VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

Ibrahimbagh, Hyderabad-31 Approved
by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsoredby
VASAVI ACADEMY OF EDUCATION
Hyderabad

SCHEME OF INSTRUCTION AND SYLLABI UNDER CBCS FOR
B.E. (EEE) III and IV Semesters
With effect from 2022-23
(For the batch admitted in 2021-22)
(R-21)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
Phones: +91-40-23146030, 23146031
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

Excellence in quality education by keeping pace with rapidly changing technologies and to create man power of global standards in the field of Electrical and Electronics Engineering.

DEPARTMENT MISSION

To impart in-depth knowledge to students through inductive teaching and learning practices, so that they acquire the skill to innovate, excel and lead in their profession with values and ethics that will benefit society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Graduates will acquire technical competence to analyze, design and solve engineering problems in the field of Electrical and Electronics engineering and use modern engineering tools, techniques and software.

PEO 2: Graduates will be able to acquire necessary skills and obtain employment and will be productive in the professional practice of Electrical and Electronics Engineering and related fields.

PEO 3: Graduates will be sensitive to professional and social contexts, committed to ethical action and engaged in lifelong learning skills.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- EEE students will be able to design, analyze Power Systems & Electrical Machines to solve complex engineering problems.

- EEE students will be able to design and analyze Electrical and Power Electronic Circuits.

- EEE students will be able to use and apply modern software tools and techniques related to Electrical Engineering.

B.E. (EEE) PROGRAM OUTCOMES (PO's)	
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.
P1O	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
P11	**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.
P12	**Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS):: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-21)::B.E. - EEE : THIRD SEMESTER(2022 - 23)

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							
U21BS310MA	Transform Techniques & Partial Differential Equations	3	-	-	3	60	40	3
U21ES310EC	Electronics Engineering - I	3	0	-	3	60	40	3
U21PC310EE	Electromagnetic Field Theory	3	1	-	3	60	40	4
U21PC320EE	Electrical Network Analysis	2	1	-	3	60	40	3
U21PC330EE	Power Systems -I	3	-	-	3	60	40	3
U21OE3X0XX	Open Elective-I	2	-	-	3	60	40	2
U21HS320EH	Skill Development Course-I (Communications Skills-I)	1	-	-	2	40	30	1
U21BS330MA	Skill Development Course-II (Aptitude-I)	1	-	-	2	40	30	1
	PRACTICALS							
U21ES311EC	Electronics Engineering – I Lab	-	-	2	3	50	30	1
U21PC321EE	Electrical Network Analysis Lab	-	-	2	3	50	30	1
ECA-I		-	-	-	-	-	-	-
CCA-I		-	-	-	-	-	-	-
Library/Sports/Proctorial Interaction		-	-	-				
	Total	18	02	04		540	360	22
	Grand Total	24				900		22

B.E (Regular) students shall complete one NPTEL Certificate Course during their III to VI semesters
B.E (Lateral Entry) students shall complete one NPTEL Certificate Course during their III to VI semesters

Note: 1. Two hours are allocated for Library/Sports/Proctorial Interaction 2. Two hours are allocated for CCA-I 3.Two hours are allocated for ECA-I

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF MATHEMATICS

Transform Techniques & Partial Differential Equations
SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21BS310MA**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1. **Understand** the Definition of Laplace and its Properties 2. **Understand** the Definition of inverse Laplace Transforms- Properties and it's applications. 3. **Study** the Fourier series, conditions for expansion of function and half range series 4. **Formulate** and understand linear and nonlinear partial differential equations. 5. **5. Study** the applications of Partial Differential equations	**1. Evaluate** Laplace transforms of functions. Apply Laplace transforms to evaluate integrals **2. Evaluate** Inverse Laplace transforms of functions. Apply transforms to solve ordinary differential equations arising in engineering problems. **3. Expand** any function which is continuous, Discontinuous, even or odd in terms of its Fourier series. **4. Formulate t**he Partial differential equations by eliminating arbitrary constants and functions and solve linear, non linear Partial differential equations. **5. Solve the** one dimensional wave(Vibrations of a string), heat equations and two dimensional heat equations.

UNIT-I

Laplace Transforms: Introduction to Laplace transforms - Sufficient Condition for Existence of Laplace Transform –Properties of Laplace Transform-First shifting-Second shifting-Change of scale- Multiplication with t^n - Division by t – Laplace Transform of Derivatives - Laplace Transform of Integrals Evaluation of Integrals by Laplace Transforms.

UNIT-II
Inverse Laplace Transforms: Introduction to Inverse Laplace transforms - – Properties of Inverse Laplace Transform-First shifting- Second shifting-Change of scale- Multiplication with s^n - Division by s – Method of partial fractions - Convolution Theorem (without proof)- Application of Laplace transforms to higher order linear differential equation with Constant Coefficient

UNIT –III
Fourier series: Introduction to Fourier series – Conditions for a Fourier expansion – Functions having points of discontinuity – Change of Interval - Fourier series expansions of even and odd functions - Fourier Expansion of Half- range Sine and Cosine series.

UNIT –IV
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-III
Applications of Partial Differential Equations: Method of Separation of Variables - One Dimensional Wave Equation- One Dimensional Heat Equation – Two Dimensional Heat equation (steady state condition).

Learning Sources:
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.
3 Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
4 A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
5 **http://mathworld.wolfram.com/topics**
6 **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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL COMMUNICATION ENGINEERING

Electronics Engineering – I

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21ES310EC**
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. 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.	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 Test: 90 minutes

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Electromagnetic Field Theory

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):3:1:0	SEE Marks: 60	Course Code: **U21PC310EE**
Credits: 4	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	COURSE OUTCOMES On completion of the course, students will be able to
To impart the fundamentals and applications of Electromagnetic fields such that student will be able to understand, develop, and design various engineering applications involving electromagnetic fields	1. Evaluate electric filed intensity and electric potential due to different charge configurations using Coulomb's Law and Gauss's Law in different coordinate systems. 2. Determine electric field intensity in different materials applying boundary conditions , Laplace's and Poisson's Equations. 3. Compute magnetic filed intensity and magnetic force due to different current configurations using Biot Savart's Law and Ampere's Law and determine Inductance of different geometries. 4. Determine electromotive force using faraday's law and illustrate the concepts of Electromagnetic Compatibility 5. Comprehend the wave propagation in different materials, Skin depth, loss angle and estimate the power transmitted using Poynting theorem

UNIT I:

Review of Vector Algebra & Calculus: Vector algebra-addition, subtraction, components of vectors, scalar and vector multiplications, three orthogonal coordinate systems(rectangular, cylindrical and spherical), Conversion of a Point & vector from one coordinate system to another. Vector calculus: differentiation, integration, vector operator del, gradient, divergence and curl; Divergence and Stoke's theorem

Static Electric Field: Coulomb's law, Electric field intensity, Electrical field Intensity due to point, Line, Surface and Volume charge distributions, Gauss's law and its applications, Absolute Electric potential, potential difference, Calculation of potential differences due to different configurations.

UNIT II:

Conductors, Dielectrics and Capacitance:

Electric filed in conductors, Electric field in Dielectrics, Electric dipole, Dipole moment, Polarization, Permittivity of dielectric materials, E and V due to dipole, Boundary conditions of perfect dielectric materials, Capacitance, Capacitance of parallel plate, co-axial and spherical capacitors, Electrostatic Energy and Energy density. Poisson's equation, Laplace's equation, Solution of Laplace and Poisson's equation, Application of Laplace's and Poisson's equations. Current and current density, Ohms Law in Point form, Continuity equation of current

UNIT III:

Static Magnetic Fields: Biot-Savart's Law, Magnetic field intensity due to line of current, sheet of current, magnetic field intensity inside a solenoid. Ampere Law, Magnetic flux and magnetic flux density, Scalar and Vector Magnetic potentials. Magnetic Dipole and Dipole moment.

Magnetic Forces, Materials and Inductance: Force on a moving charge, Force on a differential current element, Force between differential current elements, Nature of magnetic materials, Magnetization and permeability, Magnetic boundary conditions, Magnetic circuits, inductances (Solenoid and Toroid) and mutual inductances.

UNIT IV:

Time Varying Fields and Maxwell's Equations: Faraday's law for Electromagnetic induction, Motional Electromotive forces ,Displacement

current, Point form of Maxwell's equation, Integral form of Maxwell's

equations.

Electromagnetic Interference and Compatibility (Theoretical Aspects only):

Introduction to electromagnetic interference and electromagnetic compatibility (EMI & EMC) – sources and characteristics of EMI – control techniques of EMI – Grounding – Shielding – Filtering

UNIT V:

Electromagnetic Waves: Derivation of Wave Equation, Uniform Plane Waves, Maxwell's equation in Phasor form, Wave equation in Phasor form, Plane waves in free space and in a homogenous material. Wave equation for a conducting medium, Plane waves in lossy dielectrics, Propagation in good conductors, Skin effect, and Poynting theorem.

Learning Resources:

1. M. N. O. Sadiku, "Elements of Electro magnetics", Oxford University Publication, 6th edition September 2015.
2. W. Hayt, "Engineering Electro magnetics", McGraw Hill Education, 9th edition 2020.
3. A. Pramanik, "Electromagnetism - Theory and applications", PHI Learning Pvt. Ltd, New Delhi, 2009.
4. A. Pramanik, "Electromagnetism-Problems with solution", Prentice Hall India, 2014.

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 Test: 90 minutes

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Electrical Network Analysis

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):2:1:0	SEE Marks: 60	Course Code: **U21PC320EE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
The objective of Electrical Network Analysis is to provide the Knowledge on transient and steady state analysis of electrical circuits, Resonance, coupled circuits and two port network parameters. Also provide the Laplace approach to analyse electrical networks.	At the end of this course, students will demonstrate the ability to 1. Analyse the transient and steady-state response of first order and second order electrical circuits. 2. Apply and analyse the resonance in electrical circuits 3. Analyse the coupled circuits. 4. Analyse the two port networks. 5. Apply Laplace transforms to analyse the electrical circuits

Unit I:Solution of First order networks
Solution of First order networks
Introduction, Terminology: Time constant, natural response, forced response;
The source free RC circuit, Source free RL circuit, Singularity functions,
 Step response of an RC circuit, Step response of an RL circuit.

Unit II: Solution of Second order networks
Solution of Second order networks
Introduction, Finding initial and final values, The Source free series RLC circuit,
Source free parallel RLC circuit, Step response of a series RLC circuit,
Step response of a parallel RLC circuit, General second order circuits.

Unit III:
Dual networks. Resonance and Magnetically Coupled Circuits
Duality and dual networks; series and parallel resonances;
Mutual inductance, energy in a coupled circuit, Mutual coupled circuits,
Dot Convention in coupled circuits, Linear transformer , Ideal Transformer.

Unit IV: Two Port Networks
Two Port Networks
Two Port Networks, terminal pairs, relationship of two port variables,
impedance parameters, admittance parameters, transmission parameters
and hybrid parameters, interconnections of two port networks.

Unit V: Electrical Circuit Analysis Using Laplace Transforms:
Review of Laplace Transform: Definition, properties; Inverse Laplace Transform;
Analysis of electrical circuits using Laplace Transform for standard inputs,
convolution integral, Circuit element models,
Analysis of transformed network with initial conditions.
Transfer function representation, Poles and Zeros.

Learning Resources:
1. C. K. Alexander and M. N. O. Sadiku, "Fundamentals of Electric
Circuits", Tata McGraw Hill Education, 2013.
2. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", Tata
McGraw Hill Education, 2013.
3. D. Roy Choudhury, "Networks and Systems", New Age International
Publications, 1998.
4. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.
5. K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico
Publishers, 1999.

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 Test: 90 minutes

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Power Systems - I

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21PC330EE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Have a fair knowledge about the fundamentals of various conventional power plants like Thermal, Hydel, Nuclear and Gas. 2. Acquire the knowledge of different types of Non conventional energy generation methods like Solar, Wind, Ocean Thermal Energy Conversion (OTEC), Tidal and Geo thermal. 3. Understand the Economics of Power Generation, Types of costs, Depreciation, methods of P.f. improvement, Tariffs 4. Have the knowledge of construction of Over head lines, materials, Supports, insulators and Underground cables. 5. General aspects of AC & DC distribution systems.	1. Identify and select the proper type of Power Plant for the Power Generation. 2. Estimate the Energy generated by Different Non conventional Generating stations. 3. Assess the P.F. improvement methods, Tariffs 4. Test and categorize the insulators and calculate the Sag & Tension in Over head lines. 5. Differentiate AC & DC distribution systems.

UNIT – I

Thermal, Hydel, Nuclear Power Generation Principles, Choice of site, layout and various parts of generating stations. Estimation of power in Hydel, flow duration curve, hydrograph, mass curve etc.

Types of Hydel stations. Nuclear Stations, PWR, BWR, FBR. GAS Turbines, GAS power stations, Combined cycle power stations. MAJOR DISASTERS around the world in power plants- lessons learnt.

UNIT – II
Non-Conventional energy generation methods: Solar, Wind, Ocean Thermal Energy Conversion (OTEC), Tidal, Geo Thermal. Solar cells, Efficiency, Solar collectors, Concentrators. Wind generators, Wind turbine types, rotors construction, Hybrid power generation.

UNIT – III
Economics of Power Generation : Load Curve, load demand and diversity factors, base load and peak load operation, types of costs and depreciation fund calculations. Methods of power factor improvement, economics of p.f. improvements, tariffs.

UNIT- IV
Construction of Overhead lines - Overhead line materials – Supports – types, Vibration Dampers, Arcing Horns, Sag / Tension calculations, Equal / Unequal supports ,Effects of Wind, ICE/ Erection Conditions Stringing Charts
Insulators-Types –Material for construction – potential distribution over string of insulators, Equalizing of potential-Methods, Insulators testing.
Underground cables –Insulating Materials, Mechanical Protection, EHV / HV / LV cables, grading of cables, capacitance of 3 core cables.

UNIT – V
General aspects of AC and DC distribution systems –DC Systems, ringmain, Radial, Voltage drop calculations, Distributor fed at one end, Distributor fed at both ends.

Learning Resources

1. C.L. Wadhwa, Electrical Power Systems, Wiley Eastern Ltd.
   5th Edition, 2005
2. C.L.Wadhwa,Generation, Distribution and Utilization of Electrical
   Energy, Wiley Eastern Ltd., 5th Edition,2005
3. S.N.Singh- Electrical Power Generation, Transmission and
   Distribution- Prentice Hall pvt.ltd.New-2003.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

Skill Development Course I - Communication Skills -I

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: **U21HS320EH**
Credits: 1	CIE Marks: 30	Duration of SEE :2 Hours

COURSE OBJECTIVES The course will enable the learners to:	COURSE OUTCOMES At the end of the course the learners will be able to:
1. Get students proficient in both receptive and productive skills especially virtuall 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.	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

1.1 Introductions on an Online Forum

1.2 Making Observations and Giving Opinion

1.3 Recalling and Describing

Unit 2:   Formal Conversation Skills

2.1 Ask for Information

2.2 Give Information

2.3 Give Feedback

2.4 Seek Permission

Unit 3: Technical Expositions and Discussions

3.1 Classification

3.2 Sequence

3.3 Compare and Contrast

3.4 Cause and Effect

3.5 Problem and solution

Unit 4: Rational Recap

4.1 Paraphrasing - Written

4.2 Summarizing - Written

4.3 Paraphrasing – Spoken

4.4 Summarizing – Spoken

METHODOLOGY	ASSESSMENTS
- Case Studies	- Online assignments
- Demonstration	- Individual and Group
- Presentations	
- Expert lectures	
- Writing and 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Humanities and Social Sciences

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: **U21BS330MA**
Credits: 1	CIE Marks: 30	Duration of SEE :2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	**At the end of the course the learners will be able to: -**
1. Students will be trained to enhance their employability skills.	1. Solve questions in the mentioned areas using shortcuts and smart methods.
2. Students will be introduced to higher order thinking and problem solving skills in the following areas - Arithmetic Ability, Numerical Ability and General Reasoning.	2. Understand the fundamentals concept of Aptitude skills.
3. Students will be trained to work systematically with speed and accuracy while problem solving.	3. Perform calculations with speed and accuracy.
4. Students will be trained to apply concepts like percentages and averages to solve complex problems.	4. Solve complex problems using basic concepts.
5. Students will be trained to use effective methods like elimination of options and shortcuts to solve problem accurately.	5. Use shortcuts with ease for effective problem solving.

UNIT 1: QUANTITATIVE APTITUDE - NUMERICAL ABILITY
1.1 Introduction to higher order thinking skills
1.2 Speed Math

1.3 Number systems
1.4 LCM & HCF

UNIT 2: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY FOUNDATION
2.1 Ratio proportions
2.2 Partnership
2.3 Ages
2.4 Allegations and mixtures
2.5 Averages

UNIT 3: QUANTITATIVE APTITUDE- WORD PROBLEMS PART 1
3.1 Percentages
3.2 Profit and loss

UNIT 4: REASONING ABILITY- GENERAL REASONING PART 1
4.1 Blood Relations
4.2 Number Series
4.3 Coding and decoding

UNIT 5: QUANTITATIVE APTITUDE- WORD PROBLEMS PART 2
5.1 Time and Work
5.2 Chain Rule
5.3 Pipes and Cisterns

Prescribed textbook for theory: Prescribed textbook for theory:
1. Quantitative Aptitude S.CHAND by Dr. R S Aggarwal
2. A Modern Approach to Verbal & Non-Verbal Reasoning S.CHAND by Dr. R S Aggarwal

Suggested Reading
1. Learn.talentsprint.com/References Courses
2. Quantitative Aptitude Disha Publications
3. LOGICAL Reasoning Disha Publications

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

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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 Test: 90 minutes

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

DEPARTMENT OF ELECTRICAL COMMUNICATION ENGINEERING

Electronics Engineering Lab-I

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U21ES311EC**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
To develop an understanding of the characteristics of Electronic devices and circuits with Qualitative approach	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. MOSFET as a switch in Microwind and in Multisim tools.
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.

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Electrical Network Analysis Lab

SYLLABUS FOR B.E. III SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U21PC321EE**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
The objective of Electrical Networks Laboratory is to provide Under Graduate Engineer a thorough understanding on the behavior of electrical networks with hands-on experience, so that the student will acquire in depth knowledge on network analysis, network elements, resonance and coupled circuits to analyze and apply electrical engineering problems.	1. Analyze the Sinusoidal response of R-L-C circuits. 2. Analyze the Step response of first order and second order circuits. 3. Understand and analyze the characteristics of resonance in electrical circuits. 4. Understand and analyze the Coupled circuits. 5. Evaluate two-port network parameters 6. Apply simulation tools for analyze electrical networks.

List of the Experiments:
1. Step response of first order R-L and R-C circuits.
2. Step response of series R-L-C circuits.
3. Characteristics of Series resonance
4. Characteristics of Parallel resonance
5. Polarity test in coupled circuits and testing of transformer.
6. Determination of impedance and admittance parameters of a two port network

7. Determination of hybrid parameters and transmission parameters a two port network.
8. Simulation of Sinusoidal steady state response for R-L and R-C circuits.
9. Simulation of Step response of R-L, R-C and R-L-C circuits.
10. Simulation of resonant circuits- Characteristics and analysis
11. Simulation of two port networks- Determining z, y, h and ABCD parameters.
12. Simulation of Step response for a second order system with addition ofpoles and zeros

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

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. III SEMESTER (2021-22)

Dept	Title	Code	credits
Civil	Green Buildings	U21OE310CE	2
CSE	Principles of Python Programming	U210E310CS	2
CSE	Cyber Security	U210E320CS	2
ECE	Principles of Communication Engineering	U21OE320EC	2
IT	Fundamentals of Data Structures	U21OE310IT	2
IT	Introduction to Linux	U21OE320IT	2
Mech.	Geometric Modelling	U21OE310ME	2
Mech.	Introduction to Unmanned Aerial Vehicles	U21OE320ME	2
Mech.	Basic Heat Transfer For Electronic Systems	U21OE330ME	2
Maths	Linear Algebra	U210E310MA	2
Chemistry	Battery science and Technology	U21OE310CH	2
Chemistry	Corrosion and it's application	U21OE320CH	2
Physics	Smart Materials & Applications	U21OE310PH	2
H&SS	Learning to Learn	U21OE310EH	2

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE310CE**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES Objectives of this course are to:	**COURSE OUTCOMES** 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 the need of Green Technology 3. Understand the concepts of green building technologies 4. Understand rating systems of GRIHA IGBC and LEED

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

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

UNIT-III: Green Building Technologies: Introduction- Necessity - Concept of Green building. Principles of green building – Site selection criteria for Green Buildings – effective cooling and heating systems – effective electrical systems-Passive solar architecture - effective water conservation systems

UNIT-IV: Certification Systems: Certification systems- Green Rating for Integrated Habitat Assessment (GRIHA), Indian Green Building Council (IGBC) 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 : 3 | Max. Marks for each Assignment : 5
3. No. of Quizzes : 3 | Max. Marks for each Quiz Test : 5

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U210E310CS**
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 2. Learn programming and solve problems using Python language	1. Design python programs using arithmetic expressions and decision making statements 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 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U210E320CS**
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: Shellcode, 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 SunitBelpure, 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE320EC**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
Distinguish analog and digital Modulation techniques used in various Communication systems.	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 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
FUNDAMENTALS OF DATA STRUCTURES (Open Elective-I)

SYLLABUS FOR B.E. III-SEMESTER (for other Branches)

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE310IT**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
Explore efficient storage mechanisms for easy access, design and implementation of various data structures.	1. Identify appropriate linear data structure to solve a problem. 2. Illustrate the usage of linked lists for various applications 3. Demonstrate the usage of non-linear data structures – graphs & trees

UNIT – I:Introduction to Data Structures: Performance Analysis: Time and Space complexity.
Introduction to Data Structures: Stacks, Representation of a Stacks using Arrays, Applications.
Queues: Representation of a Queue using array ,Applications.

UNIT – II: Linked List: Introduction, Singly Linked list ,Operations on a Singly linked list, Dynamically Linked Stacks and Queues.

UNIT – III: Doubly linked list: Introduction, Doubly linked list, Operations on a doubly linked list.

UNIT – IV: Introduction to Non-Linear Data Structures: Trees and Graphs

Learning Resources :

1. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, 2/e, Universities Press, 2008
2. Mark Allen Weiss, ―Data Structures and Algorithm Analysis in C, Second Edition, Pearson Education, 1996
3. Robert Kruse, C.L.Tondo, Bruce Leung, Shashi Mogalla , ― Data Structures and Program Design in C, Second Edition, Pearson Education, 2007
4. Jean-Paul Tremblay, Paul G. Sorenson,'An Introduction to Data Structures with Application', TMH, 2nd Edition.
5. Richard F, Gilberg, B.A. Forouzan, "Data Structures, A Pseudocode Approach with C", Cengage, 2nd Edition
6. http://nptel.ac.in/courses/106106127/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO LINUX (Open Elective – I)

SYLLABUS FOR –III SEMESTER
(Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE320IT**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES On completion of the course, students will be able to:
Acquire basic skills for using Linux operating system.	1. Install Linux operating system and use desktop environment. 2. Identify and use Linux utilities to create and manage simple file processing operations. 3. Organize directory structures with appropriate security. 4. Configure and use Linux shell.

UNIT – I:
Introduction to Linux, Installing Linux, Running Linux from USB Drive, Understanding X Windows System and Desktop, Navigating through Linux Desktop and Managing files. Understanding Linux file system, listing files and directory attributes, Making files and directories, Listing and changing permissions and ownership.

UNIT – II:
Understanding the Linux Shell, Understanding aliases, Using the shell from console or terminals, using command history and tab completion, Connecting and expanding commands, Creating aliases, Making shell settings permanent, Using man pages and other documentation.

UNIT – III:
Introduction to Shell Scripting: Reading input from the user, logical operators, Arithmetic operators, Environment variables, Read-only variables, command line arguments, working with arrays.

UNIT – IV:
Decision Making: Conditional constructs, Functions: Introduction to functions, passing arguments, sharing of data, declaration of local variables, returning information from functions, running functions in the background, creating a library of functions

Learning resources:
1. Introduction to Linux – A Hands On Guide, MachteltGarrels.
2. Ganesh SanjivNaik, Learning Linux Shell Scripting, Packt Publishing, 2015. Open Source Community
3. https://linuxjourney.com/
4. https://nptel.ac.in/courses/117106113/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE310ME**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**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 : 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE320ME**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**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	:	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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE330ME**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	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 : 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS
LINEAR ALGEBRA (Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE310MA**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	COURSE OUTCOMES On completion of the course, students will be able to
1. **Study** the concept of Vector Spaces and understand the meaning of Basis and Dimension of a vector Space and Co-ordinates.	1. **Solve the** problems on Vector Spaces and determine the Basis and Dimension of a Vector Space and find the Co-ordinates.
2. **Understand** the meaning of Linear transformation, properties. 3. **Understand** Range and Kernel, Rank-Nullity and Matrix of Linear Transformation.	2. **Determine** Linear Transformation, Range and Kernel and Matrix of Linear Transformation. 3. **Determine** Range and Kernel, Rank-Nullity and Matrix of Linear Transformation.
4. **Understand** Inner Product Spaces, Orthonormal sets, Gram-Schmidt's Orothogonalization process.	4. **Determine** distance, orthogonal, orthonormal sets and construct orthonormal basis based on Gram-Schmidt's Orothogonalization process.

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- Linear sum- Scalar multiple- Composition of maps.

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- Gram-Schmidt's Ortho normolization process.

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

Online Resources :
1   http://mathworld.wolfram.com/topics
2   http://www.nptel.ac.in/course.php

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

1. No. of Internal Tests : 2 Max. Marks for each Internal 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CHEMISTRY
Battery science and Technology (Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE310CH**
Credits: 2	CIE Marks: 40	Duration of SEE :1.5 Hours

COURSE OBJECTIVES The objectives of the course are	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Introduce the various terms to understand the efficiency of batteries. 2. Know the relevant materials required for the construction of primary and secondary batteries. 3. Familiarize with the reactions involved during charging and discharging processes. 4. Emphasise 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. Evaluate different batteries or fuel cells in order to select a suitable battery or 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).

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).
3. Dell R. M. and Rand D. A. J., "Understanding Batteries", Royal Society of Chemistry, UK, 2001.
4. Chemistry of Engineering Materials by R. P. Mani and K. N. Mishra, CENGAGE learning
5. Shasi Chawla, "Text Book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi, 2008.

Suggested Reading:

1. Dell R. M. and Rand D. A. J., "Understanding Batteries", Royal Society of Chemistry, UK, 2001.
2. Derek Pletcher and Frank C. Walsh, "Industrial Electrochemistry", Chapman and Hall, New York, 1993.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CHEMISTRY
CORROSION AND ITS PREVENTION (Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE320CH**
Credits: 2	CIE Marks: 40	Duration of SEE :1.5 Hours

COURSE OBJECTIVES The objectives of the course are	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Acquaint with the causes and factors influencing the rate of corrosion 2. Understand the different types of corrosion like dry, wet and galvanic corrosion and their relative impact 3. Familiarize with various preventive methods of corrosion such as cathodic protection, use of inhibitors, coatings, etc. 4. Familiarize with industrial coating methods like electroplating, electrolessplating.	1. Explain different types of corrosion and factors that affect corrosion and passivation of metals. 2. Select a suitable metallic coating, organic coating and inhibitors for corrosion control of the equipment in a given application. 3. Discuss the principles and applications of cathodic protection and surface conversion coatings for corrosion control. 4. Apply the knowledge of various methods of corrosion control to suggest a solution for corrosion control of a given equipment in a given industrial application.

UNIT-I: CHEMICAL AND ELECTROCHEMICAL CORROSION
Introduction - gravity, cause, chemical and electrochemical corrosion, Pilling – Bed worth rule, effect of nature of oxide layer on rate of chemical corrosion. Galvanic corrosion, electrochemical series and galvanic series. Formation of anodic and cathodic areas, Differential aeration corrosion -pitting, waterline corrosion, crevice corrosion, stress corrosion andcorrosion fatigue. Passivation of metals, polarization curve of passivating metals, effect of pH and potential for iron (pourbaix diagram) and the polarization curve of iron.
Factors influencing corrosion
a. Nature of metal: Relative position of metal in galvanic series, over voltage, relative areas of anode and cathode and nature of corrosion product.

b. Nature of environment: Temperature, pH, humidity and dissolved oxygen.

UNIT-II: CORROSION CONTROL BY METALLIC COATINGS
Metallic coatings: Types - anodic and cathodic. Pre treatment of surface of base metal. Methods of application of metallic coatings: Hot dipping- galvanization - applications of galvanized RCC steel bars. Cladding, electro plating and electroless plating- Principle and their differences. Electroplating of Cu and Cr on Fe, electroless plating of Ni and Cu on insulators, Preparation of printed circuit board (PCB) by electrolessplating.

UNIT-III: CORROSION CONTROL BY ORGANIC COATINGS AND INHIBITORS
Organic Coatings: Paints – constituents and their functions. Vitreous enamel coatings. Varnishes. Super hydrophobic and self healing coatings. Epoxy coatings on RCC steel bars-impervious coatings.
Corrosion inhibitors: Anodic, cathodic and vapour phase inhibitors.

UNIT-IV: CORROSION CONTROL BY CATHODIC PROTECTION AND SURFACE MODIFICATION
Cathodic protection: Principle, sacrificial anodic protection (SAP), impressed current cathodic protection (ICCP). Application of cathodic protection for bridges, ship hulls and underground pipelines.
Surface conversion coatings: Carburizing, nitriding, cyaniding.

Books:
1. P. C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Pub, Co., New Delhi (2002)
2. S. S. Dara "A text book of engineering chemistry" S. Chand and Co. Ltd., New Delhi (2006).
3. Shasi Chawla, "Text Book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi (2008).
4. Wiley Engineering chemistry, Wiley India pvt Ltd, II edition.
5. Chemistry in engineering and technology by J. C. Kuriacose and Rajaram.

Suggested Reading:
1. Principles and prevention of corrosion: Denny A. Jones, Prentice Hall, 1996.
2. Derek Pletcher and Frank C. Walsh, "Industrial Electrochemistry", Chapman and Hall, New York, 1993
3. Fundamentals of Corrosion: Michael Henthorne, Chemical Engineering
4. Corrosion Engineering: Mars G Fontana, Mc Graw Hill, 1987

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of PHYSICS
Smart Materials & Applications (Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE310PH**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to::	COURSE OUTCOMES On completion of the course, students 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	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 inengineering 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 sensorsand devices.
Photo-chromaticity, Photo-chromic materials, Photo-chromic sensors anddevices.
Thermo-chromaticity, thermo-chromic materials, thermo-chromic sensorsand devices.
Smart fluids: Magneto-rheological and Electro-rheological fluids.

Learning Resources:

1. K. Otsuka and C M Wayman, Shape memory materials, Cambridgeuniversity press, 1998.
2. TW Duerig, KN Melton, D Stockel, CM Wayman, Engineering aspects ofshape 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 Test : 30
2. No. of Assignments : 3 Max. Marks for each Assignment : 5
3. No. of Quizzes : 3 Max. Marks for each Quiz Test : 5

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
COURSE NAME-LEARNING TO LEARN
(Open Elective)

SYLLABUS FOR B.E.III-SEMESTER

L:T: P (Hrs/Week):2:0:0	SEE Marks: 60	Course Code:**U21OE310EH**
Credits: 2	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	At the end of the course the learners will be able to: -
1. Develop effective study skills, and enable students to cut down on the number of hours spent studying.	1. Get learners maximize their learning in a stipulated amount of time.
2. Explore illusions of competence in learning, the challenges of overlearning, and the advantages of interleaving.	2. Become competent learners and learn creatively. 3. Meet deadlines, submit progress reports and recall what has been learnt for effective usage.
3. Handle procrastination and learn for long term.	4. Set Performance Standards and take initiative based on set goals.
4. Plan, prioritise and carry out tasks based on goals and priority.	

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
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

1.1 Study Skills Checklist
1.2 Learning Styles
1.3 Habits of Effective Students
1.4 Using the Focused and Diffuse Modes
1.5 Introduction to memory and Memory Technique

UNIT 2: Chunking

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.

2.1 Knowledge Chunking
2.2 Skill and Will
2.3 Sleep and Learning

UNIT 3: Procrastination and Memory

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.

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

UNIT 4: Renaissance Learning and Unlocking Your Potential

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!

4.1 Psychology of Goal Setting
4.2 Criteria for Goal Setting
4.3 Steps in Goal Setting
4.4 Visioning
4.5 Strategy & Action Plan
4.6 Goal Progress Review

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	:	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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS) :: IBRAHIMBAGH, HYDERABAD – 500 031.
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-21) :: B.E. - EEE : FOURTH SEMESTER(2022 - 23)

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								
U21BS410MA	Numerical methods, Probability and Statistics	3	-	-	3	60	40	3
U21ES420IT	Data Structures Using C	3	-	-	3	60	40	3
U21ES410EC	Electronics Engineering-II	3	-	-	3	60	40	3
U21PC410EE	Power Systems- II	3	-	-	3	60	40	3
U21PC420EE	DC Machines & Transformers	2	1	-	3	60	40	3
U21OE4X0XX	Open Elective-II	3	-	-	3	60	40	3
U21BS430MA	Skill Development Course-III (Aptitude-II)	1	-	-	2	40	30	1
U21PE430EE	Skill Development Course-IV (Technical Skills-I)	1	-	-	2	40	30	1
U21HS010EH	Human Values and Professional Ethics -II	1	-	-	2	40	30	1
PRACTICALS								
U21ES411EC	Electronics Engineering –II Lab	-	-	2	3	50	30	1
U21ES421IT	Data Structures Using C Lab	-	-	2	3	50	30	1
U21PC421EE	DC Machines & Transformers Lab	-	-	2	3	50	30	1
CCA-II		-	-	-	-	-	-	-
Remedial/Tutorial/CC		-	-	-	-	-	-	-
Sports/Library/Proctorial Interaction		-	-	-	-	-	-	-
	Total	**20**	**01**	**06**		**630**	**420**	**24**
	Grand Total	**27**				**1050**		**24**

B.E (Regular) students shall complete one NPTEL Certificate Course during their III to VI semesters
B.E (Regular) students shall complete one NPTEL Certificate Course during their III to VI semesters

Note: 1. One hour is allocated for Library/Sports/Proctorial Interaction 2. Two hours are allocated for CCA-II 3. Two hours are allocated for CC/TC/RC

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS
Numerical Methods, Probability and Statistics

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21BS410MA**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1 **Study t**he methods of interpolation, apply numerical methods to interpolate.	1. **Apply** numerical methods to interpolate.
2 **Understand** numerical differentiation and integrate functions and to solve differential equations using numerical methods .	2. **Solve** problems using numerical differentiation using interpolation approach and differential equations using numerical methods.
3. **Understand** Random variables Probability Distributions.	3. **Apply** various probability distributions to solve practical problems.
4. **Understand** tests of hypothesis for large and small samples**.**	4. **Estimate** unknown parameters of populations and apply the tests of hypotheses for large and small samples.
5. **Study** the method to fit different curves to a given data, how Correlation between variables can be measured.	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
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 –II
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 of 4th order(without proofs)

UNIT-III

Probability Distribution:

Random Variables - Discrete and Continuous Random variables-Properties-Distribution functions and densities - Normal Distribution-Properties-Standard normal variate.

UNIT-IV

Test of Hypothesis:

Introduction -Testing of Hypothesis- Null and Alternative Hypothesis -Errors- -Level of Significance – Confidence Intervals-Tests of Significance for small samples - t-test for single mean - F- test for comparison of variances - Chi-square test for goodness of fit – Introduction to Design of experiments.

UNIT-V

Curve Fitting:

Curve fitting by the Method of Least Squares - Fitting of Straight line- Second order curve (parabola) - Exponential curve- -Correlation – Karl Pearson's Co-efficient of Correlation.

Learning Resources:

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.
3. Probability, Statistics and Random Processes, T. Veerarajan , Tata MCGraw Hill Education Private Ltd.
4. Advanced Engineering Mathematics, Kreyszig E, 8 th Edition, John Wiley & Sons Ltd, 2006.
5. A text book of Engineering Mathematics by N.P.Bali & Manish Goyal, Laxmi Publication.
6. Fundamentals of Mathematical Statistics, Gupta & Kapoor, Sultan chand & sons, New Delhi.
7. **http://mathworld.wolfram.com/topics**
8. **http://www.nptel.ac.in/course.php**

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

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

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY

DATA STRUCTURES Using C

SYLLABUS FOR B.E. IV SEMESTER
Common for ECE and EEE

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21ES420IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
Implement linear data structures Stacks, Queues and Linked Lists and the non-linear data structures Trees, Binary Search Trees and Graphs.	1. Explain importance of Recursion, ADTs, Performance Analysis and dynamic allocation of arrays 2. Apply Stack concepts in certain specific applications. 3. Apply Queue concepts in certain specific applications. 4. Apply the concepts of Linked Lists for implementation of certain tasks including implementation of Stacks and Queues. Demonstrate an understanding of Trees, Binary Search Trees and basic operations in Graphs.

Unit I
Algorithm Specification - Introduction, Recursive algorithms, Data Abstraction, Performance analysis- space complexity, time complexity and Asymptotic Notation-Big 0, Omega and Theta notations, ADT, **Arrays:** Arrays – Dynamically allocated Arrays – 1D and 2D

Unit II
Stacks: Stack Abstract Data Type, Representation of a Stack using Arrays — Implementation of Stack Operations - Stack Applications: Infix to postfix Transformation - Evaluating Arithmetic Expressions.

Unit III
Queues: Queue Abstract Data Type- Representation of a Queue using array -
Implementation of Queue Operations - Applications of Queues – Circular Queues.

Unit IV
Linked List: Introduction — Singly Linked list -Operations on a singly linked list -
Dynamically Linked Stacks and Queues -Doubly linked list-Operations on a doubly
linked list.

Unit V
Trees: Introduction, Binary Trees, Binary Tree Traversals
Binary Search trees (BST): Definition, Searching a BST, Insertion into a BST,
Deletion from a BST. **Graphs:** The Graph ADT, Elementary graph operations –
Depth First Search (DFS), Breadth First Search (BFS).

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, 2nd
   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. Carmen, Charles E. Leiserson, Ronald L Rivest,
   Clifford Stein, Introduction to Algorithms, Third Edition(2009),
   MIT Press
7. YedidyahLangsam , 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-fa11-2011/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 Test : 30
2. No. of Assignments : 3 | Max. Marks for each Assignment : 5
3. No. of Quizzes : 3 | Max. Marks for each Quiz Test : 5

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL COMMUNICATION ENGINEERING

Electronics Engineering-II

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21ES410EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students :	COURSE OUTCOMES On completion of the course, students will be able to
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.	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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Power Systems – II

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U21PC410EE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	COURSE OUTCOMES On completion of the course, students will be able to
1.Acquire knowledge of Transmission Lines Performance, Power circle diagrams & Corona. 2. Understand the Per Unit system of Representation, load flow studies and different load flow methods. 3. Learn about the Symmetrical Fault analysis and S.C capacity of a Bus. 4. Acquire the knowledge of the fundamentals of Sequence components, Sequence networks of Generator, T/F, T.M.L & Load and Unsymmetrical Fault analysis of power system 5. Understand the concept of Travelling Wave theory and Bewley Lattice diagram.	1.Calculate and compare the performance (Constants A, B, C & D, voltage regulation & efficiency) of different types of Transmission lines. 2. Apply proper load flow method for the solution of load flow problems of any power system network. 3.Calculate the P.U quantities in power system and analyze symmetrical fault (LLL Fault) and calculate S.C capacity of a Bus. 4. Draw the diagram of Sequence networks of different components and compute the Unsymmetrical Fault (LG, LL, LLG& LLLG) current value & MVA values. 5. Evaluate the value of coefficient of reflection and refraction of voltage or current wave and construct Bewley Lattice diagram.

UNIT I

Transmission Line Theory: Short, medium, long lines – Line calculations, Tuned lines – Power circular diagrams and their applications. Corona: Causes – Disruptive and Visual Critical Voltages, Power loss – minimization of Corona Effects.

UNIT II

Per Unit of Representation: Use of per Unit Quantities in power systems, Advantages of per unit system. Y bus formation, Modeling tap changing and phase shifting of transformers, formation of load flow problem, Gauss and Gauss seidel , Newton Raphson and fast decoupled methods

UNIT III

Symmetrical faults:

Z bus, Symmetrical Three phase Transients in R-L series circuits – short circuit currents – Reactance's of Synchronous Machines – Symmetrical Fault calculations. short circuit capacity of bus.

UNIT IV

Unsymmetrical faults: Symmetrical components of unsymmetrical phasors – Power in terms of symmetrical components - sequence impedance and sequence networks. Sequence networks of unloaded generators – Sequence impedances of circuit elements – Single line to ground, line-to-line and double line to ground faults on unloaded generator – Unsymmetrical faults of power systems.

UNIT V

Transients in power systems : Causes of over voltages : Traveling Wave Theory – Wave equation – Open Circuited Line – The short circuited line – Junction of lines of different natural impedances – Reflection and refraction – Coefficients – Junction of Cable and overhead lines – Junction of three lines of different natural impedances – Bewley Lattice diagram.

Learning Resources:

1. C.L. Wadhwa , Electrical Power Systems, Wiley Eastern Ltd., 4th Ed. 2006.
2. John J.Grainger William D. Stevenson Jr. Power System Analysis, Tata MCGraw Hill Edn.2003
3. I.J.Nagrath & D.P.Kothari "Modern Power Systems Analysis" TMH Edition, 2003.
4. A. Chakrabarti, M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A Text book on Power System, Dhanpat Rai & Co(P) Ltd.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

DC MACHINES & TRANSFORMERS

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):2:1:0	SEE Marks: 60	Course Code: **U21PC420EE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
To study the concepts of magnetic circuits, principles, performances and applications of electromechanical energy conversion devices like D.C machines and Transformers which are used in many industries	1. Analyze the concepts of magnetic circuits, evaluate the stored and converted energy and also exerted force in electromechanical energy conversion devices. 2. Identify and analyze the operation of dc Generators. 3. Analyze the operation and characteristics of DC motors. 4. Analyze the single phase transformer operation and characteristics. 5. Analyze three phase transformer operation and different configurations.

UNIT –I
Magnetic circuits, Electromagnetic force and torque:
Visualization of magnetic fields produced by a bar magnet and a current carrying coil - through air and through a combination of iron and air; influence of highly permeable materials on the magnetic flux lines.B-H curve of magnetic materials; Field energy and mechanical force, Direction of

mechanical force developed, Flow of energy in electro-mechanical devices, singly excited and multiply excited systems

UNIT –II
DC Machines:
Basic construction of a DC machine, magnetic structure - stator yoke, stator poles, pole-faces or shoes, air gap and armature core, Armature windings-Simple lap and wave windings, Brush position, Classification of DC Machines.
DC Generators:
Generated EMF, Types of field excitations – separately excited, shunt, series and compound, voltage build-up in a shunt generator, critical field resistance and critical speed, Internal and External characteristics, Armature reaction, Theory of commutation, compensating windings, inter poles, parallel operation.

UNIT –III
DC Motors:
Generation of electromagnetic torque, torque-speed characteristics of separately excited, shunt, series and compound motors. Application of motors, Starting and speed control methods of DC motors. Testing of DC Motors, Losses and efficiency, Swinburne's test, Hopkinson's test, Field test for series motors, Retardation test.

UNIT –IV
Transformers:
Constructional features, Classification of transformers, Principle of operation, Ideal transformer, Transformer on 'No load' and 'On load', Vector diagram, Equivalent circuit, Polarity test, O.C & S.C tests, Sumpner's test, Regulation & efficiency, condition for maximum efficiency, All day efficiency, , Separation of losses.

UNIT –V
Auto transformer, Realization of auto transformer from two winding transformer, Tap Changing Transformers: Concept of tap changing, on-load and off-load tap changers. Three Phase Transformers: Realization of 3-phase transformer from 3single phase transformers, Three phase transformers connections Y-Y, Δ- Δ, Δ-Y,Y-Δ, V-V and Scoot connections, tertiary Parallel Operation.

Suggested Books:

1. Dr. P.S. Bhimbra, Electrical machinery, 7th edition (2011), Khanna Publications, Delhi

2. Fitzgerald, Kingsley, Umans, Electric Machinery, 6th edition (2002), Tata McGraw Hill Publications New Delhi3. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013.

3. D.P Kothari and I.J Nagrath, Electrical Machines, 1st edition (2006), Tata McGraw Hill Publications, Sigma series, New Delhi

4. Dr. P.S. Bhimbra, Generalized Electrical Machines, 5th edition (1991), Khanna Publications, Delhi

5. J. B Gupta, Theory and performance of electrical machines, 15th edition (2015), S. K. Kataria& Sons publications, New Delhi

6. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2004.

7. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.

8. H. Cotton, Electrical Technology, 7th edition (2005), CBS publishers, New Delhi

9. Stephen. J. Chapman: Electric Machinery Fundamentals, 4th edition (2005), McGraw Hill, Singapore

10. John Hindmarsh, Electric Machines and their Applications, Pergamon Press, London, 1977.

11. http://www.nptelvideos.in/2012/11/electrical-machines-i.html

12.http://ieeexplore.ieee.org/search/searchresult.jsp?queryText=Electrical%20Machinery&newsearch=true

Online resources: http://nptel.ac.in/courses/; http://ocw.tufts.edu; http://ocw.upm.es; www.open.edu/openlearn/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

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:**U21BS430MA**
Credits: 1	CIE Marks: 30	Duration of SEE :2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	**At the end of the course the learners will be able to: -**
1. Students will be trained to enhance their employability skills.	1. Solve questions in the mentioned areas using shortcuts and smart methods.
2. Students will be introduced to higher order thinking and problem solving skills in the following areas - Arithmetic Ability, Numerical Ability and General Reasoning.	2. Understand the fundamentals concept of Aptitude skills.
3. Students will be trained to work systematically with speed and accuracy while problem solving.	3. Perform calculations with speed and accuracy.
4. Students will be trained to apply concepts like percentages and averages to solve complex problems.	4. Solve complex problems using basic concepts.
5. Students will be trained to use effective methods like elimination of options and shortcuts to solve problem accurately.	5. Use shortcuts with ease for effective problem solving.

UNIT 1: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED -1
1.1 Time speed and distance
1.2 Boats and Streams
1.3 Problems on trains

UNIT 2: REASONING ABILITY- LOGICAL REASONING
2.1 Seating Arrangements- Linear; Circular; Complex

2.2 Venn diagrams
2.3 Syllogism
2.4 Cubes & Cuboids
2.5 Dices

UNIT 3: REASONING ABILITY- NON VERBAL REASONING

3.1 Figure Series
3.2 Directions
3.3 Clocks
3.4 Calendars

UNIT 4: QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED -2

4.1 Mensuration Part -1
4.2 Mensuration Part -2
4.3 Logarithms

UNIT 5: QUANTITATIVE APTITUDE- ENGINEERING MATHEMATICS

5.1 Permutations and combinations
5.2 Probability

Prescribed textbook for theory:

Quantitative Aptitude S.CHAND by RS AGARWAL
A Modern Approach to Verbal & Non-Verbal Reasoning S.CHAND by Dr. R S Aggarwal

Suggested Reading

Learn.talentsprint.com/References Courses
Quantitative Aptitude Disha Publications
LOGICAL Reasoning Disha Publications

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Skill Development-IV : Technical Skills-I

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: **U21PE430EE**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours
COURSE OBJECTIVES	**COURSE OUTCOMES**	

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

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

Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Human Values and Professional Ethics -II

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: **U21HS010EH**
Credits: 1	CIE Marks: 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to:	**At the end of the course the learners will be able to: -**
1. Create an awareness on the interrelation between Society, Ethics and Human Values	1. Identify ethical risks in everyday life and in societies that can lead to unethical choices, such as structures that diffuse responsibility or a group that has collectively de-stigmatized unethical behavior
2. Understand how ethical dilemmas apply to real life scenarios	2. Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, and the objective presentation of data.
3. Develop ethical human conduct and professional competence	3. Assess their own ethical values and the social context of problems and articulate what makes a particular course of action ethically defensible
4. Understand the role of good ethical practices and apply it in a project	4. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research

UNIT 1: NORMATIVE ETHICS & SOCIETAL ETHICS

This unit deals with normative ethics, the branch of moral philosophy, or ethics, concerned with criteria of what is morally right and wrong. It includes the formulation of moral rules that have direct implications for what human actions, institutions, and ways of life should be like. This unit also covers societal ethics which is the systematic reflection on the moral dimensions of social structures, systems, issues, and communities.

1.1 Ethical Accountability
1.2 Society & Ethics
1.3 Rights & Responsibilities

UNIT 2: PROFESSIONAL ETHICS - NEED FOR ETHICAL CODES

This unit covers the code of Professional Ethics- it is designed to ensure that students learn the necessary skills that groom them to behave like employees should, one that is socially acceptable and respectful of one another. It establishes the rules for behavior and sends a message to every employee that universal compliance is expected.

2.1 Professional Ethics
2.2 Ethical Code
2.3 Flipped Classroom

UNIT 3: PRIVACY

This unit covers "Cyber ethics" - the code of responsible behaviour on the Internet. Just as we are taught to act responsibly in everyday life with lessons such as "Don't take what doesn't belong to you" and "Do not harm others," we must act responsibly in the cyber world as well. The basic rule is "Do not do something in cyberspace that you would consider wrong or illegal in everyday life."

3.1 Basics of Cyber Ethics
3.2 Privacy
3.3 Flipped Classroom

UNIT 4: MEDIA AND MEDICAL ETHICS

This unit covers Media and Medical ethics is the best division of applied ethics dealing with the specific ethical principles and standards of media (including broadcast media, film, theatre, the arts, print media and the internet) and medicine (practice of clinical medicine and related scientific

research)

4.1 Media Ethics
4.2 Medical Ethics
4.3 Flipped Classroom

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 ● Project

Relevant Websites, CD's and Documentaries

- https://plato.stanford.edu/

Learning Resources:

- learn.talentsprint.com

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

1. No. of Internal Tests : 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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRICAL COMMUNICATION ENGINEERING

Electronics Engineering Lab-II

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U21ES411EC**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	**COURSE OUTCOMES** On completion of the course, students will be able to
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.	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.

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF INFORMATION TECHNOLOGY

DATA STRUCTURES Using C Lab

SYLLABUS FOR B.E. IV SEMESTER
Common for ECE and EEE

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: **U21ES421IT**
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

Each Department will conduct under Technical Skills

COURSE OBJECTIVES The course will enable the students to:	COURSE OUTCOMES On completion of the course, students will be able to
Design and implement various linear and non-linear data structures with their practical applications.	1. Perform operations on Abstractions like stacks, queues, linked lists. 2. Implement problems involving Trees. 3. Implement problems involving Binary Search Trees. 4. Implement problems involving Graphs.

Programming Exercise:

1) Program using Arrays, Pointers & Dynamic Memory Allocation.
2) Menu driven program that implements Stacks using arrays for the following operations
   a) Create   b) push   c) pop   d) display
3) Menu driven program that implements Queues using arrays for the following operations
   a) Create   b) insert   c) delete   d) display
4) Menu driven program that implements Circular Queues for the following operations
   a) create   b) Insert   c) delete d) display
5) Implementation of Infix to Postfix Conversion
6) Implementation of evaluation of postfix expression.

7) Implementation of Singly Linked List.
8) Implementation of Stacks using Singly Linked List.
9) Implementation of Queues using Singly Linked List.
10) Implementation of Doubly Linked List.
11) Implementation of Binary Tree Traversals (Inorder, Preorder. Postorder, Level Order)
12) Implementation of Binary Search Tree Traversals (Inorder, Preorder. Postorder, Level Order) and search.
13) Implementation of Graphs Traversals – DFS and BFS.

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. Sand 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. Carmen, 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

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

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

DC Machines and Transformers Lab

SYLLABUS FOR B.E. IV SEMESTER

L:T: P (Hrs/Week):0:0:2	SEE Marks: 50	Course Code: U21PC421EE
Credits: 1	CIE Marks: 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES The course will enable the students to:	COURSE OUTCOMES On completion of the course, students will be able to
To expose the students to practical experiments of DC machines and single-phase and three-phase transformers.	1. Test the performance of various DC generators. 2. Test the performance of various DC motors. 3. Test the performance of single phase transformers. 4. Test the performance of a 3-phase transformer 5. Identify various connection of 3-phase transformer.

List of Experiments:
1. Magnetization characteristics of a self excited D.C. generator
2. Load characteristics of D.C Shunt Generator
3. Load characteristics of D.C Compound generator
4. Performance characteristics of a DC shunt motor
5. Performance characteristics of D.C Compound motor
6. Performance characteristics of D.C Series motor
7. Retardation Test, Dynamic Braking of DC Shunt Motor
8. Speed control and Swinburn's Test on DC shunt motor
9. Open circuit and short circuit test on a 1-phase transformer
10. Separation of core losses in a Single Phase transformer
11. Sumpner's test on two identical transformers
12. Estimation of efficiency of DC Machine by Hopkinson test.

13. Three phase to Two phase conversion (Scott Connection)
14. Heat run test on Three phase transformer.
15. Polarity Test and estimation of self and mutual inductance of a 1-phase transformer

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

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

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. IV SEMESTER (2021-22)

Dept	Title	Code	credits
Civil	Disaster Management	U21OE410CE	3
CSE	Fundamental of object oriented programming	U21OE420CS	3
CSE	Introduction To Software Engineering	U21OE420CS	3
ECE	Mathematical Programming for Engineers	U21OE410EC	3
ECE	Introduction to Communication Systems	U21OE420EC	3
IT	Introduction to Object Oriented Programming	U21OE410IT	3
IT	Introduction to Scripting Languages	U21OE420IT	3
Mech.	Optimization Methods	U21OE410ME	3
HSS	Critical Thinking	U21HS430EH	3

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENTOF CIVILENGINEERING

DISASTER MANAGEMENT (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U21OE410CE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES Objectives of this course are to:	**COURSE OUTCOMES** 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.

Suggested Books:

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 Test : 30
2. No. of Assignments   : 3   Max. Marks for each Assignment   : 5
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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Computer Science & Engineering
Fundamental of Object Oriented Programming (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:**U210E410CS**
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. Apply object oriented principles for developing an application using Java constructs. 2. Design GUI using existing Java classes and interfaces.	1. Adopt the fundamentals of Object oriented system development for developing a application. 2. Apply basic features of OOP to design an application. 3. Employ runtime error handling, concurrent programming practices to develop a parallel processing application. 4. Perform string handling, read and write operations using console and files IO streams. 5. Design GUI for a java application using AWT classes.

UNIT-I: Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.
Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control Statements.

UNIT-II: Building blocks of OOP: Classes and Methods, Constructor, Parameterized constructor, Garbage Collection, this, static, final keywords,

Inheritance, types of inheritance, Method Overriding, Abstract class, Nested class, Interface, Package.

UNIT-III: Exception Handling: try, catch, throw, throws, finally, creating user defined exceptions
Multithreaded Programming: Types of Thread creation, multiple threads, isalive, join, thread priority, Thread Synchronization, Inter process communication.

UNIT-IV: String Handling: String constructors, operations, character extraction, comparison, search, modification. StringBuffer, methods, StringBuilder, StringTokenizer
Util: Date, Calendar, Random, Timer, Observable
IO: Files and Directories, I/O Classes and Interfaces, Byte Streams classes and Character Stream classes

UNIT-V: Applet: Applet Class, Applet architecture
Event Handling: The Delegation Event Model, Event Classes, Source of Events, Events Listener Interfaces
GUI Development: AWT: Classes, Working with Graphics, Frames, Menu, Layout Managers**.**

Learning Resources:
1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill 2005.
2. P. Radha Krishna, Object Oriented Programming through Java, Universities Press, 2007.
3. Sachin Malhotra, Saurabh Choudhary, Programming in Java, 2nd Edition, Oxford Press, 2014.
4. https://docs.oracle.com/javase/tutorial/java

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

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:**U210E420CS**
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 2. learn the best practices to be employed for the design, and testing of a software project.	1. Explain the software development lifecycle models for software system development. 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

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Mathematical Programming for Engineers (OPEN ELECTIVE - II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U21OE410EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
To provide fundamental knowledge of programming language for solving problems.	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 4th 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 EnginneringbyS.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

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Introduction to Communication Systems (OPEN ELECTIVE - II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U21OE420EC**
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. 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	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 Super heterodyne 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

<u>Learning Resources:</u>

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

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE410IT**
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/

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

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:**U21OE420IT**
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.	1. Write a python script to solve a basic problem using structured programming constructs 2. Write a python script to solve a basic problem using object oriented programming constructs 3. Create and use python modules 4. Handle file related operations 5. 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.

<u>Learning Resources</u>

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/

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
OPTIMIZATION METHODS (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U21OE410ME**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able 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)	1. Optimization of resources in multi disciplinary areas through linear programming under different conditions. 2. Understand revised simplex methods per customer requirements to suit for 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 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

Special cases in simplex method, Duality in LPP, Differences between primal and dual, shadow prices, Dual simplex method, Revised simplex method.

UNIT-III
Transportation Model
Introduction to 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.

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, Univariate search, pattern Directions, Hook Jeeves, Powel method, steepest decent method.

Learning Resources:
1.   SingiresuS.Rao, "Engineering optimization- Theory and Practice", 4thEdition, 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.

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Duration of Internal Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES
CRITICAL THINKING (Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code:**U21HS430EH**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the learners to: 1. Identify the core skills associated with critical thinking. 2. Comprehend the various techniques of critical thinking 3. Evaluate data and draw insights from it to make the right decisions 4. Understand where to look for bias and assumptions in problem 5. Understand structure, standards and ethics of critical writing	**At the end of the course the learners will be able to: -** 1. Analyse and compare techniques for comparing alternate solutions 2. Demonstrate the difference between deductive and inductive reasoning and construct logically sound arguments 3. Check for accuracy of data and use it as a tool for problem solving 4. Evaluate, identify and distinguish between relevant and irrelevant information to formulate a thesis or hypothesis. 5. Employ evidence and information effectively

UNIT 1: COMPONENTS OF CRITICAL THINKING

1.1 Applying Reason
1.2 Open Mindedness
1.3 Analysis
1.4 Logic

UNIT 2: NON-LINEAR THINKING

2.1 Step out of your Comfort Zone
2.2 Don't Jump to Conclusions
2.3 Expect and Initiate Change

2.4 Being Ready to Adapt

UNIT 3: LOGICAL THINKING
3.1 Ask the Right Questions
3.2 Organize Data
3.3 Evaluate Information
3.4 Draw Conclusions

UNIT 4: INFER MEANING FROM INFORMATIVE TEXTS
4.1 Making Assumptions
4.2 Watch out for Bias
4.3 Ask Clarifying Questions
4.4 SWOT Analysis

UNIT 5: PROBLEM SOLVING
5.1 Identifying Inconsistencies
5.2 Trust your Instincts
5.3 Asking Ask?

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

Learning Resources:-
     learn.talentsprint.com

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