VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

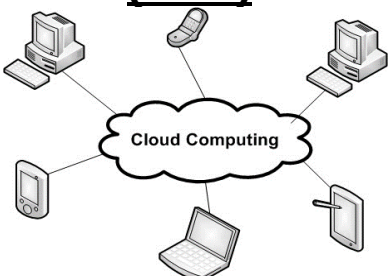
IBRAHIMBAGH, HYDERABAD-500 031

ACCREDITED BY NAAC WITH A++ GRADE

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (IT) I and II Semesters with effect from 2024-2025
(For the batch admitted in 2024-25)
(R-24)



DEPARTMENT OF INFORMATION TECHNOLOGY
+91-40-23146050, 23146051
Fax: +91-40-23146090
Website: www.vce.ac.in

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

ACCREDITED BY NAAC WITH A++ GRADE

IBRAHIMBAGH, HYDERABAD-500 031

Vision

Striving for a symbiosis of technological excellence and human values.

Mission

To arm young brains with competitive technology and nurture holistic development of the individuals for a better tomorrow.

Quality Policy

Education without quality is like a flower without fragrance. It is our earnest resolve to strive towards imparting high standards of teaching, training and developing human resources.

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(AUTONOMOUS)
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DEPARTMENT OF INFORMATION TECHNOLOGY

Vision

To be a center of excellence in the emerging areas of Information Technology.

Mission

- Provide a comprehensive learning experience on the latest technologies and applications.
- Equip the stakeholders with latest technical knowledge and leadership skills with collaboration to become competent professionals.
- Motivate innovation and contribute to the societal issues with human values and professional ethics.

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DEPARTMENT OF INFORMATION TECHNOLOGY

Programme Educational Objectives (PEOs) for IT Program

A Graduate of Information Technology will be able to:

PEO1: Pursue higher studies in multidisciplinary areas with research orientation.

PEO2: Develop core IT competencies aligned with emerging industry trends to become global leaders with ethical values.

PEO3: Engage in continuous learning and address the societal problems with sustainable solutions.

Program Specific Outcomes (PSOs) for IT Program

Our students, upon graduation from the program, will be able to

PSO1: Identify and develop software solutions using programming languages, tools and AI/ML concepts.

PSO2: Design, develop and maintain secure stand-alone, embedded and networked systems.

PSO3: Analyze the architectures of autonomous or semi-autonomous intelligent systems and apply to real-time scenarios.

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Program Outcomes (POs) for IT Program

At the end of the program, the graduates will demonstrate

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-24)
B.E. – INFORMATION TECHNOLOGY : FIRST SEMESTER (2024 - 2025)

B.E (IT) I Semester

Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U24HS010EH	English Language and Communication	2	-	-	3	60	40	2
U24BS120MA	Calculus and Linear Algebra	3	-	-	3	60	40	3
U24BS110PH	Physics of Semiconductors and Optoelectronic Devices	3	-	-	3	60	40	3
U24ES110IT	Python Programming	3	-	-	3	60	40	3
U24ES010EE	Basic Electrical Engineering	2	-	-	3	60	40	2
U24ES030CE	Basic Engineering Drawing	1	-	2	3	60	40	2
U24MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
PRACTICALS								
U24HS011EH	English Language and Communication Skills Lab	-	-	2	3	50	30	1
U24BS111PH	Semiconductor physics and Optoelectronic Devices Lab	-	-	2	3	50	30	1
U24ES111IT	Python Programming Lab	-	-	2	3	50	30	1
U24ES011EE	Basic Electrical Engineering Lab	-	-	2	3	50	30	1
	Library / Sports / Personality Development Programme / Mentor Interaction	-	-	-	-	-	-	-
• Student should acquire one NPTEL Certification Course equivalent to 2 credits (8 weeks) by the end of VI Semester. • Students opting for Honours should complete one NPTEL Course of 2 credits (8 Weeks) by the end of IV Semester.								
Total		**15**	**-**	**10**	--	**600**	**390**	**19**
Grand Total		**25**			--	**990**		

VASAVI COLLEGE OF ENGINEERING
(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION

(Common to all branches)
SYLLABUS FOR B.E. 1/4

Instruction: 3:0:0	SEE : 60	Course code: **U24HS010EH**
Credits : 3	CIE: 40	Duration of SEE: 3 Hours
COURSE OBJECTIVES **The course will enable the learners to:** 1. Build greater confidence and proficiency in oral and written communication. 2. Equip themselves with essential language skills to analyze and articulate their point of views. 3. Develop the ability to engage in reading for reflection and enquiry. 4. Construct grammatically correct and contextually appropriate correct sentences. 5. Learn how project reports are written in their related field of study.		**COURSE OUTCOMES** **At the end of the course the learners will be able to: -** 1. Communicate effectively, appropriately and ethically in both professional & personal spheres. 2. Listen to different types of spoken discourses and take notes for future reference. 3. Research, collect data and make effective presentations using, graphs, charts, statistical information and text. 4. Construct grammatically correct sentences using adequate vocabulary to compose written and spoken discourses. 5. Read, comprehend and appreciate various text types using the various techniques.

UNIT-1 1.0 Effective communication and Interpersonal skills

1.1 Roleand Importance of Communication – Types of Communication (Verbal-non-verbal, formal- informal, oral, written, visual, intrapersonal, inter personal and extra personal communication); styles, channels and barriers of communication.
1.2 Johari Window.
1.3 Persuasion techniques.
1.4 Stages of Team Building by Bruce Tuckman; Qualities of a team player/leader.

UNIT-2 2.0 Listening and Speaking skills

2.1 Importance of listening-- Types of listening;Note taking.
2.2 Speaking skills: Presentation Skills (on Projects/ Topics related to the branch).

UNIT-3 3.0 Reading and Writing skills

3.1 Reading strategies- SQ3R (Survey, Question, Read, Recite &Review); Types of
Comprehension - Global, Factual and Inferential.
3.2 Features of Writing-Principles of writing paragraphs (Coherence, Cohesion& Unity); Use of
appropriate linkers/connectives; Focus on cause, effects, comparison, definition, classification
problem/ solution, process, argument.
3.3 Email-Etiquette.

UNIT-4 4.0Vocabulary BuildingandGrammar

4.1**Vocabulary Building:**Synonyms,Antonyms,One-wordsubstitutes;Words often
Confused; Idioms.
4.2 Functional Grammar: Tense and Aspect; Subject-Verb agreement; Sentence types
(Declarative sentence, Interrogative sentence, Exclamatorysentence and Imperative sentence)

UNIT-5 5.0 Reading for appreciation of literary texts

5.1 **Prose text**- The Knowledge Society by APJ Abdul Kalam.
5.2 **Poem**-'What Life should be' by Patricia A Fleming.

Prescribed textbook for theory:
Technical communication - Principles and Practice (2nd Edition 2014) - Meenakshi Raman and Sangeeta Sharma- Oxford University Press.

Suggested Reading
Paul V. Anderson – Technical Communication

E.Suresh Kumar, P. Sreehari and J. Savithri - Essential English
Reading comprehension - Nuttal.J.C - Orient Blackswan
SunithaMishra,C. Murali Krishna, Communication Skills for Engineers, Pearson, 2004.
M. Ashraf Rizvi. Effective Technical Communication. Tata McGraw Hill, 2005.
Allen and Waters. How English Works.
Willis Jane., English through English.
Brown, Penelope and Stephen C. Levinson. 1978. Universals in language usage: politeness phenomena: Cambridge University Press.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal tests	:	2	Max.Marks	:	30
2	No. of assignments	:	3	Max. Marks	:	5
3	No. of Quizzes	:	3	Max. Marks	:	5

Duration of Internal Tests : 90 Minutes

With effect from Academic Year 2024-25(R-24)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC with A++ Grade
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State
DEPARTMENT OF MATHEMATICS

CALCULUS & LINEAR ALGEBRA
for B.E., I- Sem., (CBCS)
(Common to CSE, CSE-AIML & IT)

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code:**U24BS120MA**
Credits :03	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to:	***At the end of the course students should be able to:***
1. Develop a deep understanding of the concepts and applications of Taylor's series, Maclaurin's series, curvature, radius of curvature, centre of curvature, and evolutes. **2. Learn** the techniques for finding limits, continuity, partial derivatives of functions of several variables and Taylor's series for functions of two variables, methods for finding maxima and minima of functions of several variables. **3. Study** the fundamental concepts of vector spaces, vector subspaces, linear dependence and independence of vectors, span, basis of a vector space, dimension of a vector space, and coordinates. **4**. **Understand** the fundamental concepts of linear transformations and their properties. **5. Understand** of linear algebra concepts, including the rank of a matrix, characteristic equation, eigenvalues and eigenvectors, LU decomposition, and single value decomposition.	**1. Apply** the concepts of Taylor's series and Maclaurin's series to approximate functions and calculate the curvature, radius, centre of curvature of curves, and evolutes. **2. Calculate** limits, continuity, partial derivatives of functions of several variables and apply Taylor's series for functions of two variables, analyze functions to find maxima and minima. **3. Analyze** vector spaces and their subspaces, determine linear dependence and independence of vectors, identify bases of vector spaces, and compute the dimension of vector spaces. **4. Determine** linear transformations, their null space and range, calculating the dimension of these spaces, understanding the rank and nullity of a linear transformation, and representing a linear transformation using a matrix. **5. Find** the rank of a matrix, eigenvalues and eigenvectors, performing LU decomposition, and applying single value decomposition to real-world problems.

UNIT- I (08 classes)

DIFFERENTIAL CALCULUS

Taylor's Series – Maclaurin's Series – Curvature - Radius of Curvature – Centre of Curvature – Evolutes. (Cartesian and Parametric co-ordinates)

UNIT –II (10 classes)

MULTIVARIABLE CALCULUS

Limits- Continuity (Concepts) - Partial Derivatives - Higher Order Partial Derivatives - Total Derivates - Derivatives of Composite and implicit functions - Taylor's series of functions of two variables – Jacobian - Maxima and Minima of functions of two variables - Lagrange's Method of multipliers.

UNIT-III: (08 classes)

VECTOR SPACES

Definition of Vector Space - Vector Subspaces – Linear Dependence and Independence of vectors - Span of a set of vectors - Basis of a Vector Space – Dimension of a Vector Space –Co-ordinates.

UNIT-IV (08 classes)

LINEAR TRANSFORMATIONS

Introduction to Linear Transformations- The null space and range of a linear map – Dimension of null space and range space - Rank -Nullity theorem (without proof)-Matrix of a linear transformation.

UNIT-V (08 classes)

MATRICES

Rank of a Matrix - Characteristic equation - Eigen values and Eigenvectors – LU Decomposition - Single Value Decomposition.

Learning Resources:

Text Books:

1. Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
2. Higher Engineering Mathematics, B. S. Grewal 40th. Edition, Khanna Publishers.
3. Introduction to linear algebra with applications, Jim DeFranza, Daniel Gagliardi, Tata McGraw-Hill
4. Operational Mathematics by R.V. Churchill, Mc Graw-Hill Book Company, INC.

Reference Books:

1. Advanced Engineering Mathematics 8th Edition by Erwin Kreyszig, John Wiley & Sons.
2. Differential Calculus by Shanti Narayan, S. Chand & Co
3. Elementary Linear algebra, Anton and Rorres, Wiley India Edition
4. An introduction to Linear Algebra, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Online Resources:

1. https://onlinecourses.swayam2.ac.in/cec24_ma10/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma31/preview

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF PHYSICS

PHYSICS OF SEMICONDUCTORS AND OPTOELECTRONIC DEVICES

(Common to CSE, AI&ML and IT)
SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **U24BS110PH**
Credits :03	CIE Marks:40	Duration of SEE: 3 Hours

CO code	Course Objectives	Course Outcomes	Highest BTL
BS110PH.1	Demonstrate the significance of crystal structure in device applications.	Classify crystals based on their structure and apply effects of defects to manipulate properties of solids.	3
BS110PH.2	Appreciate the merits of quantum mechanics over classical mechanics.	Apply Schrodinger wave equation to quantum mechanical systems and obtain Eigen values.	4
BS110PH.3	Arrive at the expressions for carrier concentration in semiconductors	Apply semiconductor physics to fabricate various devices.	3
BS110PH.4	Describe working of optoelectronic devices	Categorize optoelectronic devices and use them for appropriate applications	2
BS110PH.5	Comprehend lasing action and relate the use of lasers in optical fiber communication	Compare different types of lasers. Summarize merits and demerits of optical fibers.	3

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	2	2	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	2	1	-	-	-	-	-	-	-	-	-	1
CO5	3	1	-	-	-	-	-	-	-	-	-	1

UNIT-I: FUNDAMENTALS OF CRYSTALLOGRAPHY (12 hours)

Introduction to crystallography-Miller Indices, inter planar spacing (d_{hkl}), Bragg's law, x- ray diffraction, Debye-Scherrer (Powder) method, distinction between crystalline, polycrystalline, and amorphous materials, Point Defects and their effects, expression for concentration of Schottky and Frankel defects, applications relevant to computer science and engineering.

UNIT-II: INTRODUCTION TO QUANTUM MECHANICS (10 hours)

De Broglie hypothesis, wave packet, wave function and its significance, Schrodinger time dependent and independent wave equations, Eigen values and Eigen functions of infinite square-well potential (particle in a box). Potential barrier-quantum tunneling problem. Introduction to ket and bra vector notation, representation of Qubit, applications of quantum computing.

UNIT-III: SEMICONDUCTOR PHYSICS (10 hours)

Kronig-Penny model, E-k diagram, effective mass of an electron, energy bands in solids, Fermi energy level, density of states, expression for intrinsic and extrinsic equilibrium carrier concentration, conductivity of intrinsic and extrinsic semiconductors, variation of Fermi level with doping and temperature, Hall effect and its applications, formation of a PN junction, diode current equation. Applications of semiconductor devices to computer architecture.

UNIT-IV: OPTOELECTRONIC DEVICES (10 hours)

Light Emitting Diode (LED): Direct and indirect band gap semiconductors, electron-hole pair generation and recombination, non-radiative and radiative recombination in semiconductors, construction and working of homo junction LED, quantum efficiency of LED, advantages, and applications of LED.

Photo detectors: Principle of a photo detector, construction and working of photodiode and PIN diode, applications of photo detectors.

Solar Cell: Photovoltaic effect, construction and working of solar cell, V-I characteristics of solar cell, conversion efficiency, fill factor, applications of solar cells.

UNIT-V: LASERS AND OPTICAL FIBERS (10 hours)

Lasers: Induced absorption, spontaneous and stimulated emissions, characteristics of lasers, population inversion, meta-stable states, pumping mechanisms, components of laser, types of lasers, construction and working of He-Ne laser and semiconductor laser, advantages of lasers, applications of lasers including computer devices such as memory, printers.

Optical Fibers: principle of optical fiber, propagation of light in optical fiber, numerical aperture, acceptance angle, types of optical fibers, V- number, signal losses in optical fibers: Attenuation-absorption, scattering, bending and alignment losses, Signal distortion: intermodal and intra model dispersions, block diagram of optical communication system, advantages, and application of optical fibers.

Learning Resources:

1. Charles Kittel, Introduction to Solid State Physics, 8th edition, John Wiley & Sons, 2012.
2. Donald A Neamen, Semiconductor Physics and Devices, 3rd edition, Tata McGraw 2008.
3. S.O. Kasap, Optoelectronic and Photonics: Principles and Practices, Pearson, 2001
4. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun, Murthy A Textbook Engineering Physics, 11th edition, S. Chand, 2019.
5. M.R Shenoy, NPTEL MOOCS course, Semiconductor opto-electronics. 2020.
6. Prof.Digbijoy N Nath, NPTEL MOOCS, Fundamentals of Semiconductor Devices

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

With effect from Academic Year 2024-25(R-24)

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERBAD-500031,
DEPARTMENT OF INFORMATION TECHNOLOGY

PYTHON PROGRAMMING

SYLLABUS FOR B.E. I SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks :60	Course Code:**U24ES110IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The Objectives of the course:	*On completion of the course, students will be able to:*
1. Demonstrate the key features of python, containers and its applications. 2. Explain OOP concepts, exception handling, serialization using JSON and pickle in python.	1. Understand the features of python, control structures and recursive functions. 2. Access and visualize the data stored in lists, NumPy arrays and evaluate regular expressions using strings. 3. Implement tuples, sets and dictionary data structures in python. 4. Develop python programs to implement object oriented concepts. 5. Implement serialization using JSON and perform exception handling.

UNIT – I

Introduction to Python: Features of Python, variables and identifiers, operators and expressions.

Decision making and repetition: if, if else, nested if-else and else if, while loops and for loops, nested loops, break, continue, pass

Functions: Definition, function call, more on defining functions, recursive functions.

Unit – II

Strings: Introduction, accessing strings, basic operations, string slice, String function and methods, Regular Expressions.

Lists and Plotting: Introduction, Operations on lists, nested list, list methods, list comprehension, Functional programming - filter(), map(), reduce() function, Plotting data in lists using matplotlib and SciPy.

NumPy arrays basics: Importing NumPy, Basic array attributes and operations, 1-D and multi-dimensional arrays, Array slicing and striding, Other array creation functions, Basic array math. Creating matrices using NumPy arrays, accessing elements, accessing rows and columns, setting elements, setting rows and columns, multi-dimensional slicing, and striding.

UNIT – III

Tuples: Introduction, operations on tuples, packing and unpacking, nested tuples, tuple methods and functions.

Set: Introduction, Set operations.

Dictionaries: Basic operations, sorting items, looping over dictionary, nested dictionaries, built-in dictionary functions.

UNIT – IV

OOPS Concepts: Introduction, classes and object, class method and self-argument, the __init__()method, class variables and object variables, public and private data members, Inheritance, Operator Overloading.

UNIT – V

Files and Exceptions: reading and writing files, serialization using JSON and pickle, encoding and decoding, handling exceptions, assertions, modules – math, random, calendar, turtle, built-in and user-defined exceptions.

Learning Resources:

1. Allen Downey, "Think Python: How to Think Like a Computer Scientist", O'Reilly publications,2nd Edition.
2. Reema Thareja, "Python programming using problem solving approach ", Oxford university press.
3. Mark J Guzdial, Introduction to Computing and programming in Python, 3rd Edition (2013), Pearson India
4. https://onlinecourses-archive.nptel.ac.in/noc19_cs09/
5. http://nptel.ac.in/courses/117106113/34
6. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-01sc-introduction-to-electricalengineering-and-computer-science-i-spring-2011/python-tutorial/

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Electrical & Electronics Engineering

Basic Electrical Engineering

SYLLABUS FOR B.E I – SEMESTER
(Common to CSE and IT Branches)

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U24ES010EE**
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be
1. To provide an understanding of basics in Electrical circuits 2. To explain the working principles of Electrical Machines.	1. Analyze Electrical Dc circuits using different analyzing methods and theorems. 2. Analyze Electrical single phase and three phase AC circuits 3. Comprehend the working principles of DC machines 4. Comprehend the working of single phase transformer and various Electrical

Unit-I

D.C. Circuits:

Electrical circuit elements (R, L and C), independent voltage and current sources, Kirchhoff current and voltage laws, Source transformation, Mesh Analysis, Nodal analysis, Superposition theorem, Thevinin's and Norton's Theorem, Maximum power transfer theorem, Tellegen's theorem.

Unit II

A.C. Circuits:

Representation of sinusoidal waveform - peak and rms values, form factor, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac series combinations of R-L-C circuits, Three-phase balanced circuits, voltage and current relations in star and delta connections, analysis of three phase balanced star and delta connected loads.

Unit III

DC Machines:

Construction, Working principle of DC Generator and DC motor , EMF equation, Types of DC Generators & motors, Torque in a DC motor, Torque – speed characteristic of DC Shunt motor, Speed control of DC shunt motor.

Unit IV

Single Phase Transformers and Electrical Installation:

Principle of operation, Ideal and practical transformer on No-load and Load, Equivalent circuit, losses in transformers, efficiency.

Components of LT Switchgear: Switch fuse unit (SFU), MCB, Earthing, elementary calculations for Energy consumption, power factor improvement.

Unit V

Induction Motors and Stepper Motors:

Generation of rotating magnetic fields, Construction and working of a three- phase induction motor, torque derivation, losses and efficiency, torque-slip characteristics.

General construction, working and applications of Stepper motor and BLDC motor.

Learning Resources:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", 4th edition Tata McGraw Hill, 2019.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2019.
3. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
4. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
5. V.K Mehta, Rohit Mehta, "Principles of Electrical Engineering and Electronics", S Chand & Company Ltd, 2006.
6. J.B. Guptha, A course in electrical installation estimating and costing, reprint 2013, published by S.K. Kataria & Sons.
7. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests		:	90 Minutes		

With effect from Academic Year 2024-25(R-24)

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF CIVIL ENGINEERING

BASIC ENGINEERING DRAWING

(Common to CSE & IT)
SYLLABUS FOR B.E. I-SEMESTER

L:T:P (Hrs./week): 1:0:2	SEE Marks: 60	Course Code: **U24ES030CE**
Credits: 2	CIE Marks: 40	Duration of SEE: 3Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are to:	At the end of the course, students will be able to:
1. Impart skills in using drawing instruments to convey exact and complete information of the object. 2. Construct conic sections and regular polygons. 3. Construct the orthographic projections of points, lines, planes and solids. 4. Visualize and construct isometric projections.	1. Understand the fundamentals of drawing, Draw polygons and Conics. 2. Draw the orthographic projections of points and straight lines. 3. Draw the orthographic projections of planes inclined to both reference planes. 4. Draw the orthographic projections of solids inclined to one reference plane. 5. Draw the isometric projections of lines, planes and solids.

UNIT-I: Introduction to Engineering Drawing: Necessity of Engineering Drawing for engineers, Use of Drawing Instruments, Types of Lines, Lettering practice, Dimensioning and its methods, Conic sections by eccentricity method, Regular polygons given the length of side.

UNIT-II: Orthographic Projections: Principles of orthographic projections, conventions, projections of points placed in different quadrants.
Projections of straight lines inclined to one and two reference planes placed in first quadrant only. Traces (By conventional methods only).

UNIT-III: Projections of Planes: Projections of perpendicular planes, oblique planes and their traces.

UNIT-IV:Projections of Regular Solids: Projections of prism, cylinder, pyramid and cone in simple positions and axis inclined to one reference plane. Development of lateral surfaces of full solids.

UNIT-V: Isometric Projections: Principles of isometric projections – Isometric scale, Isometric axes, Isometric planes, Isometric view. Isometric views of lines, planes, regular solids, and combination of two solids.

Learning Resource:

1. Bhatt N.D. "Elementary Engineering Drawing",Charotar Publishers,54th Edition, 2023.
2. Basanth Agrawal, Agrawal C.M " Engineering Drawing" Second Edition, Tata McGraw Hill,2019
3. Thomas E French, Charles J Vierck, Robert J. Foster,"Engineering Drawing and Graphic Technology",Mc Graw Hill Education, 1993.
4. Gill P.S."Engineering Drawing: Geometrical Drawing",S K Kataria &sons,13th Edition, 2021.
5. Venu gopal. K" EngineeringDrawingand Graphics Plus Autocad",New Age International (P) Ltd., New Delhi,2011.
6. Siddiquee A.N" Engineering Drawing with a Primer on Autocad", Prentice hall of India Ltd., New Delhi,2004.
7. BVR Gupta, M RajaRoy, "Engineering Drawing with AutoCad", IKInt Pvt Ltd, 2020.
8. NPTEL Course (www.nptel.ac.in)
9. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

With effect from Academic Year 2024-25(R-24)

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

Department of Mechanical Engineering

INTRODUCTION TO ENTREPRENEURSHIP

SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: **U24MC010ME**
Credits : --	CIE Marks:30	Duration of SEE: 02Hours

COURSE OBJECTIVE *The objective of the course is to*	**COURSE OUTCOMES** *On completion of the course, students will be able to*
Inspire students develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	1 get awareness about entrepreneurship and potentially become an entrepreneur. 2 discern the characteristics required to be a successful entrepreneur 3 know the importance of effective communication. 4 demonstrate effective sales skills.

UNIT-I

Sources of new ideas, techniques for generating ideas.

Team formation, how entrepreneurship has changed the country and world, entrepreneurial myths, E-cells and their significance, success story of entrepreneurs, eg: Practo, global entrepreneurs, entrepreneurial journeys, challenges, and successes, characteristics of a successful entrepreneur, entrepreneurial styles, introduction to business model.

UNIT-II

Importance of effective communication for entrepreneurs, communication barriers, miscommunication, incorrect assumptions about people, importance of listening, design thinking, sales skills, understanding the customer-centric approach, personal selling techniques, show and tell, elevator pitch, managing risks and learning from failures, women entrepreneurs.

Learning Resources:

1. Bruce R. Barringer and R. Duane Ireland, "Entrepreneurship: successfully launching new ventures", 3rd edition, Pearson Prentice Hall, 2009.
2. P. Denning and R. Dunham, "The Innovator's Way", MIT Press: Cambridge, Massachusetts, 2010.

3. Arya Kumar, "Entrepreneurship", Pearson Education, Delhi, 2012.
4. Michael H. Morris, D.F.Kuratko, J G Covin, "Corporate Entrepreneurship and Innovation", Cengage learning, New Delhi, 2010
5. Peter F. Drucker, "Innovation and Entrepreneurship", Routledge Classics, 2015.
6. Eric Ries, "The Lean Start-up", Currency, 1st edition, 2011.
7. http://www.learnwise.org

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests:	01	Max. Marks for each Internal Test:	20
2	No. of Assignments:	01	Max. Marks for each Assignment:	05
3	No. of Quizzes:	01	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **1 Hour**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

English Language and Communication Skills Laboratory

(Common to all branches)
SYLLABUS FOR B.E.I-SEMESTER

L : T : P (Hrs/Week) : 0 : 0 : 2	SEE Marks : 50	Course Code: **U24HS011EH**
Credits: 1	CIE Marks : 30	Duration of SEE : Hours : 3

COURSE OBJECTIVES **The course will enable the learners to:**	**COURSE OUTCOMES** **On completion of the course, learners will be able to:**
1. Learn the speech sounds, parts of speech and distinguish between vowel and consonant sounds in the English language to reduce mother tongue influence when speaking English. 2. Understand and follow the rules in debates, group discussions, interviews. 3. Develop reading skills and analyse various text types.	1. Speak well using 'generally acceptable English' in terms of pronunciation and diction. 2. Participate effectively in group discussions, public speaking, debates (formal and informal). 3. Read, analyse, evaluate and infer meaning from different types of texts and Paraphrase them.

1.0 PHONETICS LAB- TOPICS

1.1 **Introduction to English Phonetics:**
Classification of consonants and vowel sounds and related symbols. Pronunciation of commonly mispronounced words.

1.2 **Aspects of language learning and ear training activities-** Word stress and intonation, Pronunciation of silent letters, mispronounced words, and Foreign words used in English

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

2.1 **Formal and informal conversations**—From initiating to terminating stage.

2.2 **Group discussion:** Objectives of GD, Types of GDs; Initiating, Sustaining, and concluding a GD—Using discourse markers.

2.3 **Public speaking:**
Dos and don'ts of public speaking. Listening and analysing speeches of great personalities in history, Josh talks, Movies.

2.4 **Debate:**
Understanding the difference between a debate and a group discussion, essentials of debates.

3.0 READING SKILLS LAB

3.1 Strategies of reading using SQ3R, applying it to various text types.

3.2 Teaching different types of texts for comprehension—Fromshort stories to technical articles.

2.3.1 Newspaper reading. Summarizing, paraphrasing, and presenting news articles.

Learning Resources:

Prescribed textbook for laboratory:

1. Speak Well: JayshreeMohanraj, KandulaNirupa Rani and Indira Babbellapati - Orient Black Swan
2. Longman Dictionary of Contemporary English–Latest Edition.

Learning Resources:

1. Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.
2. PriyadarshiniPatnaik : Group discussion and interviews, Cambridge University Press India private limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A Definitive guide to contemporary English Pronunciation.
4. Reading Cards (Eng400): Orient Black Swan. Reading Squabble - Hadfield.

With effect from Academic Year 2024-25(R-24)

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, Hyderabad-31
DEPARTMENT OF PHYSICS

SEMICONDUCTOR OPTOELECTRONICS LAB

B.E Syllabus for CSE, CSE (AI & ML) and IT Branches
SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: **U24BS111PH**
Credits :01	CIE Marks:30	Duration of SEE: 3 Hours

Course Objectives	**Course Outcomes**	**Highest BTL**
• to study and discuss the characteristics of a given device	1. Conduct experiment independently and in team to record the measurements	2
• to identify probable errors and take in the readings and known possible precautions	2. Outline the precautions required to be taken for each experiment	1
• to compare the experimental and theoretical values and draw possible conclusions.	3. Compare the experimental results with standard values and estimate errors	2
• To interpret the results from the graphs drawn using experimental values.	4. Draw graphs and interpret the results with respect to graphical and theoretical values	2
• To write the record independently with appropriate results.	5. Write the summary of the experiment and draw appropriate conclusions	1

CO-PO Mapping

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	-	-	-	-	-	-	-	2	-	-	2
CO2	3	-	-	-	-	-	-	-	-	-	-	1
CO3	2	2	-	-	-	-	-	-	-	-	-	1
CO4	3	-	-	-	-	-	-	-	-	-	-	1
CO5	2	-	-	-	-	-	-	1	-	-	-	2

1. Study of I-V characteristics of P-N Junction diode.
2. Study of I-V characteristics of Zener Diode.
3. Study of I-V characteristics of LED and Photodiode
4. Determination of wavelength of laser light.
5. Calculation of numerical aperture, acceptance angle and power loss

due to bending of an optical fiber.

6. Study of I-V characteristics of solar cell and to calculate fill factor and efficiency
7. Determination of Planck's constant using Photocell
8. Determination of Hall's coefficient, carrier concentration of given semiconductor- Hall's effect
9. Study of resonance in LCR series circuits and estimation of band width & Q- factor
10. Study of resonance in LCR parallel circuits.
11. Determination of energy gap of a given semiconductor by four probe method
12. Determination of Seebeck coefficient.
13. Helmholtz coil –calculation of magnetic field along the axis of a solenoid

*Each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18
Duration of Internal Test: 3 Hours			

With effect from Academic Year 2024-25(R-24)

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

PYTHON PROGRAMMING LAB

SYLLABUS FOR B.E. I SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code: **U24ES111IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Objectives of the course:	*On completion of the course, students will be able to:*
1. Provide hands on experience to use python containers and numpy arrays. 2. Explain object-oriented concepts, file handling in python.	1) Solve problems using different decision-making statements, loops and functions. 2) Visualize the data by plotting data in lists. 3) Interpret Object Oriented concepts in Python 4) Understand and perform different File handling operations.

List of Programs:

1) Programs on operators and expressions.
2) Programs on decision making.
3) Programs on loops.
4) Programs on functions.
5) Programs on Strings.
6) Programs on Lists.
7) Programs on Plotting data in lists and NumPy Arrays.
8) Programs on Matrices and Vectors.
9) Programs on Tuples and sets.
10) Programs on Dictionaries.
11) Programs on classes and objects.
12) Programs on Inheritance.
13) Programs on file handling.
14) Programs on exceptions.
15) Programs on writing user defined modules.

Virtual Lab

16) Modules in Python - https://python-iitk.vlabs.ac.in/exp/built-in-modules/

Learning Resources:

1. Allen Downey, "Think Python: How to Think Like a Computer Scientist", O'Reilly publications,2nd Edition.
2. Reema Thareja, "Python programming using problem solving approach ", Oxford university press.
3. Mark J Guzdial, Introduction to Computing and programming in Python, 3rd Edition (2013), Pearson India
4. https://onlinecourses-archive.nptel.ac.in/noc19_cs09/
5. http://nptel.ac.in/courses/117106113/34
6. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-01sc-introduction-to-electricalengineering-and-computer-science-i-spring-2011/python-tutorial/

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18
Duration of Internal Test: 3 Hours			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Electrical & Electronics Engineering

BASIC ELECTRICAL ENGINEERING LABORATORY

SYLLABUS FOR B.E I – SEMESTER
(Common to IT, CSE and CSE(AI& ML))

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: **U24ES011EE**
Credits :1	CIE Marks:30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
To provide the practical knowledge on operation of DC, AC machines and circuits.	1. Handle basic electrical equipment and apprehend safety precautions 2. est the performance of various AC and DC machines 3. Apply and Verify various Network theorems 4. [illegible]

List of Experiments

1. Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
2. Verification of Kirchoff's Voltage Law & Kirchoff's Current Law.
3. Verification of Superposition theorem and maximum power transfer theorems.
4. Verification of Thevenin's and Tellegen's theorems.
5. Sinusoidal steady state response of R-L and R-C circuits, Measurement of phase angle.
6. Measurement of cumulative three-phase power in balanced three-phase circuits.
7. 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.
8. Torque Speed Characteristic of dc shunt motor.
9. Speed control of dc shunt motor.
10. Loading of a transformer: measurement of primary and secondary voltages and currents and power.

11. Torque-Slip Characteristic of a three phase induction motor.
12. Measurement of electrical energy consumption.
13. Improvement of Power factor in R-L-C Circuits.

From the above experiments, each student should perform at least 10 (Ten) experiments.

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for assessment of each experiment			18
Duration of Internal Test: **3 Hours**			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-24)

B.E. – INFORMATION TECHNOLOGY : SECOND SEMESTER(2024 - 2025)

B.E (IT) II Semester								
Course Code	**Name of the Course**	**Scheme of Instruction**			**Scheme of Examination**			
		Hours per Week			**Duration in Hrs**	**Maximum Marks**		**Credits**
		L	**T**	**P/D**		**SEE**	**CIE**	
THEORY								
U24BS220MA	Advanced Calculus	3	-	-	3	60	40	3
U24BS210CH	Material Chemistry	3	-	-	3	60	40	3
U24ES010CE	Basic Engineering Mechanics	3	-	-	3	60	40	3
U24ES210IT	Basic Electronics	3	-	-	3	60	40	3
U24ES220IT	Structured Programming for Problem Solving	3	-	-	3	60	40	3
U24HS020EH	Human Values & Professional Ethics – I	1	-	-	2	40	30	1
U24MC010CE	Environmental Science	2	-	-	3	60	40	-
PRACTICALS								
U24BS211MA	Mathematics Lab	-	-	2	3	50	30	1
U24BS011CH	Chemistry Lab	-	-	2	3	50	30	1
U24ES211IT	Basic Electronics Lab	-	-	2	3	50	30	1
U24ES221IT	Structured Programming for Problem Solving Lab	-	-	2	3	50	30	1
	Library / Sports / Personality Development Programme / Mentor Interaction	-	-	-	-	-	-	-
• Student should acquire one NPTEL Certification Course equivalent to 2 credits (8 weeks) by the end of VI Semester. • Students opting for Honours should complete one NPTEL Course of 2 credits (8 Weeks) by the end of IV Semester.								
Total		**18**	-	**8**	**--**	**600**	**390**	**20**
Grand Total		**26**				**990**		

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC with A++ Grade
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State
DEPARTMENT OF MATHEMATICS

ADVANCED CALCULUS

B.E., II- Sem., (CBCS)
(Common to CSE, CSE-AIML & IT)

L :T:P (Hrs./week):3:0:0	SEE Marks :60	Course Code: **U24BS220MA**
Credits : 3	CIE Marks :40	Duration of Semester End Exam : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	***At the end of the course students should be able to:***
1. Learn to Solve the first order differential equations and its applications. **2. Learn** to Solve the various higher order homogeneous and non-homogeneous linear differential equations with constant coefficients and its applications. **3. Study** the concepts of vector differentiation. **4. Learn** how to evaluate double and triple integrals and Study the concepts of vector integration. **5. Identify** the nature of an infinite series using various tests.	**1. Solve** the first order differential equations, model the real time engineering problems viz., RC& LR Circuits into differential equations. **2. Solve** the higher order Linear Differential equations; model the real time engineering problems. **3. Find** the gradient of a scalar point function, divergence and curl of vector field and its applications. **4. Apply** the concepts of multiple integrals to evaluate area, volume and vector integral theorems **5. Apply** an appropriate test to check the nature of an infinite series.

UNIT – I :
ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER
Exact first order differential equations - Integrating factors- Clairaut's equation - Applications of First Order Differential Equations - Orthogonal trajectories (Cartesian families) – LR and RC Circuits.

UNIT – II
HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS
Solutions of Homogeneous and Non-Homogeneous linear equations with constant coefficients - Method of Variation of Parameters – Applications of linear differential equations to LCR circuits.

UNIT – III
VECTOR CALCULUS

Scalar and Vector point functions -Vector Differentiation - Level Surfaces - Gradient of a scalar point function - Normal to a level surface - Directional Derivative – Divergence and Curl of a Vector Field - Solenoidal and Irrotational vectors- Conservative vector field.

UNIT – IV

MULTIPLE INTEGRALS: Double and Triple integrals (Cartesian) - Change of order of integration (Cartesian Coordinates)- Jacobian for two variables - Change of the Variables (Cartesian to polar Coordinates)

VECTOR INTEGRATION: Line, Surface and Volume integrals - Green's Theorem – Gauss Divergence theorem - Stokes's Theorem (All theorems without proof) -

UNIT – V

INFINITE SERIES

Definition of Sequence, Convergence of Sequence- Series – Convergence and Divergence- Series of positive terms-Geometric series- p-series test - Comparison tests - Limit comparison test- D'Alemberts Ratio Test – Cauchy's root test - Alternating Series – Leibnitz test – Absolute and Conditional convergence.

Learning Resources:

1. Higher Engineering Mathematics 40thEdition Dr. B.S Grewal, Khanna Publishers.
2. Advanced Engineering Mathematics 3rd Edition, R.K.Jain&S.R.K.Iyengar, Narosa Publishing House.
3. A Text book of Engineering Mathematics, N.P.Bali& Manish Goyal, Laxmi Publications.
4. Advanced Engineering Mathematics, by Wylie & Barrett, Tata Mc Graw Hill, New Delhi.
5. Advanced Engineering Mathematics, 8th Edition by Erwin Kreyszig, John Wiley & Sons, Inc.
6. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
7. http://mathworld.wolfram.com/topics
8. http://www.nptel.ac.in/course.php
9. https://www.coursera.org/in

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	: 3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	: 3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests: :90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

ACCREDITED BY NAAC WITH A++ GRADE

DEPARTMENT OF CHEMISTRY

MATERIAL CHEMISTRY

(For CSE, CSE (AI & ML) and IT branches)

L:T:P (Hrs./week):3:0:0	SEE Marks : 60	Course Code: **U24BS210CH**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES:	**COURSE OUTCOMES**
The course will enable the students to:	**At the end of the course, students should be able to:**
1. Study types of conductance, variation of electrode potential and EMF and to acquaint with applications of Galvanic Cell. 2. Classify and compare various types of batteries and fuel cells. 3. Get acquainted with different types of polymers and their applications 4. Appraise few engineering materials.	1. Construct a galvanic cell and calculate its EMF and pH wherever applicable. 2. Describe the construction, chemistry and applications of the selected primary, secondary batteries and fuel cells. 3. Classify the macro molecules and discuss the synthesis and applications of a few macro molecules. 4. Get expose to basic concepts of engineering materials such as composites and liquid crystals. 5. Familiarise with the classification, synthesis, characterization, properties and applications of nanomaterials.

CO-PO MAPPING FOR MATERIAL CHEMISTRY

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	-	-	-	1
2	3	1	-	-	-	-	2	-	-	-	-	2
3	3	1	-	-	-	-	2	-	-	-	-	1
4	3	1	-	-	-	-	1	-	-	-	-	1
5	3	1	-	-	-	-	1	-	-	-	-	2

UNIT-I: ELECTRODICS AND ITS APPLICATIONS

Introduction, conductance, types of conductance – specific, equivalent, molar conductance and their interrelationship - numericals. Principle and applications

of conductometric titrations – strong acid *vs* strong base, weak acid *vs* strong base and mixture of acids *vs* strong base.
Concept of electrode potential, Helmholtz electrical double layer theory, electro motive force (EMF). Electrochemical series – applications. Nernst equation – derivation, applications and numericals. Concentration cells – numericals.
Types of electrodes- construction and working of calomel electrode (CE), quinhydrone electrode and glass electrode (GE). Determination of pH using glass electrode and quinhydrone electrode. Applications of potentiometry – acid base and redox titration (Fe(II) Vs $KMnO_4$).

UNIT-II: CHEMISTRY OF BATTERIES
Introduction – definition of cell and battery – Types of cells (reversible and irreversible cells). Battery characteristics: free energy change, electromotive force of battery, power density, energy density – numericals.
Primary batteries: Types-acidic, alkaline and reserve batteries. Construction and electrochemistry of Zn-C, Ag_2O-Zn battery and lithium-V_2O_5 battery.
Secondary batteries: Construction and working of lead-acid and lithium ion battery – advantages, limitations and applications.
Fuel cells: Concept, types of fuel cells and merits. Construction, working and applications of methanol – oxygen(AFC), phosphoric acid and molten carbonate fuel cells.

UNIT-III: MACRO MOLECULES
Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers. Classification of polymers – i) homo and co-polymers; ii) homo chain and hetero chain polymers; iii) plastics, elastomers, fibers and resins.
Types of Polymerization - Addition and condensation polymerization.
Molecular weight- number average and weight average molecular weight, numericals.
Glass transition temperature (Tg), factors affecting Tg.
Plastics: Thermoplastics and thermosets - preparation, properties and applications of i) Aramid (Kevlar); ii) Poly carbonate iii) Bakelite
Elastomers: Natural rubber- structure – chemistry of vulcanization and its advantages.
Artificial rubbers- i) BuNa-S ii) BuNa-N
Biodegradable polymers: Concept, preparation and uses of poly lactic acid.
Conducting polymers: Definition- classification, mechanism of conduction in polyacetylene and applications.

UNIT-IV: ENGINEERING MATERIALS
Composite materials:

Introduction, constituents of composites, advantages over conventional materials. Applications of composites. Types of composites based on matrix and dispersed phases. Fiber reinforced composites: glass, carbon and aramid reinforced composites. Layered composites- applications. Manufacturing techniques – Hand layup, Resin transfer and filament winding methods.

Liquid Crystals:

Introduction, classification of liquid crystals – Thermotropic and Lyotropic liquid crystals – Chemical constitution and liquid crystalline behavior.

Molecular ordering in liquid crystals – Nematic, Smectic and Cholesteric liquid crystals – Applications.

UNIT-V: NANOMATERIALS

Introduction – Concept of nanomaterials – quantum confinement and surface volume ratio.

Properties of nanomaterials: Catalytic and Optical - properties. Applications of Nanomaterials.

Types of Nanomaterials**:** Zero dimensional (0-D), One dimensional (1-D), Two dimensional (2-D), Three Dimensional(3-D).

Characterization of nanomaterials- Principle and block diagram of Scanning Electron Microscope (SEM), Atomic Force Microscope (AFM).

Synthesis of nanomaterials: Top down and bottom-up approaches – mechanical grinding by ball milling and sol-gel method.

Graphene: Introduction, synthesis of graphene by chemical vapor deposition (CVD).

Carbon Nanotubes**:** Classification – single walled carbon nanotubes (SWCNTs – armchair, zig-zag, chiral) and Multi walled carbon nanotubes (MWCNTs- Russian doll and parchment model).

Synthesis of CNTs – Arc discharge and laser ablation methods.

Text Books:

1. P. C. Jain, M Jain Engineering Chemistry, Dhanapathi Rai publishing company (17th edition), New Delhi.
2. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai & Co, New Delhi.
3. O. G. PALANNA, Engineering Chemistry, TMH Edition.
4. J.C. Kuriacose and Rajaram, Chemistry in Engineering and Technology
5. Wiley Engineering Chemistry, Wiley India pvt Ltd, II edition.
6. The chemistry of nanomaterials – Synthesis, Properties and Applications by C. N. R. Rao, Wiley India Pvt. Ltd.

Learning Resources:

1. B. H. Mahan, University Chemistry.
2. B. L. Tembe, Kamaluddin and M. S. Krishnan, Engineering Chemistry (NPTEL Web-book).

3. P. W. Atkins, Physical Chemistry.
4. S. S. Dara, S Chand and sons, Engineering Chemistry, New Delhi.
5. Puri, Sharma and Pathania, Principles of Physical Chemistry, Vishal Publishing Co.
6. D. Dhara, IIT Kharagpur, NPTEL Polymer Chemistry Course.
7. Gowarikar V R, Polymer chemistry, V Edition.
8. S M Lindsay, Introduction to Nanoscience, Oxford University press.

The break-up of CIE : Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	**90 Minutes**			

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF CIVIL ENGINEERING

BASIC ENGINEERING MECHANICS

(Syllabus for IT)
SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: **U24ES010CE**
Credits: 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be able to:
1. Explain the resolution of a system of forces (coplanar, spatial, concurrent, non-concurrent) and compute their resultant. 2. Solve particle equilibrium problem using equation of equilibrium 3. Determine forces in the members of a truss 4. Perform analysis of bodies lying on rough surfaces. 5. Locate the centroid of a body and also compute the area moment of inertia of standard and composite sections.	1. Determine resultant of forces acting on a body. 2. Analyse equilibrium of a body subjected to a system of forces. 3. Perform analysis of trusses using method of joints and method of sections. 4. Solve problem of bodies subjected to friction. 5. Find the location of centroid and calculate moment of inertia and polar moment of inertia of a given section.

UNIT-I: Force Systems: Rectangular components, moment, couple and resultant of two dimensional and three dimensional force systems.

UNIT-II: Equilibrium of Force Systems: Free body diagram, Equations of equilibrium, Equilibrium of planar and spatial system.

UNIT-III: Determinate Trusses: Analysis of plane trusses like Warren girder, Pratt truss, Fink truss etc using method of joints and method of sections.

UNIT-IV: Friction: Laws of friction. Application to simple systems, Connectedsystems and belt friction, Wedge friction.

UNIT-V: Centroid and Moment of Inertia: Centroids of lines, areas and volumes, Moment of inertia of areas, Composite areas, Polar moment of inertia, Radius of gyration.

Learning Resources:

1. Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2023.
2. Timoshenko S.P and Young D.H "Engineering Mechanics", McGraw Hill International Edition, 2017
3. Andrew Pytel., Jaan Kiusalaas., "Engineering Mechanics", 4th edition, Cengage Learning, 2015.
4. Beer F.P & Johnston E.R Jr. "Vector Mechanics for Engineers", TMH, 2019.
5. Hibbeler R.C, "Engineering Mechanics", 4th edition, Pearson Education, 2017.
6. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", 4th Edition, Umesh Publications, 2011.
7. Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2014, 2nd Edition
8. Meriam. J. L. and Kraige L.G., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2017.
9. NPTEL Course (www.nptel.ac.in)
10. Virtual labs (www.vlab.co.in)

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

BASIC ELECTRONICS

SYLLABUS FOR II-SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks :60	Course Code:**U24ES210IT**
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Objectives of the Course:	*On completion of the course, students will be able to:*
Introduce different electronic devices, their characteristics and apply this knowledge in building simple electronic circuits.	1. Design simple circuits like rectifiers, voltage regulators, clipping and clamping circuits for the given specifications based on the operating principles of the diode. 2. Analyze different bipolar junction transistor circuits to determine Input impedance, output impedance, Voltage gain, current gain using exact and approximate h parameter models. 3. Verify the implementation of simple Boolean functions using CMOS circuits with the help of Truth table indicating the different transistors ON/OFF conditions. 4. Determine the kind of feedback used in a given negative feedback amplifier circuit and determine the frequency of oscillation of Hartley, Colpitt and RC phase shift oscillators. 5. Analyze simple operational amplifier circuits to determine the voltages at specific points in the circuit and design simple operational amplifier circuits for given application.

UNIT – I
Diodes
PN junction diode, Biasing, Zener diodes, Rectifier Circuits, Limiting and clamping circuits, Schottky Barrier diode and Varactor diode.

UNIT – II
Bipolar Junction Transistors
Bipolar junction transistors –characteristics, analysis of transistor circuits at DC, biasing, transistor as amplifier, effect of emitter bypass capacitance, h-parameter model of BJT, approximate analysis of BJT circuits using h-

parameter model, transistor as switch, internal capacitance. Pi equivalent circuit, low frequency and high frequency operation, thermal run away

UNIT – III

Field Effect Transistors

MOSFET current-voltage characteristics, MOSFET as an amplifier and as a switch, Digital CMOS logic circuits: Introduction, digital IC technologies and logic circuit families, Voltage Transfer Characteristic (VTC) of inverter, Noise Margins, Propagation delay, static and dynamic operation of CMOS inverter. CMOS logic gate circuits: Basic structure (PUN and PDN), Implementation of 2-input NOR gate, NAND gate, complex gates and exclusive OR gate.

UNIT – IV

Feedback Amplifiers and Oscillators

Feedback – Structure, Properties of negative feedback, Topologies, Advantages of negative feedback amplifiers Sinusoidal Oscillators – Loop gain, Barkhausen criteria, RC Phase shift, LC and Crystal Oscillators.
Power Amplifiers: class A, B and C amplifiers.

UNIT – V

Operational Amplifiers

Operational Amplifiers: Ideal characteristics, op. amp. as adder, Subtractor, Integrator, differentiator and comparator using op. amp. generation of square and Triangular waveforms, Monostable multi vibrator.
Op. Amp. As Voltage –controlled current switch(VCCS), Current-controlled Voltage source(CCVS), Instrumentation Amplifier, antilogarithmic amplifiers and analog multipliers.

Learning Resources :

1. Jacob Millman, Christos CHalkais, Satybratajit, Electronic Devices and Circuits,Mc Graw Hill India Private Ltd, 3rd Edition
2. Adel S. Sedra, Kenneth C. Smith, Microelectronic Circuits, 5th Edition, Oxford International Student Edition, 2006
3. D. Roy Choudhury, Shail B. Jain, Linear Integrated Circuits, New Age International Publishers, 4th Edition.
4. Jocob Millman, Arvin grable – Micro Electronics – 2nd Edition, McGraw Hill 1987.
5. Donald L. Schilling, Charles Belove, Electronic Circuits Discrete and Integrated, Tata Mc Graw Hill Education, 3rd Edition
6. https://nptel.ac.in/courses/117103063/

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

STRUCTURED PROGRAMMING FOR PROBLEM SOLVING
SYLLABUS FOR B.E. II-SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks : 60	Course Code :**U24ES220IT**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The Objectives of the Course:	*On completion of the course, students will be able to:*
1. Introduce the fundamentals of C Programming. 2. Describe control structures, searching, sorting on arrays and other user-defined data types. 3. Illustrate the applications of pointers and files.	1. Illustrate flowcharts, algorithms, number systems and evaluate expressions using C program. 2. Apply functions and control structures for problem solving. 3. Understand recursion, preprocessor directives, and analyze searching and sorting on arrays. 4. Develop C programs for string manipulation and dynamic memory allocation using pointers. 5. Apply user-defined data types and file handling operations for problem solving using C.

UNIT-I:
Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flowcharts. Number Systems (Binary, Octal, Decimal and Hexadecimal), Representation of Numbers (Fixed and Floating Point).
Introduction to C Language: Background, C Programs, Identifiers, Types, Variables, Constants, Input/Output, Expressions, Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion, Statements, Bitwise Operators.

UNIT-II:
Functions: Designing Structured Programs, Functions Basics, User Defined Functions, Inter-Function Communication, Standard Functions, Scope, Storage Classes-Auto, Register, Static, Extern, Scope Rules and Type Qualifiers.
Selection: Logical Data and Operators, if… else, switch Statements, Standard Functions.
Repetition: Loops, while, for, do-while Statements, Loop Examples, break, continue, goto.

UNIT-III:
Recursion: Recursive Functions, Preprocessor Commands.

Arrays: Concepts, Using Arrays in C, Inter-Function Communication, Array Applications, Two-Dimensional Arrays, Multidimensional Arrays, Linear Search and Binary Search, Selection Sort and Bubble Sort.

UNIT-IV:

Pointers: Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, LValue and RValue, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing on 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:

User-defined data types: Type Definition (typedef), Enumerated Types.

Structures - Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures, Unions.

Input and Output: Files, Streams, Standard Library Input/Output Functions, Character Input/Output Functions.

Learning Resources:

1. Forouzan B.A & Richard F.Gilberg, A Structured Programming Approach using C,3rd Edition(2013),CengageLearning.
2. Brian W.Kernighan & Dennis M. Ritchie, The C Programming Language, 2nd Edition (2006), Prentice-Hall.
3. Rajaraman V, The Fundamentals of Computer, 4th Edition(2006), Prentice-Hall of India
4. Steve Oualline, Practical CProgramming,3rd Edition(2006),O'Reilly Press.
5. Jeri R. Hanly, Elliot B. Koffman, Problem Solving and Program Design in C, 5thEdition (2007), Pearson Education.
6. Balagurusamy E, Programming in ANSI C, 4th Edition(2008), TMG.
7. Gottfried, Programming with C, 3rd Edition(2010), TMH.
8. R G Dromey, How to Solve it byComputer,1st Edition(2006), Pearson Education.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max.Marks for each Internal Tests:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: **90 Minutes**

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

HUMAN VALUES AND PROFESSIONAL ETHICS-1
(Common to all branches) SYLLABUS FOR B.E. 1/4 - I & II SEMESTERS

Instruction: 1 Hour	SEE: 40	Course code: **U24HS020EH**
Credits: 1	CIE: 30	Duration of SEE: 2 Hours
COURSE OBJECTIVES **The course will enable the learners to:** 1. Get a holistic perspective of value- based education. 2. Grasp the meaning of basic human aspirations vis-a-vis the professional aspirations 3. Understand professionalism in harmony with self and society. 4. Develop ethical human conduct and professional competence. 5. Enrich their interactions with the world around, both professional and personal.		**COURSE OUTCOMES** **At the end of the course the learners will be able to: -** 1. Understand the significance of value inputs in a classroom and start applying them in their life and profession 2. Distinguish between Personal and Professional life goals–constantly evolving into better human beings and professionals. 3. Work out the strategy to actualize a harmonious environment wherever they work. 4. Distinguish between ethical and unethical practices, and start implementing ethical practices 5. Apply ethics and values in their personal and professional interactions.

UNIT-1 HARMONY WITH SELF AND FAMILY

Understanding and living in harmony at various levels-with self, family, society and nature and the Ethical and moral values**:** which include self-sufficiency, self-determination, self-advocacy, self-competence, self-direction, self-efficacies, self-regulation, self-reliance, and self-responsibility. This also includes Family values involving all the ideas of how you want to live your family life, and they are often passed down from previous generations.

1.1 Self-Values and Ethics

1.2 Family – Values and Ethics
1.3 Self-Care Practices

UNIT-2 PROFESSIONAL VALUES AND BEHAVIOUR
At the level of individuals: as socially and ecologically responsible engineers and technologists. Team Work: Developing Credibility and building trust by having open and truthful communication. This includes recognizing the value of time and respecting time of self and others.

2.1 Professional Ethics – Individual
2.2 Professional Behaviour - Body Language and Etiquette
2.3 Professional Ethics – Team

UNIT-3 SOCIAL VALUES
Values of service, social justice, dignity and worth of the person Importance of human relationships, integrity, and competence.

3.1 Understanding Social Values
3.2 Importance of relationship
3.3 Diversity and Inclusion

UNIT -4 SPIRITUAL VALUES
Developing individual practice has to do with having a sense of peace and purpose. Spiritual values, namely, benevolence, charity, dignity, forbearance, hope, humility, kindness, love, modesty, peace, perseverance, piety, repentance, righteous, sacredness, sincerity, steadfastness, striving, trusting, truthfulness, unity, and wisdom.

4.1 Exploring Different Traditions
4.2 Values in Action
4.3 Spirituality in Everyday Life

MODE of DELIVERY

● Questionnaires ● Quizzes ● Case-studies ● Observations and practice ● Home and classroom assignments	● Discussions ● Skits ● Short Movies/documentaries ● Team tasks and individual tasks ● Research based tasks ● Viva

Relevant Websites, CD's and Documentaries

- https://plato.stanford.edu/

Learning Resources:

learn.talentsprint.com

1. Sapiens: A Brief History of Humankind By Yuval Noah Harari
2. How to Think About What You Don't Know: The Art of Counterfactual Thinking by Judith Lichtenberg
3. Ethics in the Professions by Charles E. W. Tessera
4. Thinking in Ethics: A Practical Guide to Right and Wrong by Jeanne Halifax

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal tests	:	1	Max. Marks	:	20
2	No. of assignments	:	2	Max. Marks	:	5
3	No. of Quizzes	:	2	Max. Marks	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF CIVIL ENGINEERING

ENVIRONMENTAL SCIENCE

(Common to CSE & IT)
SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 2 : 0 : 0	SEE Marks:60	Course Code: **U24MC010CE**
Credits : - - -	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will	*Upon the completion of this course students will be able to*
1. Describe various types of natural resources available on the earth surface. 2. Explain the concepts of an ecosystem and the biotic and abiotic components of various aquatic ecosystems. 3. Identify the values, threats of biodiversity, endangered and endemic species of India along with the conservation of biodiversity. 4. Explain the causes, effects and control measures of various types of environmental pollutions. 5. Describe the methods for water conservation, the causes, effects of global warming, climate change, acid rain, ozone layer depletion, population explosion.	1. Describe the various types of natural resources. 2. Differentiate between various biotic and abiotic components of ecosystem. 3. Examine the values, threats of biodiversity, the methods of conservation, endangered and endemic species of India. 4. Illustrate causes, effects, control measures of various types of environmental pollutions. 5. Explain the methods of water conservation, causes, effects of climate change, global warming, acid rain and ozone layer depletion, population explosion.

UNIT-I: Environmental Studies: Definition, importance of environmental studies. Natural resources: Water resources; floods**,**drought, conflicts over water, dams-benefits and problems. Food resources; Effects of modern agriculture, fertilizer-pesticide problems, Eutrophication, Biomagnification, water logging, salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT-II: Ecosystems: Definition of ecosystem, classification of ecosystem, Structure and function of an ecosystem, producers, consumers and

decomposers, food chains, food webs, ecological pyramids, aquatic ecosystem (ponds) ,Terrestrial ecosystem(Forest)

UNIT-III: Biodiversity: Definition, Genetic, species and ecosystem level diversity. Values of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity. Biological diversity Act 2002.

UNIT-IV: Environmental Pollution: Causes, effects and control measures of air pollution, air pollution control devices (catalytic convertor) water pollution, water pollution monitoring devices, soil pollution, noise pollution, solid waste types, Municipal solid waste & e-waste recycling, Air act and water act.

UNIT-V: Social Aspects and the Environment: Water conservation, global warming, case study related to self cooling technologies, acid rain, ozone layer depletion, Kyoto protocol, Climate change, Dubai and Paris aggrements. Environmental Impact Assessment. Consumerism, Sustainable development goals (SDG-17), Environmental protection act 1986.

Learning Resources:

1. Deswal S. and Deswal A., A Basic Course on Environmental studies, Dhanpat Rai & Co Pvt. Ltd. 2013.
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2006.
3. Suresh K. Dhameja, Environmental Studies, S.K. Kataria & Sons, 2010.
4. De A.K., Environmental Chemistry, New Age International, 2003.
5. Odum E.P., Fundamentals of Ecology, W.B. Sunders Co., USA, 2004.
6. Sharma V.K., Disaster Management, National Centre for Disaster Management, IIPE, Delhi, 2013.
7. Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2013.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	: 2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	: 2	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Hyderbad-500031, Telangana State
DEPARTMENT OF INFORMATION TECHNOLOGY

Mathematics Lab

(Calculus, Linear Algebra & Differential Equations)
(B.E. Semester - II)

L:T:P (Hrs./week): 0 : 0 : 2	SEE Marks :50	Course Code: **U24BS211MA**
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

Course Objectives	**Course Outcomes**
The Objectives of the Course:	**At the end of the course student will be able to:**
1. Demonstrate the linear algebra, calculus and differential equation concepts using Numpy and SciPy. 2. Provide hands on experience on plotting and symbolic mathematics.	1. Perform basic operations on vectors and matrices using Linear Algebra module of NumPy and SciPy. 2. Use matplotlib library for numerical analysis and visualization. 3. Perform matrix decompositions and solve system of linear equations. 4. Use SymPy library to solve calculus problems. 5. Solve Differential equations using SymPy library.

1. Introduction to Anaconda & Jupyter Notebook setup and evaluating elementary functions.
2. Basic operations on Matrix & Vector.
3. Matrix analysis: Rank, Determinant, Trace, Orthogonal basis & Inverse of matrices.
4. Eigen values and Eigenvectors of Matrix.
5. Matrix decompositions: SVD, QR, LU, Pseudo Inverse
6. Solve system of linear equations.
7. Data plotting (2D,3D) of various mathematical functions.
8. Test the convergence of infinite series i.e., power, Taylor.
9. Intro to calculus and examine minima, maxima and saddle points of a given function.
10. Application of definite integrals to area & volume calculations.
11. Solving differential equations.

Learning Resources:

1. Kong, Qingkai, Timmy Siauw, and Alexandre Bayen. Python Programming and Numerical Methods: A Guide for Engineers and Scientists. Academic Press, 2020.
2. https://numpy.org/doc/1.21/user/tutorials_index.html
3. https://personal.math.ubc.ca/~pwalls/math-python/linear-algebra/linear-algebra-scipy/

System requirements

- Anaconda/Jupyter (software that you are required to install)

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
For day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

ACCREDITED BY NAAC WITH A++ GRADE

DEPARTMENT OF CHEMISTRY

CHEMISTRY LAB

L:T:P (Hrs./week): 0 : 0 : 2	Semester End Exam Marks : 50	Subject Reference Code : U24BS011CH
Credits : 1	Continuous Internal Exam Marks : 30	Duration of semester End Exam : 3 Hours

COURSE OBJECTIVES:	**COURSE OUTCOMES:**
The course will enable the students to:	**At the end of the course, students should be able to:**
1. Describe the quantitative analytical techniques 2. Learn the skills to handle the instruments 3. Apply the theoretical principles in experiments	1. Estimate the amount of metals in the given solutions. 2. Analyze the hardness, alkalinity and chloride content of a given water sample. 3. Determine the concentration a given solution by conductometry, potentiometry and pH metry. 4. Use the principle of colorimetry in the estimation of Permanganate / Copper (II) in a given solution.

CO-PO MAPPING FOR CHEMISTRY LAB

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	3	2	-	-	-	-	-	-	2	-	-	1
2	3	2	-	-	-	-	-	-	2	-	-	1
3	3	2	-	-	-	-	-	-	2	-	-	1
4	3	2	-	-	-	-	-	-	2	-	-	1

Note: Minimum of Ten experiments of the following.

1. Preparation of standard FAS or oxalic acid solution and standardization of $KMnO_4$ or NaOH solution.
2. Estimation of ferrous iron in the given solution by permanganometry.
3. Estimation of chromium (VI) in the given solution by standardized FAS.
4. Estimation of copper (II) in given solution by hypo.
5. Estimation of available chlorine in bleaching powder.
6. Estimation of total hardness of given water sample.
7. Estimation of alkalinity of a given sample.

8. Conductometric acid-base titrations -Determination of strength of given acids (HCl *Vs* NaOH and CH_3COOH *Vs* NaOH).
9. Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids (HCl and CH_3COOH *Vs* NaOH)
10. Determination of strength of a given acid by Potentiometry.
11. Determination of concentration of a given $FeSO_4$ using redox titration by Potentiometry.
12. Determination of strength of a given acid by pH metry.
13. Determination of strength of permanganate or copper in brass solution by Colorimetry.
14. Synthesis of Phenol formaldehyde resin / PANI.
15. Chemistry of blue printing.

Text Books:

1. G H Jeffery, J Bassett, J Mendham, R C Denney, Vogel's text book of quantitative chemical analysis, Fifth Edition.
2. M S Kaurav, Engineering chemistry with laboratory experiments, PHI learning (P) ltd, New Delhi.
3. Sunita rattan, Experiments in applied chemistry, S K Kataria & Sons (2010)
4. A text book on experiments and calculation Engg. S.S. Dara.

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
For day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18

VASAVI COLLEGE OF ENGINEERING(Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

BASIC ELECTRONICS LAB

SYLLABUS FOR B.E. II SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code:**U24ES211IT**
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Objectives of the Course:	On completion of the course, students will be able to
1. Introduce different electronic devices and measurement equipments. 2. Demonstrate building simple electronic circuits.	1. Identify and use different electronic devices and measuring equipment. 2. Use PN diode, Zener diode for applications like rectifiers, clipping and clamping circuits and voltage regulators. 3. Use BJT transistor in the design of amplifier circuit. 4. Implement different types of oscillator circuits. 5. Use operational amplifier for different applications and verify the operation of different digital circuits.

EXPERIMENTS:

1. CRO and its applications: Measurement of amplitude, frequency.
2. Characteristics of pn junction diode.
3. Characteristics of Zener diode.
4. Zener diode as a Voltage Regulator.
5. Half-wave Rectifier.
6. Full-wave rectifier.
7. Clipping Circuits.
8. Clamping Circuits.
9. Characteristics of Common Emitter Transistor configuration.
10. Characteristics of Common Base Transistor configuration.
11. Frequency response of Common Emitter amplifier.
12. RC phase shift oscillators.
13. Operational Amplifier as an adder, subtractor, and comparator.

Virtual Lab:

14. BJT CE amplifier - https://be-iitkgp.vlabs.ac.in/exp/ce-amplifier/

ADDITIONAL EXPERIMENTS:

1. Truth table verification of logic gates using TTL 74 series ICs.
2. Implementation of Half Adder, Full Adder.

3. Verification of Multiplexer Operation.
4. Implementation of Boolean logic using decoders and MUXes.
5. Truth table verification of D flip flop, T flip-flop and JK flip-flop.

Learning Resources:

1. Paul B Zbar and Alber P Malvino, Michael A Miller, "Basic Electronics: A Text Lab Manual", 7th edition, Tata McGraw Hill, 2009.
2. David A Bell, "Laboratory Manual for Electronic Devices and Circuits", 4th edition, PHI, 2001.
3. Muhammed H Rashid, "SPICE for circuits and electronics using PSPICE", 2nd edition, PHI, 1995.
4. Mithal. G.K, "Practicals in Basic Electronics", G K Publishers Private Limited, 1997.
5. Maheswari. L.K and Anand.M.M.S, "Laboratory Manual for Introductory Electronic Experiments", New Age, 2010.
6. PoornachandraRao.S and Sasikala.B, "Handbook of Experiments in Electronics and Communication Engineering", Vikas publishers, 2003
7. http://www.nptelvideos.in/2012/11/basic-electronics-prof-tsnatarajan.html

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
For day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18

VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

STRUCTURED PROGRAMMING FOR PROBLEM SOLVING LAB

SYLLABUS FOR B.E. II-SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U24ES221IT**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The Objectives of the Course:	***On completion of the course, students will be able to***
1.Introduce various control statements, functions, arrays in C language. 2.Demonstrate user defined data types and file handling.	1. Choose appropriate data type for implementing programs in C language. 2. Design and implement modular programs involving input output operations, decision making and looping constructs. 3. Implement search and sort operations on arrays. 4. Apply the concept of pointers for implementing programs on dynamic memory management and string handling. 5. Design and implement programs to store data in structures and files.

Programming Exercise:

1. Programs on operators and expressions.
2. Programs on selection control statements. [if, if-else, elseif ladder, nested if, switch case]
3. Programs on loop control statements. [while, for, do-while]
4. Programs on nested loop control statements. [printing patterns]
5. Programs on functions and recursion [factorial, Fibonacci, GCD]
6. Programs on one dimensional array. [Searching and Sorting]
7. Programs on two-dimensional array. [Matrix addition, Matrix Multiplication]
8. Programs on pointers. [pointer to arrays, pointer to functions]
9. Programs on strings. [string handling functions]
10. Programs on structures and union.

11. Programs on File handling.

Virtual Lab:

12. Call by value and call by reference with pointers - https://cse02-iiith.vlabs.ac.in/exp/pointers/simulation.html

Learning Resources:

1. Forouzan B.A & Richard F. Gilberg, A Structured Programming Approach using C, 3rd Edition(2013), Cengage Learning.
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition (2006), Prentice-Hall.
3. Steve Oualline, Practical CProgramming,3rd Edition(2006),O'Reilly Press.
4. Balagurusamy E, Programming in ANSI C, 4th Edition(2008), TMG.
5. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical programming-in-c-january-iap-2010/syllabus/
6. http://nptel.ac.in/syllabus/syllabus.php?subjectId=106104128

No. of Internal Tests:	02	Max. Marks for Internal Test:	12
Day-to-day laboratory class work which will be awarded based on the average of assessment for each experiment considering at the end of the course			18
Duration of Internal Test: 120 Minutes			