simple organic compounds by IR
11. Preparation of nanomaterials by precipitation method
12. Estimation of Ferrous Iron by Dichrometry
13. 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 /	**Course Code : 23ES1L02** (*for CSE & Allied Branches*)	**L**	**T**	**P**	**C**
I YEAR II SEM	**Course Code : 23ES2L02** (*for CE, EEE, ME & ECE Branches*)	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

I Year - I Semester	Code: 23ES1L03	L	T	P	C
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<div align="center">

IT WORKSHOP
(Common to CSE/CSE(AI&DS)/ CSE(AIML)/AIML)

</div>

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 isno 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 LaTeX 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

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COMPUTER PROGRAMMING LAB

(CommontoAllbranches)

e Objectives:
ourseaimstogivestudentshands–onexperienceandtrainthemontheconceptsoftheC-programming language.

e Outcomes:
Read, understand, and trace the execution of programs written in C language.
Select theright control structureforsolvingthe problem.
DevelopCprogramswhichutilizememoryefficientlyusingprogrammingconstructslikepointers.
Develop,DebugandExecuteprogramstodemonstrate theapplicationsofarrays,functions,basic conceptsof pointers in C.

T I
EK 1:
ctive: Gettingfamiliarwiththeprogrammingenvironmentonthecomputerandwritingthefirst program.
stedExperiments/Activities:

rial1: Problem-solvingusingComputers.
:Familiarizationwith programmingenvironment
BasicLinuxenvironmentand itseditorslikeVi, Vim&Emacsetc.
) Exposureto TurboC, gcc
i) Writingsimpleprogramsusingprintf(),scanf()

2:
ctive: Gettingfamiliarwithhowtoformallydescribeasolutiontoaprobleminaseriesoffinite steps both using textual notation raphic notation.

rial2: Problem-solvingusingAlgorithmsandFlowcharts.

2:ConvertingalgorithmsflowchartsintoCSourcecode.

lopingthealgorithmsflowchartsforthefollowingsampleprograms

  Sumand averageof 3numbers

) ConversionofFahrenheitto Celsiusandviceversa

i) Simpleinterestcalculation

3:

ctive:Learnhowtodefine variableswiththedesireddata-type,initialize themwithappropriatevaluesandhow arithmeticoperatorsca

edwithvariablesandconstants.

rial3: Variabletypesandtypeconversions:

3:Simplecomputationalproblemsusingarithmeticexpressions.

  Findingthesquare rootofagivennumber

) Findingcompoundinterest

i) Areaofatriangleusing heron'sformulae

') Distancetravelledbyan object

T II

EK 4:

ctive: Explore the full scope of expressions, type-compatibility of variables & constantsandoperators used in the expression

operator precedenceworks.

rial 4: Operatorsandtheprecedenceandasassociatively:

:Simplecomputationalproblemsusingtheoperator'precedenceandassociativity

  Evaluatethefollowingexpressions.

  a. A+B*C+(D*E)+F*G

  b. A/B*C-B+A*D/3

  c.A+++B---A

  d.J=(i++) +(++i)

) Findthemaximumofthreenumbersusingconditionaloperator

i) Takemarksof5subjectsinintegers, andfindthe total,averagein float

5:

ctive: Explore the full scope of different variants of "if construct" namely if-else, null-else, if-else if*-else, switch and neste

ding   in   what   scenario   each   one   of   them

edandhowtousethem.Exploreallrelationalandlogicaloperatorswhilewritingconditionalsfor"if construct".

rial5: Branchingandlogicalexpressions:

5:Problemsinvolvingif-then-elsestructures.

  WriteaCprogram to findthemaxand min offour numbersusing if-else.

) WriteaCprogramtogenerate electricitybill.

i) Findtherootsofthequadraticequation.

') WriteaCprogramtosimulate acalculatorusingswitchcase.

) WriteaC programtofind thegivenyear isaleapyearornot.

6:

ctive: Explorethefullscopeofiterativeconstructsnamelywhileloop,do-whileloopand

opinadditiontostructuredjumpconstructslikebreakandcontinueincludingwheneachofthesestatements is moreappropriate to use

rial6: Loops,while andforloops
:Iterativeproblemse.g.,thesumofseries
   Findthefactorialof givennumberusingany loop.
) Findthegivennumber isaprimeor not.
i) Computesineandcosseries
) Checkinganumberpalindrome
) Constructapyramidofnumbers.

T III
K 7:
ctive: Explore the full scope of Arrays construct namely defining and initializing 1-Dand 2-D and more generically n-D ar
eferencing individual array elements from thedefinedarray. Usinginteger 1-Darrays,exploresearchsolution linear search.

rial7:1DArrays: searching.

:1DArraymanipulation,linearsearch
   Findtheminand maxofa 1-Dintegerarray.
) Performlinearsearchon1Darray.
i) Thereverseofa1D integerarray
) Find2's complementofthegivenbinary number.
) Eliminateduplicateelementsinanarray.

8:
ctive: Explore the difference between other arrays and character arrays that can be usedas Strings by using null character
omfortable with string by doing experiments thatwill reverse a string and concatenate two strings. Explore sorting solu
le sort usingintegerarrays.

rial8:2D arrays,sorting
:Matrix problems,Stringoperations, Bubblesort
   Additionoftwomatrices
) Multiplicationtwomatrices
i) Sortarrayelementsusingbubblesort
K 9:
ctive: Explore   pointers   tomanage   a   dynamic   arrayof   integ
dingmemoryallocation&valueinitialization,resizingchangingandreorderingthecontentsofanarray

memoryde-allocationusingmalloc(),calloc(),realloc()andfree()functions.Gainexperienceprocessing command-linearguments
ved by C

rial9: Pointersanddynamicmemoryallocation
:Pointersandmemorydereference.
   WriteaCprogram to findthesum ofa1D arrayusing malloc ()
) Enternstudents datausingcalloc () anddisplayfailed studentslist
i) WriteaCprogramtoimplement realloc ()

V
K 10:

ctive: ExploretheFunctions,sub-
nes,scopeandextentofvariables,doingsomeexperimentsbyparameterpassingusingcallbyvalue.Basicmethodsofnumericalintegra

stedExperiments/Activities:

rial10: Functions,callbyvalue,scopeandextent,
0:Simplefunctionsusingcallbyvalue,solvingdifferentialequationsusingEulerstheorem.
Concatenatetwostringswithoutbuilt-infunctions
) Reverseastring using built-inand without built-instring functions
i) WriteaCfunction to find the length of astring.
) WriteaC function totranspose ofamatrix.
) WriteaCfunctiontodemonstratenumericalintegrationofdifferentialequationsusingEuler'smethod

11:

ctive: Explorehowrecursivesolutionscanbeprogrammedbywritingrecursivefunctionsthat can be invoked from the main
ramming at-least five distinct problems that havenaturallyrecursivesolutions.

estedExperiments/Activities:

rial11: Recursion,recursive calls
1:Recursivefunctions
WritearecursivefunctiontogenerateFibonacciseries.
) Writearecursivefunction to find thelcm oftwo numbers.
i) Writearecursivefunction to find thefactorial of a number.
) WriteaC Programto implement Ackermannfunction using recursion.
) Writearecursivefunction tofind thesum of series.

12:

ctive: Explore the basic difference between normal and pointer variables, Arithmeticoperationsusing pointersand passing
blestofunctionsusing pointers

stedExperiments/Activities:

rial12: Callbyreference,danglingpointers
2:SimplefunctionsusingCallbyreference, Danglingpointers.
WriteaC programto swaptwonumbers usingcall byreference.
) DemonstrateDanglingpointerproblemusingaCprogram.
i) WriteaC programto copy onestring into anotherusingpointer.
) WriteaCprogramtofindnooflowercase,uppercase,digitsandothercharactersusing pointers.

T V

13:

ctive: ExperimentwithCStructures,Unions,bitfieldsandself-referentialstructures(Singlylinked lists) andnested structures

stedExperiments/Activities:

rial13: Structure,Bitfields,Self-ReferentialStructures,Linkedlists
3:Structure, Self-ReferentialStructures, Bitfields,linkedlists
andprintadateusingdd/mm/yyyyformatusingbit-fieldsanddifferentiatethesamewithout usingbit-fields
WriteaCprogramto findthetotal,averageofnstudentsusing structures
) Readstudentnameandmarksfromthecommandlineanddisplay thestudentdetails alongwith thetotal.
i) Createanddisplayasinglylinkedlistusingself-referentialstructure.
) DemonstratethedifferencesbetweenstructuresandunionsusingaCprogram.
) WriteaCprogram toshift/rotate usingbitfields.
i) WriteaCprogram to copyonestructurevariable to anotherstructureof thesame type.

14:

ctive: To understand data files and file handling with various file I/O functions. Explore the differences between text and binary files.

stedExperiments/Activities:

rial14: File handling

4: File operations

WriteaC program to write and read text into a file.
) WriteaCprogram to write and read text into a binary file using fread() and fwrite()
i) Copy the contents of one file to another file.
') WriteaCprogram to merge two files into the third file using command-line arguments.
) Find no. of lines, words and characters in a file
i) WriteaCprogram to print last n characters of a given file.

ooks:

. ProgramminginC - Apracticalapproach by AjayMittal, Pearson Education, First Edition.
. Schaum's OutlineofProgrammingwith C by ByronS. Gottfried, McGrawHill, Second Edition.

ence Books:

ianW.KernighanandDennisM.Ritchie,TheCProgrammingLanguage,Prentice-HallofIndia
Programming,AProblem-SolvingApproach,Forouzan,Gilberg,Prasad,CENGAGE

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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, career guidance.

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 societal issues etc.
iv) Conducting talent show in singing patriotic songs-paintings- any other contribution.

UNIT II   Nature & Care
Activities:

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 Service
Activities:

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, Directorate General 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 Environmental Engineering 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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