R24

SCHEMEOFINSTRUCTION&EXAMINATION
B.E (Group A- IT, CSE(AI), CSE(AI&ML),CSE(DS) ECE, ETE, ME,CE) SEMESTER-I

S. No.	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hrs/Wk	CIE	SEE	Duration in Hrs	
Theory Courses										
Three Week Induction Program										
1	MC801PO	Indian Constitution	2	-	-	2	30	70	3	-
2	BS201MT	Matrices & Differential Calculus	3	1	-	4	30	70	3	4
3	BS202PH	Engineering Physics	3	1	-	4	30	70	3	4
4	ES302CS	Programming for Problem Solving	3	-	-	3	30	70	3	3
5	ES301EE	Basic Electrical Engineering	3	1	-	4	30	70	3	4
Practical/Laboratory Courses										
6	BS251PH	Engineering Physics Lab	-	-	3	3	25	50	3	1.5
7	ES351CS	Programming for Problem Solving Lab	-	-	3	3	25	50	3	1.5
8	ES353CE	Engineering Graphics	-	-	2x2	4	50	50	3	2
9	ES354EE	Basic Electrical Engineering Lab	-	-	2	2	25	50	3	1
Total			**14**	**3**	**12**	**29**	**275**	**550**	**27**	**21**

B.E (Group A- IT, CSE(AI), CSE(AI&ML), CSE(DS) ECE, ETE, ME,CE) SEMESTER-II

S. No.	Course Code	Course Title	Scheme of Instruction				Scheme of Examination			Credits
			L	T	D/P	Contact Hrs/Wk	CIE	SEE	Duration in Hrs	
Theory Courses										
1	MC802CE	Environmental Sciences	2	-	-	2	30	70	3	-
2	MC803PY	Essence of Indian Traditional Knowledge	2	-	-	2	30	70	3	-
3	HS101EG	English	2	-	-	2	30	70	3	2
4	BS204CH	Engineering Chemistry	3	1	-	4	30	70	3	4
5	BS203MT	Differential Equations &Numerical Methods	3	1	-	4	30	70	3	4
6	ES303CS	Scientific Programming	3	-	-	3	30	70	3	3
Practical/Laboratory Courses										
7	HS151EG	English Lab	-	-	2	2	25	50	3	1
8	BS252CH	Engineering Chemistry Lab	-	-	3	3	25	50	3	1.5
9	ES352ME	Engineering Workshop Practice	-	-	2x3	6	50	50	3	3
10	ES353CS	Scientific Programming Lab	-	-	2	2	25	50	3	1
Total			**15**	**2**	**13**	**30**	**305**	**620**	**30**	**19.5**

BS: Basic Science ES: Engineering Science MC: Mandatory Course
L: Lecture T: Tutorial P: Practical D: Drawing
CIE: Continuous Internal Evaluation SEE: Semester End Evaluation

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INDIAN CONSTITUTION

MC 801 PO

Instruction: 2 periods per week *Duration of SEE: 3 hours*
CIE: 30 marks *SEE: 70 marks*
Credits: 0

Objectives:

1. To create awareness among students about the Indian Constitution.
2.To acquaint the working conditions of union, state, local levels, their powers and functions
3. To create consciousness in the students on democratic values and principles articulated in the constitution.
4.To expose the students on the relations between federal and provincial units.
5.To divulge the students about the statutory institutions.

Outcomes: Student will be able to:

1. Know the background of the present constitution of India
2.Understand the working of the union, state and local levels
3.Gain consciousness on the fundamental rights and duties
4.Be able to understand the functioning and distribution of financial resources between the centre and states
5.Be exposed to the reality of hierarchical Indian social structure and the ways the grievances of the deprived sections can be addressed to raise human dignity in a democratic way.

UNIT – I
Evolution of the Indian Constitution: 1909 Act, 1919 Act and 1935 Act. Constituent Assembly: Composition and Functions; Fundamental features of the Indian Constitution
UNIT – II
Union Government: Executive-President, Prime Minister, Council of Minister ***State Government***: Executive: Governor, Chief Minister, Council of Minister ***Local Government***: Panchayat Raj Institutions, Urban Government
UNIT – III
Rights and Duties: Fundamental Rights, Directive principles, Fundamental Duties
UNIT – IV
Relation between Federal and Provincial units: Union-State relations, Administrative, legislative and Financial, Inter State council, NITI Ayog, Finance Commission of India.
UNIT – V
Statutory Institutions: Elections-Election Commission of India, National Human Rights Commission, National Commission for Women.

Suggested Readings:

1	Durga Das Basu, "*Introduction to the Constitution of India*", Lexis Nexis Butterworths Wadhwa Nagpur, 2008
2	Subhash Kashyap, "*Our Parliament*", National Book Trust, India, 2004.
3	Peu Ghosh, "*Indian Government and Politics*", Prentice Hall of India, New Delhi,2012.

BE I-Semester syllabus for affiliated engineering colleges of Osmania University
(wef: academic year 2024-2025)
Common to all branches
MATRICES &DIFFERENTIAL CALCULUS

BS201MT	MATRICES &DIFFERENTIAL CALCULUS	3L:1T:0P	4 credits

Course objectives:

- To study matrix algebra and its use in solving system of linear equations and in solving eigen values problems
- To introduce the concepts of functions of one variable
- To introduce the concepts of functions of several variables
- To introduce and Interpret Multiple Integrals
- To Understand Vector Derivatives, Vector Integration techniques to solve real-world problems.

Outcomes :After completing this course, the students will be

- Solve system of linear equations and eigen value problems
- Understand and Apply Mean value theorems
- Understand partial derivatives, Maxima and minima of function of two and three variables
- Evaluate multiple integrals
- Analyze and Interpret Vector Derivatives& Vector Integration to Real-World Problems

UNIT-I

Matrices: Rank of a matrix, Echelon form, System of linear equations, Linearly dependence and independence of vectors, Linear transformation, Orthogonal transformation, Eigen values, Eigen vectors, Properties of eigen values, Cayley-Hamilton theorem(without proof), Reduction of quadratic form to canonical form by orthogonal transformation, Nature of quadratic forms.

UNIT-II

Calculus of one Variable: Rolle's theorem, Lagrange's Mean-value theorem, Cauchy's mean value theorem, Taylor's series(All theorems without proof), Curvature, Radius of Curvature, Circle of Curvature, Envelope of a family of curves.

UNIT-III

Multivariable Calculus (Differentiation): Functions of two variables, Limits and Continuity, Partial derivatives, Total derivative, Derivatives of composite and implicit functions (Chain rule), Change of variables, Jacobians, Higher order partial derivatives, Taylor's series of functions of two variables, Maximum and minimum of values of functions of two variables, Lagrange's method of undetermined multipliers.

UNIT-IV

Multivariable Calculus(Integration): Double integrals, Change of order of integration, Change of variables from Cartesian to plane polar coordinates, Triple integrals.

UNIT-V

Vector calculus: Scalar and vector fields, Gradient of a scalar field, Directional derivative, Divergence and Curl of a vector field, Line, Surface and Volume integrals, Green's theorem in a plane, Gauss's divergence theorem, Stoke's theorem(without proofs) and their verification.

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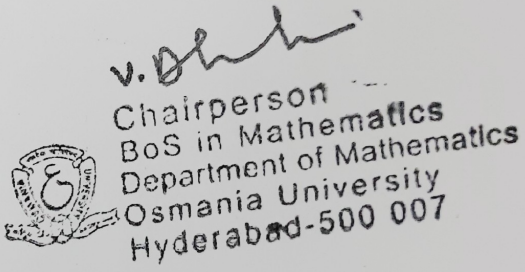
TEXT BOOKS:

1. R.K.Jain&S.R.K.Iyengar, Advanced Engineering Mathematics, Narosa Publications, 2014.
2. B.S.Grewal, Higher Engineering Mathematics, Khanna Publications, 43rd Edition, 2014.

REFERENCE BOOKS:

1. N.P.Bali&Dr.ManishGoyal, A textbook of Engineering Mathematics (Volume I), 10th Edition, Laxmi Publications, 2022.
2. B.V.Ramana, Higher Engineering Mathematics, 23rd edition, 2015.



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Engineering Physics Syllabus for Osmania University Affiliated Engineering Colleges
B.E (SEM–I & II) AICTE
Academic Year 2024-2025 onwards (Common to All Branches)

CourseCode: BS202PH	CourseTitle : Physics						Core/Elective: Core
Prerequisite	ContactHoursper Week				CIE	SEE	Credits
	L	T	D	P			
	3	1	-	-	30	70	04

Course objectives

- Understand the Fundamental Principles and Applications of Lasers, Fiber Optics & Ultrasonics
- Explore Semiconductor Physics and Electromagnetic Theory
- Analyze Magnetic Materials and Superconductors
- Investigate Wave Mechanics and Quantum Computation
- Explore Nano Materials and Thin Film Technologies

Course outcomes

Upon successful completion of the course student will able to:

- Understand and apply the principles of lasers, fiber optics & ultrasonics, including their construction, types, and engineering applications.
- Gain thorough knowledge of semiconductor physics, including key devices and energy harvesting technologies, and understand fundamental electromagnetic theory.
- Analyze magnetic materials and superconductors, including their properties, theories, and technological applications.
- Grasp wave mechanics concepts and quantum computing fundamentals, including quantum gates and their practical applications.
- Explore nano materials and thin film technologies, including preparation methods, characterization techniques, and their engineering uses.

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UNIT I

Lasers, Fiber Optics & Ultrasonics

Characteristics of Lasers, Stimulated Emission, Population Inversion, Einstein's Coefficients, CO2 Laser, Semiconductor Laser, working of Laser Induced Breakdown Spectroscopy (LIBS) Instrument, Engineering Applications of Lasers.

Construction of Optical Fiber, Types of Optical Fibers (Refractive Index Profiles), Fiber Drawing Process (Double Crucible Method), Basic Principles of Fiber Optics Sensors, Construction and Working of Pressure Sensors, Applications of Optical Fibers in Engineering.

Introduction to Ultrasonic Waves, Production of Ultrasonic Waves - Magnetostriction Method, Ultrasonic Pulse-Echo Testing Method, Engineering Applications of Ultrasonics.

UNIT II

Semiconductor Physics and EM Theory

Types of Semiconductors, Direct and Indirect Bandgap Semiconductors, Hall Effect, Construction and Working of Quantum Light Emitting Diodes (QLEDs) & Solar Cells, Applications of Semiconductor Devices, Concept of Harvesting Energy Devices (Piezoelectric Generators, Thermoelectric Generators), Properties and Advantages of Graphene.

Basic Laws of Electricity and Magnetism, Displacement Current, Maxwell's Equations, Expression for Maxwell's Integral to Differential Equations, Poynting Theorem.

UNIT III

Magnetic Materials & Superconductors

Types of Magnetic Materials, Weiss Molecular Field Theory, Magnetic Domains, Hysteresis Curve, Soft and Hard Magnetic Materials, Magneto-Resistance Materials (CMR & GMR), Applications of Magnetic Materials.

Superconductors, Properties of Superconductors, Meissner Effect, Type I and Type II Superconductors, BCS Theory (Qualitative), High-Tc Superconductors, Applications of Superconductors.

UNIT IV

Wave Mechanics & Quantum Computation

Matter Waves, de-Broglie Wavelength, Physical Significance of Wave Function, Schrödinger Time-Independent Wave Equation, Energy of Particle in 1-D Potential Box, Kronig-Penney Model (Qualitative).

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Introduction to Quantum Computing, Idea of Classical Bits and Qubits, Basics of Quantum Gates (Hadamard, CNOT), Comments on No-Cloning Theorem, Basic Idea of Quantum Teleportation, Applications of Quantum Computing.

UNIT V

Nano Materials & Thin Films

Introduction, Properties of Materials at Reduced Size, Surface-to-Volume Ratio at Nano Scale, Classification of Nano Materials, Preparation Techniques: Bottom-Up Method (Sol-Gel), Top-Down Methods (Ball Milling), Principles of Characterization Techniques (X-ray Diffraction, Scanning Electron Microscope, Transmission Electron Microscope), Applications of Nano Materials.

Distinction between Bulk and Thin Films, Thin Film Preparation Techniques: Thermal Evaporation Method, Electron Beam Evaporation Method, Applications of Thin Films.

PRESCRIBED BOOKS

1. Modern Engineering physics-I &II : S. Chandralingam, K. Vijayakumar, S Chand Co.
2. Engineering Physics: P.K.Palanisamy, Scitech Publishers.
3. Engineering Physics: S.O.Pillai, New age International.
4. Nielsen M. A., I. L Chung, Quantum Computation & Quantum Information, Cambridge Univ. Press
5. Thin Film Fundamentals, A. Goswami , New Age International New Delhi
6. Nano Materilas, A.K. Bandyopadhyay, Newagepublishers

REFERENCE BOOKS

1. Solid State Physics: Charles Kittel, Wiley & Sons (Asia) Pvt. Ltd.
2. Fundamentals of physics:Halliday,Resnick,Walker.
3. Engineering Physics – By V Rajendran, McGraw Hill Edn.
4. Solar Photovoltaics – Fundamentals, Technologies and Applications 3rd Edition, PHI
5. Principles of Quantum computation and Information – By G. Benenti, G. Casati, G. Strini, World scientific.

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ES 302 CS	PROGRAMMING FOR PROBLEM SOLVING					
Pre-requisites			**L**	**T**	**P**	**C**
			3	-	-	3
Evaluation	**SEE**	70 Marks	**CIE**		30 Marks	

Course Objectives :	
1	To introduce the basic concepts of Computing environment, number systems and flowcharts
2	To familiarize the basic constructs of C language – data types , operators and expressions
3	To understand modular and structured programming constructs in C
4	To learn the usage of structured data types and memory management using pointers
5	To learn the concepts of data handling using files

Course Outcomes :	
On completion of this course, the student will be able to :	
CO-1	Explain various functional components in computing environment
CO-2	Develop algorithmic solutions to problems and draw the flow charts
CO-3	Explain and use basic constructs of C in writing simple programs
CO-4	Use standard library functions in C and develop modular programs using user defined functions and structured data types

UNIT – I

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flow charts. **Number Systems**: Binary, Octal, Decimal, And Hexadecimal.

Introduction to C Language - Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output Statements

Arithmetic Operators and Expressions: Evaluating Expressions, Precedence and Associativity of Operators, Type Conversions.

UNIT – II

Conditional Control Statements: Bitwise Operators, Relational and Logical Operators, If, If-Else, Switch-Statement and Examples. Loop Control Statements: For, While, Do-While and Examples. Continue, Break and Go to statements

Functions: Function Basics, User-defined Functions, Inter Function Communication, Standard Functions, Methods of Parameter Passing. **Recursion-** Recursive Functions. **Storage Classes:** Auto, Register, Static, Extern, Scope Rules, and Type Qualifiers

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UNIT– III
Preprocessors: Preprocessor Commands **Arrays** - Concepts, Using Arrays in C, Inter-Function Communication, Array Applications, Two- Dimensional Arrays, Multidimensional Arrays, Linear and Binary Search, Selection and Bubble Sort.

UNIT – IV
Pointers - Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, L -value and R-value, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing an Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command-line Arguments. **Strings** - Concepts, C Strings, String Input/Output Functions, Arrays of Strings, String Manipulation Functions

UNIT –V
Structures: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures, Unions, Type Definition (typedef), Enumerated Types. **Input and Output:** Introduction to Files, Modes of Files, Streams, Standard Library Input/Output Functions, Character Input/Output Functions.

Suggested Reading:

1	B.A. Forouzan and R.F. Gilberg, "*A Structured Programming Approach in C*" , Cengage Learning, 2007
2	Kernighan BW and Ritchie DM, "*The C Programming Language*", 2nd Edition, Prentice Hall of India, 2006.
3	Rajaraman V, "*The Fundamentals of Computer*", 4th Edition, Prentice-Hall of India, 2006.
4	Dromey " *How to Solve it By Computer* , Pearson education, 2006

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BASIC ELECTRICAL ENGINEERING

ES 301 EE

Instruction: 3+1 periods per week *Duration of SEE: 3 hours*
CIE: 30 marks *SEE: 70 marks*
Credits: 4

Objectives:

1. To provide an understanding of basics in Electrical circuits.
2. To provide an overview of ordinary differential equations

Outcomes: Student will be able to:

1. To analyse Electrical circuits to compute and measure the parameters of Electrical Energy
2.To comprehend the working principles of Electrical DC Machines
3. To Identify and test various Electrical switchgear, single phase transformers and assess the ratings needed in given application
4.To comprehend the working principles of electrical AC machines

UNIT – I
DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems.
UNIT – II
AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, and RL, RC, RLC combinations (series only). Three phase balanced circuits, voltage and current relations in star and delta connections.
UNIT – III
Transformers and 3-ph Induction Motors: Transformers: Electromagnetic induction, Faradays laws, statically induced emf, Lenz law, BH characteristics, ideal and practical transformer, losses and efficiency, Auto-transformer and three-phase transformer connections. ***Three Phase Induction motor:*** Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, squirrel cage IM, slip-ring IM, Applications
UNIT – IV
Single-phase induction motor and DC Machines: Single-phase induction motor: Construction and principle of operation, Capacitor start & capacitor run motor, applications. ***DC Generators***: Dynamically induced emf, Flemming's Right hand and Left hand rules, Construction and principle of operation of DC generator, EMF equation, Types of DC Generators, OCC characteristics, applications. ***DC Motors:*** principle of operation of DC Motor, Types of DC motors, applications
UNIT – V
Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

Suggested Readings:

1	N. K. De, "*Basic Electrical Engineering*", Universities Press, 2015.
2	J.B. Gupta, "*Fundamentals of Electrical Engineering and Electronics*" S.K. Kataria & Sons Publications, 2002
3	J.B. Gupta, "*Utilization of Electric Power and Electric Traction*" S.K. Kataria & Sons Publications, 2010
4	Abhijit Chakrabarti, Sudipta Nath, Chandan Kumar Chanda, "*Basic Electrical Engineering*" Tata McGraw Hill, Publications, 2009
5	Hughes, "*Electrical Technology*", 7th Edition, Addison Welsey Longman Inc., 1995

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Engineering Physics Lab Syllabus for Osmania University Affiliated Engineering Colleges
B.E (SEM-I&II) AICTE
Academic Year 2024-2025 Onwards (Common to All Branches)

CourseCode: BS251PH	CourseTitle: Physics Lab						Core/Elective : Core
Prerequisite	ContactHoursper Week				CIE	SEE	Credits
	L	T	D	P			
	-	-	-	3	25	50	1.5

Course Objective

- Master experimental procedures and programming techniques.
- Conduct experiments independently with precision and measurement accuracy
- Analyze data graphically and derive conclusions from graphs
- Evaluate experiment results critically and draw meaningful conclusions.
- Improve communication skills through group work and effective laboratory report writing.

Course Outcomes

- Apply the various procedures and programming techniques for the experiments.
- Demonstrate the experiment with task and take the measurement independently
- Examine the graphical representation data and estimate results from the graph.
- Compare and evaluate the results of the experimentand draw relevant conclusions
- Develop communication skills through working ingroups in performing the laboratory Experiments andby writing laboratory reports.

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Listof Experiments

1. Determination of Dielectric Constant and Phase Transition Temperature of Dielectric Materials
2. To study the I-V Characteristics of P-N Junction Diode and Resistance Evaluation
3. Find the Electrical Conductivity and Energy Gap of Germanium (Ge) Crystal
4. Study Hall Effect in Semiconductors & find Hall Coefficients, Hall Voltage, and Conductivity
5. Study Characteristics of Thermistor: Determination of Constants A and B
6. Draw Hysteresis Loop for Ferromagnetic Material (B-H Curve)
7. Study V-I Characteristics of Solar Cell: Fill Factor and Series Resistance Calculation
8. Visualization Energy Levels of 1-Dimensional Potential Box Using Schrödinger Wave Equation in Python
9. Visualization of Allowed Energy Levels and Kronig-Penney Model in Python/MATLAB
10. Determine the Density and Elastic Properties of Oxide Glasses/polymers Using Machine learning algorithms
11. Calculate the Numerical Aperture (NA) and Acceptance Angle of Optical Fiber
12. Find the Wavelength of Laser Source using diffraction grating
13. To study the Transition Temperature Measurement of High-Temperature Superconductor
14. Find the Rigidity Modulus of Wire Using Torsional Pendulum
15. To estimate the pressure using optical fiber sensor.

Note: **Minimum Eight experiments should be conducted in the semester**

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ES351CS	Programming for Problem Solving Lab					
Pre-requisites			**L**	**T**	**P**	**C**
			-	-	2	1
Evaluation	**SEE**	50 Marks	**CIE**		25 Marks	

Course Objectives :	
1	To use tools available under LINUX for C programming
2	To gain hands-on experience on basic constructs of C programming
3	To formulate problems and implement algorithmic solutions in C
4	To write modular programs in C using structure programming techniques and data files.

Course Outcomes :	
On completion of this course, the student will be able to:	
CO-1	Write, compile and debug C programs in Linux environment
CO-2	Write simple programs using control structures, user defined functions and data manipulation using arrays
CO-3	Use standard C library functions to develop modular programs in C

1. Introducing to programming Environment(Linux commands, editing tools such as vi editor, sample program entry, compilation and execution)
2. Write programs using arithmetic, logical, bitwise and ternary operators.
3. Write programs simple control statements : Roots of a Quadratic Equation, extracting digits of integers, reversing digits ,finding sum of digit ,printing multiplication tables, Armstrong numbers, checking for prime, magic number,
4. Sin x and Cos x values using series expansion
5. Conversion of Binary to Decimal, Octal, Hexa and Vice versa
6. Generating a Pascal triangle and Pyramid of numbers
7. Recursion: Factorial, Fibonacci, GCD
8. Finding the maximum, minimum, average and standard deviation of given set of numbers using arrays
9. Reversing an array ,removal of duplicates from array
10. Matrix addition , multiplication and transpose of a square matrix .using functions
11. Bubble Sort, Selection Sort ,
12. Programs on Linear Search and Binary Search using recursion and iteration

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13. Functions of string manipulation: inputting and outputting string , using string functions such as strlen( ),strcat( ),strcpy( )……etc
14. Writing simple programs for strings without using string functions.
15. Finding the No. of characters, words and lines of given text file
16. File handling programs : student memo printing
17. Create linked list, traverse a linked list, insert a node, delete a node, reversing list .

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ENGINEERING GRAPHICS

ES 353 CE

Instruction:6 periods per week *Duration of SEE: 3 hours*
CIE: 50 marks *SEE: 50 marks*
Credits: 3

Objectives:

1.To prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
2. To prepare you to use the techniques, skills, modern engineering tools to use for Engineering practice.

Outcomes: Student will be able to:

1. Introduction to engineering design and its place in society
2. Exposure to the visual aspects of engineering design
3. Exposure to engineering graphics standards
4. Exposure to solid modelling
5. Exposure to computer-aided geometric design
6. Exposure to creating working drawings
7. Exposure to engineering communication

S.No	Description	Lectures	Drawing
1	Principles of Engineering Graphics and their significance, usage of drawing instruments	1	
2	Conic Sections – I, Construction of ellipse, parabola and hyperbola given focus and eccentricity.	1	2
3	Conic Sections – II, Construction of ellipse (given major and minor axis), parabola (given bas and height), rectangular hyperbola	-	2
4	Cycloids (cycloid & epicycloid)	1	2
5	Involutes (involute of triangle, square & circle)	-	2
6	Scales (plain & diagonal scales)	1	2+2
7	Introduction to AutoCAD –Basic commands and simple drawings	-	2+2
8	Orthographic Projection , Projection of points situated in different quadrants	1	2
9	Projections of straight lines-I Lines parallel to both the reference planes, lines perpendicular or inclined to one reference plane	1	2
10	Projections of straight lines-II Lines parallel to both the reference planes	1	2
11	Projections of planes-I Perpendicular planes	1	2
12	Projections of planes-II Oblique planes	-	2
13	Projections of solids – I Polyhydra and solids revolution, projections of solids in simple position	1	2
14	Projections of solids – II	1	2

	Polyhydra and solids when the axes inclined to one or both the reference planes.		
15	Section of solids – I When the sectional plane is parallel or perpendicular to one reference plane	1	2
16	Section of solids – II When the sectional plane is inclined to one reference plane	-	2
17	Development of surfaces – I Prisms and Cylinders	1	2
18	Development of surfaces – II Pyramids and Cones	-	2
19	Intersection of surfaces – I Intersection of cylinder and cylinder	1	2
20	Intersection of surfaces – I Intersection of cylinder and cones	-	2
21	Isometric projection – I- planes and simple solids	1	2
22	Isometric projection – I – Combination of two or three solids	-	2
23	Conversion of Isometric Views to Orthographic Views	1	2
24	Floor plans of 2 or 3 rooms including windows, doors, and fixtures such as WC, bath, sink, shower, etc.	1	2

Suggested Readings:

1	Bhatt N.D., Panchal V.M. & Ingle P.R.,"*Engineering Drawing"*, Charotar Publishing House, 2014
2	Shah, M.B. & Rana B.C., " *Engineering Drawing and Computer Graphics"*, Pearson Education, 2008
3	S.N Lal, " *Engineering Drawing with Introduction to Auto CAD"*, Cengage Learning India Pvt Ltd, New Delhi, 2018
4	Agarwar B. & Agrawal C. M., "*Engineering Graphics*", TMH Publication, 2012
5	Narayana, K.L. & P Kannaiah," *Text book on Engineering Drawing*", Scitech Publishers, 2008
6	(Corresponding set of) CAD Software Theory and User Manuals

NOTE:

1. At least 20 sheets must be covered.
2. Sheet number 1 to 6 (Graph sheets / drawing sheets)
3. Sheet number 7 to 24 (AutoCAD drawings.

BASIC ELECTRICAL ENGINEERING LAB

ES 354 EE

Instruction:2 periods per week *Duration of SEE: 3 hours*
CIE: 25 marks *SEE: 50 marks*
Credits: 1

Objectives:

1. To impart the practical knowledge on testing of DC and AC Machines.
2. To learn the usage of common electrical measuring instruments

Outcomes: Student will be able to:

1.Get an exposure to common electrical components and their ratings
2. Analyse the performance of DC and AC Machines
3.Comprehend the usage of common electrical measuring instruments
4. Test the basic characteristics of transformers and electrical machines

List of Experiments:

Dem1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.

Exp 1. Verification of KVL and KCL, superposition theorem (with DC excitation)

Exp 2 Verification of Thevinens and Nortons theorems (with DC excitation)

Exp 3. Sinusoidal steady state response of R-L, and R-C circuits – impedance calculation and verification. Observation of phase differences between current and voltage. Power factor calculation

Exp 4. Transformers: Observation of the no-load current waveform on an oscilloscope (nonsinusoidal wave-shape due to B-H curve nonlinearity should be shown along with a discussion about harmonics).

Exp 5. Loading of a transformer: measurement of primary and secondary voltages and currents, and power.

Exp 6. Three-phase transformers: Star and Delta connections. Voltage and Current relationships (line-line voltage, phase-to-neutral voltage, line and phase currents).

Exp 7. Measurement of phase voltage/current, line voltage/current and power in a balanced three-phase circuit connected in star and delta.

Dem2. Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), synchronous machine (field winging - slip ring arrangement) and single-phase induction machine.

Exp 8. OCC characteristics of DC Generator

Exp 9. Synchronous speed of two and four-pole, three-phase induction motors. Direction reversal by change of phase-sequence of connections.

Exp 10. Power factor improvement of Induction Motor using static capacitors

Exp 11. Load Test of DC Motor

Note - 1:

(i) List of Experiments and Demonstrations suggested above are already available in the

	Laboratory of the electrical department. No need to purchase any extra equipment except Demonstration2 equipments
iii)	Procurement of Demonstration 2 equipments can be done during the course work of that semester. It can be included in the laboratory.

Suggested Readings:

1	J.B. Gupta, "*Fundamentals of Electrical Engineering and Electronics*" ,S.K. Kataria & Sons Publications, 2002.
2	J.B. Gupta, "*Utilization of Electric Power and Electric Traction*" S.K. Kataria & Sons Publications, 2010
3	Abhijit Chakrabarti, Sudipta Nath, Chandan Kumar Chanda, "*Basic Electrical Engineering*", Tata McGraw Hill, Publications, 2009
4	Hughes, "*Electrical Technology*", 7th Edition, Addison Wesley Longman Inc., 1995

ENVIRONMENTAL SCIENCES

MC 802CE

Instruction: 2 periods per week *Duration of SEE: 3 hours*
CIE: 30 marks *SEE: 70 marks*
Credits : 0

Objectives:

1. To create awareness and impart basic knowledge about the environment and its allied problems.
2. To know the functions of ecosystems, social and environment related issues and their preventive measures
3. To understand importance of biological diversity, different pollutions and their impact on environment

Outcomes: Student will be able to:

1. Adopt environmental ethics to attain sustainable development
2. Develop an attitude of concern for the environment
3. Conservation of natural resources and biological diversity
4. Creating awareness of Green technologies for nation's security
5. Imparts awareness for environmental laws and regulations

UNIT – I

The Multidisciplinary Nature of Environmental Studies: Definition, scope and importance, need for public awareness.

***Natural Resources*:** Water Resources – Use and over utilization of surface and ground water, flood, drought, conflicts over water, Dams: Benefits and Problems. Food Resources –World Food Problems, effects of modern agriculture, fertilizer-pesticides problems, water logging, salinity, Forest Resources – Use and over exploitation, deforestation & its effect on tribal people.Land Resources –Land Degradation, environmental effect of mining, man induced landslides, soil erosion and desertification. Energy Resources –Growing energy needs, Renewable and Non-renewable energy resources.

UNIT – II

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in ecosystem, food chains, ecological pyramids, ecological succession, types of ecosystems (marine, pond, river, forest, grassland, desert)

UNIT – III

Biodiversity: Levels of Biodiversity, Bio-geographical classification of India, Value of biodiversity, Threats to biodiversity, endangered and endemic species of India, Conservation of biodiversity, global and national efforts.

UNIT – IV

Environmental Pollution: Definition, Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution, solid waste management.

Environment Protection Act: Air, water, forest and wildlife Acts, issues in the enforcement of environmental legislation

UNIT – V

Social Issues and the Environment: Watershed management and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion.

Environmental Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology. Disaster management cycle and disaster management in India.

Field Work:Visit to a local area to document environmental issues- agricultural area/ pond/lake/terrestrial ecosystem.Visit to a local polluted area- market/slum area/Industrial area/traffic area.

Suggested Readings:

1	De Anil Kumar, "*Environmental Chemistry",* New Age Publisher International Pvt Ltd, New Delhi , 2016
2	E.P. Odum, '*Fundamentals of Ecology',* W.B. Sunders Co., USA.,1971
3	M.N. Rao and A.K. Datta, "*Waste Water Treatment",* Oxford and IBK Publications, New Delhi, 2009.
4	Benny Joseph, "*Environmental Studies",* Tata McGraw Hill, New Delhi, 2009
5	V.K. Sharma, "*Disaster Management",* National Centre for Disaster Management, IIPE, New Delhi, 1999

ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

MC 803 PY

Instruction: 2 periods per week *Duration of SEE: 3 hours*
CIE: 30 marks *SEE: 70 marks*
Credits : 0

Objectives:

1. To get a knowledge in Indian Culture
2. To Know Indian Languages and Literature and the fine arts in India
3. To explore the Science and Scientists of Medieval and Modern India

Outcomes: Student will be able to:

1. Understand philosophy of Indian culture
2. Distinguish the Indian languages and literature.
3. Learn the philosophy of ancient, medieval and modern India.
4. Acquire the information about the fine arts in India
5. Know the contribution of scientists of different eras.

UNIT – I

Introduction to Culture: Culture, civilization, culture and heritage, general characteristics of culture, importance of culture in human literature, Indian Culture, Ancient India, Medieval India, Modern India

UNIT – II

Indian Languages, Culture and Literature: Indian Languages and Literature-I: the role of Sanskrit, significance of scriptures to current society, Indian philosophies, other Sanskrit literature, literature of south India.

Indian Languages and Literature-II: Northern Indian languages & literature

UNIT – III

Religion and Philosophy: Religion and Philosophy in ancient India, Religion and Philosophy in Medieval India, Religious Reform Movements in Modern India (selected movements only)

UNIT – IV

***Fine Arts in India (Art, Technology& Engineering*)**: Indian Painting, Indian handicrafts, Music, divisions of Indian classic music, modern Indian music, Dance and Drama, Indian Architecture (ancient, medieval and modern), Science and Technology in India, development of science in ancient, medieval and modern India.

UNIT – V

Education System in India: Education in ancient, medieval and modern India, aims of education, subjects, languages, Science and Scientists of Ancient India, Science and Scientists of Medieval India, Scientists of Modern India

Suggested Readings:

1	Kapil Kapoor, "*Text and Interpretation*: *The India Tradition*", D. K. Print world, 2005
2	Gopala Krishnan , "*Science in Samskrit*", Samskrita Bharti Publisher, New Delhi, 2017
3	NCERT, "*Position paper on Arts, Music, Dance and Theatre*" NCERT, New Delhi, 2010.
4	S. Narain, "*Examinations in Ancient India*", Arya Book Depot, New Delhi, 1993
5	Satya Prakash, "*Founders of Sciences in Ancient India*", Vijay Kumar Publisher, New Delhi, 1989
6	M. Hiriyanna, "*Essentials of Indian Philosophy*", Motilal Banarsidass Publishers, New Delhi, 2005

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Syllabus with effect from the Academic Year 2024-25

BE I year | **English (Theory)** | **HSMC 201**
(Common to all branches of BE)

Instruction: 2 hours per week
CIE: 30 marks
Credits: 2
SEE: 70 marks
Duration of the SEE: 3 hours

Course Objectives

To enhance the English language abilities of Engineering students, especially in reading and writing by

- using authentic material for language learning and exposing them to a variety of content-rich texts
- strengthening their vocabulary and grammar
- improving their reading and comprehension skills and honing their writing skills
- encouraging them to think creatively and critically

Course Outcomes

On successful completion of the course, the student will be able to

- read, understand, and interpret a variety of written texts
- use appropriate vocabulary and correct grammar
- undertake writing with confidence

Unit 1

Reading:	Rudyard Kipling, "If"
Vocabulary:	Word Formation: Root Words, Affixes, Compounding, Standard Abbreviations
Grammar:	Basic Sentence, Sentence Structures and Types; Tenses
Writing:	Note-taking, Note-making

Unit 2

Reading:	Satyajit Ray, "Anukul"
Vocabulary:	Synonyms, Antonyms, Homophones, Homographs, Homonyms
Grammar:	Linkers and Connectives; Combining Sentences
Writing:	Paragraph Writing – Structure and Development

Unit 3

Reading:	Adrienne Rich, "Planetarium"
Vocabulary:	Phrasal Verbs, Collocation
Grammar:	Determiners and Modifiers, Comparison, Concord
Writing:	Essay Writing, Paraphrasing, Summarizing

Unit 4

Reading:	Martha Nussbaum, "The Silent Crisis" (From *Not for Profit: Why Democracy Needs the Humanities)*
Vocabulary:	Formal/Informal Vocabulary, Inclusive Language
Grammar:	Voice, Reported Speech, Prepositions
Writing:	Formal Letters, Letters of Application, Curriculum Vitae/Resume

Unit 5

Reading:	Chimamanda Ngozi Adichie, "The Danger of a Single Story" (TED Talk)
Vocabulary:	Words often Confused; One Word Substitutes
Grammar:	Punctuation, Common Errors (covering errors in all items of grammar)
Writing:	Coherence and Cohesion in Writing; Avoiding Redundancy and Ambiguity

Suggested Reading

Board of Editors. *Language and Life: A Skills Approach*". Orient Black Swan, 2018.
Kumar, Sanjay and Pushp Lata. *English Language and Communication Skills for Engineers*. Oxford University Press, 2018.
Sudarshana, NP and C. Savitha. *English for Engineers*. Cambridge University Press, 2018.
Wood, F.T. *A Remedial English Grammar for Foreign Students*. Trinity Press, 2022.

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Chemistry

BS104CH
Instruction : 3+1 periods per week Duration of
SEE : 3 hours
CIE : 30marks
SEE : 70 marks
Credits : 4

Objectives:

1. Explain the principles of electrochemical processes and study analyze working principles and applications of various batteries.
2. Gain knowledge about the causes of corrosion and its prevention. Attain knowledge about the hard water and treatment of water for drinking purpose
3. Appraise Engineering materials their classifications, structure-property relationship,
4. Expose to qualitative and quantitative parameters of chemical fuels and awareness of eco-friendly materials, fuels and processes.
5. Understand the concepts and applications of spectroscopy

Outcomes: Student will be able to:

1. **Apply** concept of electrode potential in identifying feasibility of electrochemical reaction; **develop** a more in-depth perception on working of various types of batteries and their applications especially in electric vehicles (EVs).
2. **Identify** the mechanism of corrosion of materials on basis of electrochemical approach and devise corrosion control methods. **Estimate** the physical & chemical parameters of quality of water and explain the process of water treatment
3. **Classify** chemical fuels and grade them through qualitative analysis and **acquire** knowledge on environment-friendly bio diesel
4. **Explain** the influence of chemical structure on properties of materials and their choice in engineering applications
5. **Relate** the concept of green chemistry to **modify** engineering processes and

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materials. **Understand** the concepts and applications of spectroscopy

BS104CH

UNIT – I

Electrochemistry: Electrolytic conductance, its types, factors affecting electrolytic conductance. Electrochemical cells: Electrolytic and Galvanic cells. Cell notation, cell reaction and cell potentials. Nernst equation and its derivation. Applications of Nernst equation to electrode potential and emf of cells. Numerical problems. Types of electrodes, Calomel, Quinhydrone and Glass electrodes. Determination of pH of a solution by using Quinhydrone electrode.

Battery Chemistry: Construction and Applications of Primary batteries: Zn-Carbon battery. Secondary batteries : Pb-Acid battery and Li-Ion battery, Flow Batteries (Fuel cells): Methanol-Oxygen fuel cells.

UNIT – II

Corrosion: Causes and its effects. Types of Corrosion-Dry or Chemical Corrosion and Wet or Electrochemical corrosion and their mechanism. Electrochemical corrosion – Galvanic and Waterline Corrosion. Factors influencing rate of corrosion.

Corrosion control methods: Cathodic protection methods - Sacrificial anodic and Impressed current Cathodic protection methods.

Surface coating methods: Hot Dipping-Galvanizing.

Water Chemistry: Hardness of Water-Types and units of hardness of water, estimation of hardness of water by EDTA method - Numerical problems. Alkalinity of water and its sources. Water softening by Ion exchange and Reverse Osmosis methods. Specifications of potable water. Sterilization by Chlorination. Break Point of Chlorination.

UNIT – III

Engineering Materials: Polymers: Monomer and its functionality, Polymers and degree of polymerization. Types of Polymerization - Addition, Condensation and Co-Polymerization with one example each. Classification of polymers–Plastics: (Thermoplastics &Thermosetting resins - PVC and Bakelite), Fibers: (Nylon-6:6)

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Elastomers: (Buna-S and Buna –N rubber). ***Conducting polymers***: Introduction, classification, properties and applications of conducting polymers. ***Biomaterials:*** Introduction .Definition of Biomaterials , Preparation, properties and applications of Poly lactic acid (PLA)
UNIT – IV ***Chemical Fuels:*** Introduction, definition and classification of chemical fuels.- primary and secondary – solid ,liquid and gaseous fuels Requirements of a good fuel. Calorific Value – HCV and LCV. Theoretical calculations of calorific value by Dulong's formula – Numerical problems. ***Solid Fuels:*** Coal and its Ranking. Analysis of coal-Proximate and Ultimate analysis. ***Liquid Fuels:*** Composition and uses of Gasoline, Diesel and Kerosene. Knocking. .Fuel-rating– Octane and Cetane numbers. ***Gaseous Fuels***: LPG, CNG-Composition and Uses. ***Biodiesel:*** Sources, Concept of Trans esterification, properties and applications of biodiesel. Carbon neutrality and its significance. Ethanol – Biodiesel, sources and uses.
Unit V **Spectroscopy**- Description of Electromagnetic spectrum. **Principles of UV-Visible Spectroscopy**: Statement of Beer-Lambert Law. Absorption and intensity shifts: Bathochromic, Hypsochromic, Hyperchromic and Hypochromic shifts with one example each.
Principle and applications of UV – Visible Spectroscopy.
IR Spectroscopy: Principle of IR Spectroscopy. Principle and applications of IR.
NMR Spectroscopy: Principle of H 1 -NMR Spectroscopy. Multiplicity, Chemical Shift. Principle and Applications of MRI
Green Chemistry: Concept, Mention - Principles of Green chemistry – example Diels – Alder reaction

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Suggested Readings

1	, *Principles of Physical Chemistry*‖ ,S.N. Chand &Co. New Delhi,1987
2	PCJain and M Jain ,—*Engineering Chemistry*‖ ,DhanpatRai&Sons ,15th Edition, New Delhi, 2004
3	JCKuriacoseandJRajaram,—*ChemistryinEngineeringandTechnology*—,TataMcGrawHill , New Delhi,2010
4	OG Palanna, —*Engineering Chemistry*‖,TataMcGrawHill, New Delhi, 2009
5	S SDaraand SSU mare, —*Engineering Chemistry*‖ ,S.N. Chand & Co. New Delhi, 2004
6	SashiChawla,—*Engineering Chemistry*‖, DhanpatRai&Sons, New Delhi, 2017
7	PrasantaRath,—*Engineering Chemistry*‖,Cengage Learning India Pvt. Ltd, 2015
8	Dr. Kishore Palle, Dr. V. Shanthi , Dr. A. Kishore Kumar and K. Ramesh -Engineering Chemistry.

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BE II-Semester syllabus for affiliated engineering colleges of Osmania University
(wef: academic year 2024-2025)
Common to all branches
DIFFERENTIAL EQUATIONS&NUMERICAL METHODS

BS203MT	DIFFERENTIAL EQUATIONS & NUMERICAL METHODS	3L:1T:0P	4 credits

Course objectives:

- To Develop strong problem-solving skills by tackling a variety of problems involving first-order differential equations
- To Develop strong problem-solving skills by tackling a variety of problems involving higher order differential equations
- To familiarizes concept of Laplace Transforms
- To Understand the Limitations and Applicability of Numerical Methods
- To Understand the Limitations and Applicability of Numerical Differentiation & Integration

Outcomes: After completing this course, the students will able to

- Students will enhance their problem-solving skills by applying the methods learned involving first-order differential equations.
- Students will enhance their problem-solving skills by applying the methods learned involving higher order differential equations.
- To learn Laplace transform and its properties
- Analyze and Interpret Interpolation
- Analyze and Interpret Numerical differentiation & integration

UNIT-I

Differential Equations of First Order: Exact differential equations, Integrating factors, Linear differential equations, Bernoulli's, Riccati's and Clairaut's differential equations, Orthogonal trajectories of a given family of curves.

UNIT-II

Differential Equations of Higher Orders: Solution of second and higher order linear homogeneous equations with constant coefficients, Method of reduction of order for the linear homogeneous second order differential equations with variable coefficients, Solutions of non-homogeneous linear differential equations, Method of variation of parameters, solution of Euler-Cauchy equation.

UNIT-III

Laplace Transforms: Laplace Transforms, Inverse Laplace Transforms, Properties of Laplace Transforms and inverse Laplace Transforms, Convolution Theorem (without proof), Solution of ordinary differential equations using Laplace Transforms.

UNIT-IV

Numerical Methods-I: Solution of polynomial and transcendental equations- Bisection method, Iteration Method, Newton-Raphson Method and Regula-Falsi method. Finite differences-forward differences-backward differences-central differences-symbolic relations and separation of symbols, Interpolation using Newton's forward and backward formulae: Lagrange's method of interpolation.

UNIT-V

Numerical Methods-II: Numerical Integration: Trapezoidal rule and Simpson's $1/3^{rd}$ and $3/8^{th}$ rules. Ordinary differential equations: Taylor's series; Picard's method; Euler and modified Euler's methods; Runge-Kutta method of fourth order.

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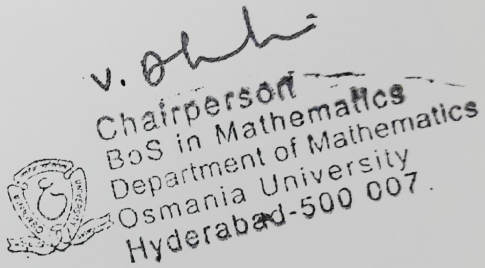
TEXT BOOKS:

1. R.K.Jain&S.R.K.Iyengar, Advanced Engineering Mathematics, Narosa Publications, 2014
2. B.S.Grewal, Higher Engineering Mathematics, Khanna Publications, 43rd Edition, 2014.

REFERENCE BOOKS:

1. S.S.Sastry, Introductory Methods of Numerical Analysis, 5th edition, PHI Private Limited, 2012.
2. Dr.B.S.Grewal, Numerical Methods in Engineering and Science, Khanna Publishers, 2014.
3. H.K.Dass, Er.RajnishVarma, Higher Engineering Mathematics, S.Chand Publishers, 3rd Edition.



ES 303 CS	Scientific Programming					
Pre-requisites			**L**	**T**	**P**	**C**
			3	-	-	3
Evaluation	**SEE**	70 Marks	**CIE**		30 Marks	

Course Objectives :	
1	**Introduce basic scientific programming** concepts using Python and MATLAB
2	**Teach effective use of data structures** within Python and MATLAB environments.
3	**Develop competence in applying numerical methods** to solve mathematical problems.
4	**Enable data manipulation and visualization** using Python and MATLAB tools.
5	**Expose students to emerging technologies** like machine learning, IoT, and big data

Course Outcomes :	
On completion of this course, the student will be able to :	
CO-1	**Proficiency in Scientific Programming** using Python and MATLAB for computational tasks.
CO-2	**Implementation of Data Structures and Algorithms** to solve computational problems.
CO-3	**Understanding and Application of Numerical Methods** and linear algebra in scientific computing.
CO-4	**Ability to Analyze and Visualize Data** using Python and MATLAB tools.
CO-5	**Introduction to Emerging Technologies** and project development in scientific computing.

UNIT – I
Introduction to Scientific Programming and Python Basics: Overview of Scientific Computing, Introduction to Python Programming, Basic Syntax, Variables, and Data Types, Control Structures (if-else, loops), Functions and Modules, Introduction to MATLAB.

UNIT – II
Data Structures and Algorithms: Lists, Tuples, Dictionaries, and Sets in Python, Arrays and Matrices in MATLAB, Basic Algorithms (Searching and Sorting), Complexity Analysis.

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UNIT– III
Numerical Methods and Linear Algebra: Introduction to Numerical Methods, Root Finding Algorithms (Bisection, Newton-Raphson), Numerical Integration and Differentiation, Basics of Linear Algebra, Matrix Operations and Solving Linear Systems.

UNIT – IV
Data Analysis and Visualization: Importance of Data Analysis, Data Manipulation using Pandas (Python) and MATLAB, Data Visualization Techniques, Introduction to Matplotlib, Seaborn (Python), and MATLAB Plotting.

UNIT –V
Emerging Technologies and Project Work: Overview of Emerging Technologies (Machine Learning, IoT, Big Data), Introduction to Machine Learning using Scikit-Learn (Python), Basics of IoT and Big Data Applications in Engineering, Guidelines for Scientific Projects, Report Writing and Presentation Skills

Suggested Reading:

1	**Python Programming and Numerical Methods: A Guide for Engineers and Scientists"** by Qingkai Kong, Timmy Siauw, and Alexandre Bayen
2	**Introduction to Scientific Programming with Python"** by Joakim Sundnes
3	**MATLAB for Engineers"** by Holly Moore
4	**Learning MATLAB** by Tobin A. Driscoll

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Department of English
Osmania University
Syllabus with effect from the Academic Year 2024-25

BE I year | **English (Laboratory)** | **HS151EG**
(Common to all branches of BE)

Instruction: 2 hours per week | **Credits: 1**
CIE: 25 marks | **SEE: 50 marks**

Course Objectives

To enhance the listening and speaking skills of students by

- Giving them adequate practice in listening with comprehension
- Providing them ample opportunities to improve their public speaking skills
- Training them in the use of correct pronunciation, stress, and intonation
- Sensitizing them to the use of verbal and non-verbal communication appropriate to the context
- Encouraging them to learn the art of conversation to suit formal and informal situations
- Preparing them to make formal presentations and face interviews

Course Outcomes

On successful completion of the course, students will be able to

- Listen, understand, and interpret formal and informal spoken language
- Speak English with acceptable pronunciation, stress, and intonation
- Present themselves with confidence in formal situations
- Participate in individual and group activities with relative ease

Interactive Sessions in Language Lab:

Experiments and Practice Sessions to Enhance Listening and Speaking Skills

1. Listening Skills, Barriers to Listening, Listening for Comprehension
2. English Phonology; Varieties of English-Indian, British, American
3. Intelligible Pronunciation, Intonation, Word Stress and Sentence Stress
4. Conversation Skills: Face-to-Face and Telephone
5. Introducing Oneself and Others, Asking for and Giving Information
6. Making Requests and Responding to them Appropriately
7. Giving Instructions and Responding to them Appropriately
8. Agreeing and Disagreeing, Seeking Clarification
9. Making Formal Announcements and Emceeing
10. JAM; Role Play
11. Group Discussions
12. Debate
13. Public Speaking Skills and Body Language
14. Interviews
15. Formal Presentations

Suggested Reading

Balasubramanian, T. *A Textbook of English Phonetics for Indian Students*. Macmillan, 1981.
Board of Editors. *Language and Life: A Skills Approach.* Orient Black Swan, 2018.
CIEFL. *Exercises in Spoken English. Parts. I-III.* Oxford University Press.
Pillai, Radhakrishna G. *Spoken English For You - Level II.* 8th Edition. Emerald Publishers, 2014.
Sethi, J, PV Dhamija. *A Course in Phonetics and Spoken English.* 2nd Edition, Prentice Hall, 1999.
Shinde, Maithry et al. *Life Skills and Personality Development*. Cambridge University Press, 2022.

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Course Code	Course Title						Core/ Elective
BS153CH	Chemistry Lab (Common to All Branches)						Core
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
-	-	-	-	3	25	50	1.5

Course Objectives

- Conduct experiments, take measurements and analyze the data through hands-on experience n order to demonstrate understanding of the theoretical concepts of quantitative Analysis while working in small group.
- Interpret the electro analyticalprinciples with experimental results graphically
- Demonstrate writing skills through clear laboratory reports
- **Course Outcomes**

On successful completion of this course, students will be able to:

- Apply the principles of Colourimetryand Electrochemistry in quantitative estimations.
- Estimate the rate constants of reactions from concentration of reactants/products as a function of time.
- Synthesize small drug molecules.

List of Experiments:

- Introduction to Chemical Analysis.
- Techniques of Weighing

.Volumetric Analysis:

- Preparation of Standard Mohr's salt solution, Standardization of $KMnO_4$ and estimation of ferrous ion.by Permanganometry,
- Estimation Iron(II) by Dichromatometry

Water Analysis:

- Preparation of Standard Magnesium sulphate solution, Standardization of EDTA and Estimation of Total Hardness.
- Preparation of Standard Sodium Carbonate Solution, Standardization of HCl and Estimation of Carbonate and Bicarbonate Alkalinity.

Conductometry:

- Estimation of HCl
- Estimation of CH_3COOH
- Estimation of mixture of acids

Potentiometry

- Estimation of HCl
- Estimation of Iron

pHMetry:

- Estimation of HCl

Colorimetry:

- Verification of Beer-Lambert's law and estimation of Manganese
- **Drug Synthesis** Preparation of Aspirin and paracetamol.

Note: Minimum ten experiments should be conducted in the semester **Suggested Readings:**

- SeniorPracticalPhysicalChemistry,B.D.Khosla,A.GulatiandV.Garg(R.Chand& Co.,Delhi)
- AnIntroductiontoPracticalChemistry,K.K.SharmaandD.S.Sharma(Vikaspublishing,N.Delhi)

01/07/2024

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ENGINEERING WORKSHOP PRACTICE

ES 352 ME

Instruction:6 periods per week *Duration of SEE: 3 hours*
CIE: 50 marks *SEE: 50 marks*
Credits: 3

Objectives:

1.Identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances.
2.To provide hands on experience about use of different engineering materials, tools, equipments and processes those are common in the engineering field.
3.To gain a good basic working knowledge required for the production of various engineering products.
4.To Study different hand operated power tools, uses and their demonstration.
5.Adopt safety practices while working with various tools

Outcomes: Student will be able to:

1. Demonstrate an understanding of and comply with workshop safety regulations.
2. Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
3. Study and practice on machine tools and their operations
4.Undertake jobs connected with Engineering Workshop trades including fitting, carpentry, sheet metal, house wiring, welding, smithy and foundry.
5.Apply basic electrical engineering knowledge for house wiring practice

List of Experiments:

A. TRADE FOR EXERCISES:

1. Carpentry
2. Fitting
3. House wiring
4. Sheet metal working
5. Smithy
6. Welding
7. Plumbing

B. TRADES FOR DEMONSTRATION AND EXPOSURE:

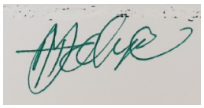
1. Machining (Lathe & Drilling)
2. Injection moulding
3. Mould making and casting
4. Basic Electronics lab instruments

C. PRESENTATIONS AND VIDEO LECTURES

1. Manufacturing Methods
2. Rapid Prototyping
3. Glass Cutting
4. 3D printing
5. CNC LATHE

D. IT WORKSHOP: Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, operating system installation.

Note: At least two exercises from each trade.



Suggested Readings:

1	Venugopal, K, "*Workshop Manual*", Anuradha Publications, Kumbakonam, TN, 2012
2	K.C. John, "*Mechanical Workshop*" 2nd Edn., PHI, 2010.
3	Hajra Choudary, "*Elements of Workshop Technology*" Vol. 1, Asian Publishers, Edn., 1993.
4	G.S. Sawhney, "*Mechanical Experiments and Workshop Practice*", I.K. International Publishing House, New Delhi, 2009.

ES353CS	**Scientific Programming Lab**					
Pre-requisites			**L**	**T**	**P**	**C**
			-	-	2	1
Evaluation	**SEE**	50 Marks	**CIE**		25 Marks	

Course Objectives :	
1	Enable students to install and use Python and MATLAB for writing and debugging programs.
2	To implement control structures, data structures, and algorithms and analyze their complexities.
3	Train students to perform data manipulation and create customized visualizations using Python and MATLAB tools.

Course Outcomes :	
On completion of this course, the student will be able to:	
CO-1	Set up and use Python and MATLAB for scientific programming.
CO-2	Implement and analyze data structures, control structures, and algorithms.
CO-3	Gain skills in data manipulation, visualization, and analysis using Python and MATLAB.

1. Python and MATLAB Installation and IDE Setup
2. Writing Simple Python and MATLAB Programs
3. Implementing Control Structures and Functions
4. Implementing Data Structures in Python and MATLAB
5. Writing and Testing Search and Sort Algorithms
6. Analyzing Algorithm Complexity in Practical Problems
7. Implementing Numerical Methods in Python and MATLAB
8. Performing Matrix Operations and Solving Linear Systems
9. Case Studies and Applications in Engineering
10. Data Manipulation and Analysis using Pandas and MATLAB
11. Creating Various Plots (Line, Scatter, Bar, Histogram)
12. Customizing and Interpreting Plots for Engineering Data
13. Implementing Basic Machine Learning Algorithms in Python
14. Exploring IoT and Big Data Tools
15. Working on Individual/Group Projects
16. Preparing Project Reports and Presentations
17. Final Project Presentation

Prepared and Compiled By
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MJCET,HYD-34

4/9/2024
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Board of Studies in CSE
Dept. of Computer Science & Engg.
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