VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
Ibrahimbagh, Hyderabad-31
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. (ECE) III and IV Semesters

With effect from 2021-22
(For the batch admitted in 2020-21)
(R-20)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Phones: +91-40-23146040, 23146041
Fax: +91-40-23146090

Institute Vision

Striving for a symbiosis of technological excellence and human values

Institute Mission

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

Department Vision

Striving for excellence in teaching, training and research in the areas of Electronics and Communication Engineering and fostering ethical values

Department Mission

To inculcate a spirit of scientific temper and analytical thinking and train the students in contemporary technologies in Electronics and Communication Engineering to meet the needs of the industry and society with ethical values

B.E (ECE) Program Educational Objectives (PEO's)	
PEO I	Graduates will be able to identify, analyze and solve engineering problems.
PEO II	Graduates will be able to succeed in their careers, higher education, and research.
PEO III	Graduates will be able to excel individually and in multidisciplinary teams to solve industry and societal problems.
PEO IV	Graduates will be able to exhibit leadership qualities and lifelong learning skills with ethical values.

B.E. (ECE) PROGRAM OUTCOMES (PO's) Engineering Graduates will be able to:	
PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	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.
PO6	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.
PO7	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.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO10	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, give and receive clear instructions.
PO11	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.
PO12	Lifelong learning: Recognize the need, and for have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

B.E (ECE) PROGRAM SPECIFIC OUTCOMES (PSO's)	
PSO I	ECE students will be able to analyze and offer circuit and system level solutions for complex electronics engineering problems, keeping in mind the latest technological trends.
PSO II	ECE students will be able to apply the acquired knowledge and skills in modeling and simulation of wireless communication systems.
PSO III	ECE students will be able to implement signal and image processing techniques for real time applications.

1. Attendance and Sessional marks requirements:

1	B.E(4yrs)	**Attendance:** Minimum aggregate attendance required to eligible to attend semester end exams is 75% and 65% with Medical Condonation respectively.
		Sessional Marks: Minimum aggregate of sessional marks required to become eligible for appearing semester end examinations is 40%

II. Promotion rules for B.E(4ydc) course

S.No.	Semester/Class	Conditions to be fulfilled
1	I-SEM TO II- SEM	Regular course of study of I-SEM and 40% aggregate CIE marks in I-SEM
2	II-SEM TO III SEM	a. Regular course of study of II SEM and
		b. 40% aggregate CIE marks in II-SEM
		c. Must have secured at least 50% of total credits prescribed for I and II SEMs together
3	III-SEM to IV-SEM	a. Regular course of study of III-SEM and
		b. 40% aggregate CIE marks in III-SEM
4	IV-SEM to V-SEM	a. Regular course of study of IV SEM
		b. 40% aggregate CIE marks in IV-SEM
		c. Passed in all the courses of I and II SEMs
		d. Must have secured at lest 50% of total credits prescribed for III and IV SEMs put together
5	V-SEM to VI-SEM	a) Regular course of study V-SEM b) 40% aggregate CIE marks in V-SEM
6	VI-SEM to VII-SEM	a. Regular course of study of VI SEM
		b. 40% aggregate CIE marks in VI-SEM
		c. Passed in all the courses of III and IV SEMs
		d. Must have secured at least 50% of total credits prescribed for V and VI SEMs put together

S.No.	Semester / Class	Conditions to be fulfilled
7	VII-SEM to VIII-SEM	a. Regular course of study of VII SEM b. 40% aggregate CIE marks in VII SEM
8	Eligibility to appear VIII-SEM exams	a. Regular course of study of VIII SEM and 40% aggregate CIE marks in VIII-SEM

III. Promotion rules for B.E (3 YDC) course (Lateral Entry)

S.No.	Semester / Class	Conditions to be fulfilled
1	III-SEM to IV-SEM	a. Regular course of study of III-SEM and
		b. 40% aggregate CIE marks in III-SEM
2	IV-SEM to V-SEM	a. Regular course of study of IV SEM
		b. 40% aggregate CIE marks in IV-SEM
		c. Must have secured at lest 50% of total credits prescribed for III and IV SEMs put together
3	V-SEM to VI-SEM	a) Regular course of study V-SEM b) 40% aggregate CIE marks in V-SEM
4	VI-SEM to VII-SEM	a. Regular course of study of VI SEM
		b. 40% aggregate CIE marks in VI-SEM
		c. Passed in all the courses of III and IV SEMs
		d. Must have secured at least 50% of total credits prescribed for V and VI SEMs put together
5	VII-SEM to VIII-SEM	a. Regular course of study of VII SEM b. 40% aggregate CIE marks in VII SEM
6	Eligibility to appear VIII-SEM exams	a. Regular course of study of VIII SEM and 40% aggregate CIE marks in VIII-SEM

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. - ECE : THIRD SEMESTER (2021-22)

B.E (ECE) III - SEMESTER								
Course Code	Name of the Course	Scheme of Instruction Hours per Week			Scheme of Examination Duration in Hrs	Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U20PC310EC	Electronic Devices	3	-	-	3	60	40	3
U20PC320EC	Digital System Design	3	1	-	3	60	40	4
U20PC330EC	Networks Analysis and Transmission Lines	3	-	-	3	60	40	3
U20BS330MA	Partial Differential Equations and Numerical Methods	3	-	-	3	60	40	3
U20OE3XXXX	Open Elective - I	2	-	-	3	60	40	2
U20HS330EH	Skill Development Course-I : (Communication Skills - I)	1	-	-	2	40	30	1
U20BS350MA	Skill Development Course-II : (Aptitude - I)	1	-	-	2	40	30	1
U20MC310ME	Introduction to Entrepreneurship	1	-	-	2	40	30	-
U20MC010CE	Environmental Science	2	-	-	3	60	40	-
PRACTICALS								
U20PC311EC	Electronic Devices Lab	-	-	2	3	50	30	1
U20PC321EC	Digital System Design Lab	-	-	2	3	50	30	1
U20PC331EC	Basic Circuits and Networks Lab	-	-	2	3	50	30	1
U20PC341EC	Electronic Workshop	-	-	2	3	50	30	1
	TOTAL	**19**	**1**	**8**	**-**	**680**	**450**	**21**
	GRAND TOTAL	**28**			**-**	**1130**		**-**
Left over hours will be allocated for : Sports / Library / Mentor - Mentee Interaction / CC / RC / TC / ECA / CCA								
Note: Every student should acquire one online course certification equivalent to 2 Credits weightage during III – VII Semester								

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. - ECE : THIRD SEMESTER (2021-22)

Bridge Course for ECE Lateral Entry Students								
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								
UB20BS300MA	Matrix Theory and Vector Calculus	2	-	-	3	50	-	-
UB20ES310CS	Computer Programming	2	-	-	3	50	-	-

COURSES OFFERED TO EEE								
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								
U20ES310EC	Electronics Engineering – I	3	-	-	3	60	40	3
PRACTICALS								
U20ES311EC	Electronics Engineering - I Lab	-	-	2	3	50	30	1

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronic Devices

SYLLABUS FOR B.E. III – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20PC310EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To familiarize the students with various two terminal and three terminal electronic devices working and use in the design of real time electronic products. 2. To understand the students with fabrication process for Electronic devices.	On completion of the course, students will be able to 1. Understand the PN junction operation and Distinguish between drift and diffusion currents. 2. Plot the electric field distribution across the junctions. 3. Employ PN- Junction diode as a rectifier in power supplies. 4. Employ the mathematical models of semiconductor junctions and MOS transistors for circuits and systems. 5. Distinguish between properties of BJT and MOSFET with reference to packing density and power dissipation. 6. Illustrate the fabrication processes for CMOS inverter.

UNIT - I : Carrier Transport Mechanisms

Review of semiconductor physics. Carrier Drift: Drift Current Density, Mobility Effects, Conductivity, Velocity Saturation. Carrier Diffusion: Diffusion Current Density, Total Current Density. Graded Impurity Distribution: Induced Electric Field, The Einstein Relation. Carrier Generation and Recombination.

UNIT - II : PN Junction Characteristics

Basic Structure of the pn Junction, Zero Applied Bias: Built-in Potential Barrier, Electric Field, Space Charge Width. Forward and Reverse Applied Bias. Junction Capacitance, Non-uniformly Doped Junctions.pn Junction Current equation, I-V characteristics, Temperature Effects. Small-Signal Model of the pn Junction. Charge Storage and Diode Transients: The Turn-off Transient, the Turn-on Transient. Junction Breakdown: Avalanche and Zener breakdown.

UNIT - III : PN junction applications & Metal-Semiconductor

Full wave rectifier with filters. Zener diode as regulator. Special Diodes :LED, Photo diode, solar cell and Tunnel Diode. The Schottky Barrier Diode: Ideal Junction Characteristics, Comparison of the Schottky Barrier Diode and the PN Junction Diode, Metal-Semiconductor Ohmic Contacts.

UNIT - IV : Transistors

Bipolar Junction Transistor I-V characteristics, Ebers-Moll Model, JFET, MOS capacitor, C-V characteristics, MOSFET, I-V characteristics, and small signal models of MOS transistor, CMOS Invertor.

UNIT - V : Transistor biasing and Integrated circuit fabrication process
Transistor biasing and small signal analysis of transistor amplifier.
Oxidation, diffusion, ion implantation, photolithography, Etching, Chemical vapor deposition, sputtering, twin-tub CMOS process

Learning Resources:

1. D. Neamen, D. Biswas & quot; Semiconductor Physics and Devices, 4th Edition, McGraw-Hill Education 2012.
2. Christos C. Halkias, SatyabrataJit, Jacob Millman "Electronic Devices and Circuits (SIE)" 4th Edition, MC Graw Hill Publication 2015.
3. S. M. Sze and K. N. Kwok, “Physics of Semiconductor Devices,” 3rd edition, John Wiley & amp; Sons, 2006.
4. VLSI Fabrication Principles, Silicon and Gallium Arsenide 2nd Edition-1994 Sorab K Gandhi, Wiley- India Publications.
5. G. Streetman, and S. K. Banerjee, “Solid State Electronic Devices,” 7th edition, Pearson, 2014.
6. https://nptel.ac.in/courses/113106062/# Electronic materials, Devices and Fabrication by Dr. S. Parasuraman IIT Madras.
7. https://nptel.ac.in/courses/117106091/ Solid State Devices by Prof. S. Karmalkar, IIT Madras.

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Digital System Design

SYLLABUS FOR B.E. III – SEMESTER

L:T:P (Hrs./week): 3:1:0	SEE Marks : 60	Course Code: **U20PC320EC**
Credits : 4	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To acquire knowledge of combinational and sequential circuits. 2. Learn language fundamentals of Verilog and able to simulate and synthesize digital circuits.	On completion of the course, students will be able to 1. Understand the basics of Boolean algebra and simplification. 2. Design & analyze combinational circuits. 3. Design & analyze sequential logic circuits 4. Understand the basic concept of Verilog HDL & Model digital circuits using Verilog. 5. Use the behavioural constructs for Logic Synthesis.

UNIT - I :

Logic Simplification and Combinational Logic Design: Review of Boolean Algebra and De Morgan's Theorem, SOP & POS forms, introduction to logic gates, Minimization of switching functions: Karnaugh map method (up to 5 variables), Binary codes, Code Converters.

UNIT - II :

Combinational circuits : Binary half and full adders, parallel adders, carry look ahead adder, Binary Subtractors, BCD adder, Encoders, Priority encoders, decoders. Multiplexers, Demultiplexers, and their applications, Comparators.

UNIT - III :

Sequential Logic Design: Latches and Flip flops, Ripple and Synchronous counters, Shift registers, Finite state machines, design of synchronous circuits like pulse train generator, Pseudo Random Binary Sequence generator, Clock generation.

UNIT - IV :

Introduction to HDLs: Basic Concepts of Verilog HDL, Data Types, System Tasks and Compiler Directives, Gate Level Modelling, Gate types and delays, Dataflow Modelling, continuous assignment and delays, Switch level Modelling, Design of Stimulus Block.

UNIT - V :

Behavioral Modelling: Structured procedures, procedural assignments, timing control, conditional statements, sequential and parallel blocks, Tasks and Functions, Design of Moore and Mealy FSMs using Verilog, Logic Synthesis. Introduction to FPGA.

Learning Resources:

1. Morris Mano M. and Michael D. Ciletti, "Digital Design. With an Introduction to Verilog HDL ", 5th edition, Pearson 2013.
2. Charles Roth, “Digital System Design using Verilog”, Tata McGraw Hill 2nd edition 2014.
3. Samir palnitkar, “Verilog HDL: A Guide to Digital Design and Synthesis, “Second edition, Pearson 2008.
4. Stephen Brown, “Fundamentals of Digital Logic Design using Verilog”, Tata McGraw Hill edition 2007
5. https://nptel.ac.in/courses/108/106/108106177/
6. https://nptel.ac.in/courses/106/105/106105185/
7. https://www.youtube.com/watch?v=FWE0-FOoE4s&list=PLUtfVcb-iqn-EkuBs3arreilxa2UKIChl

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Networks Analysis and Transmission Lines

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20PC330EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students Able to analyze any lumped and distributed networks	On completion of the course, students will be able to 1. Determine the parameters of any given two-port network 2. Perform the transient and steady state analysis of RL, RC and RLC circuits 3. Analyze the given circuit in time and frequency domains. 4. Design a passive filter for given specifications. 5. Analyze the characteristics of Transmission lines at VHF and UHF 6. Apply impedance matching using transmission line for any arbitrary load

UNIT - I : Two Port networks

Review of Network theorems: Maximum power transfer theorem, Reciprocity theorem, Tellegen's theorem.

Two Port Networks: Z, Y, h, g, ABCD parameters and conversions, equivalence of two port networks, T & Pi network transformations, Inter connection of two ports.

UNIT - II : Time Domain Analysis

Transient and steady state response of circuits: Zero Input Response (ZIR), Zero State Response (ZSR) and complete response. Transient and steady state analysis of RL, RC and RLC for unit step and sinusoidal inputs.

UNIT - III : Frequency domain Analysis

Analysis of Series and Parallel resonance, Q-factor, Selectivity and

bandwidth.
Passive Filters: Constant K-filters – low pass, high pass, band pass, and band elimination filter design, m-derived (LPF & HPF) and composite filter design.

UNIT - IV : Transmission lines

Properties of transmission lines. Transmission line equations from source and load end. Finite and infinite lines. Velocity of propagation, input impedance. Open and short circuited lines, distortion less transmission.

UNIT - V : Transmission lines at UHF

Reflection co-efficient, Standing waves, Distribution of voltages and currents on loss less line. Transmission lines as circuit elements. Characteristics of half wave, Quarter-wave and one eighth wave lines. Construction and applications of Smith chart. Impedance matching using Transmission lines.

Learning Resources:

1. M. E. Van Valkenburg, “Network Analysis”, Prentice Hall, 3rd edition 2006.
2. C. K. Alexander and M. N. O. Sadiku, “Fundamentals of Electric Circuits”, McGraw Hill Education, 5th edition 2014.
3. William Hayt and Jack E. Kemmerly "Engineering Circuit Analysis", Mc Graw Hill Company,6th edition,2016.
4. John D Ryder, “Networks Lines and Fields”, Pearson Education, 2015
5. Nagoor Kani "Circuit Theory", Mc Graw Hill Company, 1st edition, 2018.
6. https://nptel.ac.in/courses/117101056/
7. https://nptel.ac.in/courses/117/105/117105138/
8. https://nptel.ac.in/courses/108/102/108102042/

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MATHEMATICS

Partial Differential Equations and Numerical Methods

SYLLABUS FOR B.E. III – SEMESTER (for ECE only)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U20BS330MA**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to: 1. Formulate and understand linear and nonlinear partial differential equations. 2. Study the applications of Partial Differential equations 3. Study the methods to solve algebraic and transcendental equations, apply numerical methods to interpolate. 4. Understand numerical differentiation and integrate functions and to solve differential equations using numerical methods. 5. Study the method to fit different curves to a given data, how Correlation between variables can be measured.	At the end of the course students will be able to: 1. Formulate the Partial differential equations by eliminating arbitrary constants and functions and solve linear, non linear Partial differential equations. 2. Solve the one dimensional wave (Vibrations of a string), heat equations and two dimensional heat equations. 3. Solve algebraic and transcendental equations using Bisection method Regula-Falsi, Newton-Raphson and apply numerical methods to interpolate. 4. Solve problems using numerical differentiation using interpolation approach and differential equations using numerical methods. 5. Solve problems to fit various curves to the given data using curve fitting, and also to find co-efficient of correlation and to determine regression lines and their applications.

UNIT-I :

Partial Differential Equations:

Formation of first and second order Partial Differential Equations - Solution of First Order Equations – Linear Equation - Lagrange's Equation- Non-linear first order equations -Standard Forms.

UNIT-II:

Applications of Partial Differential Equations:

Method of Separation of Variables - One Dimensional Wave Equation- One Dimensional Heat Equation – Two Dimensional Heat equation- Laplace's Equation- (Temperature distribution in long plates).

UNIT-III:

Interpolation :

Finite Differences- Interpolation- Newton's Forward and Backward Interpolation Formulae – Interpolation with unequal intervals – Lagrange's Interpolation Formula – Divided differences- Newton's Divided difference formula.

UNIT-IV:

Numerical solutions of ODE:

Numerical Differentiation -Interpolation approach- Numerical Solutions of Ordinary Differential Equations of first order - Taylor's Series Method - Euler's Method - Runge-Kutta Method of 4^{th} order(without proofs).

UNIT-V:

Curve Fitting:

Curve fitting by the Method of Least Squares - Fitting of Straight line- Second degree parabola- Regression - Lines of Regression - Correlation – Karl Pearson's Co-efficient of Correlation.

Learning Resources:

Text Books:

1. R.K. Jain & S.R.K. Iyengar, Advanced Engineering Mathematics, Third Edition, Narosa Publications, 2007.
2. Higher Engineering Mathematics, Dr.B.S Grewal 40th Edition, Khanna Publishers.

Reference Books:

1. Advanced Engineering Mathematics, Kreyszig E, 8th Edition, John Wiley & Sons Ltd, 2006.
2. A text book of Engineering Mathematics by N.P. Bali & Manish Goyal, Laxmi Publication.

Online Resources :

1. http://tutorial.math.lamar.edu/Classes/DE/DE.aspx
2. http://mathworld.wolfram.com/topics
3. 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 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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD - 500 031

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Skill Development Course-I (Communication Skills - I)

SYLLABUS FOR B.E. III – SEMESTER (COMMON FOR ALL BRANCHES)

L:T:P (Hrs./week) : 1:0:0	SEE Marks : 40	Course Code: **U20HS330EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:- 1. Get students proficient in both receptive and productive skills especially virtually 2. Enable students to understand the importance and method of exchanging information in a formal space- both written and spoken 3. Introduce students to an ideal structure for a presentation and discussion- individually and in groups 4. Develop and improve reading skills needed for college work and reproduce the content based on the situational need	At the end of this course, the student will be able to: 1. Introduce themselves effectively and converse in a formal environment especially in the online space 2. Write emails with appropriate structure and content 3. Use appropriate structure based on the content employing appropriate transitions in written and spoken communication 4. Paraphrase content and write an effective summary

Unit 1: Delightful Descriptions 6 hrs

- Introductions on an Online Forum
- Making Observations and Giving Opinion
- Recalling and Describing

Unit 2: Formal Conversation Skills 6 hrs

- Ask for Information
- Give Information
- Give Feedback
- Seek Permission

Unit 3: Technical Expositions and Discussions 8 hrs

- Classification
- Sequence

- Compare and Contrast
- Cause and Effect
- Problem and solution

Unit 4: Rational Recap 4 hrs

- Paraphrasing
- Summarizing

METHODOLOGY	**ASSESSMENTS**
- Case Studies - Demonstration - Presentations - Expert lectures - Writing and Audio-visual lessons	- Online assignments - Individual and Group

Learning Resources:
learn.talentsprint.com

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

1.	No. of Internal Tests	: 2	Max. Marks for each Internal Test	:	20
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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD - 500 031

DEPARTMENT OF MATHEMATICS

Skill Development Course-II : Aptitude-I

SYLLABUS FOR B.E. III – SEMESTER

L:T:P (Hrs./week) : 1:0:0	SEE Marks : 40	Course Code: **U20BS350MA**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. This is a foundation course and aims at enhancing employability skills. 2. Students will be introduced to higher order thinking and problem solving skills in the following areas-Arithmetic Ability, Numerical Ability and General Reasoning. 3. Students will be trained to work systematically with speed and accuracy while problem solving.	On completion of the course, students will be able to 1. Solve questions in the mentioned areas using shortcuts and smart methods. 2. Understand the fundamentals concept of Aptitude skills. 3. Perform calculations with speed and accuracy.

UNIT-I : QUANTITATIVE APTITUDE-NUMERICAL ABILITY - 6 hrs

- Introduction to higher order thinking skills
- Speed Math
- Number systems
- LCM & HCF

UNIT-II : QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION 6 hrs

- Ratio proportions
- Partnership
- Ages
- Allegations and mixtures
- Averages

UNIT-3: QUANTITATIVE APTITUDE 4 hrs

- Percentages
- Profit and loss

UNIT-4: REASONING ABILITY- GENERAL REASONING PART 14hrs

- Blood Relations
- Number Series
- Coding and decoding

UNIT-5: QUANTITATIVE APTITUDE 4 hrs

- Time and Work
- Chain Rule
- Pipes and Cisterns

METHODOLOGY	ASSESSMENTS
- Demonstration	- Online assignments
- Presentations	- Individual and Group
- Expert lectures	
- Audio-visual lessons	

Learning Resources:

learn.talentsprint.com

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

1.	No. of Internal Tests	: 2	Max. Marks for each Internal Test	:	20
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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING

Introduction to Entrepreneurship

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U20MC310ME**
Credits : -	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The objective of the course is to 1. inspire students develop an entrepreneurial mind-set, educate about the resources and schemes available to start enterprises in India.	On completion of the course, students will be able to 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	: 1	Max. Marks for each Internal Test	: 20
2. No. of Assignments	: 1	Max. Marks for each Assignment	: 5
3. No. of Quizzes	: 1	Max. Marks for each Quiz Test	: 5

Duration of Internal Tests: 1 Hour

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

Environmental Science

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code: **U20MC010CE**
Credits : -	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
In this subject the students will 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.	Upon the completion of this course students will be able to 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:

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

Learning Resources:

1. Deswal S. and Deswal A., A Basic Course on Environmental studies, DhanpatRai& Co Pvt. Ltd. 2016
2. Benny Joseph, Environmental Studies, Tata McGraw-Hill, 2017
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. 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 Test	:	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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronic Devices Lab

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week) : 0:0:2	SEE Marks : 50	Course Code: **U20PC311EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
To develop an understanding of the underlying concepts of Electronic devices so that they can use them for circuits and systems.	On completion of the course, students will be able to 1. Analyze the characteristics of diodes, BJT's and FET's experimentally. 2. Design different rectifiers with various filter combinations. 3. Verify practically the response of optical devices. 4. Design transistor biasing circuits and carryout analysis of single stage RC coupled amplifiers.

Cycle - I Experiments

1. Zener Diode Characteristics and Zener as Voltage Regulator
2. Design of Half wave and Full wave Rectifiers with and without Filters
3. Common Base characteristics of BJT and measurement of h – parameters
4. Common Emitter characteristics of BJT and measurement of h-parameters,
5. JFET Characteristics and measurement of its small signal parameters.
6. MOSFET Characteristics and measurement of its small signal parameters.

Cycle - II Experiments

1. Transistor Biasing
2. Transistor as switch.(BJT, JFET and MOSFET).
3. Analysis and bandwidth calculation of Single stage RC coupled CE Amplifier.
4. Analysis and bandwidth calculation of Single stage RC coupled CC Amplifier.
5. Analysis and bandwidth calculation of single stage RC coupled FET CS Amplifier.
6. Optical device characteristics.(LED, Laser diode, Photo Diode, Photo

Transistor and Optocouplers).

New Experiments

1. CMOS layout in Micro wind tool
2. Measurement of Sheet resistance (4-point method)

Mini Project(s)

Learning Resources:

1. "LAB MANUAL", Department of ECE, Vasavi College Of Engineering.
2. Paul B Zbar and Alber P Malvino, Michael A Miller, "Basic Electronics: A Text Lab Manual", 7th edition, Tata McGraw Hill, 2009.
3. David A Bell, "Laboratory Manual for Electronic Devices and Circuits", 4th edition, PHI, 2001.
4. Muhammed H Rashid, "SPICE for circuits and electronics using PSPICE", 2nd edition, PHI, 1995.

Tools:

1. PSPICE or Multisim may be used to facilitate analysis of characteristics of devices.
2. Micro wind tool can be used to draw CMOS Layout.

The break-up of CIE :

1.	No. of Internal Test	:	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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Digital System design Lab

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week) : 0:0:2	SEE Marks : 50	Course Code: **U20PC321EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To acquire knowledge on simulation and synthesis of digital circuits using HDL.	On completion of the course, students will be able to 1. Lists various constructs and features in Verilog HDL. 2. Design and analyze various combinational and sequential circuits. 3. Use HDL tools for digital logic design simulation and Synthesis.

CYCLE - I Experiments

1. Adders, Subtractors.
2. Multiplexers and Demultiplexers.
3. Encoders, Decoders, Priority Encoder and Comparator.
4. 16-bit adder using 4-bit tasks and functions.
5. Arithmetic and Logic Unit with minimum of sixteen instructions.
6. Flip-Flops.
7. Registers, Counters.
8. Sequence Detector using Mealy and Moore type state machines.
9. Implementation of logic functions using multiplexers.

Note:

1. All the codes should be implemented appropriately using Gate level, Dataflow and Behavioral Modeling.
2. All the programs should be simulated using test benches.

CYCLE - II Experiments

10. Transistor Level implementation of : Inverter, NAND and NOR, Half Adder and Full Adder.
11. Transistor Level implementation of 4:1 Multiplexer, 2:4 Decoder.
12. Mini Project.

New Experiments

Atleast four combinational and sequential circuits should be implemented on FPGA.

The break-up of CIE :

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

Duration of Internal Tests: 3 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Basic Circuits and Networks Lab

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20PC331EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVE	COURSE OUTCOMES
To apply the concepts of circuit theory for a given circuit and verify its response using discrete components and Multisim tools	On completion of the course, students will be able to 1. Find different two port network parameters for a given network 2. Design the frequency response of resonance circuits and filters. 3. Measure various parameters of a given transmission line 4. To simulate and determine the response of a given circuit using multisim tools.

CYCLE - I Experiments

1. Verification of network theorems.
2. Measurement of two-port network parameters.
3. Design and Verification of Series and Parallel Resonance.
4. Finding the complete response of a given RC and RL circuits.
5. Design of Constant-K and m-derived filters.
6. To measure the primary and secondary constants of transmission line.

CYCLE - II Experiments

1. Verification of network theorems in the presence of dependent source.
2. Determination of two port network parameters in the presence of at least one dependent source.
3. Transient response of RL and RC circuits.
4. Transient response of RLC circuits.
5. Frequency response of series and parallel resonance circuits.
6. Frequency response of passive filters.
7. To measure the SWR and reflection coefficients of a transmission line for any given arbitary load.

New Experiments

1. To measure the primary and secondary constants of transmission line.
2. Frequency response of passive filters.
3. To measure the SWR and reflection coefficients of a transmission line for any given arbitary load.

Mini Project(s)

Suggested Reading / Tools :

1. Dr. Petru A. COTFAS, Dr. Daniel T. COTFAS, Dr. Doru URSUTIU, and Dr. Cornel SAMOILA, "Introduction to NI ELVIS Computer-Based Instrumentation", Transilvania University of Brasov.
2. David A. Bell, "Fundamentals of Electric Circuits: Lab Manual 7th Edition", Oxford University Press; 7 edition (November 9, 2009)

The break-up of CIE :

1.	No. of Internal Test	:	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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronic Workshop

SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20PC341EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To apply the concepts of circuit theory for a given circuit and verify its response using discrete components and Multisim tools	On completion of the course, students will be able to 1. Students will be able to identify electronics components like resistors, capacitors, diodes, transistors etc. 2. Students will be assessing your ability to use measuring instruments like the multimeter and equipments such as Function generator, power supply & DSO. 3. Students will be able to assemble circuits on a breadboard. 4. Students understand soldering and desoldering skills, useful in electronic circuit interconnections. 5. Students will be able to understand PCB fabrication process.

Experiments

1 Study of (with reference to typical electromechanical specifications, circuit representation): Electronic components (all types of discrete active & passive devices, display devices, integrated components/circuits with their packaging etc.,), electro mechanical components (switches, sockets, connectors etc.,) electromagnetic components (coils-different types of magnetic and ferrite cored, potted components, relays etc.,)

2 Study and use of different meters (moving coil, moving iron, volt/ammeter, AVO/Multimeter) for the measurement of electrical parameters.

3 Measurement of R, L, C components using LCR Meter

4 Study and use of bread board to connect circuits and measure basics

parameters.

5 Study of CRO & Measurement of voltage, frequency and Phase Angle.

6 Design and fabrication (winding) of an iron cored inductance coil for a given value of L, current and core specifications.

7 Design of AC mains operated step down transformer for a given turns ratio, current ratings and core specifications. Measurements of their functional electrical parameters

8 PCB design of a small circuit with its layout using tapes & etching.

9 Soldering & de-soldering exercises using discrete components & ICs for a specific circuit requirement.

10 Fault diagnosis

11 Mini Project

Mini Project(s)

Learning Resources / Tools:

1. Paul Zbar, Albert Malvino, Michael Miller, Basic Electronics: A Text-Lab Manual, McGraw Hill Education (India) Private Limited; 7/e , 2001.
2. Paul B. Zbar, Industrial Electronics, A Text – Lab Manual, 3rd Edition, TMH, 1983

The break-up of CIE :

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

Duration of Internal Test : 3 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MATHEMATICS

Matrix Theory and Vector Calculus

SYLLABUS FOR B.E. III SEMESTER

BRIDGE COURSE B.E. III-SEMESTER (CBCS)
(For CSE, EEE, ECE & IT)

L:T:P (Hrs./week): 2:0:0	SEE Marks :50	Course Code: **UB20BS300MA**
Credits : -	CIE Marks : -	Duration of SEE : 3 Hours

UNIT-I: (4 Hours)
DIFFERENTIATION & INTEGRATION
Differentiation of standard functions (Formulae) - Partial Derivatives – Derivative of Composite functions and Implicit functions - Chain Rule - Total Derivative
Integration - Elementary Integration – Integration of standard functions- Methods of Integration-Integration by substitution- Integration by parts.

UNIT – II (6 Hours)
VECTOR DIFFERENTIATION
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 – III (6 Hours)
VECTOR INTEGRATION
Line, Surface and Volume integrals- Green's Theorem – Gauss Divergence theorem - Stokes's Theorem. (all theorems without proof).

UNIT- IV(8 Hours) MATRIX THEORY
Rank of matrix- Echelon form - System of Linear Equations- Consistency of Homogeneous and Non-homogeneous system of equations- Eigen values and Eigen Vectors.

Suggested Books:
B.S. Grewal, Higher Engineering Mathematics.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD– 500031

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Computer Programming

SYLLABUS FOR BRIDGE COURSE B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 50	Course Code :**UB20ES310CS**
Credits :--	CIE Marks : --	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Acquire problem solving skills 2. Develop flow charts 3. Understand structured programming concepts 4. Write programs in C Language	On completion of the course, students will be able to 1. Design flowcharts and algorithms for solving a problem and choose appropriate data type for writing programs in C language 2. Design modular programs involving input output operations, decision making and looping constructs 3. Apply the concept of arrays for storing, sorting and searching data 4. Apply the concept of pointers for dynamic memory management and string handling 5. Design programs to store data in structures and files

UNIT-I

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Flowcharts.

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.

UNIT-III

Recursion-Recursive Functions, Preprocessor Commands.

Arrays: Two-Dimensional Arrays, Linear Search and Binary Search, Selection Sort and Bubble Sort.

UNIT-IV

Pointers: Introduction, Pointers to Pointers, Arithmetic operations using pointers

Strings – Concepts, C Strings, String Input/output, Functions, Arrays of Strings, String Manipulation Functions.

UNIT-V

Structure: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Unions.

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

Learning Resources:

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronics Engineering – I

SYLLABUS FOR B.E. (EEE) III - SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20ES310EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To give understanding on semiconductor materials and characteristics of the p-n junction diode. 2. To understand the operation of BJT, FET, MOSFET and characteristics of special purpose electronic devices. 3. To familiarize students with biasing circuits of BJT, FET, MOSFET.	On completion of the course, students will be able to 1. Define and describe the principle of operation of electronic devices like PN junction diode, Zener diode, BJT, FET and MOSFET etc. 2. Analyze and design various rectifier circuits with and without filters for a regulated DC power supply. 3. Illustrate the use of diode in practical applications and gain knowledge on special diodes 4. Analyze the small signal low frequency Bipolar junction Transistor model in exact and approximate model. 5. Analyze the small signal low frequency Field effect transistor amplifiers in different configurations with the help of their equivalent circuits.

UNIT - I : **Semiconductor Diodes and Rectifiers**

P-n junction as a rectifier, V-I characteristics, temperature dependence of V-I characteristics, Breakdown of junctions – Zener and Avalanche, halfwave, fullwave, bridge rectifiers, L,C, π –section filters, Regulation and Ripple characteristics.

UNIT - II : BJT circuits

BJT current components, Structure and I-V characteristics of a BJT, modes of transistor operation, Early effect, BJT input and output characteristics in CB, CE and CC configuration. BJT as a switch.BJT as an amplifier. BJT biasing techniques thermal runaway, operating point, bias

stabilization circuits.

UNIT - III : Small Signal analysis of Transistor Circuits

Small signal low frequency h-parameters model of BJT, h-parameters, analysis of BJT amplifier with exact and approximate models, comparison of CB, CE and CC amplifier configurations, Miller's theorem. RC coupled amplifier.

UNIT - IV : Filed effect transistors

V-I characteristics of JFET, JFET biasing, low frequency small signal model of FETs, MOSFETs: Enhancement and depletion mode MOSFETs, V-I characteristics. MOSFET biasing, MOSFET as a switch. MOSFET as an amplifier: common-source amplifier and common-gate amplifier. small signal equivalent circuits - gain, input and output impedances, trans conductance.

UNIT - V : CRO & Special devices:

Study of CRO block diagram, Elementary treatment on the functioning of tunnel diode, varactor diode, photo diode, light emitting diode, LCD, UJT, SCR, photo transistor.

Learning Resources:

1. Jacob Millman and Christos C. Halkias, Satyabratajit "Electronics Devices and Circuits", McGraw hill, 3rd edition, 2010.
2. Jacob Millman and Christos C. Halkias, Chetan D Parikh, "Integrated Electronics" Mc Graw Hill, 2009.
3. Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", PHI, 11th edition 2015.
4. A. S. Sedra and K. C. Smith, "Microelectronic Circuits", Seventh Edition New York, Oxford University Press, 2014.
5. https://nptel.ac.in/courses/108102095/
6. https://nptel.ac.in/courses/117101106/

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronics Engineering – I Lab

SYLLABUS FOR B.E. (EEE) III - SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20ES311EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To develop an understanding of the characteristics of Electronic devices and circuits with Qualitative approach	On completion of the course, students will be able to 1. Estimate the parameters from V-I characteristics of different diodes. 2. Design various rectifiers with different filter combinations. 3. Set up bias point in a transistor. 4. Estimate the parameters from BJT and FET characteristics. 5. Compute the bandwidth of RC coupled BJT and FET amplifiers from the frequency response.

CYCLE - I Experiments

1. V-I Characteristics of Si, Ge and Zener diode
2. Zener as Voltage Regulator
3. Design of Half wave and Full wave Rectifiers with and without Filters
4. Common Base characteristics of BJT and measurement of h – parameters
5. Common Emitter characteristics of BJT and measurement of h-parameters,
6. JFET Characteristics and measurement of its small signal parameters.
7. Applications of Cathode ray oscilloscope.

CYCLE - II Experiments

8. BJT biasing.
9. Analysis and bandwidth calculation of Single stage RC coupled CE Amplifier.
10. Analysis and bandwidth calculation of Emitter follower.
11. Single stage FET Common Source RC coupled Amplifier
12. Analysis and bandwidth calculation of Source follower.
13. Characteristics of UJT.

New Experiments

1. Transistor as a switch.
2. V-I Characteristics of Light Emitting Diode.

Mini Project(s)

Designing of various basic applications using devices.

Learning Resources:

1. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", 7th Edition, TMH 2001.
2. S.Poorna Chandra,B. Sasikala, Electronics Laboratory Primer,A design approach, Wheeler publishing, 2005.

The break-up of CIE :

1. No. of Internal Test	:	1
2. Max. Marks for each internal tests	:	12
3. Marks for assessment for day to day evaluation	:	18

Duration of Internal Test : 3 Hours

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. III SEMESTER

Dept	Title	Code	credits
Civil	Green Building	U20OE310CE	2
CSE	Principles of Python Programming	U200E310CS	2
	Cyber Security	U200E320CS	2
ECE	Introduction to Signals & Systems	U20OE310EC	2
	Principles of Communication Engineering	U20OE320EC	2
EEE	Non Conventional Energy Sources	U20OE310EE	2
Mech.	Geometric Modelling	U20OE310ME	2
	Introduction to Unmanned Aeiral Vehicle	U20OE320ME	2
	Basic Heat Transfer for Electronic Systems	U20OE330ME	2
IT	Object Oriented Programming Using Java	U20OE310IT	2
	Introduction To Scripting Languages	U20OE320IT	2
Maths	Linear Algebra and its Applications	U190E310MA	2
Chemistry	Battery science and Technology	U21OE31OCH	2
Physics	Smart Materials & Applications	U19OE31OPH	2
H&SS	Learning to Learn	U20OE310EH	2

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

GREEN BUILDINGS (Open Elective-I)

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week):2:0:0	SEE Marks:60	Course Code: **U20OE310CE**
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Learn the principles of planning and orientation of buildings. 2. Environmental implications of natural and building materials along with green cover 3. Acquire knowledge on various aspects of green buildings	1. Explain the principles of building planning, its bylaws and provide facilities for rainwater harvesting 2. Relate safety to Green Technology 3. Understand the concepts of green buildings 4. Understand rating systems of GRIHA and LEED

UNIT-I: Planning of building: Principles of planning, Relevant building bylaws, site selection for buildings, orientation of buildings, common errors in planning, Provision of rain water harvesting

UNIT-II: Buildings Energy-Implications: Environmental implications of buildings energy, carbon emissions, water use, waste disposal; Building materials: sources, methods of production and environmental Implications. Green cover and built environment

UNIT-III: Green Building Technologies: Introduction- Necessity - Concept of Green building. Principles of green building – Selection of site and Orientation of the building – usage of low energy materials – effective cooling and heating systems – effective electrical systems – effective water conservation systems

UNIT-IV: Certification Systems: Certification systems- Green Rating for Integrated Habitat Assessment (GRIHA) and Leadership in Energy and Environmental Design (LEED), case studies

Learning Resources:

1. Kumara Swamy N.Kameswara Rao A., Building Planning And Drawing, Charotar, Publications, 2013.
2. Shahane, V. S, "Planning and Designing Building", Poona, Allies Book Stall, 2004.
3. Michael Bauer, Peter Mösle and Michael Schwarz "Green Building – Guidebook for Sustainable Architecture" Springer, 2010.
4. Tom Woolley, Sam Kimmins, Paul Harrison and Rob Harrison "Green Building Handbook" Volume I, Spon Press, 2001.
5. Mili Majumdar, "Energy-efficient buildings in India" Tata Energy Research Institute, 2002.
6. TERI "Sustainable Building Design Manual- Volume I & II" Tata Energy Research Institute, 2009.

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	:	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)
IBRAHIMBAGH, HYDERABAD – 500 031
Department of Computer Science & Engineering

PRINCIPLES OF PYTHON PROGRAMMING(OPEN ELECTIVE-I)

(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code :**U200E310CS**
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 Acquire problem solving skills	1 Design python programs using arithmetic expressions and decision making statements
2 Learn programming and solve problems using Python language	2 Design modular python programs using functions 3 Develop programs using strings and list 4 Develop programs using tuples and dictionaries

UNIT-I: **Introduction to Python**: Variables, expressions and statements, order of operations

Conditionals: Modulus operators, Boolean expressions, logical operators, conditional execution, alternative executions, chained conditional, nested conditional

Iteration: while statement

UNIT-II: Functions: function calls, type conversion and coercion, mathematical functions, User-defined functions, parameters and arguments.

Recursion

UNIT-III: Strings: string length, string traversal, string slices and string comparison with examples, strings are immutable, find function, string module

List: list values, accessing elements, list traversal, list length, list membership, list and for loop, list operations with examples

UNIT-IV: **Tuples**: Mutability, tuple assignment, tuple as return values
Dictionaries: dictionary operations, dictionary methods, aliasing and copying, counting letters using dictionaries

Learning Resources:

1. Downey A, How to think like a Computer Scientist :Learning with Python, 1st Edition(2015), John Wiley
2. Lambert K.A, Fundamentals of Python –First Programs, 1st Edition(2015), Cengage Learning India
3. Perkovic L, Introduction to Computing using Python,2/e, (2015), John Wiley
4. Stewart Venit and Elizabeth Drake, Prelude to Programming: Concepts and Design, 6th Edition(2015),Pearson India
5. Mark J Guzdial, Introduction to Computing and programming in Python, 3rdEdition(2013), Pearson India
6. Allen Downey, Think Python, 2nd Edition(2015),Shroff Publisher Orielly
7. http://nptel.ac.in/courses/117106113/34
8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-01sc-introduction-to-electrical-engineering-and-computer-science-i-spring-2011/python-tutorial/
9. www.scipy-lectures.org/intro/language/python_language.html

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)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CYBER SECURITY (OPEN ELECTIVE-I)

(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E. III-SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks : 60	Course Code :**U200E320CS**
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 safeguard from threats and infection spread through the internet	1 Explain the concepts of confidentiality, availability and integrity 2 Explain the basics of fraud techniques used by a hacker 3 Explore the common exploitation mechanisms and inspect data sniffing over the network 4 Determine the ways an organization attempts to discover threats.

UNIT-I: **CYBER SECURITY FUNDAMENTALS:** Network and Security concepts: Information assurance fundamentals, Basic Cryptography, Symmetric Encryption, Public key encryption, Digital Signature, Key Exchange Protocols, DNS, Firewalls, Virtualization.

UNIT-II: ATTACKER TECHNIQUES AND MOTIVATIONS: How hackers cover their tracks, Tunneling techniques, Fraud Techniques: Phishing, Smishing, Vishing and Mobile Malicious Code, Rogue Antivirus, Click Fraud, Threat Infrastructure: Botnets, Fast-Flux, Advanced Fast-Flux.

UNIT-III: EXPLOITATION: Techniques to gain foothold: Shell code, Integer overflow, Stack based buffer overflow, Format String Vulnerabilities, SQL Injection, Web Exploit Tools, Misdirection, Reconnaissance, and Disruption Methods

UNIT-IV:**MALICIOUS CODE, DEFENSE & ANALYSIS TECHNIQUES:** Self-replicating replicating code, Worms, Viruses, Evading Detection and

Elevating Privileges: Obfuscation, Spyware, Token Kidnapping, Memory Forensics, Honeypots, Malicious code naming, Intrusion detection systems

Learning Resources:

1. James Graham, Ryan Olson, Rick Howard, "Cyber Security Essentials", Auerbach Publications , CRC Press, 2011
2. Mike Shema, "Anti-Hacker Tool Kit (Indian Edition)", Mc Graw Hill, 2014
3. Cyber Security - Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunit Belpure, Publication Wiley , 2011
4. https://www.edx.org/micromasters/ritx-cybersecurity
5. https://www.coursera.org/specializations/cyber-security
6. http://nptel.ac.in/courses/106105031/
7. https://www.netacad.com/courses/security/introduction-cybersecurity

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	:	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)
IBRAHIMBAGH, HYDERABAD – 500 031
ACCREDITED BY NAAC WITH 'A++' GRADE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

INTRODUCTION TO SIGNALS & SYSTEMS (OPEN ELECTIVE)

SYLLABUS FOR B.E. III – SEMESTER (for CSE & IT)

L:T:P (Hrs./week) :2:0:0	SEE Marks : 60	Course Code:**U20OE310EC**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Define and classify continuous and discrete time signals and systems. 2. Determine frequency domain characteristics of continuous and discrete time signals.	*On completion of the course, students will be able to* 1. Analyze basic signals and systems in continuous and discrete time domain 2. Apply the properties of different transformation techniques to analyze continuous time domain signals and systems in frequency domain 3. Determine the response of an LTI system using Convolution 4. Apply the properties of different transformation techniques to convert a discrete time domain signal to frequency domain

UNIT - I

Continuous time signals: types of signals, representation of signals, basic elementary signals, operations on signals.

Continuous time systems: classification of systems - static and dynamic, linear and non linear, time invariant and time variant.

UNIT - II

Continuous time Fourier transforms: Introduction, existence, properties, magnitude and phase spectrums.

Laplace transforms: Introduction, existence, Laplace transform of basic elementary signals, properties, inverse Laplace transforms

UNIT - III

Discrete time signals: types of signals, representation of signals, basic elementary signals, operations on signals.

Discrete time systems: classification of systems - static and dynamic, linear and non linear, time invariant and time variant.

UNIT - IV

LTI Systems: Introduction to continuous and discrete time LTI systems, properties, impulse response, convolution, causality, stability, transfer function.

Z-transform: Introduction, existence, Z-transform of basic elementary signals, properties, inverse Z-transforms.

Applications: Basic network Analysis, Servo Motor

Learning Resources:

1. P. Ramakrishna Rao, Signals and Systems,McGraw Hill, 2008.
2. Alan V. Oppenheim, Alan S. Wilsky and S. Hamid Nawab, Signals and Systems, 2nd ed., PHI, 2009.
3. Nagoor kani , Signals and Systems McGraw Hill, 2013
4. https://onlinecourses.nptel.ac.in/noc19_ee07/preview (Principle of Signals and Systems by Prof. Aditya K Jagannatham
5. https://www.edx.org/course/signals-and-systems-part-1-1
6. https://www.edx.org/course/signals-systems-part-2-iitbombayx-ee210-2x-3

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)
IBRAHIMBAGH, HYDERABAD – 500 031
ACCREDITED BY NAAC WITH 'A++' GRADE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PRINCIPLES OF COMMUNICATION ENGINEERING

(OPEN ELECTIVE)

SYLLABUS FOR B.E. III – SEMESTER (for EEE, CSE & IT)

L:T:P (Hrs./week) :2:0:0	SEE Marks : 60	Course Code: **U20OE320EC**
Credits : 2	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Distinguish analog and digital Modulation techniques used in various Communication systems.	On completion of the course, students will be able to 1. Analyze the power and transmission bandwidth of Amplitude and Frequency Modulated signals. 2. Familiarize the process of reproduction of base band signal. 3. Analyze various pulse analog and pulse digital Modulation Techniques. 4. Understand the transmission of binary data in communication systems.

UNIT - I

Amplitude Modulation: Introduction to Modulation, Need for Modulation, Ordinary Amplitude Modulation – Modulation index, Side bands, AM Power, Double Side Band Suppressed Carrier Modulation, Single Side Band Modulation, Vestigial Side Band Modulation, AM demodulation, Applications of AM.

UNIT - II

Angle Modulation: Angle Modulation fundamentals, Frequency Modulation – Modulation index and sidebands, Narrowband FM, Wideband FM, Principles of Phase Modulation, Frequency Modulation verses Amplitude Modulation, FM demodulation, Frequency Division Multiplexing, Applications of FM.

UNIT - III

Signal Sampling and Analog Pulse Communication: Ideal

Sampling, Pulse Amplitude Modulation, Pulse Width Modulation, Pulse Position Modulation.

Digital Communication Techniques: Quantization, Digital Transmission of Data, Parallel and Serial Transmission, Data Conversion, Time Division Multiplexing, Pulse Code Modulation, Delta Modulation.

UNIT - IV

Transmission of Binary Data in Communication Systems: Digital Codes, Principles of Digital Transmission, Transmission Efficiency, Modem Concepts and Methods – FSK, BPSK, Error Detection and Correction.

Learning Resources:

1. Louis E. Frenzel, Principles of Electronic Communication Systems, 3rd Edition. Tata Mcgraw Hill.
2. Wayne Tomasi, Electronic Communications Systems, 5th Edition, Pearson Education.

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)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Non Conventional Energy Sources

Open Elective-I

SYLLABUS FOR B.E. III SEMESTER

L: T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U20OE310EE**
Credits:2	CIE Marks: 40	Duration of SEE: 3Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
To provide a survey of the most important renewable energy resources and the technologies for harnessing these resources within the framework of a broad range of simple to state- of -the-art energy systems.	1. Demonstrate the generation of electricity from various Non-Conventional sources of energy and solar power generation 2. Illustrate the generation of energy from wind and generation of energy from waste 3. Demonstrate the generation of energy by biomass and fuel cells 4. Illustrate the ocean and geo thermal energy generation

UNIT-I: Introduction and Solar Energy:

Introduction: Need for Non-conventional energy sources, Types of Non-Conventional energy sources. Renewable energy across the Global and in India. Renewable energy for rural applications, Renewable energy for urban, industrial and commercial applications

Solar Energy: Solar cell fundamentals: Semiconductors, Photovoltaic effect, Solar PV cell, module, panel, array, Solar cell operating characteristics: Voltage-current characteristic, energy losses, maximising the performance. Applications of solar energy, Solar energy program in India, Case study

UNIT-II: Wind Energy and Waste to Energy:

Wind Energy: Nature of wind, Basic components of Wind Energy Conversion System(WECS), Power extraction from the wind, Applications of wind energy. Wind energy program in India, Case Study

Waste to Energy: Key issues, Waste recovery management, Case study

UNIT-III: Biomass Energy and Fuel Cells:

BiomassEnergy: Definition, Bio fuels, Biomass resources, Biomass conversion technologies: Incineration- Thermo chemical conversion- Bio-chemical conversion. Advantages and disadvantages of biomass energy, Case study

Fuel Cells: Definition-Classification of fuel cells, Principle of operation, Hydrogen-oxygen fuel cell, Alkaline fuel cell, Proton exchange membrane fuel cell, Molten carbonate fuel cell, Solid oxide electrolyte cells, Comparison of fuel cells- Advantages and Disadvantages of fuel cells- Applications of Fuel cells. Case study

UNIT-IV: Ocean Energy and Geothermal Energy:

Ocean Energy: Ocean thermal electric conversion (OTEC) methods: Open cycle and Closed cycle- Principles of tidal power generation- Advantages and limitations of tidal power generation, Case study

Geothermal Energy: Geothermal resources- Vapour dominated geothermal plant- Liquid dominated geothermal plant- Applications of Geothermal Energy, Case study

Learning Resources:

1. B H KHAN, Non-Conventional Energy Resources, McGraw Hill, 2nd Edition, 2009.
2. G. S. Sawhney, Non-Conventional Energy Resources, PHI Learning Pvt Ltd, 2012
3. ShobhNath Singh, Non-Conventional Energy Resources, Pearson, 2016
4. G.D. Rai, Non-Conventional Energy Sources ,Khanna Publishers, New Delhi, 2011.
5. Ashok Desai V, Non-Conventional Energy, Wiley Eastern Ltd, 1990.
6. Mittal K.M, Non-Conventional Energy Systems, Wheeler Publishing Co. Ltd, 1997.
7. Ramesh R, Kurnar K.U, Renewable Energy Technologies, Narosa Publishing House, New Delhi, 1997.

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

GEOMETRIC MODELLING (Open Elective-I)

SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U20OE310ME**
Credits :02	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVE	**COURSE OUTCOMES** *On completion of the course, students will be able to*
The objective of this course is to understand wire-frame modelling & transformations, surface, solid modelling and assembly modelling techniques.	1 identify various Wire frame modelling entities and their representations. 2 interpret synthetic curve representations and various 2D transformations for geometric model by matrix approach. 3 development of various surfaces using surface modelling. 4 analyze various solid models using various solid modelling schemes and Study various Assembly constraints, Assembly tree and develop few assembled models.

UNIT-I: INTRODUCTION TO CAD

product life cycle, conventional design and computer aided design.

Wire Frame Modelling: wire frame entities and their definitions. Interpolation and approximation of curves. Concept of parametric and non–parametric representation of circle and helix curves, demonstration of 2D geometry through CAD software.

UNIT-II: SYNTHETIC CURVES

Parametric representation of cubic spline, Bezier and B– spline curves, continuity, properties and characteristics of splines. Concepts of NURBS, synthetic curves demonstration.

2D transformation and their mathematics: Translation, scaling, rotation, Homogeneous co-ordinates, Concatenated transformations.

UNIT-III: SURFACE MODELING

Analytical surfaces: Definitions of planar, surface of revolution, Tabulated cylinder. Synthetic surfaces: Cubic and Bezier surfaces, visualization of different surfaces.

UNIT-IV: **SOLID MODELLING**

C– rep and B– rep and feature instancing, Octree encoding, spatial enumeration, cell decomposition, sweeping approaches. Euler's representation of solid models, creation of solid model in CAD software.

ASSEMBLY MODELING: Assembly constraints, assembly tree, top down assembly, bottom up assembly, development of a history tree for a simple assembly, demonstration of simple assembly.

Learning Resources:

1. Ibrahim Zeid, "CAD/CAM- Theory and Practice", McGraw-Hill Inc. New York, 2011.
2. Steven Harrington, "Computer graphics: a programming approach", McGraw-Hill, 1987.
3. David Rogers, J. Alan Adams, "Mathematical elements for computer graphics", McGraw Hill, 1990.
4. McConnell, J. J. "Computer graphics theory into practice", Jones and Bartlett Publishers, 2006.

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

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

Duration of Internal Test: **1 Hour 30 Minutes**

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

INTRODUCTION TO UNMANNED AERIAL VEHICLES
(Open Elective-I)
SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U20OE320ME**
Credits :02	CIE Marks:40	Duration of SEE: 03Hours

COURSE OBJECTIVE	**COURSE OUTCOMES**
	On completion of the course, students will be able to
The objective of this Course is to understand the features of UAV, elements, navigation and guidance of UAV and to design and silmulate UAV	1. Explain the types and characteristics of UAVs and their applications. 2. Illustrate the concepts of aerodynamics of flight vehicle. 3. Identify and explain the components, sensors and payload of UAVs, their navigation and guidance. 4. Design and perform structural, aerodynamic analysis of UAV components

Unit-I: Introduction to UAV
UAV: Definition, History; Difference between aircraft and UAV; DGCA Classification of UAVs; Types and Characteristics of Drones: Fixed, Multi-rotor, and Flapping Wing; Applications: Defense, Civil, Environmental monitoring.

Unit-II: Basics of Flight
Different types of flight vehicles; Components and functions of an airplane; Forces acting on Airplane; Physical properties and structure of the atmosphere; Aerodynamics – aerofoil nomenclature, aerofoil characteristics, Angle of attack, Mach number, Lift and Drag, Propulsion and airplane structures.

Unit-III: UAV Elements, Navigation and Guidance
Components: Arms, motors, propellers, electronic speed controller (ESC), flight controller; Propulsion; Data Link; Sensors and Payloads: GPS, IMU,

Light Detection and Ranging (LiDAR), Imaging cameras, Classification of payload based on applications; Hyper-spectral sensors; Laser Detection and Range (LADAR); Synthetic Aperture Radar (SAR); Thermal cameras; ultra-sonic detectors; Case study on payloads. Introduction to navigation systems and types of guidance; Mission Planning and Control.

Unit-IV: Design & Simulation of UAV

Introduction to CAD; Design of UAV components; Structural Analysis using CAE; Aerodynamic Analysis using CFD; Manufacturing of the components of UAVs: 3D printing; Case studies;

Learning Resources:

1. Andey Lennon, "Basics of R/C Model Aircraft Design" Model Airplane News Publication
2. John Baichtal, Building Your Own Drones: A Beginners' Guide to Drones, UAVs, and ROVs.
3. K Valavanis, George J Vachtsevanos, Handbook of Unmanned Aerial Vehicles, New York, Springer, Boston, Massachusetts: Credo Reference, 2014. 2016.
4. DGCA RPAS Guidance Manual, Revision 3 - 2020

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

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

Duration of Internal Test: **1 Hour 30 Minutes**

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

BASIC HEAT TRANSFER FOR ELECTRONIC SYSTEMS
(Open Elective-I)

SYLLABUS FOR B.E.III-SEMESTER

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U20OE330ME**
Credits :02	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVE	**COURSE OUTCOMES** *On completion of the course, students will be able to*
The objective of this course is to study the basic laws of thermodynamics and the cooling of electronic equipment along with basic modes of heat transfer	1 understand and apply the first and Second laws of thermodynamics to various engineering problems. 2 formulate heat conduction problems in rectangular, cylindrical and spherical coordinate system by transforming the physical system into a mathematical model. 3 to determine heat transfer coefficient in forced and free convection heat transfer. 4 analyse heat transfer processes involved in cooling of electronic components

UNIT-I: BASIC THERMODYNAMICS

Basic Concepts-System, Types of Systems, Control Volume, Surrounding, Boundaries, Universe, Macroscopic and Microscopic viewpoints, Thermodynamic Equilibrium, State, Property, Process, Cycle – Reversibility – Quasi–static process; Zeroth Law of Thermodynamics, First and Second laws of Thermodynamics. Numerical problems.

UNIT-II: HEAT TRANSFER: CONDUCTION

Heat Transfer – Different Modes, governing laws and application to heat transfer: Fourier, Newton, Stefan–Boltzmann laws; general heat conduction equation - Steady state one-dimensional heat conduction through slabs, hollow cylinders and spheres. Concept of thermal resistance in series and parallel (composite systems), contact resistance, overall heat transfer coefficient. Critical radius of insulation. Heat transfer with and without internal heat generation. Numerical problems.

UNIT-III: HEAT TRANSFER: CONVECTION

Extended surfaces: Fins - Applications of fins, Fin Equation, Fin Effectiveness and Efficiency. Convection Heat Transfer: Heat transfer coefficient - Forced and Natural Convection in Electronic Devices, non dimensional numbers - Nusselt number, Reynolds number, Grashoff

number and Prandlt number, forced and free convection correlations - flat plates and cylinders. Numerical problems.

UNIT-IV: COOLING OF ELECTRONIC EQUIPMENT

Needs & Goals; Temperature effects on different failure modes; Electronic equipment for airplanes, missiles, satellites and spacecraft; electronic equipment for ships & submarines; electronic equipment for communication systems and ground support system; chassis and circuit boards cooling.

Learning Resources:

1. P.K. Nag, “Engineering Thermodynamics”, Tata Mc Graw Hill, 4th Edition, 2008.
2. Yunus Cengel & Boles, “Thermodynamics – An Engineering Approach”, TMH New Delhi, 2008.
3. Sachadeva R.C., “Fundamentals of Engineering Heat and Mass Transfer”, New Age International (P) Ltd Publishers, New Delhi, 2010.
4. Dave S. Steinberg, "Cooling Techniques for Electronic Equipment", Second Edition, John Wiley & Sons, 1991.
5. Yunus Cengel & Afshin J Ghajar, “Heat and Mass Transfer: Fundamentals & its Applications”, Mc Graw Hill, 5th Edition, 2013.

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

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

Duration of Internal Test: **1 Hour 30 Minutes**

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

OBJECT ORIENTED PROGRAMMING USING JAVA
(Open Elective-I) (Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs/week):2:0:0	SEE Marks: 60	Course Code: **U20OE310IT**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, building simple GUI applications.	1. Understand fundamental concepts in Object oriented approach. 2. Develop object-oriented programs using the concepts of exception handling and multi threading. 3. Demonstrate the usage of Java I/O streams to handle user input and output. 4. Design and develop GUI programs.

UNIT- I

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables-scope and lifetime, Operators, Control statements, Structure of a Java class, Classes, Methods, Inheritance, and Command Line Arguments.

Arrays: One-dimensional arrays, creating an array, declaration of arrays, initialization of arrays, two-dimensional arrays.

Packages: Creation, importing a package and user defined package.

Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II

Exception Handling: Introduction, types of exceptions, syntax of exception handling code, multiple catch statements, using finally statement, user-defined exceptions.

UNIT- III

Basic I/O Streams: Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams.

Exploring java.lang: Object, Wrapper classes, String, StringBuffer, System

UNIT- IV

Introducing Awt,Awt Controls:

Event Handling: The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
2. James M Slack, Programming and Problem solving with JAVA, Thomson Learning, 2002.
3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th edition, McGraw Hill Publishing, 2010.
4. Y. Daniel Liang , An Introduction to JAVA Programming, Tata McGraw Hill, 2009.
5. Kathy Sierra, Head First Java, 2/e, Shroff Publishers, 2012.
6. https://docs.oracle.com/javase/tutorial/
7. https://nptel.ac.in/courses/106105191/

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)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF INFORMATION TECHNOLOGY

INTRODUCTION TO SCRIPTING LANGUAGES

(Open Elective-I)
(Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E. III SEMESTER

L:T:P (Hrs./week): 2:0:0	SEE Marks: 60	Course Code :**U200E320IT**
Credits : 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
This course will enable the students to acquire basic skills for writing python scripts.	1. Demonstrate basic knowledge of Python script. 2. Demonstrate an understanding of fundamental Python syntax and semantics and be fluent in the use of Python control flow statements and functions. 3. Construct python data structure programs using list, tuples, dictionaries, sets and numpy arrays. 4. Develop programs using Object oriented paradigm, and handle file related operations.

Unit – I

Introduction to Python, running a python script, writing comments, using variables, operators, expressions, strings and text, format specifiers, printing information. passing command line arguments, prompting users, parameters, unpacking variables.

Unit – II

Decision making: if and else if, repetition: while loops and for loops.
Defining functions, passing arguments to functions, returning values from functions, recursion.

Unit – III

Data structures: lists, operations on list, tuples, operations on tuples, sets, operations on sets, dictionaries, operations on dictionaries.
Numpy arrays: creation, access, slicing, matrix operations.

Unit – IV

Modules, Classes and Objects, is – a relationship: inheritance, has-a relationship: composition, Exception handling, File handling: reading and writing files, serialization using JSON.

Intro to Python Standard Library & other useful libraries: Scipy, Scikit, Pandas, Seaborn.

Learning Resources

1. Allen B. Downey, Think Python, 2nd Edition, Green Tea Press
2. "Learning Python", 5th Edition, O'reilly
3. https://www.python.org
4. https://nptel.ac.in/courses/106106182/
5. The Python Standard Library — Python 3.9.6 documentation
6. Python Tutorial (w3schools.com)
7. Best Python Libraries for Every Python Developer | by Claire D. Costa | Towards Data Science
8. Search results · PyPI

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)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF MATHEMATICS

LINEAR ALGEBRA AND ITS APPLICATIONS

(OPEN ELECTIVE-I for all branches of 2/4 B.E sem-3)

L:T:P (Hrs./week):2:0:0	SEE Marks :60	Course Code: **U200E310MA**
Credits : 2	CIE Marks: 40	Duration of SEE: 3 Hrs

UNIT – I (8 classes)
Vector Spaces-Definition of a Vector Space, Subspaces, Basis and Dimension, Coordinates and Change of Basis.

UNIT – II (6 classes)
Linear Transformation -I
Definition of Linear Transformation- Properties of Linear Transformations – Product of Linear Transformations – Algebra of Linear Operators.

UNIT – III (6 classes)
Linear Transformation -II
Range and kernel of a linear map – Dimension of Range and Kernel - Rank and nullity – Inverse of linear transformation - Rank nullity theorem (without Proof)- Matrix of Linear Transformation.

UNIT – IV (8 classes)
Inner Product Spaces-The Dot Product on R and Inner Product Spaces, Orthonormal Bases, Orthogonal Complements, Application: Least Squares Approximation

Learning Resources:

1. Introduction to Linear Algebra with Application, Author : Jim Defranza, Daniel Gagliardi, Publisher : Tata McGraw-Hill

2. An Introduction to Linear Algebra, V.Krishna Murthy, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Reference Books:

1. Elementary Linear Algebra, Author: Anton and Rorres, Publisher: Wiley India Edition.
2. Advanced Engineering Mathematics, Author : Erwin Kreysig, Publisher : Wiley Publication
3. Elementary Linear Algebra, Author : Ron Larson, Publisher : Cengage Learning

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 (A)
DEPARTMENT OF CHEMISTRY

Open Elective: BATTERY SCIENCE AND TECHNOLOGY

B E III Semester

Instruction:2Hrs/Week	Semester End Exam Marks : 60	Subject Reference Code : U20OE310CH
Credits : 2	Continuous Internal Exam Marks : 40	Duration of semester End Exam : 3Hours

LEARNING OBJECTIVES:	LEARNING OUTCOMES
The course will enable the students to:	**At the end of the course, students should be able to:**
1. To introduce the various terms to understand the efficiency of batteries. 2. To know the relevant materials required for the construction of primary and secondary batteries. 3. To familiarize with the reactions involved during charging and discharging processes. 4.To focus on the need of fuel cells and the concept of their construction and functioning.	1. Discuss the construction, electrochemistry, technology and applications of selected primary batteries 2. Discuss the construction, electrochemistry, technology and applications of few secondary batteries 3. Explain the working principle, electrochemistry, technology and applications of prominent fuel cells 4. Choose a suitable battery or a fuel cell for a given application.

UNIT-I: BATTERIES- FUNDAMENTALS

Introduction and types of batteries: Primary and secondary.
Battery characteristics: Free energy change, electromotive force of battery, ampere-hour, capacity, power, power density, energy density, efficiency, cycle life, tolerance to service conditions, performance characteristics.

UNIT-II: PRIMARY BATTERIES

Construction, chemistry and technology of Zinc-Air Battery, Zinc –HgO battery and their applications.
Primary lithium batteries: Soluble cathode cells, solid cathode cells- Lithium manganese dioxide, solid electrolyte cells- Lithium polymer electrolyte battery- Applications. Reserve battery- Electrochemistry of perchloric acid cell- applications.

UNIT-III: SECONDARY BATTERIES

Construction, chemistry and technology of maintenance free lead acid battery (MFLA), valve regulated lead acid battery (VRLA), absorbed glass

mat lead acid battery (AGMLA) - comparision between lead acid battery and VRLA along with advantages - Construction, electro chemistry and applications of Nickel-Cadmium battery, Nickel metalhydride battery.
Lithium ion batteries: Construction, chemistry and applications of liquid organic electrolyte cells, polymer electrolyte cells, lithium ion cells.

UNIT- IV: FUEL CELLS

Introduction, classification based on temperature and nature of electrolyte. Working principle, components, applications and environmental aspects of alkaline fuel cell (AFC)- Hydrogen-Oxygen alkaline fuel cell, Molten carbonate fuel cell (MCFC), Polymer electrolyte membrane fuel cell (PEMFC), Solid oxide fuel cell (SOFC).

Learning Resources:

Text Books:

1. P.C.Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai and Pub, Co., New Delhi (2002)
2. S.S. Dara "A text book of engineering chemistry" S.Chand and Co.Ltd., New Delhi (2006).

Reference Books:

1. Dell R. M. and Rand D. A. J., "Understanding Batteries", Royal Society of Chemistry, UK, 2001.
2. Chemistry of Engineering Meterials by R.P Mani and K.N.Mishra, CENGAGE learning
3. Shasi Chawla, "Text Book of Engineering Chemistry", Dhanpat Rai Publishing Company, NewDelhi,2008.
4. Derek Pletcher and Frank C. Walsh, "Industrial Electrochemistry", Chapman and Hall, New York, 1993.

CIE: 40 Marks	
Average of 2 Internals	: 30 Marks each
Average of 2 Assignments	: 5 Marks each
Average of 2 Quizzes	: 5 Marks each

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

SMART MATERIALS AND APPLICATIONS

Open Elective Course

L:T:P(Hrs/week):2:0:0	SEE Marks:60	Course Code: **U20OE310PH**
Credits :02	CIE Marks:40	Duration of SEE:03Hours

Course Objectives	Course Outcomes
The student will be able to 1. grasp the concepts of peizo and ferro electric materials 2. Learn fundamentals of pyro and thermo electric materials 3. gain knowledge on shape memory alloys 4. acquire fundamental knowledge on chromic materials	At the end of the course, the student should at least be able: 1. summarize various properties and applications of peizo and ferro electric materials 2. apply fundamental principles of pyro and thermo electricity in relevant fields of engineering 3. acquaint with various types of shape memory alloys and their properties and applications 4. appreciate the importance of chromic materials in engineering field.

UNIT I: PIEZO AND FERRO MATERIALS

Piezo electric effect and inverse piezoelectric effect, Piezo electric materials, Structure of Quartz crystal, Piezoelectric oscillator, Magnetostriction, Magnetostriction oscillator, piezo-electric sensors, applications of Piezo-electric materials.

Characteristics and properties of ferro-electric materials, Structure of Barium Titanate, Curie-Weiss law, applications of Ferro electric materials

UNIT II: PYRO AND THERMO-ELECTRIC MATERIALS

Pyroelectricity: pyro electric effect, pyro electric materials, pyro-electric sensors.

Thermoelectricity: thermoelectric effect, Seebeck effect, Peltier effect, thermoelectric sensor, Properties and applications of thermoelectric materials, thermoelectric generator and Thermoelectric cooler.

UNIT III: SHAPE MEMORY MATERIALS

Introduction to shape memory alloys (SMA)- Shape Memory Effect (SME) different phases of Shape memory alloys, Austenite, Martensite, Properties and characteristics of engineering SMAs**,** Super elasticity, one

and two way shape memory effects, Properties of Ni-Ti shape memory alloy, Cu-based shape memory alloys, biomedical Materials, Advantages, disadvantages of SMAs, Applications of SMAs.

UNIT-IV: CHROMIC MATERIALS

Electro-chromaticity, Electro-chromic materials, Electro-chromic sensors and devices. Photo-chromaticity, Photo-chromic materials, Photo-chromic sensors and devices. Thermo-chromaticity, thermo-chromic materials, thermo-chromic sensors and devices. Smart fluids: Magneto-rheological and Electro-rheological fluids.

Learning Resources:

1. K. Otsuka and C M Wayman, Shape memory materials, Cambridge university press, 1998.
2. TW Duerig, KN Melton, D Stockel, CM Wayman, Engineering aspects of shape memory alloys, Butterworth-Heinemann, 1990
3. A.K. Sawhney, A Course in Electronic Measurements and Instrumentation, Dhanpat Rai & Sons, 2015
4. D. Patranabis, Sensors and Transducers, PHI Learning Pvt. Ltd., 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)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Course Name: LEARNING TO LEARN

OPEN ELECTIVE B.E. 2nd Year Semester 3rd Semester
Common to all Branches

L:T: P (Hrs/Week):3	SEE Marks: 40/ 60	Course Code:
Credits: 2	CIE Marks: 20/ 40	Duration of SEE:Hours:03

COURSE OBJECTIVES	COURSE OUTCOMES
Learning to Learn	**Learning to Learn**
Develop effective study skills, and enable students to cut down on the number of hours spent studying	Get learners maximize their learning in a stipulated amount of time
Explore illusions of competence in learning, the challenges of overlearning, and the advantages of interleaving	Become competent learners and learn creatively
Handle procrastination and learn for long term	Meet deadlines, submit progress reports and recall what has been learnt for effective usage
Plan, prioritise and carry out tasks based on goals and priority	Set Performance Standards and take initiative based on set goals

OVERVIEW:

No matter what your skill levels in topics you would like to master, you can change your thinking and change your life. If you are struggling to cope, you'll see a structured treasure trove of practical techniques that walk you through what you need to do to get on track. If you've ever wanted to become better at anything, this course will help serve as your guide.

UNIT 1: STUDY SKILLS

5 hrs.

Good study skills can increase a student's confidence, competence, and self-esteem. They can also reduce anxiety about tests and deadlines. This module is designed to develop effective study skills, and enable students to cut down on the number of hours spent studying, leaving more time for other important things in their life

- Study Skills Checklist
- Learning Styles

- Habits of Effective Students
- Using the Focused and Diffuse Modes
- Introduction to memory and Memory Technique

UNIT 2: Chunking
6 hrs.

In this module, we're going to be talking about chunks. Chunks are compact packages of information that your mind can easily access. We'll talk about how you can form chunks, how you can use them to improve your understanding and creativity with the material, and how chunks can help you to do better on tests. We'll also explore illusions of competence in learning, the challenges of overlearning, and the advantages of interleaving.

- Knowledge Chunking
- Skill and Will
- Sleep and Learning

UNIT 3: Procrastination and Memory
6 hrs.

In this module, we talk about two intimately connected ideas—procrastination and memory. Building solid chunks in long term memory--chunks that are easily accessible by your short term memory—takes time. This is why learning to handle procrastination is so important. Finally, we talk about some of the best ways to access your brain's most powerful long term memory systems so that learning is long term and the learner has the ability to recall and use it as per need.

- Controlling Procrastination
- Ranking the importance of tasks with a to- do list
- Finding their most productive time
- Keeping track of time spent on different tasks
- Introduction to Deep learning

UNIT 4: Renaissance Learning and Unlocking Your Potential
7 hrs.

In this module we're going to talk more about important ideas and techniques that will enhance student's ability to learn. Students will also discover how to more profitably interact with fellow learners, how to recognize your own strengths, and how to avoid the "imposter syndrome." Fighter pilots and surgeons use checklists to help them with their critical duties—you can use a similar checklist to help you prepare for tests.

Ultimately, you will learn more about the joys of living a life filled with learning!

- Psychology of Goal Setting
- Criteria for Goal Setting
- Steps in Goal Setting
- Visioning
- Strategy & Action Plan
- Goal Progress Review

METHODOLOGY	**ASSESSMENTS**
- Case Studies	- Online assignments
- Demonstration	- Individual and Group
- Presentations	- Tracking Journal
- Expert lectures	- Checklist
- Writing and Audio-visual lessons	
- Games & Activities	
- Learning Tool	

LEARNING RESOURCES

learn.talentsprint.com

The break-up of marks for CIE:
Internal Tests (2); Quiz Tests (3) + Assignments (3)

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) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. - ECE : FOURTH SEMESTER (2021-22)

B.E (ECE) IV - SEMESTER								
Course Code	Name of the Course	Scheme of Instruction Hours per Week			Duration in Hrs	Scheme of Examination Maximum Marks		Credits
		L	T	P/D		SEE	CIE	
THEORY								
U20PC410EC	Electronic Circuits	3	-	-	3	60	40	3
U20PC420EC	Signal Analysis & Transform Techniques	3	-	-	3	60	40	3
U20PC430EC	Electromagnetic Field Theory	3	-	-	3	60	40	3
U20PC440EC	Computer Organization and Architecture	3	-	-	3	60	40	3
U20PC450EC	Probability Theory and Stochastic Process	3	1	-	3	60	40	4
U20OE4XXXX	Open Elective – II	3	-	-	3	60	40	3
U20BS430MA	Skill Development Course – III (Aptitude-II)	1	-	-	2	40	30	1
U20PE4XXEC	Skill Development Course – IV (Technical Skills-I)	1	-	-	2	40	30	1
U20HS010EH	Human Values and Professional Ethics – I	1	-	-	2	40	30	1
PRACTICALS								
U20PC411EC	Electronic Circuits Lab	-	-	2	3	50	30	1
U20PC421EC	Signals and Systems Lab	-	-	2	3	50	30	1
U20PW419EC	Mini Project - I	-	-	2	-	50	30	1
TOTAL		**21**	**1**	**6**		**630**	**420**	**25**
GRAND TOTAL		**28**				**1050**		
Left over hours will be allocated for : Sports / Library / Mentor – Mentee Interaction / CC / RC / TC / ECA / CCA								
Note: Every student should acquire one online course certification equivalent to 2 Credits weightage during III - VII Semester								

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-20) :: B.E. - ECE : FOURTH SEMESTER (2021 - 22)

Bridge Course for ECE Lateral Entry Students

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	
PRACTICALS								
UB20HS411EH	English Language and Communication Skills Lab	-	-	2	3	50	-	-

COURSES OFFERED TO EEE

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								
U20ES410EC	Electronics Engineering – II	3	-	-	3	60	40	3
PRACTICALS								
U20ES411EC	Electronics Engineering - II Lab	-	-	2	3	50	30	1

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronic Circuits

SYLLABUS FOR B.E. IV - SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20PC410EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To familiarize the students with design and working of various wave-shaping circuits and analyze concepts of positive and negative feedback in amplifiers.	On completion of the course, students will be able to 1. Design and analyze the linear and non-linear wave-shaping circuits. 2. Analyze and design various small signal amplifier circuits. 3. Analyze the effect of negative feedback in amplifier circuits. 4. Design of oscillator circuits for the given specifications. 5. Design of power amplifier circuits for audio frequency applications.

UNIT - I : Wave-shaping circuits

Linear wave-shaping: RC and RL response to Step, Pulse, Square, Exponential and Ramp inputs. Integrating and differentiating circuits, Compensated attenuators. Non-linear wave shaping: Clipping and clamping circuits.

UNIT - II : BJT and MOSFET applications

Small signal amplifiers: Classification of amplifiers, BJT and MOSFET high frequency equivalent circuits, Mid-band analysis in single and multistage amplifiers. Low frequency and high frequency analysis of single and multistage RC coupled and transformer coupled amplifiers. Darlington amplifier and Differential amplifier.

UNIT - III : Feedback amplifiers

The feedback concept, general characteristics of negative feedback, Effect of negative feedback on input and output impedances, Feedback topologies: Voltage series, current series, voltage shunt, current shunt, effect of feedback on gain, bandwidth etc., calculation with practical circuits, and concept of stability.

UNIT - IV : Oscillators

Positive Feedback and conditions for sinusoidal oscillations, RC oscillators oscillators (phase shift, Wien bridge etc.), LC oscillator(Hartley, Colpitt etc.) and Crystal oscillator, Amplitude and frequency stability of oscillator.

UNIT - V : Large signal amplifiers

BJT as large signal audio amplifier, Classes of operation, Harmonic distortion, power dissipation, efficiency calculations. Design considerations of transformer coupled and transformer less push-pull audio power amplifiers under Class-A, Class-B, Class-D, Class –AB operations, Qualitative analysis on R.F. Tuned amplifiers.

Learning Resources:

1. Adel S.Sedra and Kenneth C.Smith “Micro Electronic Circuits theory and applications” 7th edition Oxford publications, 2017.
2. Jacob Millman, Christos Halkias, Chetan Parikh, "Integrated Electronics", 2nd Edition, McGraw Hill Publication, 2009.
3. Robert L. Boylestad, "Electronic Devices and Circuit Theory", 11th Edition, Pearson New International Edition, 2014.
4. J. Millman and A. Grabel, “Microelectronics”, 2nd edition, Tata McGraw-Hill Education Pvt. Ltd, 2001.
5. Horowitz and W. Hill, “The Art of Electronics”, 3rd edition, Cambridge University Press, 2015.
6. A.S. Sedra and K.C. Smith, “Microelectronic Circuits”, 7th edition, Oxford University Press, 2014.
7. https://nptel.ac.in/courses/108102097/
   (Introduction to Electronic circuits, Prof. S.C. Dutta Roy, Dept of Electrical Engineering, IIT Delhi).
8. https://nptel.ac.in/courses/108102095/
   (Analog Electronic Circuits**,** Prof. S. C. Dutta Roy, Dept of Electrical Engineering, IIT Delhi).

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Signal Analysis and Transform Techniques

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20PC420EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To define and classify continuous and discrete time signals & systems 2. To determine the frequency domain characteristics of continuous and discrete time signals using various transform techniques. 3. To verify the causality and stability of LTI system and find its response using convolution.	On completion of the course, students will be able to 1. Analyze different types of continuous and discrete time signals and systems, and investigate whether the system is stable. 2. Apply different transformation techniques on continuous time signals and systems. 3. Determine the response of an LTI system using convolution. 4. Convert continuous time signals to discrete time signals using sampling and find the effects of aliasing. 5. Apply different transformation techniques on discrete time signals and systems.

UNIT - I :

Continuous Time Signals & Systems: Signals and Systems as seen in everyday life, and in various branches of engineering and science. Elementary signals, Basic operations on signals and its classification. Introduction to systems and its classification. Orthogonal signals.

Fourier Series: Introduction, Existence and Convergence, Trigonometric and exponential Fourier series representations and their relations, Symmetry conditions, Properties, Complex Fourier spectrum.

UNIT - II :

Signal Representation by Continuous Exponentials: Introduction to Fourier Transform, Existence, Fourier transform of singularity functions and signals, Properties, Fourier transform of a periodic function.

Signal Transmission Through Linear Systems: Introduction to Linear Shift Invariant (LSI) system, Unit Impulse and step response, Convolution, Transfer function of an LSI system, Distortion less transmission.

UNIT - III :

Signal Representation by Generalized Exponentials: Introduction to Laplace transforms, Existence, Region of convergence (ROC) and it properties. Properties of Laplace transform. Inverse Laplace transform. Analysis and characterization of continuous LTI systems using Laplace Transform.

Sampling: Introduction to Sampling, Sampling Theorem, Aliasing, Sampling Techniques, Reconstruction: ideal interpolator, Zero – order hold and First order hold.

UNIT - IV :

Discrete Time Signals & Systems: Introduction, Elementary signals, Basic operations on signals and its classification. Introduction to systems and its classification. Discrete Fourier Series (DFS), Discrete Time Fourier Transform (DTFT). Linear Shift invariant (LSI) systems – Linear Convolution, Stability and Causality

UNIT - V :

Z-Transforms: Introduction to Z-Transform, Existence, Region of Convergence (ROC) and its properties. S-plane and Z-plane correspondence, Properties of Z-Transform, Inverse Z-Transform, Analysis and characterization of discrete LTI systems using Z-Transform.

Learning Resources:

1. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.
2. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
3. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2 Ed.
4. Signals and Systems – A. Rama Krishna Rao – 2008, TMH.
5. M.J. Robert " Fundamentals of signals and systems", McGraw Hill, 2008
6. https://onlinecourses.nptel.ac.in/noc19_ee07/preview (Principle of Signals and Systems by Prof. Aditya K Jagannatham)
7. https://www.edx.org/course/signals-and-systems-part-1-1
8. https://www.edx.org/course/signals-systems-part-2-iitbombayx-ee210-2x-3

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electromagnetic Field Theory

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20PC430EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To impart to the students concepts of: 1. Electric field due to charges due to different types of charge distributions 2. Electric energy and capacitance in various charge and conductor configurations 3. Magnetic field, magnetic energy and inductance due to various current configurations 4. Formulation of maxwell's equations and solution in free space 5. Propagation/ reflection characteristics of uniform plane waves in dielectric/conducting media and at interfaces	On completion of the course, students will be able to 1. Apply concept of electric field due to charges in vacuum for different types of charge distributions 2. Apply concepts of electric field, energy and capacitance, to determine for various charge configurations in materials 3. Apply concepts of magnetic field, magnetic energy and inductance to determine for various current configurations in material space 4. Apply maxwell's equations to solve problems for free space 5. Analyze propagation/ reflection characteristics of uniform plane waves and solve problems for dielectrics, conductors and interfaces

UNIT - I :

Cartesian, Cylindrical and spherical coordinate systems - review of vector analysis - Coulomb's Law. Electric Field Intensity. Electric field due to different charge distributions. Line of charge, sheet of charge and volume charge distributions. Electric flux, flux density, Gauss's Law and application.

UNIT - II :

Energy and potential, Potential field of system of charges, Potential gradient. Energy density, Boundary conditions in static electric field, Capacitance of two-wire line, Continuity equation, current density, Poisson's equation, Laplace equation, Uniqueness theorem, Applications of simple practical cases.

UNIT - III :

Steady magnetic field, Biot-Savart's law, Ampere's law, Magnetic scalar and vector potentials. Magnetic boundary conditions, Magnetomotive force, Permeability, Self and mutual inductances, Evaluation of inductance of solenoid, toroid, coaxial cable, two-wire transmission line.

UNIT - IV :

Time varying fields & Maxwell's equations: Faraday's Law, Modified Ampere's law, Displacement Current, Maxwell's Equation in Point Form, Integral Form. Wave Propagation in Free Space.

UNIT - V :

Wave Propagation in Dielectrics, Poynting's Theorem and Wave Power, Propagation in good conductors, Skin Effect. Reflection of Uniform Plane waves at normal incidence and oblique incidence, Standing wave ratio.

Learning Resources:

1. Engineering Electromagnetics, 8th Edition, William H. Hayt, Jr. John A. Buck, Tata McGraw Hill Education, 2017
2. Principles of Electromagnetics, Mathew N.O. Sadiku and SV Kulkarni, , 6th ed., Oxford Univ. Press, 2015
3. Schaum's Outline of Electromagnetics, Joseph A Edminister and Mahmood Nahvi, 4th ed., Mc-Graw Hill, 2013
4. Electromagnetics with Applications, John D Kraus and Daniel A. Fleisch, McGraw Hill, 1999
5. R.K. Shevgaonkar, Electromagnetic Waves, Tata McGraw Hill India, 2005
6. David K. Cheng, Field and Wave Electromagnetics, 2nd ed, Pearson, 2015
7. E.C. Jordan & K.G. Balmain, Electromagnetic Waves & Radiating Systems, Prentice Hall India, 1968
8. https://swayam.gov.in/nd1_noc19_ph08

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Computer Organization and Architecture

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: **U20PC440EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To familiarize the students with the concept of organization of a computer system, issues related to performance analysis of CPU in the aspect of memory and I/O interface.	On completion of the course, students will be able to 5. Apply digital engineering fundamentals to acquire knowledge of arithmetic algorithms for different processors 6. Interpret the concept of Basic processor system with reference to 8085 processor and Analyze the performance of Micro programmed Control unit organization. 7. Implementing the techniques of pipelining and parallelism to analyze the performance of a Processor. 8. Apply the conceptual knowledge of system development with appropriate I/O Interface. 9. Interpret various techniques for efficient memory utilization to develop a system application.

UNIT - I: DATA REPRESENTATION AND COMPUTER ARITHMETIC

Introduction to Computer Organization and architecture, evolution and computer generations; Fixed point representation of numbers, digital arithmetic algorithms for Addition, Subtraction, ripple carry adder, carry look-ahead adder, Multiplication using Booth's algorithm and Division using restoring and non restoring algorithms. Floating point representation with IEEE standards and its arithmetic operations.

UNIT-II: BASIC PROCESSOR ORGANIZATION AND ARCHITECTURE

8085 Architecture, CPU ,ALU UNIT, Register organization of 8085CPU, Memory organization of 8085CPU, Instruction set of Basic 8085 processor, Stored program organization, stack organization of basic processor system, Hardwired control unit, Micro programmed Control organization, address sequencing, micro instruction format and micro program sequencer.

UNIT - III: PIPELINIG & PARALLELISM

Features of CISC and RISC and their comparison,Amdhal's law ,Concept of Pipelining, Data path and control path pipelining, Design of Arithmetic pipeline, Instruction Pipeline, performance issues in pipelining, Pipeline hazards, and techniques of Reducing pipeline branch penalties. Concept of parallelism, vector processors, Array processors.

UNIT - IV: INPUT-OUTPUT ORGANIZATION

I/O Bus and interface modules, I/O versus Memory Bus, Asynchronous data transfer: Strobe control, Handshaking, Asynchronous serial transfer. Modes of Transfer: Programmed I/O, Interrupt driven I/O, Priority interrupt; Daisy chaining, Parallel Priority interrupt. Direct memory Access, DMA controller and transfer. Input output Processor , CPU-IOP communication.

UNIT - V: MEMORY ORGANIZATION

Memory hierarchy, Mapping of memory with CPU, Primary memory, Concept of memory interleaving, Associative memory, Cache memory organization and performance measures, cache mapping functions, Virtual memory organization, paging mechanism ,address mapping using pages, Memory management hardware.

Learning Resources:

1. Morris Mano, M., "Computer System Architecture," 3/e, Pearson Education, 2005.
2. Hamacher, Vranesic, Zaky, "Computer Organization," 5/e, McGraw Hill, 2007.
3. William Stallings, "Computer Organization and Architecture: Designing for performance," 7/e, Pearson Education, 2006.
4. Govindarajulu, B., "Computer Architecture and Organization," 2/e, TMH, 2010.
5. John Hennessy and David Patterson, Computer Architecture : A Quantitative Approach, 5 th Edition,Elsevier.
6. Microprocessor Architecture, Programming, and Applications with the 8085, 5th Edition, Peaerson Education
7. Computer Organization and Architecture by IIT Delhi https://nptel.ac.in/courses/106102062/
8. Computer Organization and Architecture by Prof.V. kamkoti,IIT Madras https://onlinecourses.nptel.ac.in/noc17_cs35

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Probability Theory and Stochastic Process

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 3:1:0	SEE Marks : 60	Course Code: **U20PC450EC**
Credits : 4	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To understand, analyze and solve typical problems in probability and apply to communication systems.	On completion of the course, students will be able to 1. Apply the basic theorems and concepts of probability to calculate information rate of digital communication channels 2. Apprehend a single random variable and its operations to estimate statistical properties of a distribution function. 3. Extend the concepts of single random variable to multiple random variables to estimate the statistical properties of a distribution function. 4. Analyze the temporal characteristics of a random process to estimate correlation and covariance. 5. Analyze the spectral characteristics of a random process to estimate power spectral density.

UNIT - I : Probability and Information theory

Probability: Experiments and Sample Spaces , Introduction to probability, Relative Frequency, Discrete and Continuous Sample Spaces, Events, Independent Events, Probability Definitions and Axioms, Joint Probability, Conditional Probability, Total Probability, Baye's Theorem.

Information theory: Uncertainty, Information and entropy. Discrete memory less channels, Probability relations in a channel, priori & posteriori entropies, cascaded channels, mutual information, Channel capacity, information rate and information capacity. Rate distortion.

UNIT - II : Random Variable and Operation on One Random Variable

Random Variable: Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variables.

Distribution & Density Functions: Distribution and Density functions and their Properties - Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Conditional Density, and Properties.

Operation on One Random Variable – Expectations: Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function.

UNIT - III : Multiple Random Variables and operations

Multiple Random Variables: Joint Distribution Function and its Properties Joint Density Function and its Properties, Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central
Limit Theorem (Proof not expected), Unequal Distribution, Equal Distributions.

Operations on Multiple Random Variables: Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties.

UNIT - IV : Random Processes – Temporal Characteristics

The Stochastic Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence, First-Order Stationary Processes, Second-Order and Wide-Sense Stationarity, Nth Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes,
Correlation-Ergodic Processes, Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance and its Properties, Gaussian Random Processes, Poisson Random Process.

UNIT - V : Random Processes – Spectral Characteristics

The Power Density Spectrum and its Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum and its Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function, Some Noise Definitions and Other Topics: White Noise and Colored Noise, Product Device Response to a Random Signal.

Learning Resources:

1. A.Papoulis and S. Unnikrishnan Pillai, Probability, Random Variables and Stochastic Processes, Fourth Edition, McGraw Hill.
2. Peyton Z. Peebles, Probability, Random Variables & Random Signal Principles, 4th edition, Tata McGraw Hill, 2001.
3. H. Stark and J. Woods, Probability and Random Processes with Applications to Signal Processing, Third Edition, Pearson Education
4. S. Ross, Introduction to Probability Models, tenth edition, Elsevier
5. https://nptel.ac.in/courses/117105085/
6. https://nptel.ac.in/courses/117104117/

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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MATHEMATICS

Skill Development Course-III : Aptitude-II

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U20BS430MA**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Build further on aptitude skills and enhance employability skills 2. Enhance higher order thinking skills and problem solving in the following areas - Arithmetic ability, Numerical ability and General reasoning 3. Train to work systematically with speed and accuracy while problem solving	On completion of the course, students will be able to: 1. Solve questions in the mentioned areas using shortcuts and smart methods 2. Understand the fundamentals concept of Aptitude skills 3. Perform calculations with speed and accuracy

UNIT - I : QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED 8 hrs

- Time speed and distance
- Boats and Streams
- Problems on trains

UNIT 2: REASONING ABILITY- LOGICAL REASONING 6hrs

- Seating Arrangements- Linear; Circular; Complex
- Venn diagrams
- Syllogism
- Cubes & Cuboids
- Dices

UNIT 3: REASONING ABILITY- NON VERBAL REASONING 4hrs

- Figure Series
- Directions
- Clocks
- Calendars

UNIT 4: QUANTITATIVE APTITUDE - 2hrs

- Mensuration Part -1
- Mensuration Part -2
- Logarithms

UNIT 5: QUANTITATIVE APTITUDE 4hrs

- Permutations and combinations
- Probability

METHODOLOGY

- Demonstration
- Presentations
- Expert lectures
- Audio-visual lessons

ASSESSMENTS

- Online assignments
- Individual and Group

Learning Resources:

learn.talentsprint.com

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

1.	No. of Internal Tests	: 2	Max. Marks for each Internal Test	:	20
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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Human Values and Professional Ethics - I

SYLLABUS FOR B.E. IV – SEMESTER COMMON FOR ALL BRANCHES

L:T:P (Hrs./week): 1:0:0	SEE Marks : 40	Course Code: **U20HS010EH**
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
This course will enable the students 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.	On completion of the course, students 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-I : **Understanding the need and process for Value Education**

a) Basic Human Aspirations -Philosophy, purpose & objective of Life Understanding and living in harmony at various levels-with self, family, society and nature.
b) Ethical and moral values - Truth, honesty, empathy, integrity, consistency, cooperation, confidentiality, trustworthiness, self-respect, self-restraint, self-assertion, self-reliance.

UNIT-II: Holistic Understanding of Professional Ethics and Human Values

a) At the level of individual: as socially and ecologically responsible engineers and technologists.
b) At the level of society: as mutually enriching organizations, being work conscious.
c) Recognizing the value of time and respecting time of self and others.

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

- Value Education website, Http://www.universalhumanvalues.info UPTU website, Http://www.uptu.ac.in
- Story of stuff, Http://www.storyofstuff.com
- AlGore, As Inconvenient Truth, Paramount Classics ,USA
- Charlie Chaplin, Modern Times, United Artists, USA
- IIT Delhi, Modern Technology-The Untold story-Anand Gandhi, Right Here Right Now, Cyclewala production.

Learning Resources:

1. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
2. B.L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.
3. A.N Tripathy, 2003 Human values, New Age International Publishers.
4. EG Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists and Engineers, Oxford University Press.

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

1.	No. of Internal Tests	: 1	Max. Marks for each Internal Test	:	20
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)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronic Circuits Lab

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20PC411EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To develop an understanding of the underlying concepts of electronic circuits and wave shaping circuits	On completion of the course, students will be able to 1. Analyze the amplifier circuits behavior with and without feedback. 2. Design of sinusoidal oscillators for the given specifications. 3. Analyze and compare performance of power amplifiers. 4. Design of different types of linear and non-linear wave-shaping circuits for the given waveform.

CYCLE - I Experiments

1. Linear wave shaping- Integrator & Differentiator.
2. Non-linear wave shaping- Clipping and Clamping Circuits.
3. Frequency response of single stage and multi-stage RC-Coupled amplifiers using BJT.
4. Frequency response of single stage and multi-stage RC-Coupled amplifier using MOSFET.
5. Frequency response of Voltage series feedback amplifier.
6. Frequency response of Current Shunt feedback amplifier.

CYCLE - II Experiments

7. Design of Oscillators: RC Phase shift, Hartley and Colpitts.
8. Design of tuned Amplifier.
9. Design of Power amplifiers: Class – A and Class – B.
10. Analysis & Design of circuits using PSPICE(Minimum of five experiments).

New Experiments

11. Darlingon amplifier.
12. Differential amplifier (Inverting and non-inverting modes).

Mini Project(s)

Design of simple real-time application electronic circuits.

Learning Resources / Tools :

1. Robert Diffenderfer, "Electronic Devices Systems and Applications", Cengage Learning India Private Limited, 2010.
2. Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text - Lab Manual", 7thEdition, TMH 2001.

The break-up of CIE :

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

Duration of Internal Tests: 3 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Signals and Systems Lab

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20PC421EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To impart the knowledge to write MATLAB codes for the generation of signals, to perform different operations and to verify various transforms for converting time domain signal to frequency domain signal.	On completion of the course, students will be able to 1. Write MATLAB codes for the generation of signals. 2. Apply various transforms on signals to find it's Spectrum using MATLAB. 3. Correlate two signals and can remove noise using correlation. 4. Find the response of the system using convolution function in MATLAB. 5. Perform sampling of continuous time signal.

CYCLE - I Experiments

1. Basic operations on Matrices
2. Signal representation
3. Fourier Series analysis
4. The Fourier transform and its properties
5. Frequency Domain analysis of systems
6. Mini Project

CYCLE - II Experiments

7. Convolution representation
8. The Laplace Transform and its properties
9. System response using Laplace transform
10. Fourier analysis of Discrete time signals and systems
11. Verification of Sampling theorem
12. Correlation between signals and systems

New Experiments

1. Introduction to Simulink.
2. Gaussian Distribution.

Learning Resources / Tools :

1. Taan S. ElAli and Mohammad A. Karim, “Continuous Signals and systems with MATLAB”, 2/e, 2009, CRC Press.
2. Edward W.Kamen and Bonnie S. Heck, "Fundamentals of Signals and Systems Using MATLAB", PHI Inc.

The break-up of CIE :

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

Duration of Internal Tests: 3 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Mini Project - I

SYLLABUS FOR B.E. IV – SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20PW419EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
Students should be able to 1. Learn contemporary technologies 2. Design/Develop/Implement /Solve an engineering problem in the relevant areas of Electronics and Communication Engineering	On completion of the course, students will be able to 1. Review the literature survey to identify the problem 2. Propose the solution to address the problem 3. Design/Develop/Implement /Solve the problem and test the solution 4. Demonstrate the work done in the mini project through presentation and documentation 5. Adapt to contemporary technologies

The students are required to carry out mini projects in relevant areas of Electronics Communication Engineering such as Electronic Devices and Circuits, Embedded Systems, RF Technology, Microwave and Wireless Communications, Communication Systems, Signal Processing, Image and Video Processing, VLSI, Networking.

Course of Action:

1) Students are divided into teams of 2 or 3 for each project.
2) Faculty supervisors are allotted for the teams.
3) The project titles are to be submitted by the students and approved by their supervisor.
4) Progress of the project will be reviewed weekly.

Continuous Internal Evaluation (CIE) – 30 marks: To be evaluated by the Internal Examiner as per the following:

Assesment-1 : [5 Marks]
Review of problem selection & abstract to be conducted in week-2.

Assesment-2: [10 Marks]
Review of project design & initial phase of implementation and to be conducted in week-7.

Assesment-3: [15 Marks]
Review of final implementation, presentation and report to be conducted in week-15.

Semester End Examination(SEE) – 50 marks: To be evaluated by the External Examiner

Evaluation guidelines for Semester End Examination (SEE):

Power Point Presentation	[5 Marks]
Demonstration of the application	[25 Marks]
Innovation : 05 Marks	
Implementation : 15 Marks	
Understanding : 05 Marks	
Project Report	[10 Marks]
Viva Voce	[10 Marks]

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

English Language and Communication Skills Lab

SYLLABUS FOR B.E. (ECE) IV – SEMESTER
Bridge Course for Lateral Entry Students
(Common to all branches)

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **UB20HS411EH**
Credits : -	CIE Marks : -	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The Course will enable the Learners to: 1. Converse in various situations. 2. Make paper and power point presentations. 3. Speak effectively using discourse markers.	At the end of the course the students will be able to : 1. Research and sift information to make Presentations. 2. Listen for gist and make inferences from various speeches. 3. Use connectives and make transitions effectively while speaking.

ELCS – Component - INTERACTIVE COMMUNICATION SKILLS LAB

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

Debate: Understanding the differences between a debate and a group discussion, essentials of debate, concluding a debate.

Role Plays: Types of Role plays (formal and informal), usage of discourse markers.

Presentation Skills: Making effective presentations, using non-verbal communication, coping with stage fright, use of Audio visual aids researching on various topics.

Prescribed textbook for laboratory:

Speak Well: Jayshree Mohanraj, Kandula Nirupa Rani and Indira Ballellapati – Oriented 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.

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Electronics Engineering - II

SYLLABUS FOR B.E. (EEE) IV - SEMESTER

L:T:P (Hrs./week): 2:1:0	SEE Marks : 60	Course Code: **U20ES410EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. To familiarize the student with the analysis & design of feedback amplifiers, oscillators, multistage amplifiers and power amplifiers. 2. To understand the operation and design of linear and non-linear wave shaping circuits. 3. To study and analyze the frequency response of amplifier circuits.	On completion of the course, students will be able to 1. Analyze and design various feedback and multistage amplifiers. 2. Design a sinusoidal oscillators. 3. Analyze drift compensation techniques and differential amplifiers. 4. Design and analyze linear wave shaping circuits. 5. Design and analyze various non-linear wave shaping Circuits.

UNIT - I : Wave-Shaping Circuits

RC low pass and high pass circuit, response to step, pulse, Ramp and square wave inputs, Clipping circuits for single level and two levels, clamping circuits.

UNIT - II : Multi stage amplifiers

Cascading amplifier stages, classification of amplifiers, frequency responses of RC coupled amplifiers, Transformer coupled amplifiers, effect of cascading on band width.

D.C. Amplifiers: Problems of D.C amplifiers, Drift Compensation techniques, Differential amplifiers, importance of CMRR.

UNIT - III : Feedback amplifiers

Concept of Feedback, General characteristics of negative feedback amplifier, Effect of negative feedback on input and output impedances, voltage and current, series and shunt feedbacks.

UNIT - IV : Oscillators

Barkhausen criterion, RC oscillators, Wien bridge, phase shift, LC Hartley and Colpitts oscillator, Crystal oscillators (BJT only), frequency stability of oscillator.

UNIT - V : Power amplifiers

Classification of power amplifiers, Analysis of class A and B power amplifiers, Harmonic distortion, Power dissipation, efficiency calculations, Push pull amplifiers, Complementary symmetry Power amplifiers.

Learning Resources:

1. Jacob Millman and Christos C. Halkias, Satyabratajit "Electronics Devices and Circuits", McGraw hill, 3rd edition, 2010.
2. Jacob Millman and Christos C. Halkias, Chetan D Parikh, "Integrated Electronics" Mc Graw Hill, 2009.
3. Robert L.Boylestad and Louis Nashelsky,"Electronic Devices and Circuit Theory", PHI, 11th edition 2015.
4. A. S. Sedra and K. C. Smith, "Microelectronic Circuits", Seventh Edition New York, Oxford University Press, 2014.
5. Jacob millman and Taub: "Pulse, Digital and switching wave forms", Mc Graw hill, 2003.
6. https://nptel.ac.in/courses/108102095/
7. https://nptel.ac.in/courses/117101106/

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 ELECTRONICS AND COMMUNICATION ENGINEERING

Electronics Engineering – II Lab

SYLLABUS FOR B.E. (EEE) IV - SEMESTER

L:T:P (Hrs./week): 0:0:2	SEE Marks : 50	Course Code: **U20ES411EC**
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To develop an understanding of the underlying concepts of analog electronic circuits including feedback amplifiers, power amplifiers & oscillators, and design linear wave shaping and non-linear wave shaping circuits.	On completion of the course, students will be able to 1. Build a multi stage amplifier and find the frequency response of amplifier. 2. Analyze the small signal amplifiers behavior with and without feedback. 3. Design and verify the functioning of various sinusoidal oscillators. 4. Design & Analyze RC Low pass and High pass Circuits for different time constants for various non-sinusoidal inputs. 5. Design different types of clippers and clampers 6. Examine the characteristics of a difference amplifier.

CYCLE - I Experiments

1. Frequency response of Two stage amplifier
2. Frequency response of Voltage series feedback amplifier
3. Frequency response of Voltage Shunt feedback amplifier
4. Frequency response of Current series feedback amplifier
5. Frequency response of Current Shunt feedback amplifier
6. Design of Hartley Oscillator
7. Design of Colpitt's Oscillator

CYCLE - II Experiments

8. Design of RC Phase Shift oscillator.
9. Transformer coupled Class A power amplifier
10. Class B Power amplifier
11. Linear wave shaping-Integrator & Differentiator
12. Clipping circuits
13. Clamping Circuits

New Experiments

1. OP-Amp Applications(Adder,Subtractor,Comparator)
2. OP-Amp Applications(Integrator & Differentiator)

Mini Project(s)

Designing of various applications using devices.

Learning Resources:

1 Paul B. Zbar, Albert P. Malvino, Michael A. Miller, "Basic Electronics, A Text – Lab Manual", 7thEdition, TMH 2001.
2 Paul B. Zbar, Industrial Electronics,A Text-Lab Manual, 3rd Edition, TMH 1990.

The break-up of CIE :

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

Duration of Internal Tests: 3 Hours

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. IV SEMESTER (2019-20)

Dept	Title	Code	credits
Civil	Disaster Management	U20OE410CE	3
CSE	Introduction to Data Structures	U200E410CS	3
CSE	Introduction to Software Engineering	U200E420CS	3
ECE	Mathematical Programming for Engineers	U20OE410EC	3
ECE	Introduction to Communication Systems	U20OE420EC	3
IT	Introduction to Object Oriented Programming	U20OE410IT	3
IT	Introduction to Scripting Languages	U20OE420IT	3
Mech.	Optimization Methods	U20OE410ME	3
Physics	Introduction to Optoelectronic Devices	U20OE410PH	3
HSS	Critical Thinking	U20OE410EH	3

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

DISASTER MANAGEMENT (Open Elective-II)

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):3:0:0	SEE Marks:60	Course Code: **U20OE410CE**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Know about the state of art of disaster management in world and explore the history of the disasters and comprehend how past events have helped shape the future. 2. Study the various natural and manmade disasters and apply the mitigation measures 3. Expose students to various technologies used for disaster mitigation and management.	1. Attain knowledge on various types, stages, phases in disaster with international & national policies and programmes with reference to the disaster reduction. 2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India 3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India. 4. Explain the utility of geography information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management. 5. Understand the Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster Management

UNIT-I

Introduction: Hazard, vulnerability and risk, Types of disasters, Disaster management cycle, Progress of disaster management in world, vulnerability profile of India, Disaster management act, Disaster management in India.

UNIT-II

Natural Disasters – Hydro- meteorological based disasters: Tropical cyclones, floods, drought and desertification zones - Causes, Types, effects and Mitigation measures.

UNIT-III

Natural Disasters – Geographical based disasters: Earthquake, Tsunamis, Landslides and avalanches – Causes, Types, effects and Mitigation measures.

UNIT-IV

Human induced hazards: Chemical industrial hazards, major power breakdowns, traffic accidents, etc.

UNIT-V

Role of Remote Sensing and Geographical Information Systems (GIS) in Disaster Management: Introduction to remote sensing and GIS, its applications in disaster management.

Learning Resources:

1. Rajib, S and Krishna Murthy, R.R.(2012) "Disaster Management Global Challenges and Local Solutions", Universities Press, Hyderabad, 2012.
2. Navele, P & Raja, C.K. (2009), Earth and Atmospheric Disasters Management, Natural and Manmade, B.S. Publications, Hyderabad, 2009.
3. Battacharya, T. Disaster Science and Management, Tata McGraw Hill Company, New Delhi, 2012.

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 Computer Science & Engineering

INTRODUCTION TO DATA STRUCTURES (OPEN ELECTIVE-II)
SYLLABUS FOR B.E. IV-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T:P (Hrs./week):3:0:0	SEE Marks:60	Course Code :**U200E410CS**
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 Identify and use appropriate data structure for a given problem.	1 Implement linear data structures
2 Describe the linear and nonlinear data structures.	2 Develop an application using stacks and queues.
	3 Choose the appropriate nonlinear data structure and perform various operations on trees.
	4 Perform various operations on graphs.
	5 Analyze the time and space complexities of Algorithms.

UNIT – I:
Arrays: Arrays - ADT, Polynomials, Sparse matrices,
Linked Lists: Singly Linked Lists, Circularly linked lists, Doubly Linked Lists.

UNIT – II :
Stacks: Array Representation, Linked Representation, Applications**.**
Queues: Array Representation, Linked Representation, Applications.

UNIT – III: Introduction to non linear Data Structures: Tree Definitions and Properties, Representations of Binary Trees, Operations, Binary Tree Traversal

UNIT-IV: Graphs: Graph Definitions, properties and representations, Elementary Graph operations, Minimum Cost Spanning Trees- Kruskal's Algorithm, Prim's Algorithm.

UNIT-V: Performance analysis- time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations

Learning Resources:

1. Horowitz E, Sahni S and Susan Anderson-Freed, Fundamentals of Data structures in C, 2nd Edition(2008), Universities Press
2. Mark A Weiss, Data Structures and Algorithm Analysis In C, Second Edition(2002), Pearson
3. Kushwaha D. S and Misra A.K, Data structures A Programming Approach with C, Second Edition(2014), PHI.,
4. Gilberg R. F and Forouzan B. A, Data structures: A Pseudocode Approach with C, Second Edition(2007), Cengage Leaming
5. Tanenbaum A. M , Langsam Y. Augenstein M. J, Data Structures using C, Second Edition (2008), Pearson.
6. Thomas H. Cormen, Charles E. Leiserson, Ronald L Rivest, Clifford Stein, Introduction to Algorithms, Third Edition(2009), MIT Press
7. Yedidyah Langsam , Moshe J. Augenstein ,Aaron M. Tenenbaum, Data Structures Using C and C++ , Second Edition(2009), PHI
8. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos
9. http://nptel.ac.in/courses/106106127/
10. http://www.nptel.ac.in/courses/106102064

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 : 1 Hour 30 Minutes

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

INTRODUCTION TO SOFTWARE ENGINEERING

(OPEN ELECTIVE-II)

SYLLABUS FOR B.E. IV-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code :**U200E420CS**
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 understand the concepts involved in the lifecycle of software development	1 Explain the software development lifecycle models for software system development.
2 learn the best practices to be employed for the design, and testing of a software project.	2 Learn the requirement process steps in software process model.
	3 Analyze the structural design models in object oriented system.
	4 Analyze the behavioral design models used in object oriented system.
	5 Identify verification and validation methods in a software engineering project at various phases of SDLC .

UNIT-I:

Introduction to Software Engineering:

A generic view of Process: Software Engineering, Process Framework, CMMI, Process Patterns, Process Assessment.

Process Models: Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Process.

An Agile view of Process: What is an Agile Process, Agile Process Models- SCRUM, XP.

UNIT-II: Requirements Engineering: A bridge to Design and Construction, Requirements Engineering Tasks, Initiating Requirements Engineering Process, Eliciting Requirements, Negotiating Requirements, Validating Requirements.

UNIT-III:

Object oriented Modeling & design using UML: Introduction to UML.
Structural Modeling: Classes and Advanced Classes, Relationships ,Common Mechanisms, Class Diagrams, Interfaces, Types and Roles.

UNIT-IV:
Behavioural Modelling: Interactions, Interaction diagrams, Use Cases, Use Case Diagrams, Activity diagrams, State Machines, State chart Diagrams.
Architectural Modelling: Artifacts, Artifact diagrams, Deployment diagrams.

UNIT-V:
Testing Strategies: A Strategic approach to software testing ,Strategic issues, Test strategies for Conventional software, O-O Software, Validation testing, System testing, the art of debugging.
Testing Tactics: Software testing fundamentals, Black box and White box testing, Basis path testing, Control Structure, O-O testing methods, Testing for specialized environments, architectures and Applications testing patterns.

Learning Resources:

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, 6th Edition (2005), Tata McGrawHill.
2. Grady Booch, James Rumbagu, Ivor Jacobson, The Unified Modeling Language-User guide, (Covering UML 2.0) ,2nd Edition Pearson Education, India 2007.
3. Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Edition (2005), Narosa Publishing House.
4. http://nptel.ac.in/courses/106101061/
5. http://istqbexamcertification.com/what-is-a-software-testing/
6. http://agile.csc.ncsu.edu/SEMaterials/UMLOverview.pdf

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 : 1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Mathematical Programming for Engineers

(OPEN ELECTIVE - II)

SYLLABUS FOR B.E. V - SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U20OE410EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
To provide fundamental knowledge of programming language for solving problems.	On completion of the course, students will be able to 1. Generate arrays and matrices for numerical problems solving. 2. Represent data and solution in graphical display. 3. Write scripts and functions to easily execute series of tasks in problem solving. 4. Use arrays, matrices and functions in Engineering applications 5. Design GUI for basic mathematical applications.

UNIT - I : Introduction:

Basics of MATLAB, MATLAB windows, Advantages of MATLAB,on-line help, file types.

MATLAB Basics: Variables and Constants –Vectors and Matrices- Arrays - manipulation- Built-in MATLAB Functions. Creating and printing simple plots, Creating, Saving and Executing a Script File, Creating and Executing a function file.

Programming Basics: Data types-Operators – Hierarchy of operations, Relational and logical operators, if-end structure, if-else-end structure, if-elseif-else-end structure, switch-case statement, for-end loop, while-end loop, break and continue commands.

UNIT - II : Scripts and Functions

Script Files, Function Files, Debugging methods in MATLAB.

Graphics: Basic 2D plots: Printing labels- grid and axes box- Entering text in a box- Axis control-Style options-Multiple plots-subplots-specialized 2D plots: stem-,bar, hist, pi, stairs, loglog , semilog ,polar ,comet 3D plots: Mesh,Contour,Surf,Stem3,ezplot.

UNIT - III : Numerical Methods Using MATLAB

Numerical Differentiation, Numerical integration- Newton-Cotes integration formulae, Multi-step application of Trapezoidal rule, Simpson's 1/3 Rule for Numerical Integration. MATLAB functions for integration.

Linear Equations- Linear algebra in MATLAB, Solving a linear system, Gauss Elimination, Finding eigen values and eigen vectors, Matrix factorizations, Advanced topics.

UNIT - IV : Nonlinear Equations

System of Non-linear equations, Solving System of Equations Using MATLAB function fsolve, Interpolation-Lagrange Interpolation, Two dimensional Interpolation, Straight line fit using Least Square Method, Curve fitting using built-in functions ployval and polyfit , cubic fit using least square method. Finding roots of a polynomial -roots function, Newton-Raphson Method.

UNIT - V :

Solution of Ordinary differential Equations(ODEs)-The 4^{th} order Runge-kutta Method, ODE Solvers in MATLAB,Solving First –order equations using ODE23 and ODE45.

Structures and Graphical user interface(GUI): Advanced data Objects, How a GUI works, Creating and displaying a GUI. GUI components, Dialog Boxes.

Learning Resources:

1. Getting started with MATLAB "A quick introduction for scientist and engineers by RudraPratap, Oxford publications.
2. Advanced Guide to MATLAB-Practical Examples in Science and Enginneringby S.N.Alam,S.Islam,S.K.Patel-I.K.International Publishing House Pvt.Ltd.
3. Stephen J. Chapman-"MATLAB Programming for Engineers"- 5th Edition-Cengage Learning- 2015. Getting started with MATLAB (Version 9) The Math works.
4. An Introduction to MATLAB® Programming and Numerical Methods for Engineers 1st Edition by Timmy Siauw Alexandre Bayen, Elsevier-18th April 2014.
5. https://nptel.ac.in/courses/103106118/2
6. https://www.udemy.com/numerical-methods/

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 ELECTRONICS AND COMMUNICATION ENGINEERING

Introduction to Communication Systems

(OPEN ELECTIVE - II)

SYLLABUS FOR B.E. IV – SEMESTER (for other branches)

L:T:P (Hrs./week) : 3:0:0	SEE Marks : 60	Course Code: **U20OE420EC**
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
1. Distinguish between Amplitude and Frequency modulation methods and their application in Communication Receivers 2. Explain why multiplexing methods are necessary in communications and compare FDM with TDM 3. Compare and contrast FSK and BPSK modulation schemes employed in digital data transmission 4. Draw the block diagrams of different types of communication systems and explain their operation	On completion of the course, students will be able to 1. Identify the Radio frequency spectrum and the bands of different types of radio systems 2. Analyze the power, efficiency and transmission bandwidth of Amplitude and Frequency Modulated signals. 3. Convert the Radio frequency to Intermediate frequency and explain the operation of Superheterodyne Receiver. 4. Compare and contrast Frequency Division Multiplexing and Time Division Multiplexing used in the Communication systems 5. Detect and correct errors present in bit stream data using parity check 6. Explain the basic principles of different types of communication systems.

UNIT - I :

Introduction to Electronic Communication: Communication systems, Types of Electronic Communication, Modulation and Multiplexing, The Electromagnetic Spectrum, Bandwidth, Communication Applications, Gain and Attenuation definitions

Amplitude Modulation Fundamentals: AM concepts, Modulation Index and Percentage of Modulation, Sidebands and the Frequency Domain, AM Power

UNIT - II :

Fundamentals of Frequency Modulation: Basic principles of Frequency Modulation, Principles of Phase Modulation, Modulation Index and Sidebands, Noise – Suppression Effects of FM, Frequency Modulation verses Amplitude Modulation.

Communication Receivers: Basic Principles of Signal Reproduction,

Superheterodyne Receivers, Frequency Conversion, Intermediate Frequency and Images, Noise.

UNIT - III :

Digital Communication Techniques: Digital Transmission of Data, Parallel and Serial Transmission, Data Conversion, Pulse Modulation.

Multiplexing and De-multiplexing: Multiplexing Principles, Frequency Division Multiplexing, Time Division Multiplexing, PCM Multiplexing.

UNIT - IV :

Transmission of Binary Data in Communication Systems: Digital Codes, Principles of Digital Transmission, Transmission Efficiency, Modem Concepts and Methods – FSK, BPSK, Error Detection and Correction

UNIT - V :

Different Types of Communication Systems: Microwave Concepts, Optical Principles, Optical Communication System, Satellite Communication Systems, Satellite Orbits, Cellular Telephone Systems, Bluetooth and Wi-Fi basics

Learning Resources:

1. Louis E. Frenzel, Principles of Electronic Communication Systems, 3rd Edition. Tata Mcgraw Hill.
2. Wayne Tomasi, Electronic Communications Systems, 5th Edition, Pearson Education.
3. https://nptel.ac.in/syllabus/syllabus.php?subjectId=117102059
4. https://nptel.ac.in/courses/117101051/12

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

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

(Open Elective-II) (Common for CIVIL, ECE, EEE & MECH)
SYLLABUS FOR B.E. IV SEMESTER

L:T:P (Hrs/week):3:0:0	SEE Marks: 60	Course Code: **U20OE410IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES *On completion of the course, students will be able to*
Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, building simple GUI applications.	1. Understand fundamental concepts in Object oriented approach. 2. Develop object-oriented programs using the concepts of exception handling and multi threading. 3. Demonstrate the usage of Java I/O streams to handle user input and output. 4. Design and develop GUI programs. 5. Develop Applets for web applications.

UNIT- I

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables-scope and lifetime, Operators, Control statements, Structure of a Java class, Classes, Methods, Inheritance, and Command Line Arguments.

Arrays: One-dimensional arrays, creating an array, declaration of arrays, initialization of arrays, two-dimensional arrays.

Packages: Creation, importing a package and user defined package.

Interfaces: Defining interfaces, extending interfaces, implementing interfaces.

UNIT- II

Exception Handling: Introduction, types of exceptions, syntax of exception handling code, multiple catch statements, using finally statement, user-defined exceptions.

UNIT- III

Basic I/O Streams: Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization.

Exploring java.lang: Object, Wrapper classes, String, StringBuffer, System

UNIT- IV

Introducing AWT working with Graphics: AWT Classes, Working with Graphics.

Event Handling: The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

Awt Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

UNIT- V

Applet Programming: Introduction, how applets differ from applications, building applet code, applet life cycle, HTML-APPLET tag, passing parameters to applets.

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill, 2006.
2. James M Slack, Programming and Problem solving with JAVA, Thomson Learning, 2002.
3. C Thomas Wu, An Introduction to Object Oriented Programming with Java 5th edition, McGraw Hill Publishing, 2010.
4. Y. Daniel Liang , An Introduction to JAVA Programming, Tata McGraw Hill, 2009.
5. Kathy Sierra, Head First Java, 2/e, Shroff Publishers, 2012.
6. https://docs.oracle.com/javase/tutorial/
7. https://nptel.ac.in/courses/106105191/

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 INFORMATION TECHNOLOGY

INTRODUCTION TO SCRIPTING LANGUAGES

(Open Elective-II) (Common for CIVIL, ECE, EEE & MECH)

SYLLABUS FOR B.E. IV SEMESTER

L:T:P(Hrs./week): 3:0:0	SEE Marks: 60	Course Code :**U20OE420IT**
Credits : 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** *On completion of the course, students will be able to*
This course will enable the students to acquire basic skills for writing python scripts.	5. Write a python script to solve a basic problem using structured programming constructs 6. Write a python script to solve a basic problem using object oriented programming constructs 7. Create and use python modules 8. Handle file related operations 9. Encode and decode strings

Unit – I

Introduction to Python, running a python script, writing comments, using variables, operators, strings and text, format specifiers , printing information. passing command line arguments, prompting users, parameters, unpacking variables.

Unit – II

Decision making : if and else if, repetition : while loops and for loops, lists, operations on list , tuples, operations on tuples, sets, operations on sets, dictionaries, operations on dictionaries.

Unit – III

Defining functions, passing arguments to functions , returning values from functions, Exception handling.

Unit – IV

Modules , Classes and Objects, is – a relationship : inheritance, has-a relationship : composition.

Unit – V

File handling, serialization using JSON and pickle, encoding and decoding.

Learning Resources

1. Allen B. Downey, Think Python, 2nd Edition, Green Tea Press
2. "Learning Python", 5th Edition, O'reilly
3. https://www.python.org
4. https://nptel.ac.in/courses/106106182/

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 MECHANICAL ENGINEERING
SYLLABUS FOR B.E. IV-SEMESTER

OPTIMIZATION METHODS (Open Elective-II)

Instruction : 3Hours /week	SEE Marks : 60	Course Code : U20OE410ME
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hours

Course Objectives	Course Outcomes
The objectives of this course are to: understand Linear & non-linear programming, transportation modeling , CPM & PERT for project scheduling and control, and application of various optimization techniques for respective field engineering (Inter disciplinary)	On completion of the course, the student will be able to: 1. Optimization of resources in multi disciplinary areas through linear programming under different conditions. 2. Sensitivity analysis of a linear programming problem as per customer requirements to suit various Organizations. 3. Minimization of total cost to apply for transportation techniques for the transhipment of Goods and products and Implement techniques like project management to analyze about material management. 4. Optimization of resources in multi disciplinary areas through non-linear programming under different conditions.

UNIT-I

Optimization-An overview

Meaning of Optimization-Origin of Optimization-Introduction to Linear programming problems (LPP) -Formulation of LPP- Graphical method, simplex method.

UNIT-II

Advanced topics in Linear programming

Duality in LPP, Differences between primal and dual, shadow prices, Dual simplex method, sensitivity analysis. special cases in LPP.

UNIT-III

Transportation Model

Definition of the transportation model-matrix of Transportation model-

Formulation and solution of transportation models- Methods for calculating Initial basic feasible solution-Optimization of transportation model using MODI method.

Project Scheduling

Introduction to network analysis, Rules to draw network diagram, Fulkerson rule for numbering events, Critical path method, PERT.

UNIT-IV

Non linear programming problems

Optimization methods for single variable, multivariable functions, Maxima-Minima

One Dimensional Minimization: Uni-modal Function, Unrestricted search, Exhaustive search,Dichtomous search, Interval Halving method, Fibonacci and golden bisection Method , Newton and Quasi Newton method.

UNIT-V

Non Linear - Unconstrained optimization: classification, scaling of design variables, Random search methods, Univeriate search, pattern Directions, Hook Jeeves, Powel method, Rosenbrock method.

Learning Resources:

1. SingiresuS.Rao, “Engineering optimization- Theory and Practice”, 4th Edition, John Wiley and Sons, 2009.
2. NVS Raju, “Optimization methods for Engineers ", PHI Learning Pvt. Ltd., 2014.
3. Prem Kumar Gupta and Dr. DS Hira, “Operations Research ", S.Chand& Company Pvt. Ltd., 2014.
4. R. Paneerselvam, “Operations Research”, PHI Learning Pvt Ltd., 2009.
5. Kalyanmoy Deb, Optimization for Engineering Design- algorithms and examples, PHI pvt ltd, 1st edition 2003, Delhi.

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

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	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: 1 Hour 30 Minutes

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

INTRODUCTION TO OPTOELECTRONIC DEVICES
Open elective Course

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code: **U20OE410PH**
Credits :03	CIE Marks:40	Duration of SEE:03Hours

Course Objectives	Course Outcomes
The student will be able to 1. gain knowledge on working of optoelectronic light sources like LED 2. grasp the concepts of lasing action, merits and demerits of lasers 3. acquire the fundamental knowledge on photo-detectors. 4. Narrate the properties of chromic materials	*At the end of the course, the student should at least be able:* 1. accustom with various device structures of optoelectronic light sources like LED 2. acquaint with various types of lasers and their applications 3. assimilate working and use of photo detectors and solar cells in various applications 4. appreciate the importance of chromic materials in engineering field

UNIT-I: LIGHT EMITTING DIODES

Review of semiconductors, direct and indirect band semiconductors, electron-hole pair generation and recombination process- emission radiation and band gap of semiconductor-electroluminescence-construction and working of homojunction LED- introduction to SLED and ELED-semiconductor materials for LED fabrication, and OLEDS, applications of LEDs.

UNIT-II: SEMICONDUCTOR LASERS

Semiconductor diode laser -construction-working principle- advantages and applications of diode lasers. Semiconductor lasers- rate equations for carrier and photon-density, and their steady state solutions, modes in resonating cavity, gain and loss, quantum efficiency, construction and working of homo-junction and hetero-junction semiconductor lasers, advantages and applications of lasers.

UNIT-III: SOLAR CELLS

Solar spectrum-Solar Cell- Photovoltaic effect- I-V characteristics of solar cell -fill factor, efficiency- materials fabrication of solar cells-thin film solar cell-solar panels- applications of solar cells.

UNIT-IV: PHOTODETECTORS

Photodiodes: Working and construction of Photodiode and its characteristics- dark current-PIN Photodiode-Avalanche Photodiode-Photodiode Quantum Efficiency-advantages and applications of photodiodes.

UNIT-V: CHROMIC MATERIALS (6 hours)

Electro-chromaticity, Electro-chromic materials, Electro-chromic sensors and devices.

Photo-chromaticity, Photo-chromic materials, Photo-chromic sensors and devices.

Thermo-chromaticity, thermo-chromic materials, thermo-chromic sensors and devices.

Smart fluids: Magneto-rheological and Electro-rheological fluids.

Learning Resources:

1. Ben G Streetman and Sany Kumar Banerjee, Solid state electronic devices, 7th edition, Pearson, 2016
2. Jasprit Singh, Semiconductor devices: Basic principles, Wiley, Delhi, 2014
3. M.N. Avadhanulu, Kshirsagar and TVS Arun Murthy, A textbook of Engineering Physics, 11th Edition, S. Chand, 2018.

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Test:	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: **1 Hour 30 Minutes**

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

CRITICAL THINKING
OPEN ELECTIVE B.E.-2/4- IV Semester

L:T:P(Hrs/week):3:0:0	SEE : 60	Course code : U20OE410EH
Credits : 3	CIE : 40	Duration of SEE : 3 Hours

Course Objectives	**Course Outcomes**
To help students: • Identify the core skills associated with critical thinking. • Comprehend the various techniques of critical thinking. • **Understand where to** look for bias and assumptions in problem analysis • Understand Structure, standards, and ethics of critical thinking **dents will learn** • How to control and evaluate their thought processes • How to reason effectively and consistently • Problem analysis best practices - using their decision time most effectively	**At the end of the course the student will be able to** • Analyse and use techniques for comparing alternative solutions • Demonstrate the difference between deductive and inductive reasoning. • Construct a logically sound and well-reasoned argument. • Evaluate, identify, and distinguish between relevant and irrelevant information • Formulate a thesis or Hypothesis • Employing Evidence/Information Effectively

UNIT I - Components of Critical Thinking

1. Applying Reason
2. Open Mindedness
3. Analysis
4. Logic

UNIT II - Non-Linear Thinking

1. Step Out of Your Comfort Zone
2. Don't Jump to Conclusions
3. Expect and Initiate Change

4. Being Ready to Adapt

UNIT III - Logical Thinking
1. Ask the Right Questions
2. Organize the Data
3. Evaluate the Information
4. Draw Conclusions

UNIT IV - Evaluate Information
1. Making Assumptions
2. Watch out for Bias
3. Ask Clarifying Questions
4. SWOT Analysis

UNIT-V - Problem Solving
1. Identify Inconsistencies
2. Trust Your Instincts
3. Asking Why?

METHODOLOGY:-	**ASSESSMENT :-**
Case Studies	Online assignments
Demonstration	Individual and Group Presentations
Expert lectures	Writing and Audio-visual lessons

Learning Resources:-

1. Critical Thinking: A Beginner`s Guide to Critical Thinking, Better Decision Making, and Problem Solving-Jennifer Wilson
2. Wait, What? And Life`s Other Essential Questions – James E.Ryan
3. Think Smarter: Critical Thinking to Improve problem-solving and Decision Making skill -Michael Kallet
4. The Art of Thinking Clearly-Rolf Dobelli

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

1	No. of Internal Tests:	02	Max.Marks for each Internal Test:	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)

ACCREDITED BY NAAC WITH 'A++' GRADE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Academic Activity Planner / Calendar for the Academic Year 2021-22

S.No.	Date	Day	Activities planned
1.	01-07-2021	Thursday	3 Days workshop on "Signal Generator and Spectrum Analysis" for Technical Supporting staff of ECE Dept.
2.	02-07-2021	Friday	
3.	03-07-2021	Saturday	
4.	05-07-2021	Monday	National Workshop on "Image Processing Applications using Machine Learning"
5.	06-07-2021	Tuesday	
6.	07-07-2021	Wednesday	
7.	08-07-2021	Thursday	
8.	09-07-2021	Friday	
9.	09-07-2021	Friday	Alumni Guest Lecture on "Career Guidance" by Meghana Jilla, Software Engineer, Service Now, Hyderabad.
10.	10-07-2021	Saturday	National Workshop on "Image Processing Applications using Machine Learning"
11.	22-07-2021	Thursday	3 Days workshop on "Signal Generator and Spectrum Analysis" for Technical Supporting staff of ECE Dept.
12.	23-07-2021	Friday	
13.	24-07-2021	Saturday	
14.	01-08-2021	Sunday	"Service Now Pre-placement Interaction" by Meghana Jilla, Software Engineer, Service Now, Hyderabad. (online mode)
15.	11-08-2021	Wednesday	"Oracle Pre-placement Interaction" by O. Abhigna & G. Chaitanya Kumar, Software Engineer, Oracle, Hyderabad. (online mode)
16.	18-8-2021	Wednesday	"Accolite Pre-placement Interaction" Md. Shadab Farhan, Software Engineer, Accolite, Hyderabad.
17.	21-8-2021	Saturday	"TCS Digital Pre-placement Interaction" by G. Navya & K. Madhu Sai Kalyan, Software Engineer, TCS Digital, Hyderabad
18.	01-09-2021	Wednesday	"Deloitte Pre-placement Interaction" by M. Eshwar, Deloitte, Hyderabad
19.	08-09-2021	Wednesday	3-day Workshop (Online Mode) on Modeling of RF Front-end Circuitry for 5G Communication using ADS software
	09-09-2021	Thursday	
	11-09-2021	Saturday	

S.No.	Date	Day	Activities planned
20.	13-09-2021	Monday	"Pega Systems Pre-placement Interaction" by B. Spandana & Md. Shakeer, Pega Systems, Hyderabad.
21.	17-09-2021	Friday	Guest Lecture on "IC Design"
22.	18-09-2021	Saturday	Alumni Guest Lecture on "Career Guidance" by Mr. A. Anudeep, SAP Consultant, EY, Hyderabad
23.	24-09-2021	Friday	Technical Cross Word Puzzle under IETE- ISF Unit, VCE(Autonomous).
24.	25-09-2021	Saturday	Technical Talk on "Advanced Wireless Stack Development" Mr. Md. Siddiq, Sr. Engineer, Qualcomm, Hyderabad, under IETE- ISF Unit, VCE (Autonomous).
25.	01-10-2021	Friday	Online Hackthon (Coding Contest) sponsored by IEEE SB, VCE(Autonomous)
26.	08-10-2021	Friday	Alumni Guest Lecture on "Building Hard Skills for Successful Employment" by Mr. K.N. Keshava Murthy, Freelance Consultant, Mysore.
27.	09-10-2021	Saturday	Technical Talk on "Signal Processing Applications" by Dr. Vasundhara, NIT-Warangal.
28.	23-10-2021	Saturday	Guest Lecture on "Chandrayan Mission" by M. Srikanth, Scientist-G, ISRO, Bangalore
29.	28-10-2021	Thursday	3-day FDP on VLSI Physical Design using Mentor Graphics Tools
	29-10-2021	Friday	
	30-10-2021	Saturday	
30.	05-11-2021	Friday	2-day Workshop on "Developing 5G Wireless Communication Applications using SystemVue Software Tools" in association with Synergy Measurement Technologies Pvt. Ltd., Hyderabad and Keysight Technologies, Hyderabad.
	06-11-2021	Saturday	
31.	12-11-2021	Friday	Online Elocution Contest on "Challenges in Agriculture" by IEEE-SB, VCE(Autonomous)
32.	13-11-2021	Saturday	Guest Lecture on "Radio Receivers" by P. Kishore, Scientist-F, ISRO, Bangalore
33.	20-11-2021	Saturday	Expert Lecture on "Image and Video Processing Applications" by Dr. Sumohana, IIT-Hyderabad.
34.	26-11-2021	Friday	Guest Lecture on "IoT Applications"
35.	27-11-2021	Saturday	Alumni Guest Lecture on "Product Management" by Mr. Balaji, Data Scientist,
36.	03-12-2021	Friday	Guest Lecture on "Application of Embedded Systems"

S.No.	Date	Day	Activities planned
37.	04-12-2021	Saturday	Guest Lecture on "Software Defined Radio"
38.	10-12-2021	Friday	Essay Writing Competition on "Women Empowerment" by IETE-ISF, VCE(Autonomous)
39.	11-12-2021	Saturday	Expert Lecture on "Use Cases of Blockchain and Cryptography" Mr. D. Sudarsan Rao, Sr. Delivery Manager, IBM, Hyderabad
40.	13-12-2021	Monday	FDP on Recent Trends in Antenna Design & Applications (Online)
	14-12-2021	Tuesday	
	15-12-2021	Wednesday	
	16-12-2021	Thursday	
	17-12-2021	Friday	
	18-12-2021	Saturday	
41.	18-12-2021	Saturday	Guest Lecture on "Applications of Synthetic Aperture Radar" by S. Haripriya Scientist-E, NRSC, Hyderabad
42.	31-12-2021	Friday	Guest Lecture on "GPS Applications"
43.	18-02-2022	Friday	Seminar on Climate Control systm using IoT by P. Sowmya, Senior Lead Engineer, Career Corporation, Hyderabad
44.	19-02-2022	Saturday	A technical On "Big Data" by Mr. A. Nagaraju, Experian, Data Analyst
45.	25-02-2022	Friday	Guest Lecture on "4G Wireless Internet working by Mr. Srirangan, Manager Reliance Jio Pvt. Ltd.
46.	26-02-2022	Saturday	Technical Essay Writing Competition on Digital Currency for Current 1st Year ECE (A, B & C) (1st Sem)
47.	04-03-2022	Friday	Trends in AI & ML by Ankithsingh, Senior Manager Capgemini.
48.	05-03-2022	Saturday	Alumni Technical Talk by Sriya, Python Developer, Deloitte
49.	11-03-2022	Friday	International Conference (Online Mode) on Signal Processing and Machine Learning Applications (ICSPMLA - 2022)
50.	12-03-2022	Saturday	
51.	19-03-2022	Saturday	Seminar on Mobile Communication Systems by Ms. Humera Nishat,
52.	25-03-2022	Friday	Seminar on Design of FPGA by P. Swetha, Principle Engineer, Microchip.
53.	26-03-2022	Saturday	Alumni Career guidance by Md. Furqan Khalid, Team Lead in Redseal.

S.No.	Date	Day	Activities planned
54.	01-04-2022	Friday	Technical Cross Word Puzzle under IETE-ISF, VCE(Autonomous)
55.	09-04-2022	Saturday	Online Hackthon (Coding Contest) sponsored by IEEE SB, VCE(Autonomous)
56.	22-04-2022	Friday	Technical Talk on "IC Design Flow using EDA Tools" Mr. Nagendra Bandi, CoreEL Technologies Pvt. Ltd.
57.	23-04-2022	Saturday	Expert Lecture on "Mobile Networks" by Mr. Durga Prasad, JIO, Vijayawada
58.	29-04-2022	Friday	Expert Lecture on "IoT Protocols" by Jaya Raman, Cranes, Bangalore.
59.	30-04-2022	Saturday	Alumni Career opportunities "Innovation for Social Change" by Mr. Dasanna Mareddy, Resource Person, Azim Premji Foundation
60.	06-05-2022	Friday	Online Debate Competition under IETE(ISF), VCE (Autonomous)
61.	07-05-2022	Saturday	Poster PPT on "AI"
62.	13-05-2022	Friday	Expert Lecture on Design and Verification Methodologies by Sunil J., Vaaluka Solutions Pvt. Ltd. Hyderabad.
63.	14-05-2022	Saturday	Expert Lecture on "VLSI Design" G. Ramesh Babu Design Engineer, Blaize Pvt. Ltd.
64.	20-05-2022	Friday	Expert Lecture on "Advanced Embedded System Design Issues" Mr. Nagendra Bandi, CoreEL Technologies Pvt. Ltd.
65.	21-05-2022	Saturday	Expert Lecture on "Mobile Networks" by Dr. Chayanbhar, NIT-Warangal
66.	27-05-2022	Friday	Technical Cross Word Puzzle (IETE)
67.	28-05-2022	Saturday	Base Station Antennas Design and Analysis by Kumara Swamy, Sr. Engineer, Commsvope India Pvt. Ltd, Goa.