

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

IBRAHIMBAGH, HYDERABAD-500 031

ACCREDITED BY NAAC WITH A++ GRADE

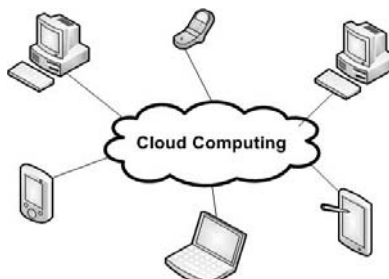
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Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad



**SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (IT) I and II Semesters with effect from 2022-2023
(For the batch admitted in 2022-23)**

(R-22)



DEPARTMENT OF INFORMATION TECHNOLOGY

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**VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
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.

DEPARTMENT OF INFORMATION TECHNOLOGY

Vision

To be a centre of excellence in core Information Technology and multidisciplinary learning and research, where students get trained in latest technologies for professional and societal growth.

Mission

To enable the students acquire skills related to latest technologies in IT through practice- oriented teaching and training.



**VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD-500 031**

DEPARTMENT OF INFORMATION TECHNOLOGY

Programme Educational Objectives (PEOs) for IT Program

The Programme will produce graduates

- PEO1. With theoretical and practical knowledge to obtain employment or pursue higher studies and solve problems in Information Technology.
- PEO2. With effective written and oral communication skills that will help them to work in diversified and dynamic working environments.
- PEO3. With competence to succeed in their professional lives with ethical values.

Program Specific Outcomes (PSOs) for IT Program

The Students will demonstrate

- PSO1. Competency in programming using different programming languages to implement algorithms.
- PSO2. Competency in the analysis and design of a software solution using different modelling tools.
- PSO3. Competency in Electronic Design and Embedded System Design using different simulation tools.

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-22)
B.E. – INFORMATION TECHNOLOGY : FIRST SEMESTER (2022 - 2023)

B.E (IT) I Semester									
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits	
		Hours per Week			Duration in Hrs	Maximum Marks			
		L	T	P/D		SEE	CIE		
THEORY									
U22HS010EH	English Language and Communication	2	-	-	3	60	40	2	
U22BS110MA	Calculus	3	-	-	3	60	40	3	
U22BS110PH	Semiconductors and Optoelectronic Devices	3	-	-	3	60	40	3	
U22ES120CS	Programming for Problem Solving	3	-	-	3	60	40	3	
U22ES010EE	Basic Electrical Engineering	2	-	-	3	60	40	2	
U22ES030CE	Basic Engineering Drawing	1	-	2	3	60	40	2	
U22MC010ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-	
PRACTICALS									
U22HS111EH	English Language and Communication Skills Lab	-	-	2	3	50	30	1	
U22BS111PH	Semiconductor and Optoelectronics Lab	-	-	2	3	50	30	1	
U22ES121CS	Programming for Problem Solving Lab	-	-	2	3	50	30	1	
U22ES011EE	Basic Electrical Engineering Lab	-	-	2	3	50	30	1	
Library / Sports / Personality Development Programme / Mentor Interaction		-	-	-	-	-	-	-	
Total		15	-	10	--	600	390	19	
Grand Total		25			--	990			
<i>Note:</i>									
1. One hour is allotted to Library / Sports / Personality Development Programme / Mentor Interaction.									
2. The left over hours are to be allotted to CC / RC / TC based on the requirement.									

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), IBRAHIMBAGH, HYDERABAD-500 037
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

ENGLISH LANGUAGE AND COMMUNICATION
 SYLLABUS FOR B.E. I-SEMESTER
 (Common to all branches)

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code : U22HS010EH
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

<p>COURSE OBJECTIVES The course will enable the learners to:</p> <ol style="list-style-type: none"> 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. Use English to communicate in various social settings. 4. Develop the ability to engage in reading for reflection and enquiry. 5. Construct grammatically and semantically correct sentences. 	<p>COURSE OUTCOMES At the end of the course the learners will be able to:</p> <p>-</p> <ol style="list-style-type: none"> 1. Communicate effectively, appropriately and ethically in both professional & personal spheres. 2. Listen for gist and make inferences from various speeches and converse intelligibly in various contexts. 3. Construct grammatically correct sentences using adequate vocabulary to compose written and spoken discourses. 4. Read, evaluate and appreciate various text types.
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UNIT-1 1.0 Effective communication and Interpersonal skills

- 1.1 Role and Importance of Communication – functions, process, types, styles, channels and barriers of communication.
- 1.2 Johari window.
- 1.3 Knapp's Model of Interpersonal Communication
- 1.4 Persuasion techniques.

UNIT-2 2.0 Listening and Speaking skills

- 2.1 Importance of listening-- Types of listening—Strategies to improve listening.
- 2.2 Speaking skills: Speaking strategies.

UNIT-3 3.0 Reading and Writing skills

- 3.1 Reading strategies--Analyzing graphics & Visual aids, SQ3R – Survey, Question, Read, Recite, Review.
- 3.2 Features of Writing---Principles of writing paragraphs-Coherence, Cohesion & Unity; Use of appropriate linkers/connectives.
- 3.3 Request letters

UNIT-4 4.0 Vocabulary Building and Grammar

- 4.1 **Vocabulary Building:** Synonyms, Antonyms, One-word substitutes; Collocations; Idioms.
- 4.2 **Functional Grammar:** Articles, Prepositions; Tense and Aspect; Subject- Verb agreement; Direct and Indirect Speech.

UNIT-5 5.0 Reading for appreciation of literary texts

- 5.1 **Prose text-** Our Own Civilization—CEM Joad.
- 5.2 **Poem-**What Life should be-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

E.Suresh Kumar, P. Sreehari and J. Savithri - Essential English
 Reading comprehension - Nuttal.J.C - Orient Blackswan
 Sunitha Mishra,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 : 120 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Ibrahimbagh, Hyderabad-500031

DEPARTMENT OF MATHEMATICS**CALCULUS**

SYLLABUS FOR B.E., I- SEMESTER

(Common to All Branches)

L:T:P (Hrs./week):3:0:0	SEE Marks : 60	Course Code : UI22BS110MA
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students should be able to:</i>
<ol style="list-style-type: none"> Identify convergence of infinite series using various tests. Understand The concepts of curvature, radius of curvature, evolutes and to expand functions using Taylor's series. Acquire knowledge of partial derivatives, and expand functions using Taylor's series functions of two real variables and, maxima- minima. Study the concepts of vector differentiation, Gradient, Divergence and Curl. Learn how to evaluate double and triple integrals, using change of order of integration and apply vector integration to transformation theorems 	<ol style="list-style-type: none"> Apply an appropriate test to check the nature of the infinite series. Compute radius of curvature, evolute of a given curve and also to expand given function using Taylor's series. Expand the given function in terms of Taylor's series and find Maxima and minima of functions of several variables also using Lagrange's method of multipliers. Use gradient to evaluate directional derivatives and conservative vector field. Apply concepts of multiple integrals to evaluate area and volume and vector integration to transformation.

UNIT-I (08 classes)**INFINITE SERIES**

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

UNIT- II (10 classes)**DIFFERENTIAL CALCULUS**

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

UNIT –III (12 classes)**MULTIVARIABLE CALCULUS**

Limits- Continuity -Partial Derivatives-Higher Order Partial Derivatives-Total Derivates - Derivatives of Composite and implicit functions - Taylor's series of functions of two variables - Maxima and Minima of functions of two variables without and with constraints - Lagrange's Method of multipliers.

UNIT – IV (08 classes)**VECTOR DIFFERENTIAL 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-Conservative vector field.

UNIT – V (12 classes)

MULTIPLE INTEGRALS: Double and Triple integrals (Cartesian) - Change of order of integration (Cartesian Coordinates)- Jacobian's-Change of the Variables(Cartesian to polar Coordinates)- Line integrals- Green's Theorem

Text Books:

- Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
- Higher Engineering Mathematics, B. S. Grewal 40th Edition, Khanna Publishers.

Reference Books:

- Advanced Engineering Mathematics 8th Edition by Erwin Kreyszig , John Wiley & Sons.
- Differential Calculus by Shanti Narayan S. Chand & Co

3 Vector Calculus – Schaum's outline series.

Online Resources :

- 1 <http://mathworld.wolfram.com/topics>
- 2 <http://www.nptel.ac.in/course.php>

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

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

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: UI22BS110PH
Credits :03	CIE Marks:40	Duration of SEE: 3 Hours

CO code	Course Objectives	Course Outcomes	Highest BTL
BS110PH.1	Demonstrate the use of crystal structure in device applications.	Classify crystals based on their structure and apply effects of defects on manipulation of 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	Articulate the concepts of semiconductor theory for various devices	3
BS110PH.4	Describe working of optoelectronic devices	Categorize optoelectronic devices and explain their device structure	2
BS110PH.5	Comprehend lasing action and relate the use of lasers in optical fiber communication	Compare different types of lasers and summarize merits and demerits of optical fiber communication	3

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	3	2	-	-	-	-	-	-	-	-	-	1	1
CO2	2	2	-	-	-	-	-	-	-	-	-	1	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1	1
CO4	2	1	-	-	-	-	-	-	-	-	-	1	1
CO5	3	1	-	-	-	-	-	-	-	-	-	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 methods: rotating crystal method and Debye-Scherrer method, distinction between crystalline, polycrystalline, and amorphous materials, Diamond crystal Structure, Point Defects and their effects, expression for concentration of Schottky and Frankel defects and applications relevant to computer science and engineering.

UNIT-II: INTRODUCTION TO QUANTUM MECHANICS (12 hours)

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

UNIT-III: SEMICONDUCTOR PHYSICS (12 hours)

Kronig-Penny model-introduction to origin of band gap, 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, law of mass action, 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 (12 hours)

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

Photodetectors: Principle of a photodetector, construction and working of photodiode and PIN diode, applications of photodetectors.

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

UNIT-V: LASERS AND OPTICAL FIBERS (12 hours)

Lasers: induced absorption, spontaneous and stimulated emissions, Einstein's coefficients; characteristics of lasers, population inversion, meta-stable states, pumping mechanisms, components of laser, types of lasers, construction and working of Ruby laser and semiconductor laser, advantages of lasers, applications of lasers including computer devices such as memory, printers and interconnects.

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 including broad band communications.

Learning Resources:

1. Charles Kittel, Introduction to Solid State Physics, 7th Edition, John Wiley & Sons, 2008.
2. Donald A Neamen, Semiconductor Physics and Devices, 3rd Edition, Tata McGraw 2008.
3. S.O. Kasap, Optoelectronic and Photonics: Principles and Practices, Pearson, 2012
4. Gerd Keiser, Optical Fiber Communications, 4th edition, Tata McGraw, 2010
5. M.N. Avadhanulu and P.G. Kshirsagar and TVS Arun, Murthy A Textbook Engineering Physics, 11th Edition, S. Chand, 2018.
6. M.R Shenoy, NPTEL MOOCS course, Semiconductor opto-electronics.2020

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 COMPUTER SCIENCE & ENGINEERING

PROGRAMMING FOR PROBLEM SOLVING

SYLLABUS FOR B.E. I-SEMESTER

(Common to CSE, AIML, IT, ECE and EEE)

L:T:P (Hrs./week):3:0:0	SEE Marks : 60	Course Code : U22ES120CS
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
1 Acquire problem solving skills.	1 Design flowcharts and algorithms for solving a given problem using the fundamentals of programming.
2 Develop flow charts.	2 Apply decision making, looping constructs and functions to develop programs for a given problem.
3 Understand structured programming concepts.	3 Store data using arrays and perform searching and sorting operations on the data.
4 Write programs in C Language.	4 Design programs on string handling and operations on arrays using dynamic memory management techniques.
	5 Develop programs to store data and perform operations using structures and files.

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:

Selection: Logical Data and Operators, if... else, switch Statements, Standard Functions.

Repetition: Loops, while, for, do-while Statements, Loop Examples, break, continue, goto.

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.

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:Type Definition (typedef), Enumerated Types.

Structure: 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)
IBRAHIMBAGH, HYDERABAD – 500 031

Department of Electrical & Electronics Engineering
Basic Electrical Engineering

SYLLABUS FOR B.E I – SEMESTER
(for IT Branch)

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: U22ES010EE
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
	On completion of the course, students will be able to
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 switchgear, electrical energy consumption and power factor improvement 5. Comprehend the working principles of AC machines

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, Thevenin'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", Tata McGraw Hill, 2010.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.
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:	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 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: U22ES030CE
Credits: 2	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. 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. Draw sections and development of regular solids. 5. Visualize and construct isometric projections from orthographic projections of regular solids.	1. Understand the fundamentals of drawing. 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 both reference planes. 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 and two reference planes. Concept of development of 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:

- Bhatt N.D. "Elementary Engineering Drawing", Charotar Publishers, 2014.
- Thomas E French, Charles J Vierck, Robert J. Foster, "Engineering Drawing and Graphic Technology", McGraw Hill Education, 1993.
- Gill P.S. "Engineering Drawing: Geometrical Drawing", SK Kataria & sons, 2012.
- Venugopal.K "Engineering Drawing and Graphics Plus Autocad", New Age International (P) Ltd., New Delhi, 2011.
- Siddiquee A.N "Engineering Drawing with a Primer on Autocad", Prentice hall of India Ltd., New Delhi, 2004.
- Basanth Agrawal, Agrawal C.M "Engineering Drawing" Second Edition, Tata McGraw Hill, 2013
- BVR Gupta, M Raja Roy, "Engineering Drawing with AutoCad", IK Int Pvt Ltd, 2009.
- NPTEL Course (www.nptel.ac.in)
- 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 Mechanical Engineering**INTRODUCTION TO ENTREPRENEURSHIP**

SYLLABUS FOR B.E.I-SEMESTER

L:T:P(Hrs/week):1:0:0	SEE Marks:40	Course Code: U22MC010ME
Credits : --	CIE Marks:30	Duration of SEE: 02Hours

COURSE OBJECTIVE <i>The objective of the course is to</i>	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
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-a problem solving process, 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.

Web Resources:

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
English Language and Communication Skills Lab
SYLLABUS FOR B.E. I – SEMESTER (Common to all branches)

L:T:P (Hrs/Week) :0:0:2	SEE Marks : 50	Course Code: U22HS111EH
Credits: 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students 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.	On completion of the course, students will be able to: 1. Speak well using 'generally acceptable English' in terms of pronunciation and use of diction. 2. Participate effectively in group discussions, public speaking, debates (formal and informal). 3. Analyse, evaluate and infer meaning from different types of texts.

1.0 PHONETICS LAB- TOPICS

1.1 Introduction to English Phonetics: Classification of consonants and vowel sounds and related symbols.

1.2 Aspects of language learning and ear training activities- Word stress and intonation.

Longman Dictionary of Contemporary English – 6th Edition, 2020.

2.0 INTERACTIVE COMMUNICATION SKILLS LAB-TOPICS

2.1 Group discussion: Objectives of GD, Types of GDs; Initiating, Continuing, and concluding a GD.

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

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

3.0 READING SKILLS LAB - TOPICS

3.1 Sub-skills of reading- skimming, scanning, extensive and intensive reading.

3.2 Teaching different types of texts for comprehension-short stories and technical articles.

3.3 Newspaper reading and paraphrasing.

Prescribed textbook for laboratory:

Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Babbellapati - Orient Black Swan

Longman Dictionary of Contemporary English - 6th Edition, 2020. (The students will be given the PDF format)

Learning Resources:

1. Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.

2. Priyadarshini Patnaik : 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.

The break-up of CIE:

- | | | |
|---|---|---------------------------------|
| 1. No. of Internal Tests | : | <input type="text" value="1"/> |
| 2. Max. Marks for Internal tests | : | <input type="text" value="12"/> |
| 3. Marks for day-to-day laboratory class work | : | <input type="text" value="18"/> |

Duration of Internal Test: 120 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
 IBRAHIMBAGH, Hyderabad-31
DEPARTMENT OF PHYSICS
 B.E Syllabus for **CSE and IT Branches** w.e.f academic year 2021-2022
SEMICONDUCTOR OPTOELECTRONICS LAB

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: UI22BS111PH
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	PSO1
CO1	2	-	-	-	-	-	-	-	2	-	-	2	1
CO2	3	-	-	-	-	-	-	-	-	-	-	1	1
CO3	2	2	-	-	-	-	-	-	-	-	-	1	1
CO4	3	-	-	-	-	-	-	-	-	-	-	1	1
CO5	2	-	-	-	-	-	-	1	-	-	-	2	1

- Comparative study of I-V characteristics of P-N Junction diode and Zener Diode
- Comparative study of I-V characteristics of LED and Photodiode
- Determination of wavelength of Semiconductor lasers
- Calculation of numerical aperture, acceptance angle and power loss due to bending of an optical fiber.
- Study of I-V characteristics of solar cell and to calculate fill factor and efficiency
- Determination of Planck's constant using Photocell
- Determination of Hall's coefficient, carrier concentration of given semiconductor- Hall's effect
- Study of resonance in LCR series circuits and estimation of resonant frequency & Q- factor
- Study of resonance in LCR parallel circuits and estimation of resonant frequency & Q- factor
- Determination of energy gap of a given semiconductor by four probe method
- Estimation of Thermistor constants
- Determination of Seebeck coefficient
- Determination of e/m of electron by Thomson's method

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

No. of Internal Test:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 120 Minutes			

VASAVI COLLEGE OF ENGINEERING(AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering
Course Name: PROGRAMMING FOR PROBLEM SOLVING LAB

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

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code : U22ES121CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1. Understand the fundamentals of programming in C Language 2. Write, compile and debug programs in C. 3. Formulate solution to problems and implement in C. 4. Effectively choose programming components to solve computing problems.	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 to illustrate operators
2. Programs to illustrate selection control statements
3. Programs to illustrate loop control statements
4. Programs to illustrate nested loop control statements.
5. Programs to illustrate functions and recursion
6. Programs to illustrate one dimensional arrays, searching and sorting.
7. Programs to illustrate two dimensional arrays
8. Programs on pointers: pointer to arrays, pointer to functions.
9. Functions for string manipulations.
10. Programs on structures and unions.
11. Finding the number of characters, words and lines of given text file.
12. File handling programs.

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, 2ndEdition (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.

No. of Internal Test:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			10
Duration of Internal Test: 120 Minutes			

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

Department of Electrical & Electronics Engineering
Basic Electrical Engineering Laboratory

SYLLABUS FOR B.E I – SEMESTER (IT Branch)

L:T:P(Hrs./week):0:0:2	SEE Marks:50	Course Code: U22ES011EE
Credits :1	CIE Marks:30	Duration of SEE: 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To provide the practical knowledge on operation of DC, AC machines and circuits.	On completion of the course, students will be able to 1.Handle basic electrical equipment and apprehend safety precautions 2.Test the performance of various AC and DC machines 3.Apply and Verify various Network theorems 4.Comprehend Measurement of Electrical Energy consumption 5.Comprehend the importance of Power Factor improvement.

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 winding - 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-22)
B.E. – INFORMATION TECHNOLOGY : SECOND SEMESTER(2022 - 2023)

B.E (IT) II Semester									
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			Credits	
		Hours per Week			Duration in Hrs	Maximum Marks			
		L	T	P/D		SEE	CIE		
THEORY									
U22BS220MA	Differential equations & linear algebra	3	-	-	3	60	40	3	
U22BS220CH	Material Chemistry	3	-	-	3	60	40	3	
U22ES010CE	Basic Engineering Mechanics	3	-	-	3	60	40	3	
U22ES210IT	Basic Electronics	3	-	-	3	60	40	3	
U22PC210IT	Python Programming	3	-	-	3	60	40	3	
U22HS010EH	Human Values & Professional Ethics – I	1	-	-	2	40	30	1	
U22MC010CE	Environmental Science	2	-	-	3	60	40	-	
PRACTICALS									
U22BS211MA	Mathematics Lab	-	-	2	3	50	30	1	
U22BS011CH	Chemistry Lab	-	-	2	3	50	30	1	
U22ES211IT	Basic Electronics Lab	-	-	2	3	50	30	1	
U22PC211IT	Python Programming Lab	-	-	2	3	50	30	1	
Library / Sports / Personality Development Programme / Mentor Interaction		-	-	-	-	-	-	-	
Total		18	-	8	--	600	390	20	
Grand Total		26			990				

Note:

1. One hour is allotted to Library / Sports / Personality Development Programme / Mentor Interaction.
2. The left over hours are to be allotted to CC / RC / TC based on the requirement.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State

DEPARTMENT OF MATHEMATICS**DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA**

for B.E., II- Sem., (CBCS)

(Common to CSE, CSE-AIML & IT)

L :T:P (Hrs./week):3:0:0	SEE Marks :60	Course Code:U22BS220MA
Credits : 3	CIE Marks :40	Duration of Semester End Exam : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students should be able to:</i>
<p>1. Solve first order differential equations using elementary techniques and learn its applications.</p> <p>2. Use the various higher order homogeneous and non-homogeneous linear differential equations with constant coefficients to solve it and apply on electrical circuits</p> <p>3. Study the concept of Vector Spaces, Subspaces, Linear Span, Linear Dependence and Independence of vectors.</p> <p>4. Understand the meaning of Linear transformation, range and Kernel, Rank-Nullity and Matrix of Linear Transformation.</p> <p>5. Study the concepts of matrices, Eigen values and Eigen vectors, Diagonalization and learn Inner Product Spaces, Orthonormal sets, Gram-Schmidt's Orthonormalization process.</p>	<p>1. Identify the suitable I.F and solve differential equations, model the real time electrical engineering problems viz., RC & LR Circuits into differential equations and solve.</p> <p>2. Apply various higher order Linear Differential equations, to solve LC and LCR circuits.</p> <p>3. Solve the problems on Vector Spaces and Linear Dependence and Independence of vectors. Also determine the Basis and Dimension of a Vector Space and find the Co-ordinates.</p> <p>4. Determine Linear Transformation, Range and Kernel and Matrix of Linear Transformation.</p> <p>5. Find the rank of a given matrix, diagonalizable a matrix also determine distance using Inner product space and construct Orthonormal basis using Gram-Schmidt's Orthonormalization process</p>

UNIT- I (08 classes)**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 (12 classes)**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: (12 classes)**VECTOR SPACES**

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

UNIT-IV (12 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 (12 classes)**MATRICES AND INNER PRODUCT SPACES**

Rank of a Matrix- Characteristic equation- -Eigen values and Eigenvectors- Similarity Transformation -Diagonalization using Similarity Transformation- Inner Product Space- Gram-Schmidt's Orthonormalization process.

Text Books:

- Advanced Engineering Mathematics, Third Edition, R. K. Jain and S. R. K. Iyengar, Narosa Publishing House.
- Higher Engineering Mathematics, B. S. Grewal 40th Edition, Khanna Publishers.
- Introduction to linear algebra with applications, Jim DeFranza, Daniel Gagliardi, Tata McGraw-Hill

Reference Books:

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

Online Resources :

- <http://mathworld.wolfram.com/topics>
- <http://www.nptel.ac.in/course.php>

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 CHEMISTRY**MATERIAL CHEMISTRY**

SYLLABUS FOR B.E.II SEMESTER

(For CSE, AIML and IT branches)

L :T:P (Hrs./week):3:0:0	SEE Marks :60	Course Code : UI22BS210CH
Credits :3	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:
<ol style="list-style-type: none"> 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. 	<ol style="list-style-type: none"> 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.

UNIT-I: ELECTRODICS AND ITS APPLICATIONS (9)

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 (9)

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, Ni-metal hydride, and lithium ion battery – advantages, limitations and applications.

Fuel cells: Concept, types of fuel cells and merits. Construction, working and applications of methanol-oxygen, phosphoric acid fuel cell and molten carbonate fuel cell.

UNIT-III: MACRO MOLECULES (9)

Introduction, degree of polymerization, functionality of monomers and its effect on the structure of polymers.

Classification of polymers – a) homo and co-polymers; b) homo chain and hetero chain polymers; c) plastics, elastomers, fibers and resins.

Types of Polymerization - Addition and condensation polymerization. Glass transition temperature (T_g), factors affecting T_g .

Molecular weight- number average and weight average molecular weight, numericals.

Plastics: Thermoplastics and thermosets - preparation, properties and applications of a) Aramid (Kevlar); b) Phenol-formaldehyde (Bakelite); and c)

Poly carbonate

Elastomers: Natural rubber- structure – chemistry of vulcanization and its advantages.

Artificial rubbers: Preparation, properties & uses of Buna-S and neoprene.

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 (7) 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, pulltrusion 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 (8)

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

Properties of nanomaterials: Catalytic, electrical, mechanical and optical properties.

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. Applications of Nanomaterials (CNTs, Graphene etc.)

Text Books:

1. P. C. Jain, M Jain Engineering Chemistry, Dhanapathi Rai and sons (16th edition), New Delhi.
2. Sashi Chawla, Text book of Engineering Chemistry, Dhanapathi Rai &sons, New Delhi.
3. O. G. PALANNA, Engineering Chemistry, TMH Edition.
4. Wiley Engineering chemistry, Wiley India Pvt. Ltd., II edition.
5. Chemistry in engineering and technology by J.C. Kuriacose and Rajaram.
6. The chemistry of nanomaterials – Synthesis, Properties and Applications by C. N. R. Rao, Wiley India Pvt. Ltd.

Learning Resources:

1. University chemistry, by B. H. Mahan
2. Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan
3. Physical Chemistry, by P. W. Atkins
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. NPTEL Polymer Chemistry Course, D. Dhara, IIT Kharagpur.
7. Polymer chemistry by Gowariker
8. Introduction to Nanoscience, by S m Lindsay, Oxford University press.

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

1	No. of Internal Test	:	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 Test : 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING
BASIC ENGINEERING MECHANICS
 (For IT)

SYLLABUS FOR B.E. II SEMESTER

L : T : P(Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U22ES010CE
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, Connected systems 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:

- Singer F.L "Engineering Mechanics", Harper & Collins, Singapore, 3rd Edition 2011.
- Timoshenko S.P and Young D.H "Engineering Mechanics", McGraw Hill International Edition, 2017
- Andrew Pytel., JaanKiusalaas., "Engineering Mechanics", Cengage Learning, 2014.
- Beer F.P & Johnston E.R Jr. "VectorMechanics for Engineers", TMH, 2019.
- Hibbeler R.C, "Engineering Mechanics", Pearson Education, 2017.
- Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
- Basudeb Bhattacharyya., "Engineering Mechanics", Oxford University Press, 2014.
- Meriam. J. L. and Kraige L.G., "Engineering Mechanics", Volume-I Statics, John Wiley & Sons, 2017.
- NPTEL Course (www.nptel.ac.in)
- 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: U22ES210IT
Credits : 3	CIE Marks :40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	On completion of the course, students will be able to:
Identify different electronic devices, their characteristics and use them in building simple electronic circuits.	<ol style="list-style-type: none"> Design simple circuits like rectifiers, voltage regulators, clipping and clamping circuits for the given specifications based on the operating principles of the diode. Analyze different bipolar junction transistor circuits to determine Input impedance, output impedance, Voltage gain, current gain using exact and approximate h parameter models. Verify the implementation of simple Boolean functions using CMOS circuits with the help of Truth table indicating the different transistors ON/OFF conditions. 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. 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 :

- Jacob Millman, Christos Chalkais, Satybratajit, Electronic Devices and Circuits, Mc Graw Hill India Private Ltd, 3rd Edition
- Adel S. Sedra, Kenneth C. Smith, Microelectronic Circuits, 5th Edition, Oxford International Student Edition, 2006
- D. Roy Choudhury, Shail B. Jain, Linear Integrated Circuits, New Age International Publishers, 4th Edition.
- Jacob Millman, Arvin Grable – Micro Electronics – 2nd Edition, McGraw Hill 1987.
- Donald L. Schilling, Charles Belove, Electronic Circuits Discrete and Integrated, Tata Mc Graw Hill Education, 3rd Edition
- <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, HYDERBAD-500031,
DEPARTMENT OF INFORMATION TECHNOLOGY
PYTHON PROGRAMMING
 SYLLABUS FOR B.E. II SEMESTER

L:T:P(Hrs./week):3:0:0	SEE Marks :60	Course Code: U22PC210IT
Credits : 3	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 student will be able to:
Acquire problem solving skills for writing python scripts	1) Demonstrate an understanding of fundamental Python syntax and semantics and be fluent in the use of Python control flow statements and functions. 2) Acquire basic knowledge on NumPy array and plotting data in lists. 3) Construct python data structure programs using tuples, dictionaries, and sets. 4) Develop programs using Object oriented paradigm. 5) Handle file related operations and do encoding and decoding of strings.

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,

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-electrical-engineering-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), HYDERABAD
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

COURSE NAME-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: U22HS020EH
Credits: 1	CIE: 30	Duration of SEE: 2 Hours
COURSE OBJECTIVES The course will enable the learners to: <ol style="list-style-type: none"> 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: - <ol style="list-style-type: none"> 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-efficacy, 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 Flipped class room

UNIT-2 PROFESSIONAL VALUES AND BEHAVIOUR

At the level of individual: 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 Ethics – Team
- 2.3 Flipped class room

UNIT-3 SOCIAL VALUES

Values of service, social justice, dignity and worth of the person Importance of human relationships, integrity, and competence.

- 3.1 Social Values
- 3.2 Importance of relationship
- 3.3 Flipped class room

UNIT -4 SPIRITUAL VALUES

Developing individual practice and 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 Spiritual Values
- 4.2 Mindful Vs Mindfull
- 4.3 Flipped class room

MODE of DELIVERY

<ul style="list-style-type: none">• Questionnaires• Quizzes• Case-studies• Observations and practice• Home and classroom assignments	<ul style="list-style-type: none">• Discussions• Skits• Short Movies/documentaries• Team tasks and individual tasks• Research based tasks• Viva
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Relevant Websites, CD's and Documentaries

- <https://plato.stanford.edu/>

Learning Resources:

learn.talentsprint.com

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

1	No. of Internal tests	:	<table border="1"><tr><td>1</td></tr></table>	1	Max. Marks	:	<table border="1"><tr><td>20</td></tr></table>	20
1								
20								
2	No. of assignments	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks	:	<table border="1"><tr><td>5</td></tr></table>	5
2								
5								
3	No. of Quizzes	:	<table border="1"><tr><td>2</td></tr></table>	2	Max. Marks	:	<table border="1"><tr><td>5</td></tr></table>	5
2								
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, Mech., & IT)

SYLLABUS FOR B.E. II-SEMESTER

L : T : P (Hrs./week): 2 : 0 : 0	SEE Marks:60	Course Code: U22MC010CE
Credit: - - -	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
<i>In this subject the students will</i>	<i>Upon the completion of this course students will be able to</i>
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, water logging salinity. Energy resources: Renewable and non-renewable energy resources. Land Resources, soil erosion and desertification.

UNIT-II: Ecosystems: Structure and function of an ecosystem, producers, consumers and decomposers, food chains, food webs, ecological pyramids, aquatic ecosystems (ponds, oceans, estuaries).

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

UNIT-IV: Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste & e-waste management.

UNIT-V: Social Aspects and the Environment: Water conservation, Climate change, global warming, acid rain, ozone layer depletion. Environmental Impact Assessment, population explosion.

Learning Resources:

- Deswal S. and Deswal A., A Basic Course on Environmental studies, DhanpatRai& Co Pvt. Ltd. 2016
- Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2017
- Suresh K. Dhameja, Environmental Studies, S.K. Kataria& Sons, 2010.
- De A.K., Environmental Chemistry, New Age International, 2003.
- Odum E.P., Fundamentals of Ecology, W.B. Sanders Co., USA, 2004.
- Rajagopalan R., Environmental Studies, Second Edition, Oxford University Press, 2015

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)
9-5-81, Ibrahimbagh, Hyderabad-500031, Telangana State
DEPARTMENT OF MATHEMATICS
(B.E. Semester - II)

Mathematics Lab (Calculus, Linear Algebra & Differential equations)

Instruction: 0 : 0 : 2	SEE Marks :50	Course Code: U22BS211MA
Credits : 1	CIE Marks: 30	Duration of SEE : 3 Hrs

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Demonstrate the linear algebra, calculus and differential equation concepts using SciPy.	<ol style="list-style-type: none"> 1. Demonstrate the knowledge of Linear Algebra module of NumPy/SciPy for numerical analysis and visualization. 2. Apply Matrix basic operations and its analysis. 3. Demonstrate the use of matrix decompositions and solving of linear equations. 4. Apply calculus theorems to examine extreme values of a function. 5. Demonstrate the knowledge of solving Differential equations.

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 Siau, 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
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF CHEMISTRY

Chemistry Lab

SYLLABUS FOR B.E. II - SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks:50	Course Code: U22BS011CH
Credits : 1	CIE Marks:30	Duration of SEE: 03 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Describe the quantitative analytical techniques 2. Learn the skills to handle the instruments 3. Apply the theoretical principles in experiments 4. Examine the accuracy	At the end of the course, students should be able to: 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 amount of a substance in 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

List of the Experiments:

- Preparation of standard FAS or oxalic acid solution and standardization of KMnO_4 or NaOH solution.
- Estimation of ferrous iron in the given solution by permanganometry.
- Estimation of chromium (VI) in the given solution by standardized FAS.
- Estimation of copper (II) in given solution by hypo.
- Estimation of available chlorine in bleaching powder.
- Estimation of total hardness of given water sample.
- Estimation of alkalinity of a given sample.
- Conductometric acid-base titrations -Determination of strength of given acids (HCl Vs NaOH and CH_3COOH Vs NaOH).
- Conductometric acid-base titrations- Determination of strength of acids in a given mixture of acids (HCl and CH_3COOH Vs NaOH)
- Determination of strength of a given acid by Potentiometry.
- Determination of concentration of a given FeSO_4 using redox titration by Potentiometry.
- Determination of strength of a given acid by pH metry.
- Determination of strength of permanganate or copper in brass solution by Colorimetry.
- Synthesis of Phenol formaldehyde resin / PANI.
- Chemistry of blue printing.

Text Books:

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

The break-up of CIE :

- | | | |
|---|---|----|
| 1. No. of Internal Tests | : | 1 |
| 2. Max. Marks for Internal tests | : | 12 |
| 3. Marks for day-to-day laboratory class work | : | 18 |

Duration of Internal Test : 3 Hours

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:U22ES211IT
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	On completion of the course, students will be able to
1. Identify the different electronic devices and use them in building different application 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.

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

PYTHON PROGRAMMING LAB
 SYLLABUS FOR B.E. II SEMESTER

L:T:P(Hrs./week): 0:0:2	SEE Marks :50	Course Code: U22PC211IT
Credits : 1	CIE Marks :30	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
The course will enable the students to:	At the end of the course student will be able to:
Effectively choose programming components to solve computing problems.	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.

Programming Exercise:

- 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 Plotting data in lists and NumPy Arrays. Introduction to Jupyter Notebook
- 8) Programs on Tuples and sets.
- 9) Programs on Dictionaries.
- 10) Programs on classes and objects.
- 11) Programs on Inheritance.
- 12) Programs on file handling.
- 13) Programs on exceptions.
- 14) Programs on writing user defined 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-electrical-engineering-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			