COURSE STRUCTURE
AND

DETAILED SYLLABUS

ELECTRICAL AND ELECTRONICS ENGINEERING

For
B.TECH FOUR YEAR DEGREE PROGRAMME
(Applicable for the batches admitted from 2018-2019)

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
Bollikunta, Warangal-506 005
Telangana State, India.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

(Applicable for the batches admitted from A.Y. 2018-2019 onwards)

I-SEMESTER

S.No	Course Code	Title of the Course	L	T	P	Credits
1	B18MA01	Linear Algebra and Calculus	3	1	0	4
2	B18PH01	Applied Physics	4	0	0	4
3	B18EN01	English	2	0	0	2
4	B18CH01	Engineering Chemistry	3	1	0	4
5	B18EN02	English Language Communication Skills Lab	0	0	2	1
6	B18PH02	Applied Physics Lab	0	0	3	1.5
7	B18ME02	Engineering Workshop and IT Workshop	0	0	3	1.5
8	B18MC01	Induction Program				
		Total Credits	**12**	**02**	**08**	**18**

II-SEMESTER

S.No	Course Code	Title of the Course	L	T	P	Credits
1	B18MA02	Differential Equations and Vector Calculus	3	1	0	4
2	B18EE01	Electrical Circuits – I	3	1	0	4
3	B18EC01	Electronic Devices and Circuits	3	0	0	3
4	B18CS01	Programming for Problem Solving	4	0	0	4
5	B18EC02	Electronic Devices and Circuits Lab	0	0	2	1
6	B18CS02	Programming for Problem Solving Lab	0	0	2	1
7	B18ME01	Engineering Graphics	1	0	4	3
		Total Credits	**14**	**02**	**08**	**20**

III – SEMESTER

Sl.No.	Code	Course Title	Hours per week			Credits
			L	T	P	
1	B18EE07	Electrical Circuits – II	3	0	0	3
2	B18MA03	Numerical Methods and Complex Variables	3	1	0	4
3	B18EE08	Power Systems – I	3	0	0	3
4	B18EE09	Electrical Machines-I	3	0	0	3
5	B18EE10	Electromagnetic Fields	3	0	0	3
6	B18CS50	Object Oriented Programming & Data Structures	3	0	0	3
7	B18EE11	Electrical Circuits Lab	0	0	3	1.5
8	B18CS08	Data Structures Through C++ Lab	0	0	3	1.5
9	B18MC02	Environmental Sciences	2	0	0	0
		Total Credits	**20**	**01**	**06**	**22**

IV - SEMESTER

Sl.No.	Code	Course Title	Hours per week			Credits
			L	T	P	
1	B18EC45	Pulse Digital and Linear Integrated Circuits	3	0	0	3
2	B18EE12	Electrical Machines-II	3	1	0	4
3	B18EE13	Electrical Measurements and Instrumentation	3	0	0	3
4	B18EE14	Power Systems – II	3	0	0	3
5	B18EE15	Control Systems	3	0	0	3
6	B18EC05	Switching Theory and Logic Design	3	0	0	3
7	B18EC47	Pulse Digital and Linear Integrated Circuits Lab	0	0	3	1.5
8	B18EE16	Electrical Machines Lab – I	0	0	3	1.5
9	B18MC03	NSS/NCC	2	0	0	0
		Total Credits	**20**	**01**	**06**	**22**

V – SEMESTER

Sl.No.	Code	Course Title	Hours per week			Credits
			L	T	P	
1	B18EE17	Electrical Machines – III	3	0	0	3
2	B18EE18	Power System Protection	3	0	0	3
3	B18EE19	Power Electronics	3	1	0	4
4		**Professional Elective – I**	3	0	0	3
	B18EE20	Electric Machine Design				
	B18EE21	Electrical Distribution Systems				
	B18EC03	Signals and Systems				
5		**Open Elective – I**	3	0	0	3
	B18CS04	Database Management Systems				
	B18EC12	Computer Organization				
	B18CS40	Internet of Things				
6	B18EE22	Electrical Machines Lab – II	0	0	3	1.5
7	B18EE23	Electrical Measurements and Instrumentation Lab	0	0	3	1.5
8	B18EE24	Control Systems Lab	0	0	2	1
9	B18MC09	Human Values and Professional Ethics	2	0	0	0
		Total Credits	**17**	**01**	**08**	**20**

VI - SEMESTER

Sl.No.	Code	Course Title	Hours per week			Credits
			L	T	P	
1	B18EE25	Power Systems Operation and Control	3	0	0	3
2	B18MB01	Managerial Economics and Financial Analysis	3	0	0	3
3	B18EE26	Power Semiconductor Drives	3	0	0	3
4		**Professional Elective – II**	3	0	0	3
	B18EE27	Renewable Energy Systems				
	B18EE28	Electrical Engineering Materials				
	B18EC16	Digital Signal Processing				
5		**Professional Elective – III**	3	0	0	3
	B18EE29	Advanced Power Electronics				
	B18EE30	Advanced Control Systems				
	B18EE31	High Voltage Engineering				
6	B18EE32	Power Electronics Lab	0	0	2	1
7	B18EE33	Power Systems Lab	0	0	2	1
8	B18EE34	Electronics Design Lab	1	0	2	2
9	B18MC05	Logical Reasoning and Quantitative Aptitude	2	0	0	0
		Total Credits	**18**	**00**	**06**	**19**

- **Summer Internship is done during summer break and evaluation is done in 7th semester.**

VII - SEMESTER

Sl.No.	Code	Course Title	Hours per week			Credits
			L	T	P	
1	B18EE35	Computer Methods in Power Systems	3	0	0	3
2	B18EC20	Microprocessors and Microcontrollers	3	0	0	3
3		**Professional Elective – IV**	3	0	0	3
	B18EE36	Soft Computing Techniques				
	B18EE37	Advanced Electrical Drives				
	B18EE38	HVDC and FACTS				
4		**Professional Elective – V**	3	0	0	3
	B18EE39	Electrical and Hybrid Vehicles				
	B18EE40	Power Quality				
	B18EE41	Digital Control Systems				
5		**Open Elective – II**	3	0	0	3
	B18MB02	Management Science				
	B18CS52	OOPS Through Java				
	B18EC21	VLSI Design				
	B18CS37	Business Intelligence and Big Data				
6	B18EC29	Microprocessors and Microcontrollers Lab	0	0	2	1
7	B18EE42	Electrical Simulation Lab	0	0	2	1
8	B18EN03	Advanced English Communication Skills Lab	0	0	2	1
9	B18EE43	Mini Project and Summer Internship	-	-	-	2
10	B18EE44	Project Stage – I	0	0	8	4
		Total Credits	**15**	**00**	**14**	**24**

VIII - SEMESTER

Sl.No.	Code	Course Title	Hours per week			Credits
			L	T	P	
1		**Professional Elective – VI**	3	0	0	3
	B18EE45	Neural Networks and Fuzzy Systems				
	B18EE46	Utilisation of Electrical Energy				
	B18EE47	Smart Grids				
2		**Open Elective – III**	3	0	0	3
	B18MB03	Entrepreneurship Development				
	B18EC31	Embedded Systems				
	B18ME36	Power Plant Engineering				
	B18MB06	Intellectual Property Rights				
3	B18EE48	Technical Seminar	-	-	-	1
4	B18EE49	Project Stage – II	0	0	16	8
		Total Credits	**06**	**00**	**16**	**15**

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18MA01) LINEAR ALGEBRA AND CALCULUS
(Common to all Branches)

B. TECH – I SEM (EEE) **L/T/P/C**
3/1 /0/4

Prerequisite: Mathematical Knowledge of 12th / intermediate level

Objectives:

- Types of matrices and their properties.
- Concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of Eigen values and Eigen vectors and to reduce the quadratic form to canonical form
- Concept of Sequence.
- Concept of nature of the series.
- Geometrical approach to the mean value theorems and their application to the mathematical problems
- Evaluation of surface areas and volumes of revolutions of curves.
- Evaluation of improper integrals using Beta and Gamma functions.
- Partial differentiation, concept of total derivative
- Finding maxima and minima of function of two and three variables.

UNIT-I: Matrices

Matrices: Types of Matrices, Symmetric; Hermitian; Skew-symmetric; Skew-Hermitian; orthogonal matrices; Unitary Matrices; Rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; solving system of Homogeneous and Non-Homogeneous equations, Gauss elimination method; Gauss Seidel Iteration Method.

UNIT-II: Eigen Values and Eigen Vectors

Linear Transformation and Orthogonal Transformation: Eigen values and Eigen vectors and their properties: Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal transformation.

UNIT-III: Sequences & Series

Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences. Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test; Raabe's test; Cauchy's Integral test; Cauchy's root test; logarithmic test. Alternating series: Leibnitz test; Alternating Convergent series: Absolute and Conditionally Convergence.

UNIT-IV: Calculus

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's Series, Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

UNIT-V: Multivariable calculus (Partial Differentiation and applications)

Definitions of Limit and continuity, Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence, Maxima and Minima of functions of two variables and three variables using method of Lagrange multipliers.

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John wiley& Sons, 2006.

References

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

Course Outcomes: After learning the contents of this subject, the student must be able to

1	Define system of linear equations to matrix and explore various methods of solving homogenous and non-homogenous equations.
2	Find matrix rank, Eigen values & Eigen vectors and to find the inverse and power of matrix. Reduce linear equations to quadratic equations and transform into canonical form.
3	Discuss convergence and divergence in its simplest form, classifying difference between a sequence and series in application context and further investigate infinite process.
4	Judge the consequences and geometrical approach to the mean value theorems and engineering applications to mathematical problems. Learn to adopt different techniques for multi-dimensional change of variables to transform the coordinates over which integration proceeds.
5	Understand the maximum & minimum function of two and three variable involving limits with Partial differential equations and recognize their applications in developing mathematical models.

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18PH01) APPLIED PHYSICS

B. TECH - I SEM (EEE) **L/T/P/C**
4/0/0 /4

Prerequisite: Knowledge of 12th /Intermediate level Physics

Course Objectives:

- The aim of Physics provides an adequate exposure and develops insight about the basic principles of physics along with the engineering applications.
- The acquaintance of basic physics principles would help the engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approach.
- Student will be able to demonstrate competency and understanding of the concepts found in Quantum Mechanics, lasers, Semiconductor and photo detectors, a broad base of knowledge in physics.
- Hence physics the foundation on which stands the elaborate structure of technology.

Unit I: Quantum Mechanics

Failures of classical mechanics, Introduction to Quantum mechanics, Wave nature of Particles, Time-dependent and time independent Schrodinger equation for wave function, Significance of Ψ, probability current, Expectation values, Free-particle wave function and wave-packets, Uncertainty principle. Particle in one dimension box.

Unit II: Wave Optics

Huygen's principle, superposition of waves and interference of light by wave front splitting and amplitude splitting; Young's double slit experiment, Thin film interference, Newton's rings, Michelson interferometer.Farunhofer diffraction from a single slit,double slit and circular aperture, Diffraction gratings and their resolving power.

Unit III Lasers

Characteristics of lasers, absorption, spontaneous emission, stimulated emission. Einstein's theory of matter radiation interaction and A and B Coefficients; amplification of light by population inversion, Ruby laser, He-Ne laser, CO_2 laser, Nd-YAG laser, applications of lasers in science, Engineering and Medicine.

Unit IV: Physics of Semi-Conductor Opto-electronics:

Origin of Energy Band formation in Solids, Classification of materials in to conductors, semi-conductors and insulators, Introduction to intrinsic and extrinsic semiconductors, Fermi level, Effect of carrier concentration and temperature on Fermi level, . Energy Diagram of P-N diode, LED, Types of semi conductor photo detectors P-N junction formation, working principles and characteristics of PIN diode, Avalanche diode, and Solar Cell.

Unit V: Optical Fibres

Optical Fibres introduction, Total internal reflection, Acceptance angle and Cone, Numerical aperture, Types of Optical Fibres, step and graded index fibres, losses in optical fibres, applications of optical fibres.

Text Books

1. A Text Book of Engineering Physics, Dr. M.N. Avadhanulu, Dr. P.G. Kshrisagar-S.Chand.
2. Modern Engineering Physics (Vol-I & II), Dr. K. Vijaya Kumar, Dr. S. Chandralingam – S.Chand..

References

1. Haliday and Resnick, Physics-Wiley
2. J. Singh Semiconductor Optoelectronics: Physics and Technology, Mc. Graw-Hill inc(1995).
3. Engineering Physics, P.K.Palani Swamy, Scitech Publications.
4. Electric Devices & Circuits – Millman&Halkies

Course Outcomes: After learning the contents of this subject, the student must be able to

1	Illustrate fabrication of semi conductors, photo detectors, design basis of quantum mechanics
2	Recall facts of wave optics extend & construct basics of wave optics.
3	Interpret about lasers, which leads to new innovations and improvements
4	Elaborate and formulate the study of characterization properties of opto-devices, organize the students to prepare new materials for various engineering applications
5	Apply basic knowledge on principles and recalls facts of light properties, and motivate for new innovations. Analyze applications of optical fibers

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18EN01) ENGLISH

B. TECH – I SEM (EEE) **L/T/P/C**
2/0/0 /2

Prerequisite: None

INTRODUCTION

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire language skills, the syllabus of English has been designed to develop linguistic, communicative and critical thinking competencies of Engineering students. In English classes, the focus should be on the skills development in the areas of vocabulary, grammar, reading and writing. For this, the teachers should use the prescribed text for detailed study.

Students should be encouraged to read the texts leading to reading comprehension and different types of passages may be given for practice in the class. The time should be utilized for working out the exercises given after each excerpt, and also for supplementing the exercises with authentic materials of a similar kind, for example, newspaper articles, advertisements, promotional material etc.

The focus in this syllabus is on skill development, fostering ideas and practice of language skills in various contexts and cultures.

Learning Objectives: The course will help to
a. improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.

b. equip students to study academic subjects more effectively and critically using the theoretical and practical components of English syllabus.

c. develop study skills and communication skills in formal and informal situations.

SYLLABUS

UNIT –I Inventions and Discoveries

a) Inventors

Vocabulary: Word Formation – Prefixes and Suffixes
Grammar: Contracted forms of verbs, Tense and Aspects.
Reading: Skimming through the Passage
Writing: Information transfer-Describing trends

b) Aliens

Vocabulary: One word substitutes
Grammar: Articles.
Reading: Comprehension and inference
Writing: Description of people, places and objectives

UNIT –II Information and Fashion

a) Social Media

Vocabulary Building: Synonyms and Antonyms
Grammar: Redundancies and Clichés.
Reading: Comprehension and inference, reading for facts and opinions.
Basic Writing Skills: Paragraph writing – Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents, E-mail, E-mail etiquette.

b) **Fashion**

Vocabulary: Words often confused
Grammar: Active and Passive Voice
Reading: Reading a procedure
Writing: Types of essays, argumentative essay.

UNIT –III Know the History

a)Indian Architecture

Vocabulary: **Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.**
Grammar: Conjunctions
Reading: Understanding a historical essay
Writing: Describing structures.

b) History

Vocabulary: Words Misspelt
Grammar: Prepositions.
Reading: Scanning, reading for Comprehension
Writing: Types of Paragraphs.

UNIT –IV Science and Fiction

a) Genetics
Vocabulary: Abbreviations and Acronyms
Grammar: Common Errors in Tenses
Reading: Categorizing Information
Writing: Report writing.

b)Superheroes

Vocabulary: Idiomatic Expressions.
Grammar: Question tags.
Reading: Reading for Comprehension
Writing: Gadget review.

UNIT –V War and Sports

a)War
Vocabulary: Homonyms, Homophones and Homographs
Grammar: Subject-verb agreement
Reading: Reading to summarize
Writing: Letter of enquiry.

b) Sports
Vocabulary: Technical Vocabulary
Grammar: Common Errors in English
Reading: Scanning a text
Writing: Letters of complaint.

Textbook:

- ***English for Technical Communication***by **Sudarshana, N.P. and C. Savitha,** Published by Cambridge University Press.

References:

1. Swan, M. (2016). Practical English Usage. Oxford University Press.
2. Kumar, S and Lata, P.(2018). Communication Skills. Oxford University Press.
3. Wood, F.T. (2007).Remedial English Grammar. Macmillan.
4. Zinsser, William. (2001). On Writing Well. Harper Resource Book.
5. Hamp-Lyons, L. (2006).Study Writing. Cambridge University Press.
6. Exercises in Spoken English. Parts I –III. CIEFL, Hyderabad. Oxford University Press.

Course Outcomes: By the end of the course, students will be able to

1. Use English Language effectively in spoken and written forms.
2. Comprehend the given texts and respond appropriately.
3. Communicate confidently in various contexts and different cultures.
4. Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
5. Develops and Communicates by stating main ideas relevantly and coherently in speaking & writing.

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18CH01) ENGINEERING CHEMISTRY

B. TECH – I SEM. (EEE) **L/T/P/C**
3/1 /0 /4

Prerequisite: Knowledge of 12th /Intermediate level Chemistry

Course Objectives:

1. To bring adaptability to the concepts of chemistry and to acquire the required skills to become a perfect engineer.
2. To impart the basic knowledge of molecular and electronic modifications which makes the student to understand the technology based on them.
3. To acquire the knowledge of electrochemistry, different batteries, solar cells, corrosion and water treatment which are essential for the Engineers and in industry.
4. To acquire the skills and knowledge to organic reactions and importance of polymers in engineering and everyday life.

UNIT-I: Molecular structure

Metallic bonding, valence bond theory, crystal field theory and the energy level diagrams of transition metal ions (splitting of d-orbitals in octahedral and tetrahedral geometry) and their magnetic properties. Atomic and molecular orbitals. LCAO, molecular orbital theory of diatomic molecules. N_2& O_2.

UNIT-II: Organic reactions and Polymers

Organic Chemistry: Introduction to types of organic reactions involving substitution, addition, elimination, oxidation by $KMnO_4$, OsO_4, reduction by $LiAlH_4$, $NaBH_4$

Polymers: Introduction to polymers, classification of polymers, mechanism of free radical addition polymerization, properties of polymers-crystallinity, melting point, boiling point and glass transition temperature. Conducting polymers-classification, mechanism of conduction in conducting polymers-poly acetylene and ploy aniline, applications.

UNIT-III: Electrochemistry

Introduction to electrochemistry, conductance-specific, equivalent and molar conductance, units and their relation. Numerical Problems. Applications of conductance – conductometric titrations.Electrochemical and Electrolytic cells, Galvanic cell, Electro chemical series-applications, measurement of e.m.f. and single electrode potential, Nernst's equation and its applications, Types of electrodes: Reference electrodes (SHE, SCE and QH), Ion-selective electrode-glass electrode, applications of electrode potentials-determination of pH and potentiometric titrations. Batteries: primary cells-lithium cells. Secondary cells – Pb-acid storage cell, lithium-ion cells. Fuels cells-hydrogen-oxygen fuel cell. Methanol-oxygen fuel cell-advantages nd applications.

UNIT-IV: Water Technology & Corrosion

Introduction, types of hardness, units and Numerical problems. Estimation of hardness of water-EDTA method. Boiler troubles-scales and sludges. Treatment of Boiler feed water-Ion-exchange

process. De-salination of brackish water-Reverse Osmosis. Domestic water treatment-specifications and steps involved in the treatment of potable water.

Corrosion: Introduction, causes of corrosioin, types of corrosion-dry and wet corrosion-mechanism of electrochemical corrosion. Caustic embrittlement and boiler corrosion. Factors affecting corrosion and corrosion control methods-proper designing, cathodic protection(sacrificial anodic protection and impressive current cathodic protection) and surface coatings (anodic and cathodic), Methods of application of metal coatings-Hot dipping(galvanization and tinning) and electroplating of copper.

UNIT-V: Phase rule and Surface chemistry

Phase rule: Definition of terms, phase rule equation, phase diagrams: one component system – water system, two component system- Ag-Pb system, Iron-carbon phase diagram-cooling curves, annealing and case hardening.

Surface Chemistry: Adsorption-types of adsorption, adsorption isotherms- Freundlich adsorption isotherm and Langmuir adsorption isotherm, applications of adsorption.

Text Books:

1. Text book of Engineering Chemistry by Jain & Jain.
2. Text book of Engineering Chemistry, CENGAGE learning by Prasanta Rath, B. Ramadevi, Ch. Venkata Ramana Reddy &SubhenduChakroborty.

References

1. University chemistry, by B. H. Mahan
2. Engineering Chemistry by Shashi Chawla

Course Outcomes: The basic concepts included in this course will help the student to gain:

1	Recall previous knowledge regarding atomic and molecular structure.
2	Design polymeric engineering materials. Recall basic organic reactions
3	Construct batteries and classify different electronics and electrical like cells, electrodes, etc., help them to construct different electrical/ electronic parts.
4	Examine which types of impurities are present in water, specification of drinking water and explain the corrosion behavior/ activity of metals.
5	Apply phase rule and adsorption to construct the materials by analyzing their compositions.

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18EN02) ENGLISH LANGUAGEAND COMMUNICATION SKILLS LAB

B. TECH –I SEM. (EEE) **L/T/P/C**

0/0 /2 /1

The **Language Lab** focuses on the production and practice of sounds of language to familiarize the students with the use of English in everyday situations both in formal and informal contexts.

Course Objectives:

1. To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning.
2. To sensitize students to the nuances of English speech sounds, stress and intonation.
3. To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking.
4. To improve the fluency of students in spoken English and neutralize the influence of the sounds of their mother tongue.
5. To train students to use language appropriately for public speaking and interviews.

English Language and Communication Skills Lab (ELCS) shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab
b. Interactive Communication Skills (ICS) Lab

Listening Skills
Objectives :
1. To enable the students develop their listening skills so that they may appreciate its role in developing LSRW skills language and improve their pronunciation
2. To impart the students with necessary training in listening so that they can understand the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language, to be able to recognize them and find the distinction between different sounds, to be able to mark stress and recognize and use the right intonation in sentences.

• Listening for general content • Listening to fill in information • Intensive listening • Listening for specific information
Speaking Skills
Objectives :
1. To involve the students in speaking activities in various contexts
2. To enable the students express themselves fluently and appropriately in social and professional contexts
• Oral practice: Just A Minute (JAM) Sessions • Describing objects/situations/people • Role play – Individual/Group activities

The following course content is prescribed for the English Language and Communication Skills Lab based on Unit-6 of AICTE Model Curriculum 2018 for B.Tech First English.

Exercise – I
CALL Lab: Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers. Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonantal Phonemes.

ICS Lab: Understand: Communication at Work Place- Spoken vs. Written language. Practice: Ice-Breaking Activity and JAM Session- Situational Dialogues – Greetings – Taking Leave – Introducing Oneself and Others.

Exercise – II
CALL Lab: Understand: Structure of Syllables – Word Stress and Rhythm– Weak Forms and Strong Forms in Context. Practice: Basic Rules of Word Accent - Stress Shift - Weak Forms and Strong Forms in Context.

ICS Lab: Understand: Features of Good Conversation – Non-verbal Communication. Practice: Situational Dialogues – Role-Play- Expressions in Various Situations –Making Requests and Seeking Permissions - Telephone Etiquette.

Exercise - III
CALL Lab: Understand: Intonation-Errors in Pronunciation-the Influence of Mother Tongue (MTI).
Practice: Common Indian Variants in Pronunciation – Differences in British and American Pronunciation.

ICS Lab: Understand: How to make Formal Presentations. Practice: Formal Presentations.

Exercise – IV
CALL Lab: Understand: Listening for General Details. Practice: Listening Comprehension Tests.

ICS Lab: Understand: Public Speaking – Exposure to Structured Talks. Practice: Making a Short Speech – Extempore.

Exercise – V
CALL Lab: Understand: Listening for Specific Details. Practice: Listening Comprehension Tests.

ICS Lab: Understand:Debate/Group Discussion/Interview Skills. Practice:Mock Group Discussion/Mock Interviews.

Course Outcomes:

1 Capable in Better Understanding of nuances of language through audio-visual experience and group activities.
2 Develop Neutralization of accent for intelligibility.
3 Speak out with clarity and confidence thereby enhances the employability skills of the students by acquiring knowledge and techniques.
4 Extend to speak fluent English, through advanced vocabulary to improve quality in speaking.

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18PH02) APPLIED PHYSICS LAB

B. TECH– I SEM. (EEE) **L/T/P/C**

0/0 /3 /1.5

The purpose of doing the experiments in laboratory is not simply to verify a principle but also to explore the other related phenomena and to find their applicability. The students are suggested to work in this direction and get benefit out of it.

Objectives:
1. To get practical knowledge which is related to the engineering course in the development of new technologies.
2. To impart fundamental knowledge in handling the equipment's in Physics laboratory.

Sl. No.	Name of the Experiment
1.	Determination of wavelength and radius of curvature of plano convex lens using Newton Rings Experiment.
2.	Study of LED & LASER diode Characteristics.
3.	Study PHOTO diode Characteristics.
4.	Determination of energy gap of material of p-n junction.
5.	Bending losses of optical fibres and evaluation of numerical aperture of a given optical fibre.
6.	Study P-N diode Characteristics.
7.	Study of Characteristics of solar cell.
8.	Determination of wavelength of Laser source – Diffraction grating.
9.	Determination of frequency of AC supply – sonometer.
10.	Determination of dispersive power of a material of a prism-spectrometer.

Course Outcomes:

1	Operate different equipments related to light & electronics.
2	Develop experimental skills to design new experiments & circuit design.
3	Understand about modern equipment like solar cell, optical fibre etc.,
4	Have Exposure to develop novel semi conductor devices.

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(AUTONOMOUS)

(B18ME02) ENGINEERING WORKSHOP/IT WORKSHOP

B. TECH -I SEM. (EEE) **L/T/P/C**

0/0 /3 /1.5

COURSE OBJECSTIVES:

1. Know the usage of various tools and their application in carpentry, tin smithy.
2. Know the usage of various tools and their application in black smithy, foundry, welding and house wiring.
3. Make lap joint and dove tail joint in carpentry.
4. Make scoop, funnel and tray like items in tin smithy.
5. Use one – way, two-way switches, parallel and series connections in house wiring.
6. Know the basics of welding.

UNIT – I

TRADES FOR EXERCISES: (Any six trades from the following for Mechanical Engineering Branch & Any four trades for all other Branches with minimum of two exercises in each trade)

1. Carpentry
2. Fitting
3. Tin – Smithy
4. Black Smithy
5. House – wiring
6. Foundry
7. Plumbing
8. Soldering

UNIT - II

TRADES FOR DEMONSTRATION & EXPOSURE

1. Demonstration of Power tools & wiring
2. Welding.
3. Machine Shop

UNIT – III

IT WORKSHOP I: Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, simple diagnostic exercises.

IT WORKSHOP II: Installation of operating system windows and Linux simple diagnostic exercises.

Text Books

1. Workshop Manual – P.Kannaiah / K.L.Narayana/Scitech Publishers.
2. Workshop Manual – Venkat Reddy/BS Publication / 6th Edition.

COURSE OUTCOMES: The students will be able to

1	Perform different trade exercise.
2	Assemble and Disassemble a computer and diagnostic exercises with installation of operating systems and Linux Tools.
3	Explore industrial environment and operation of power tools
4	Gain knowledge of foundry, welding, black smithy, fitting and house wiring

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MC01) INDUCTION PROGRAM
(Civil, EEE, Mech, ECE & CSE)

B. TECH - I SEM. (EEE) **L/T/P/C**
0/0 /0 /0

When new students enter an institution, they come with diverse backgrounds, thoughts and preparations. It is very important to help them adjust to the new environment. The following are the activities of induction program in which the students would be fully engaged throughout the day for entire duration of the program.

1. **Physical Activity:** This would involve a daily routine of physical activity with games and sports. Each student should pick one game and learn it for three weeks. This would also involve gardening or other suitably designedactivity.
2. **Creative Arts:** Every student would select one skill related to arts whether visual arts or performing arts. The student would practice it every day for the duration of the induction program.
3. **Universal Human Values:** This will help the students to experience the joy of learning, stand uptopeerpressure,takedecisionswithcourage,beawareofrelationshipswithinmates,etc.
4. **Proficiency Modules:** During the induction program crash courses have to be conducted to improve Englishskills.
5. **Lectures by Eminent people:** This period can be utilized for lectures by eminent personalities. It would give the students exposure to people who are in public life and are sociallyactive.
6. **Literary:** Literary activity would encompass reading, writing and debating, enacting a play, etc.
7. **Familiarization to Dept./Branch & Innovations:** The students are explained about different methods of study. They are further explained about the different aspects of their branches, departments and the role they play in the society. The different laboratories, workshops & otherfacilitiesavailableinthedepartmentsareintroducedtothestudents.

Notwithstanding the above activities of the induction program, any other relevant activity may be planned to enthuse, encourage and benefit the students.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MA02) DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

B. TECH – II SEM. (EEE) **L/T/P/C**
3/1 /0/4

Pre-requisites: Mathematical Knowledge of 12^{th} / Intermediate level

Objectives: To learn
1. Methods of solving the differential equations of first and higher order.
2. Evaluation of multiple integrals and their applications
3. The physical quantities involved in engineering field related to vector valued functions
4. The basic properties of vector valued functions and their applications to line, surface and volume integrals

UNIT-I: First Order ODE
Exact, linear and Bernoulli's equations; Applications: Newton's law of cooling, Law of natural growth and decay; Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

UNIT-II: Ordinary Differential Equations of Higher Order
Second order linear differential equations with constant coefficients: Non-Homogeneous terms of the type e^{ax}, sin ax, cos ax, polynomials in x, $e^{ax}V(x)$; method of variation of parameters; Equations reducible to linear ODE with constant coefficients: Legendre's equation, Cauchy-Euler equation.

UNIT-III: Multivariable Calculus (Integration)
Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals. Applications: Areas (by double integrals) and volumes (by double integrals and triple integrals), Centre of mass and Gravity (constant and variable densities) by double and triple integrals (applications involving cubes, sphere and rectangular parallel piped).

UNIT-IV: Vector Differentiation
Vector point functions and scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Tangent plane and normal line. Vector Identities. Scalar potential functions. Solenoidal and Irrotational vectors.

UNIT-V: Vector Integration
Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Editions, 2010
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006

References

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002
2. Paras Ram, Engineering Mathematics, 2nd Edition, CBS Publishers
3. S.L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

Course outcomes: After learning the contents of this subject the student must be able to

1	Recall fundamentals of differential equations to build its solutions and Summarize differential equations and inspect its exactness process. Connect real world problems to concept of differential equations.
2	Identify, analyze, formulate and perceive physical situation whose behavior can be described by ordinary differential equations.
3	Interpret the multiple integrals for functions and elaborate areas and volumes in different situations. Evaluate line, surface and volume integrals to predict its outcomes.
4	Utilize the concept of gradient, divergence and curl of vector field to predict areas and volumes.
5	Explain importance of integrals theorems to design different geometries and their characteristics.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE01) ELECTRICAL CIRCUITS-I

B. TECH- II SEM. (EEE) **L/T/P/C**
3/1 /0 /4

Prerequisite: Mathematics

Course Objectives:

1. The course introduces the basic concept of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline.
2. The emphasis of this course is laid on the basic analysis of circuits which includes

- Single phase circuits
- Magnetic circuits and theorems
- Network topology

UNIT-I: Basics of Circuits

KCL, KVL, network reduction techniques, series, parallel, series-parallel, Star-Delta, Delta Star transformations. Nodal analysis, Mesh analysis, Super node and Super mesh for DC excitations & Problems.

UNIT-II: Introduction to Electrical circuits: Essence of electricity, Electric field electric current, potential difference, E.M.F, electric power Ohm's law, R-L-C parameters, Voltage and Current sources, dependent and independent sources, Source Transformation, Voltage & Current relationship for passive elements for different input signals (square, ramp, saw-tooth, triangular **Single phase AC Circuits:** R.M.S, average values and form factor for different periodic wave forms-steady state analysis of R, L, C (in different combination) with sinusoidal excitation – concept of reactance, impedance, susceptance and admittance. Phase and phase difference, concept of power factor, real and reactive power, J-notation, complex and polar forms of representation, complex power & Problems.

UNIT-III: Network Theorems (with D.C and A.C Excitation): Super position, Reciprocity, Norton's, Thevenin's, Maximum power transfer, Milliman's, Tellegen's and compensation theorems and Problems.

UNIT-IV: Magnetic circuits: Magnetic circuits, Faraday's laws of electromagnetic induction – concept of self and mutual inductance, Dot convention, coefficient of coupling, composite magnetic circuits, analysis of series and parallel magnetic circuits & Problems.

UNIT-V:Network topology: Definitions – Graph – Tree, Basic 23utest and Basic Tieset matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent & independent voltage and current sources – Duality & Dual networks.

Text Books

1. Engineering Circuit Analysis by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6th edition.
2. Network Analysis by A.Sudhakar and Shyammohan S Palli, Tata MC Graw Hill

References

1. Network Analysis by M.E. Van Valkenberg.
2. Linear Circuit Analysis (time domain, Phasor and Laplace transform approaches) Second edition by Raymond A. Decarlo and Penmin – L in, Oxford University Press. Second edition, 2004.
3. Electrical Circuits Theory by K.Rajeswaram, Pearson Education, 2004.
4. Basic Circuits Analysis by D.R. Cunningham & J.A. Stuller, Jaico Publications.
5. Electrical Circuits by A.Chakrabarthy, Dhanpat Rai & Sons.

COURSE OUTCOMES: After the course completion, the students are able to:

1	Learn basics of electrical circuits such as laws, transformation and network reduction techniques.
2	Explore the basic principles and concepts involved in AC circuits and analyze power in series and parallel AC circuits
3	Understand various network theorems and its applications in electrical circuits.
4	Analyze the series and parallel magnetic circuits with basic magnetic principles and laws of electromagnetic induction.
5	Explore various network topologies and analyze the networks with loop and nodal methods with dependent and independent current and voltage sources.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC01) ELECTRONIC DEVICES AND CIRCUITS

B. TECH –II SEM. (EEE) **L/T/P/C**
3/0/0 /3

Prerequisite: Applied Physics

Objectives:
This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

1. To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET transistors and amplifier circuits.
2. To understand diode as rectifier.
3. To study principle of filter circuits and various types.

UNIT – I:
P-N Junction Diode: Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt- Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, varactor diode, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

UNIT-II:
Rectifiers and Filters : The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, π- Section Filters, Comparision of Filters, Voltage Regulation using Zener Diode.

UNIT-III:
Bipolar Junction Transistor and UJT: The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation ,BJT Specifications, BJT Hybrid Model, Comparison of CB, CE, and CC Amplifier Configurations.

UNIT-IV:
Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector – Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE} and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability, Analysis of a Transistor Amplifier Circuit using h- Parameters.

UNIT-V:
Field Effect Transistor and FET Amplifiers
Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage – Volt-Ampere characteristics, The JFET Small Signal

Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

Text Books

1. Millman's Electronic Devices and Circuits – J. Millman, C.C. Halkias, and Satyabrata Jit, 2 Ed.,1998, TMH.
2. Electronic Devices and Circuits – Mohammad Rashid, Cengage Learing, 2013

References

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits – K. Lal Kishore, 2 Ed., 2005, BSP.
4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.
5. Electronic Devices and Circuits – David A. Bell, 5 Ed, Oxford University Press.

Course Outcomes: At the end of the course, the student will be able to

1	Understand operation of analog devices and circuits. Evaluate the characteristics and equivalent circuit of diodes.
2	Acquire knowledge of rectifiers and filters and their classifications.
3	Analyze the operation of oscillators and amplifiers.
4	Learn transistor biasing and stabilization.
5	Design multi vibrators and wave shaping circuits using basic components.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS01) PROGRAMMING FOR PROBLEM SOLVING

B. TECH-II SEM (EEE) **L/T/P/C**
4/0/0 /4

Prerequisite: None

UNIT -I

Introductionto Computers: Block Diagram of Computer,Memory Hardware ,Software, Operating Systems, Steps in Problem Solving, Algorithms , Flowcharts, Pseudo code, Types of Programming Languages, Introduction to C, History of C, Structure of a C Program.
(Chapter 1: 1.1 - 1.10 , 1.17 – 1.20)

Introduction to C Programming: The C Character Set, Identifiers and - Keywords, Data Types, Constants and Variables, Declarations, Expressions & Statements, Input / Output Statements (Formatted and Unformatted), Creating and Running a C program.
(Chapter 2: 2.1 – 2.27 & Chapter 4: 4.1 – 4.17)

Operators and Expressions : Unary Operators ,Arithmetic Operators, Relational and Logical Operators, Assignment Operators, Conditional operator, Bitwise Operators, special operators, Precedence & Associativity, Type Casting and Type Conversion. (Chapter 3 : 3.1 – 3.17)

UNIT – II

Control Statements: Branching Statements – if, if-else, else- if, nested-if. Switch statement. Un-conditional Branching Statement- goto. Looping Statements- while, do-while, for, nested loops. Break & Continue.
(Chapter 6 : 6.1 – 6.47)

Functions : Introduction, Defining a Function, Types of Functions, Accessing a Function, Function Prototypes, Passing Arguments to a Function – call by value, Recursion. (Chapter 7: 71. - 7.26)

Storage Classes: Automatic Variables, External (Global) Variables, Static Variables, Register.
(Chapter 8: 8.1 – 8.13)

UNIT – III

Arrays: Definition - Single Dimensional Arrays, Multi Dimensional Arrays, Declaration, Initialization, Reading & Writing elements in to an Array, Passing Arrays to Functions. Linear Search , Binary search, Bubble sort
(Chapter 9: 9.1 – 9.29 & Reference book 2:)

Strings: Declaration and Initialization of Strings, Reading and Writing a String, String Manipulation Functions , String as Array of Characters, Array of strings, Sorting of Strings.
(Chapter 10: 10.1 – 10.15)

Structures and Unions: User-Defined Data Types , Defining a Structure, Processing a Structure, Array of Structures, Nested Structures, Passing Structures To Functions. Unions. Typedef. Enumerated types - enum.
(Chapter 12:12.1, 12.2, 12.3, 12.5,12.7)

UNIT –IV

Pointers: Introduction, Pointer Declarations, Pointer to Pointer, Operations on Pointers -Pointer Arithmetic, Dynamic Memory Allocation – Malloc(), Calloc(), Realloc(), Free(). Pointers and Functions - call by Reference, Pointers and Arrays (one dimensional, two dimensional), Array of Pointers. Structures and Pointers, Self-Referential Structures.

(Chapter 11: 11.1 – 11.31 & Chapter 12: 12.4 ,12.6)

UNIT- V

File Handling: Introduction, Text Files and Binary Files, File Handling Functions-Opening and Closing a File, File Opening Modes, Reading and Writing a File. Random Access File Functions – fseek() , rewind(), ftell(). (Chapter 13: 13.1 – 13.31)

Command Line Arguments, C Preprocessor Directives (Chapter 15: 15.7,15.20)

Text Book:

1. Byron Gottfried, **"Programming with C"**, Third Edition(Schaum's Outlines) McGraw Hill.
2. B.A. Forouzan and R.F. Gilberg ,"C Programming and Data Structures" , Cengage Learning (3rd Edition)

References

1. Pradip Dey &Manas Ghosh, "Programming in C", 2nd Edition, Oxford University Press,2013.
2. E. Balaguruswamy , "Programming in ANSI C " ,McGraw-Hill Education, 2008.

Course outcomes:

1	Understand the fundamental basics of programming language and learn to illustrate a problem in flowchart. Learn the basic operators and expressions in C programming.
2	Analyze the concepts of sequencing, branching, looping with respective decision making statements and also explore various functions and storage classes.
3	Implement different operations for problems using arrays, Strings and structures.
4	Learn the basics of pointers and various operations using pointers
5	Explore various file handling functions employed in problem solving.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC02) ELECTRONIC DEVICES AND CIRCUITS LAB

B. TECH- II SEM. (EEE) **L/T/P/C**
0/0/2 /1

Prerequisite: Mathematics

Course objectives

1. This course intends to provide an overview of the principles and operation of electronic components.
2. To understand the operation of power supply circuits, rectifiers and voltage regulators.
3. To understand the characteristics of the active devices.
4. To understand the construction of simple electronic circuits.

PART A: (Only for Viva-voce Examination)
Electronic Workshop Practice (In 3 Lab Sessions):

1. Identification, Specifications, Testing of R, L, C Components (Color Codes) Bread Boards, PCB's
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of
   i) Multimeters (Analog and Digital)
   ii) Function Generator
   iii) Regulated Power Supplies
   iv) CRO.

PART B: (For Laboratory Examination – Minimum of 10 experiments)

1. Forward & Reverse Bias Characteristics of PN Junction Diode
2. Zener diode characteristics & Zener voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration.
6. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
7. FET characteristics.
8. UJT characteristics.
9. Design of self bias circuit
10. Comparison of performance of self bias and fixed bias circuits.
11. Frequency response of CE amplifier
12. Frequency response of common source FET amplifier.

PART C: Equipment required for Laboratories:

1. Regulated Power supplies (RPS) -0-30 V
2. CRO's
3. Function Generators -0-1 MHz.
4. Multimeters
5. Ammeters (Analog or Digital)
6. Voltmeters (Analog or Digital)

7. Electronic Components -Resistors, Capacitors, BJTs,

Course Outcomes: After completion of this course Student able to

1	Understand the use of RPS & CRO & different meters and test electronic circuits using experiment boards.
2	Explore the operation of different electronic components and design electronic circuits to meet specific requirements.
3	Understand working principle of electronic circuits.
4	Evaluate the characteristics of the electronic circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS02) PROGRAMMING FOR PROBLEM SOLVING LAB

B. TECH- II SEM. (EEE) **L/T/P/C**
0/0/2 /1

WEEK-1
1.a) Write a C program to find the areas of shapes like circle, square, rectangle and triangle
1.b) Write a C program to demonstrate Type Casting and Type Conversion.

WEEK-2
2.a) Write a C program to find the roots of a quadratic equation.
2.b) Write a C program to find greatest of any 3 numbers.
2.c) Write a C program, which takes two integer operands and one operator from the user,performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

WEEK-3
3.a) Fibonacci sequence is defined as follows: the first and second terms in sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
3.b) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
3.c) Write a C program to find the second largest number in a set of n numbers.

WEEK-4
4.a) Write a C program to generate Pascal's triangle.
4.b) Write a C program to find the LCM(Least Common Multiple) and GCD (greatest common divisor) of two given integers.
4.c) Write a C program to construct a pyramid of numbers.

WEEK-5
5.a) Write a C program to find sum of series 1+x^1+x^2+x^3+.....+x^n using functions.
5.b) Write a C program to find factorial of a given number using Recursion.
5.c) Write a C program to demonstrate the use of Storage Classes

WEEK-6
6.a) Write a C program to find both the largest and smallest number in a list of integers.
6.b) Write a C program to reverse the elements of an array (i.e., the first value should become last value etc.)
6.c) Write a C program to insert an element at a given position in an Array using functions.

WEEK-7
7. Write a C program to perform all of the following:
   a) Matrix Addition and subtraction
   b) Matrix Multiplication
   c) Find Transpose and test if a matrix is symmetric or not
   d) test if a matrix is identity matrix or not

WEEK-8
8.a) Write a C program to perform linear search
8.b) Write a C program to perform binary search
8.c) Write a C program to sort the elements using bubble sort

WEEK-9

9.a) Write a C program to insert a sub-string in to a given main string at a given position.

9.b) Write a C program to count number of characters, words and sentences in a given text.

9.c) Write a C program to determine if the given string is a palindrome or not.

9. d) Write a C program to sort the given names in alphabetical order.

WEEK-10

10.a) Write a C program to implement array of structures.(use student structure).

10.b) Write a menu driven C program that uses functions to perform the following operations on complex numbers stored in a structure:

i.Reading a complex number
ii.Writing a complex number
iii.Addition of two complex numbers
iv.Multiplication of two complex numbers

10.c) Write a C program to demonstrate Unions and enum.

WEEK-11

11.a) Write a C program for Pointer Arithmetic.

11.b) Write a C program to swap two numbers using Call by value and Call by reference.

11.c) Write a C program to demonstrate calling of a function (like add, subtract, multiply) using a function pointer.

WEEK-12

12.a) Write a C program using pointer to create a two dimensional matrix, to input values in to the matrix and to display the matrix and its transpose. Free the memory properly.

12.b) Write a C program to demonstrate on structures and pointers.

12.c) Write a C program for dynamic creation of structures using pointers

WEEK-13

13.a) Write a C program to count no of alphabets, no of digits, no of special symbols, no of white spaces and no of tabs in a given text file.

13.b) Write a C program which copies one text file to another text file and verify the correctness.

13.c) Write a C program which copies one binary file to another binary file and verify the correctness.

WEEK-14

14.a) Write a C program to produce reverse of the content of a text fie into another text file and verify the result.

14.b) Write a C program to merge two text files into a third text file (i.e., thecontents of the first file followed by those of the second are put in the third file) and verify the correctness.

WEEK-15

15.a) Write a command-line C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

15.b)Write a C Program that removes all comment lines from a C source file.

Course Outcomes:

After the completion of this course, the students should be able to

1	Understand the fundamentals of C programming.
2	Analyze concepts of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
3	Implement different operations on arrays and functions to solve problems.
4	Design and implement different types of file structures using standard methodology.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18ME01) ENGINEERING GRAPHICS

B. TECH- II SEM. (EEE) **L/T/P/C**
1/0/4 /3

COURSE OBJECTIVES:

1. Use various engineering drawing instruments.
2. Learn the basic convention of drawings, dimensioning, scales and conic sections like ellipse, parabola and parabola.
3. Learn projection of points, lines viewed in different positions.
4. Learn projections of plane surfaces and solids viewed in different positions.
5. Gain knowledge of sections of solids and their usage in real time applications.

Unit – I Introduction to Engineering Drawing:
Principles of Engineering Graphics and their significance, ISO and ANSI standards for coordinate dimensioning- usage of Drawing instruments, lettering

a. Conic sections including the Rectangular Hyperbola (General method only);
b. Roulettes-Cycloid, Epicycloid, Hypocycloid
c. Involute
d. Scales – Plain, Diagonal and Vernier Scales.

Unit –II Principles of Orthographic Projections in First Angle Projection- Conventions
Projections of Points
Projection of lines: Parallel, Perpendicularinclined to one plane and inclined to both the planes.

Unit-III
Projection of planes: Plane parallel, perpendicular and inclined to one reference plane. Planes inclined to both the reference planes – Auxiliary Planes;
Projection of Regular Solids-Projection of regular solids, Cube, prisms, pyramids, tetrahedron, cylinder, Cylinder and cone, axis inclined to one plane and both planes – Auxiliary Views Projections of Regular Solids.

Unit-IV
Sections and sectional views of right angular solid-Prism, Cylinder, Pyramid, Cone – Auxiliary Views; **Development of surfaces** of Right Regular Solids – Prism, Pyramid, Cylinder and Cone.

Unit-V Isometric Projections:
Chapter-I Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric views to Orthographic views and Vice-versa, Conventions.

Chapter-II Overview of Computer Graphics: listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software -The Menu System, Toolbars Standard, Object Properties, Draw, Modify and Dimension.

Text Books

1. Agrawal B & Agrawal C.M. (2012), Engineering Graphics, TMH Publications.
2. Bhatt N.D., Panchal V.M. &Ingke P.R., (2014), Engineering Drawing, Charotar Publishing House.

References

1. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers.
2. (Corresponding set of) CAD Software Theory and User Manuals.
3. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
4. Engineering Drawing – P.J.ShanS.Chand Publishers.
5. Engineering Drawing – Johle/Tata McGraw Hill Book Publishers.

COURSE OUTCOMES: The students will be able to

1	Learn the principles of Engineering Graphics and their significance, ISO and ANSI standards for coordinate dimensioning- usage of Drawing instruments, lettering
2	Perform projection of lines inclined to one or two planes
3	Perform the projections and views on the planes and solids
4	Development of surfaces on solids and understand and draw different types of conic sections
5	Convert orthographic views into isometric views and vice versa. And explore various computer technologies for graphical communication

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE07) ELECTRICAL CIRCUITS – II

B. TECH- III SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:

- Electrical Circuits –I

Course Objective:

1. This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline.
2. The emphasis of this course is laid on the basic analysis of circuits which includes locus diagrams, resonance, three phase circuits, transient analysis, Network Parameters, Two port network parameters, filters and Fourier analysis of A.C. Circuits.

UNIT-I:
Locus diagram and Resonance:
Locus diagram: Series R-L, R-C, R-L-C and parallel combination with variation of various parameters. Resonance: Series, parallel circuits, concept of bandwidth and Q-factor & Problems.

UNIT-II:
Three Phase Circuits:
Three phase circuits: Phase sequence – Star and delta connection – Relation between line and phase voltages and currents in balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of active and reactive power.

UNIT-III:
Transient analysis:
Transient response of R-L, R-C, R-L-C circuits (Series and Parallel combinations) for D.C. and sinusoidal excitations – Initial conditions – Classical method and Laplace transforms methods of solutions.
Transient response of the above circuits for different inputs such as step, ramp, pulse and impulse by using Laplace transforms method.

UNIT- IV:
Network functions and Network Parameters:
Network functions driving point and transfer impedance function networks- poles and zeros – necessary conditions for driving point function and for transfer function
Two port network parameters – Z, Y, ABCD and hybrid parameters and their relations– 2-port network parameters using transformed variables.

UNIT-V:
Filters and Fourier analysis of A.C. Circuits:
Introduction to filters –low pass – high pass and band pass – RC, RL, filters- constant K and m-derived filters and composite filter design
Fourier analysis of A.C. Circuits – Fourier Theorem, consideration of symmetry, exponential form of Fourier series, line and phase angle spectra, Fourier integrals and Fourier transforms, Properties of Fourier transforms.

Text Books:

1. Engineering circuit analysis – by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.
2. Electric Circuits by A. Chakrabarthy, Dhanipat Rai & Sons.

References

1. Network Analysis by Vanvalkenburg, PHI.
2. Electrical Circuits by David .A.Bell Oxford University Press, 7th Edition.
3. Networks and systems by D.Roy Chowdary, New age international publishers.
4. Network Theory by N.C. Jagan &C.Lakshminarayana, B.S Publications.
5. Electric Circuit theory by K. Rajeswaran, Pearson Education, 2004.
6. Network Analysis by C.K. Mithal, Khanna Publishers.

Course Outcomes: After going through this course, the students are able to

1	Understand the basics of network representation, method of analyzing the network and duality of network.
2	Analyze balanced and unbalanced three phase circuits and measure voltage, current and power in three phase star and delta connections.
3	Study the transient response of series and parallel RLC circuits for DC and sinusoidal excitations. Analyze the response for step, ramp, impulse etc., using Laplace transformation
4	Study different types of network functions and evaluate the network parameters in two port network using transformed variables.
5	Learn about different types of filters and Fourier analysis applied to AC circuits

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MA03)NUMERICAL METHODS AND COMPLEX VARIABLES

B. TECH- III SEM. (EEE). **L /T/ P/ C**
3 /1/0/4

Pre-requisites: Mathematical Knowledge at pre-university level

Objectives:

To learn

- The importance of numerical methods identifying the root of an equation geometrically and finding its approximate value by different techniques.
- Solving initial value problems using numerical methods.
- Differentiation and integration of complex valued functions.
- Expansion of complex functions using Taylor's and Laurent's series.
- Evaluation of integrals using Cauchy's residue theorem.

Unit – I: Solutions of algebraic and transcendental equations: Introduction, Numerical solution of algebraic and transcendental equations by Bisection Method, Regula-Falsi method, Newton-Raphson's method.

Unit – II: Numerical Integration & solutions of ordinary Differential Equations: Numerical Integration with Trapezoidal rule, Simpson's $1/3^{rd}$ rule, Simpson's (3/8) rule Solutions of first order ordinary differential equations by Taylor's series, Euler's Method, Euler's -Modified Method, Runge-kutta methods.

UNIT-III: Functions of a Complex Variables:
Introduction Limit, Continuity and Differentiability, analyticity, properties. Cauchy-Riemann equations in Cartesian & polar coordinates (without proof), Harmonic and conjugate harmonic functions, Milne-Thompson method.

UNIT-IV: Complex Integration
Line Integral, Cauchy's Integral theorem (without proof), Cauchy's Integral formulae (without proof)
power series: Taylors Series (without proof) Laurent's series (without proof) singular points, isolated single point, Pole of order m, essential singularity.

UNIT-V: Residue & Evaluation of Integrals
Residues, Cauchy's residue theorem (without proof)
Evaluation of Real Integrals: (a) $\int_0^{2\pi} f(sin\theta, cos\theta)d\theta$, (b) $\int_{-\infty}^{\infty} f(x)dx$
Bilinear Transformation-fixed points, cross ratio properties, invariance of circles.

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36^{th} Edition, 2010.
2. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.

References

1. M. K. Jain, SRK Iyengar, R.K. Jain, Numerical methods for Scientific and Engineering Computations , New Age International publishers.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.
3. Fundamentals of Complex Analysis by Saff E.B and A.D snider Pearson.
4. Advanced Engineering Mathematics by Louis C.Barrett, Mc. Graw Hill.
3. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., Mc-Graw Hill, 2004

Course outcomes: After learning the contents of this subject the student must be able to

1. Find a better approximate root of a given equation.
2. Estimate the derivative at a given value and integral of function.
3. Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
4. Taylor's and Laurent's series expansions of complex function.
5. Evaluate bilinear transformation.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE08) POWER SYSTEMS – I

B. TECH- III SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
None

Course Objective:
1. This subject deals with different types of layouts of power generating units and process involved in generating power.
2. It gives the detailed study of economic aspects of power system.
3. It gives the detailed study of substation layout and under ground cables.

UNIT-I:
Hydroelectric Power Stations:
Elements of hydro electric power station-types-classification of turbines-working principle- efficiency calculation and design principles for Pelton Wheel, Francis and Kaplan turbines-use of these turbines for various head heights-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies. Numerical problems.

UNIT-II:
Thermal Power Stations:
Coal Fired Thermal Power Stations:
Line diagram of Coal fired Thermal Power Station (TPS) - showing paths of coal handling, condensers, cooling water systems, ash and flue gasses. Types of steam turbines- Impulse Turbine-Reaction Turbine-Brief description of TPS components: Economizers, Boilers, Super heaters, Condensers, Chimney and cooling towers.
Nuclear Power Stations: Definitions - Nuclear Fission and Chain reaction - Nuclear fuels - Principle of operation of Nuclear reactor - Reactor Components: Moderators, Control rods, Reflectors and Coolants - Types of Nuclear reactors - Brief description of PWR, BWR and FBR - Radiation hazards: Shielding and Safety precautions.
Gas Power Stations: Principle of operation and components (Block Diagram Approach Only)

UNIT-III:
Economic aspects of Power generation and Tariff :
Definitions of connected load, maximum demand, base load and peak load plants. Load curve, load duration and integrated load duration curves - load, demand, diversity, capacity, utilization and plant use factors- Numerical Problems. Costs of Generation and their division into Fixed, Semi-Fixed and Running Costs.
Desirable Characteristics of a Tariff Method-Tariff Methods: Flat Rate, Block Rate, two-part, three – part, and power factor tariff methods and Numerical Problems.

UNIT-IV

Substations and Power Distribution Systems:

Classification of substations: Air insulated substations - Gas insulated substations (GIS), Substations layout showing the location of all the substation equipment.

Classification of Distribution Systems - Comparison of DC vs. AC and Underground vs. Overhead Distribution Systems - Requirements and Design features of Distribution Systems radial and ring main systems, different types of A.C distributors with concentrated and distributed loads.

UNIT-V: Underground Cables:

Types of Cables, Construction, Types of Insulating materials, Calculations of Insulation resistance and stress in insulation, Numerical Problems. Capacitance of Single and 3-Core cables, Numerical Problems. Grading of Cables - Capacitance grading. Intersheath grading. Numerical Problems.

Text Books

1. Principles of Power Systems by V.K Mehta and Rohit Mehta S.Chand & Company Ltd., New Delhi 2004.
2. A Text Book on Power System Engineering By Soni, Gupta, Bhatnagar & Chakrabarti, Dhanpat Rai & Co, 1998.

References

1. Electrical Power Generation, Transmission and Distribution by S.N.Singh., PHI, 2003.
2. Electrics Power By S.L.Uppal, Khanna Publishers
3. Power System Engineering- by R.K.Rajput Laxmi Publications (P) Limited, New Delhi 2006.
4. Electrical Power Systems, PSR, Murthy, BS Publications.

Course Outcomes

After the completion of this course, the students should be able to

1. Gain the knowledge on operation of Hydro Electric generation.
2. Acquire and interpret fundamental concepts Thermal generation.
3. Understand various economic aspects of Power system and tariff.
4. Acquire knowledge on power system distribution systems and substation
5. Understand design of underground cables

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18EE09) ELECTRICAL MACHINES-I

B. TECH- III SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
- Electrical Circuits –I & II

Course Objective:
1. Electrical machines course is one of the important courses of the Electrical discipline.
2. In this course the different types of DC generators and Motors, which are widely used in industry are covered and their performance aspects will be studied.

UNIT – I
Electromechanical Energy Conversion:
Electromechanical Energy Conversion - Forces and torque in magnetic field systems - Energy balance - Energy and force in a singly excited magnetic field system, determination of magnetic force, Co – Energy - Multi excited magnetic field systems.

UNIT – II
D.C. Generators Construction & operation:
D.C. Generators – Principle of operation – Action of commutator – constructional features – armature windings – lap and wave windings – simplex and multiplex windings – use of laminated armature – E.M.F Equation –Problems.
Armature reaction: Cross magnetizing and demagnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation.

UNIT – III
Types of D.C Generators & characteristics:
Methods of Excitation – separately excited and self-excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self-excite and remedial measures. Load characteristics of shunt, series and compound generators. Applications, problems with practical ratings.
Parallel operation of D.C series generators - Use of equalizer bar and cross connection of field windings - Load sharing.

UNIT – IV
D.C Motors Operation & Speed control:
D.C Motors – Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation. applications, problems with practical Ratings.
Speed control of D.C. Motors: Armature voltage and field flux control methods. Motor starters (3 point and 4 point starters).

UNIT – V
Testing of D.C. machines:
Losses – Constant & Variable losses – calculation of efficiency – condition for maximum efficiency.
Methods of Testing – direct, indirect and regenerative testing – Brake test – Swinburne's test Hopkinson's test – Field's test-separation of stray losses in a D.C. motor test.

Text Books:

1. Electrical Machines – P.S. Bimbra., Khanna Publishers.
2. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers, 3rd edition, 2004.

References

1. Performance and Design of D.C Machines – by Clayton & Hancock, BPB Publishers
2. Electric Machinery – A. E. Fritzgerald, C. Kingsley and S. Umans, Mc Graw-Hill Companies, 5th edition
3. Electromechanical Energy Conversion with Dynamics of Machines – by R. D. Begamudre, New Age International (P) Ltd., Publishers, 2nd edition, 1998.
4. Electric Machines – M. V. Deshpande, PHI Learning Pvt.Ltd.

Course Outcomes:

After the completion of this course, the students should be able to

1. Evaluate the stored and converted energy and also exerted force in electromechanical energy conversion devices.
2. Able to analyze and design the types of dc generators.
3. Able to select appropriate D.C Generator to meet the requirements of the application in industry.
4. To understand the characteristics and concept s of speed control.
5. Able to Test the performance and select appropriate D.C machine to meet the requirements of the application in industry.

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18EE10) ELECTROMAGNETIC FIELDS

B. TECH- III SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
- Engineering Physics
- Electrical Circuits-I & II

Course Objectives:
1. The objective of this course is to introduce the concepts of electric field and magnetic fields and their applications.
2. Utilized in the development of the theory for power transmission lines and electrical machines.

UNIT-I:
Electrostatics:
Basics of Co-ordinate systems: Rectangular, Cylindrical, Spherical system. Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Properties of potential function – Potential gradient – Gauss's law – Application of Gauss's Law – Maxwell's first law, div (D) = ρv – Laplace's and Poison's equations. Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field.

UNIT-II:
Dielectrics & Capacitance:
Behavior of conductors in an electric field – Electric field inside a dielectric material – polarization – Conductor and Dielectric boundary conditions – Capacitance – Capacitance of parallel plates, spherical and co-axial capacitors – with composite dielectrics – Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm's law in point form – Equation of continuity

UNIT-III:
Magnetostatics:
Static magnetic fields – Biot-Savart's law – Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current carrying wire – Relation between magnetic flux, magnetic flux density and MFI – Maxwell's second Equation, div(B)=0,
Ampere's law & applications:
Ampere's circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere's circuital law – Maxwell's third equation, Curl (H)=Jc.

UNIT-IV:
Force in Magnetic fields and Magnetic Potential:
Magnetic force - Moving charges in a Magnetic field – Lorentz force equation – force on a current element in a magnetic field – Force on a straight and a long current carrying conductor in a magnetic field – Force between two straight long and parallel current carrying conductors – Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole – Torque on a current loop placed in a magnetic field - Scalar magnetic potential and its limitations – vector magnetic potential and its properties –vector Poisson's equations - Self and Mutual inductance – Neumann's formulae – determination of self-inductance of a solenoid and toroid - mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field.

UNIT-V:

Time Varying Fields:

Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation, Curl (E)= -∂B/∂t – Statically and Dynamically induced EMFs – Simple problems - Modification of Maxwell's equations for time varying fields – Displacement current and Displacement current density – Power in EM Fields – Poynting Vector and Poynting Theorem.

Text Books:

1. Engineering Electromagnetics by William H. Hayt & John. A. Buck, Mc. Graw-Hill Companies, 7th Edition - 2009.
2. Electromagnetic Fields by Matthew.N.O.Sadiku, Oxford Publications

References

1. Introduction to E-Magnetics by CR Paul and S.A. Nasar, Mc-Graw Hill Publications
2. Engineering Electromagnetics by Nathan Ida, Springer(India) Pvt. Ltd. 2nd Edition
3. Introduction to Electrodynamics" by D J Griffiths, Prentice-Hall of India Pvt.Ltd, 2nd Edition.
4. Electromagnetics by Plonsy and Collin
5. Static and Dynamic Electricity Smyth.
6. Electromagnetics by J P Tewari.
7. Electromagnetics by J. D Kraus Mc Graw-Hill Inc. 4th edition 1992.

Course Outcomes:

After completion of this course the student will be able to -

1. Analyze the relation between the electric field and the magnetic field, about the various laws such as EFI, Potential and other concepts of these fields.
2. Understand the behavior of conductors and dielectrics, their boundary conditions, Maxwell's equations with respect to electrostatics.
3. Understand the magnetic field concepts using Biot-Savart law and Ampere's law.
4. Analyze the relation between two or more conductors when subjected to magnetic fields.
5. Understand the concepts of time varying fields in both electric and magnetic fields and their relationship in evaluating power.

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VAAGDEVI COLLEGE OF ENGINEERING

(AUTONOMOUS)

((B18CS50) OBJECT ORIENTED PROGRAMMING & DATA STRUCTURES

B. TECH- III SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-requisites: Programming for Problem Solving

Objectives:

1. To provide a comprehensive working knowledge on the object oriented language C++ and to implement abstract data types, linear and nonlinear data structures for problem solving.
2. To provide a foundation on generic programming based on over loading concepts, inheritance and virtuality.
3. To inculcate ability to grasp the behavior of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving.
4. To provide a working knowledge on programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees

UNIT-1

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope **(Book1:223-257)**, Constructors and destructors, parameter passing methods **(Book1:32-36)**, Inline functions, static class members**(Book1:144-147)**, this pointer, friend functions**(Book1:32-33)**, dynamic memory allocation and de-allocation (new and delete)**(Book1:127-128,576-577).**

UNIT-2

Function over Loading, Operator Overloading**(Book1:149-156,261-297)**, Generic Programming- Function and class templates**(Book1:327-352)**, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes**(Book1:301-325).**

UNIT-3

Algorithms, performance analysis- time complexity and space complexity**(Book 3:95-120)**. Review of basic data structures- The list ADT (Single Linked List, Double Linked List), Stack ADT**(Book3:271-286)**, Queue ADT, implementation, operations- insertion, deletion and searching**(Book3:317-333)**. Hash Table Representation, Hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing. **(Book3:381-394), (Book2:49-66)**

UNIT-4

Priority Queues _ Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion. **(Book3:464-478) (Book2:406-424)** Trees definitions. **(Book2:305-324)** ,Binary trees, Tree Traversing Techniques, Binary Search Trees ADT - Implementation, Operations Searching, Insertion and Deletion. **(Book3:529-545)**

UNIT-5

Graphs: Basic terminology, representations of graphs, graph search methods DFS, BFS. **(Book3:644-656) (Book2:561-584)Sorting :** Sorting Types of sorting, General sort concepts, Insertion sort**(Book2:505-515)**, Quick sort**(Book2:529-535)**, Heap sort, Merge sort**(Book2:546-552),** Comparison of all sorting methods.

Text Books:

1. The C++ Programming Language 3rd Edition Bjarne Stroustrup, Pearson Education.
2. Data Structures: A Pseudocode Approach with C++, Richard F Gilberg, Behrouz A Forouzan, Cengage Learning.
3. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
4. DataStructures And Algorithm in C++, M.T.Goodritch, R.Tamassia and D.Mount,Wiley India.

References

1. Object Oriented Programming With C++ 5th Edition ,E Balaguruswamy,Tata Mcgraw Hill Education Private Limited
2. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
3. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
4. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek,Cengage Learning. 4. Data Structures Using C++, D.s. Malik,Cengage Learning, India Edition.

Course Outcomes:

After the completion of this course, the students should be able to

1. Find the difference between structured programming and object oriented programming language and understanding the features of C++ supporting object oriented programming.
2. Explainand apply the major object oriented concepts to implement object oriented programs in C++.
3. Buildthe basic knowledge to handle operations like insertions, deletions, searching, and traversing mechanisms in linear data structures.
4. Examinewith advanced data structure such as hash tables and priority queue data structures.
5. Attain the knowledge on trees, balanced trees,graphs and developing C++ code for non-linear data-structures and Pattern Matching Algorithms.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE11) ELECTRICAL CIRCUITS LAB

B. TECH- III SEM. (EEE) **L/T/P/C**
0/0/3 /1.5

Prerequisites: Electrical Circuits-I, Electrical Circuits-II

Course Objectives:

- This course introduces the basic concept of circuits analysis which is foundation for all subjects of Electrical engineering.
- Analyze the resonance of series and parallel circuits.

List of Experiments

1. Verification of Kirchhoff's laws(KVL & KCL) .
2. Verification of Thevenin's, Norton's Theorems.
3. Verification of Maximum Power Transfer & Tellegen's Theorems.
4. Verification of Superposition and Reciprocity Theorems.
5. Locus Diagrams of RL and RC Series Circuits.
6. Series and Parallel Resonance.
7. Determination of Self, Mutual Inductances and Coefficient of coupling.
8. Determination of Open circuit, Short circuit and ABCD parameters of two port networks.
9. Verification of Compensation and Milliman's Theorems.
10. Verification of RMS value of complex wave.
11. Verification of Time response of first order (RC,RL) and Second order (RLC) networks for periodic non – sinusoidal inputs – Time constant and Steady state error determination.

Course Outcomes:

After the completion of this course, the students should be able to

1. Explain the concept of circuit laws
2. Verify network theorems
3. Determine Z, Y and ABCD parameters for a given two port network.
4. Evaluate the time response and frequency response characteristics of RLC series circuit and their resonance conditions.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS08) DATA STRUCTURES THROUGH C++ LAB

B. TECH- III SEM. (EEE) **L/T/P/C**
0/0/3/1.5

Course Objectives:

1. To provide a comprehensive working knowledge on the object oriented language C++ and to provide implementation experience on abstract data types, linear and non-linear data structures for problem solving.
2. To provide a working knowledge on generic programming based on over loading concepts, inheritance and virtuality.
3. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving.
4. To provide an application oriented working knowledge to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

1. Write a C++ program to demonstrate classes.
2. Write a C++ program to overload operator + to find the addition of two complex numbers.
3. Write a C++ program to demonstrate
   i) single level inheritance ii) multilevel inheritance iii) multiple inheritance
   iv) Hierarchical inheritance v) Hybrid inheritance
4. Write a C++ program to demonstrate on constructors (default, parameterised and copy constructor) and destructors
5. Write a C++ program for hashing with quadratic programming
6. C++ programs using class templates to implement the following using an array.

a) Stack ADT b) Queue ADT

7. Write C++ programs using class templates to implement the following using a singly linked list.
   a) Stack ADT b) Queue ADT
8. Write C++ programs using class templates to implement the deque (double ended queue) ADT using a doubly linked list and an array.
9. Write C++ programs, using class templates, that use non-recursive functions to traverse the given binary tree in
   a) preorder b) inorder and c) postorder.
10. Write C++ programs, using class templates, that use recursive functions to traverse the given binary tree in
    a) preorder b) inorder and c) postorder.
11. Write a C++ program using class templates to perform the following operations

a) Insert an element into a binary search tree.

b) Delete an element from a binary search tree.

c) Search for a key element in a binary search tree.

12. Write C++ programs using class templates for the implementation of bfs and dfs for a given graph.

13. Write C++ programs using class templates for implementing the Heap sort.

14. Write a C++ program using class templates to perform the following operations

a) Insertion into a B-tree b) Deletion from a B-tree

15. Write a C++ program using class templates to perform the following operations

a) Insertion into an AVL-tree b) Deletion from an AVL-tree

16. Write a C++ to implement Knuth-Morris-Pratt pattern matching algorithm.

Text Books:

1. Data structures a pseudo code approach with c++, Indian edition, R.F.Gilberg and B.A.Forouzan Cengage Learning.

2. Programming Prinicples and Practice using C++, B.Stroustrup, Addition-Wiesly (Pearson Education)

References

1. Data Structures and STL,W.J.Collins,mc Graw Hill,Internationational Edition.
2. Data Structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley &sons.
3. The Art,Philosophy and Science of OOP with C++,Rick Miller,SPD.
4. C++ for Programmers ,P.J.Deitel and H.M.Deitel,PHI/Pearson.

COURSE OUTCOMES:

After the completion of this course, the students should be able

1. To be able to design and implement Object Oriented Programing concepts.
2. To select the appropriate Data Structure for given problem.
3. To illustrate operations like searching, insertion, deletion and traversing mechanism on various Data Structures and to gain practical knowledge on the applications of Data Structure.
4. To understand and apply the hashing techniques and to able to design and implement Linear and Non-Linear Data Structure.

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VAAGDEVI COLLEGE OF ENGINEERING
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(B18MC02) ENVIRONMENTAL SCIENCES

B. TECH- III SEM. (EEE) **L/T/P/C**
2/0/0 /0

Pre-Requisites:
NONE

Course Objectives:
This course is aimed to gain knowledge on

- Understanding the importance of ecological balance for sustainable development.
- Understanding the impacts of developmental activities and mitigation measures.
- Understanding the environmental policies and regulations

UNIT-I .
Ecosystems:
Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT-II
Natural Resources:
Classification of Resources:
Living and Non-Living resources,
Water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems.
Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources,
Land resources: Forest resources,
Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III
Biodiversity And Biotic Resources:
Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV:
Environmental Pollution and Control Technologies:
Environmental Pollution:
Classification of pollution,
Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards.
Water pollution: Sources and types of pollution, drinking water.
Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil.
Noise Pollution: Sources and Health hazards, standards,
Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management.

Pollution control technologies: Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation.

Global Environmental Issues and Global Efforts:

Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. NAPCC-GoI Initiatives.

UNIT-V

Environmental Policy, Legislation & EIA:

Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

Towards Sustainable Future:

Concept of Sustainable Development Goals, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

Text Books

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

References

1. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
6. Introduction to Environmental Science by Y. Anjaneyulu, BS.Publications.

Course Outcomes:

After the completion of this course, the student should be able to

1. Recall previously learned ecosystem and find how the biodiversity changes went in the environment.
2. Demonstrate outlines of types of pollutions and related to day-to-day life.
3. Organize important seminars on natural resources.
4. Apply models of food chains and energy flow models to solve the identified parameters.
5. Classify the types of pollutants and distinguish the functions of sustainable development that take part in the environment.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC45) PULSE DIGITAL AND LINEAR INTEGRATED CIRCUITS

B. TECH- IV SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites: None
Course Objectives:
To explain the complete response of R-C and R-L-C transients circuits.
To explain clippers, clampers, switching characteristics of transistors and sampling gates.
To introduce the basic building blocking of linear integrated circuits.
To teach the linear and non-linear application of operational amplifiers.
To introduce the theory and applications of analog multipliers and PLL.
To teach the theory of ADC and DAC

UNIT I
LINEAR WAVE SHAPING: High pass, low pass RC circuits, their response for sinusoidal, step, pulse. High pass RC network as differentiator and Low Pass RC network as integrator, , RL and RLC circuits and their response for step input.

UNIT II
NON-LINEAR WAVE SHAPING: Diode clippers, Transistor clippers, clipping at two independent levels. Clamping operation, clamping circuit taking Source and Diode resistances into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, synchronized clamping.

UNIT – III
Introduction to integrated circuits :Integrated circuit definition, classification, development of IC‘s OPAMP and Applications: Basic block diagram of OP-AMP, IC 741 introduction, pin diagram, ideal DC & AC characteristics, configurations (or) modes of operations, concepts of virtual ground. Basic op-amp applications, instrumentation amplifier, ac amplifier, Integrator, differentiator, electronic analog computation, comparator ,waveformgenerator‘s and active filters.

UNIT IV:
TIMERS & PHASELOCKED LOOPS Introduction to 555 timer, functional diagram, monostable and astable operations and applications, Schmitt Trigger. PLL – introduction, block schematic, principles and description of individual block of 565.

UNIT V:
D-A AND A-D CONVERTERS Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs – parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC specifications.

Text Books:
1. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw- Hill, 1991.
2. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002

References:
1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
2. Fundamentals of pulse and digital circuits-Ronald.J.Tocci,3 ed. ,2008

3. Op amps and linear intergratd circuits concepts and applications james M. Fiore, Cengage Learning/Jaico, 2009.
4. Operational amplifiers with linear integrated Circuits by K.Lal Kishore Pearson, 2009.
5. Op-amps and linear ics – ramakanth A. Gayakwad, PHI, 2003.
6. Linear integrated circuits- D. Roy Chowdhury, New Age Inernational (p) let,

Course Outcomes: After the completion of this course, the student should be able to

1. Understand operational amplifiers with linear integrated circuits.
2. Classify the different families of digital integrated circuits and their characteristics.
3. Identify the applications of diode as integrator, differentiator, clippers, clamper circuits.
4. Understand the timer circuits and phase locked loops
5. Explore various A-D and D-A converters and its applications

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE12) ELECTRICAL MACHINES-II

B. TECH- IV SEM. (EEE) **L/T/P/C**
3/1/0/4

Pre-Requisites:
- Electrical Circuits- I& II
- Electromagnetic Fields
- Electrical Machines-I

Course Objectives:

As an extensionof Electrical Machines-I course this subject facilitates

1. To study the performance of Transformers and Induction motors which are the major part of industrial drives and agricultural pump sets.
2. To know the applications of transformers and induction machines

UNIT-I:
Single Phase Transformers -Construction & operation:
Single phase transformers – constructional details –minimization of hysteresis and eddy current losses –E.M.F equation –operation on no load and on load – phasor diagrams.Equivalent circuit –losses and efficiency –regulation . All day efficiency –effect of variation of frequency & supply voltage on iron losses.

UNIT-II:
Testing of Single Phase Transformer:
OC and SC tests- Sumpner's test- predetermination of efficiency and regulation – Separation of losses test. Parallel operation with equal and unequal voltage ratios.

UNIT-III:
Auto & Polyphase Transformers:
Autotransformers –equivalent circuit – comparison with two winding transformers.
Polyphase transformers –Polyphase connections- Y/Y, Y/Δ, Δ/Y, Δ/Δ, and open Δ. Third harmonics in phase voltages –three winding transformers –teriary windings- determination of Zp, Zs, and Zt transients in switching –off load and on load tap changing, Scott connection.

UNIT-IV:
Polyphase Induction Motors:
Polyphase induction motors-construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor EMF and rotor frequency - rotor reactance, rotor current and PF at standstill and during operation.
Characteristics of Induction Motors:
Rotor power input, rotor copper loss and mechanical power developed and their interrelation-torque equation-deduction from torque equation - expressions for maximum torque and starting torque - torque slip characteristic - equivalent circuit - Phasor diagram - crawling and cogging.

UNIT-V:
Circle Diagram & Speed Control of Induction Motors:
No-load Test and Blocked rotor test –Predetermination of performance-Methods of starting and starting current and Torque calculations.
Speed Control Methods:
Speed control-change of voltage, change of frequency, V/f, injection of an EMF into rotor circuit – Numerical Problems. Induction generator – principle of operation and its role in electrical systems.

Text Books

1. Electrical machines-PS Bhimbra, Khanna Publishers.
2. Electric Machines –by I.J.Nagrath& D.P.Kothari, Tata McGraw Hill, 7th Edition.2009

References

1. Electric machinery - A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition
2. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition.
3. Performance and Design of AC Machines-M.G. Say. BPB Publishers.
4. Electrical Machines – M.V Deshpande, Wheeler Publishing
5. Electrical Machines – J.B. Gupta, S.K. Khataria & Son's Publications

Course Outcomes:

After the completion of this course, the students should be able to

1. Understand the concepts and performance of single phase transformer.
2. Test the performance of single phase Transformer.
3. Choose a suitable three phase transformer based on its application and also convert three phase to two phases or vice versa.
4. Understand the concepts of Construction, operation characteristics, testing (concept of circle diagram) and speed.
5. Analyze speed torque characteristics and control the speed of induction motors.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE13) ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

B. TECH- IV SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
- Electrical Circuits
- Electronic Devices and Circuits
- Digital Integrated Circuits
- Electromagnetic Fields
- Electrical Machines

Course Objective:
1. Electrical measurements course introduces the basic principles of all measuring instruments.
2. It also deals with the measurement of RLC parameters voltage, current Power factor, power, energy and magnetic measurements.

UNIT-I:
Introduction to Measuring Instruments:
Classification – deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type instruments – expression for the deflecting torque and control torque – Errors and compensations, extension of range using shunts and series resistance. Electrostatic Voltmeters-electrometer type and attracted disc type – Extension of range of E.S. Voltmeters.

UNIT-II:
Potentiometers & Instrument Transformers:
Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage. A.C. Potentiometers: polar and coordinate type's standardization – applications. CT and PT – Ratio and phase angle errors

UNIT-III:
Measurement of Power & Energy:
Single phase dynamometer wattmeter, LPF and UPF, Double element and three element dynamometer wattmeter, expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems.
Single phase induction type energy meter – driving and braking torques – errors and compensations – testing by phantom loading.

UNIT-IV:
D.C & A.C Bridges:
Method of measuring low, medium and high resistance – sensitivity of Wheat-stone's bridge – Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, measurement of high resistance – loss of charge method.

Measurement of inductance- Factor - Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge. Measurement of capacitance and loss angle - De Sauty Bridge. Wien's bridge – Schering Bridge.

UNIT-V:

Electronic Measurements & Instrumentation

Introduction to electronic measurements-digital voltmeters and multimeters, Phase, Time, Frequency measurement, Oscilloscopes, Error analysis.

Definition of transducers, Classification of transducers, Advantages of Electrical transducers; Principle operation of LVDT and its Applications, Strain gauge and its principle of operation.

Text Books

1. Electrical & Electronic Measurement & Instruments, A.K.Sawhney Dhanpat Rai & Co. Publications.
2. Electrical and Electronic Measurements and Instrumentation, R. K. Rajput, S. Chand & Company Ltd.

References

1. Electrical and Electronic Measurements, G. K. Banerjee, PHI Learning Pvt. Ltd.
2. Electrical Measurements and Measuring Instruments, Golding and Widdis, Reem Publications.
3. Electrical Measurements, Buckingham and Price, Prentice – Hall
4. Electrical Measurements: Fundamentals, Concepts, Applications, Reissland, M.U, New Age International (P) Limited, Publishers.
5. Electrical Measurements and measuring Instruments, E.W. Golding and F.C. Widdis, fifth Edition, Wheeler Publishing.

Course Outcomes:

After the completion of this course, the student should be able to

1. Identify Different types of measuring instruments and their construction, operation and characteristics
2. Classify Resistance, voltage, current measurements through potentiometers, voltage and current measurements through instruments transformers.
3. Find Power and energy measurements through watt and energy meters with examples.
4. Calculate Resistance measurements through DC bridges, capacitance and inductance measurements through AC bridges and different types of transducers.
5. Gain Knowledge on Measurement of frequency and phase through CRO, range extension of measuring instruments and different types of errors & their reduction methods in measuring instruments.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE14) POWER SYSTEMS – II

B. TECH- IV SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Electrical Circuits-I
Electrical Circuits-II
Electromagnetic Fields
Power Systems-I

Course Objective:
This course is an extension of Power systems-I course.

- It deals with basic theory of transmission lines modeling and their performance analysis.
- Also this course gives emphasis on Mechanical design of Transmission lines and Insulators.

UNIT-I: Power system components and per unit system:
Basic components of a power system, Single line diagram – per phase model of a three phase balanced system and per unit analysis – Generator - transformer – transmission line and load representation for different power system studies, Examples of per unit system.

UNIT-II: Transmission Line Parameters
Types of Conductors, Inductance and capacitance of single phase and three phase lines, concept of self GMD (GMR), Mutual GMD, double circuit line, inductance of composite conductors, transposition, Numerical problems, Effect of earth on capacitance, skin effect and proximity effect.

UNIT-II: Performance of Transmission Lines
Classification of Transmission Lines - Their model representations - Nominal-T, Nominal-Pie representation of Medium and Long Transmission lines - A, B, C, D Constants for all lines, Numerical Problems. Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems.
Long Transmission Line-Rigorous Solution, Interpretation of the Long Line Equations, Incident, Reflected and Refracted Waves - Surge Impedance and SIL of Long Lines - Numerical Problems - Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line.

UNIT-IV Power System Transients
Wave Length and Velocity of Propagation of Waves - Types of System Transients - Travelling wave on transmission line - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-junction, Lumped Reactive Junctions - Bewley's Lattice Diagrams - Numerical Problems
Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

UNIT-V Overhead Line Insulators & Sag and Tension Calculations
Types of Insulators, String efficiency and Methods for improvement voltage distribution, calculation of string efficiency - Capacitance grading and Static Shielding - Numerical Problems

Sag and Tension Calculations with equal and unequal heights of towers, Effect of Wind and Ice on weight of Conductor, Numerical Problems - Stringing chart and sag template and its applications.

Text Books

1. Electrical Power Systems by C.L.Wadhawa New age International (P) Limited, Publishers 1997.
2. A course in Power Systems , J B Gupta, Katson publishers.

References

1. Elements of Power System Analysis, William D. Stevenson, McGraw Hill.
2. Elements of Electrical Power Station Design, 3rd Edition, Wheeler. Pub.1998-M.V.Deshpande.

Course Outcomes

After the completion of this course, the students should be able to

1. Represent power system in P.U values.
2. Calculate inductance and capacitance of single phase and three phase.
3. Analyse performance of transmission line.
4. Understand the transients on transmission line.
5. Compute sag and string efficiency.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE15) CONTROL SYSTEMS

B. TECH- IV SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Engineering Physics
Mathematics-I&II
Electrical Circuits-I&II

Course Objectives:
In this course it is aimed to introduce

1. The principles and applications of control systems in everyday life.
2. The basic concepts of block diagram representation,
3. Introduce concept of stability of systems in frequency domain and time domain.
4. Concept of state space representation and multi input and multi output systems.

UNIT-I:
Introduction
Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feedback Characteristics, Effects of feedback. Mathematical models – Differential equations, Impulse Response and transfer functions-Translational and Rotational mechanical systems.

Transfer function representation
Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using mason's gain formula.

UNIT-II:
Time Response Analysis
Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

UNIT-III:
Stability Analysis
The concept of stability – Routh- Hurwitz stability criterion – Absolute stability and conditional stability.
Root Locus Technique:
The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.
Frequency Response Analysis:
Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT-IV:

Stability Analysis in Frequency Domain

Polar Plots, Nyquist Plots and applications of Nyquist criterion to find the stability–Effects of adding poles and zeros to G(s)H(s) on the shape of the Nyquist diagrams.

Classical Control Design Techniques:

Compensation techniques – Lag, Lead, and Lead-Lag Controllers design in frequency Domain, PID Controllers- Numerical Problems.

UNIT-V:

State Space Analysis of Continuous Systems

Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization - Solving the Time invariant state Equations- State Transition Matrix and its Properties. Concepts on Controllability and Observability.

Text Books

1. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.
2. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John wiley and sons.

References

1. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
2. Control Systems Engg. by NISE 3rd Edition – John wiley
3. Control Systems by S.Kesavan, Hitech Publications.
4. Modeling & Control of Dynamic Systems by Narciso F. Macia George J. Thaler, Thomson Publishers.
5. Solutions and Problems of Control Systems by A.K.Jairath, CBS Publications,1992.
6. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

Course Outcomes: After going through this course, the student able to

1. Understand the concept of feedback and analyze the control system components by their Mathematical modeling.
2. Estimate the time domain specifications and steady state error.
3. Apply various time domain and frequency domain techniques to assess the system performance.
4. Improve the system performance by designing a suitable controller and/or a compensator for a specific application.
5. Test system Controllability and Observability using state space representation and applications of state space representation to various systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC05) SWITCHING THEORY AND LOGIC DESIGN

B. TECH- IV SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre Requisites: None

Course objectives:
This course provides in-depth knowledge of switching theory and the design techniques of digital circuits, which is the basis for design of any digital circuit. The main objectives are:

- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
- To implement simple logical operations using combinational logic circuits
- To design combinational logic circuits, sequential logic circuits.
- To impart to student the concepts of sequential circuits, enabling them to analyze sequential systems in terms of state machines.
- To implement synchronous state machines using flip-flops.

UNIT-I: Number System and Boolean Algebra And Switching Functions:
Review of number systems, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes.
Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Gates, Multilevel NAND/NOR realizations.

UNIT-II:
Minimization and Design of Combinational Circuits:
Introduction, the minimization of switching function using theorem, The Karnaaugh Map Method-Up to Five Variable Maps, Don‘t Care Map Entries, Tabular Method, Design of Combinational Logic: Adders, Subtractors, comparators, Multiplexers, Demultiplexers, Decoders, Encoders and Code converters.

UNIT-III:
Sequential Machines Fundamentals and Applications:
Introduction: Basic Architectural Distinctions between Combinational and Sequential circuits, Latches, Flip Flops: SR, JK, Race Around Condition in JK, JK Master Slave, D and T Type Flip Flops, Excitation Table of all Flip Flops, Design of a Clocked Flip-Flop , Timing and Triggering Consideration, Conversion from one type of Flip-Flop to another., Shift Registers, Applications of Shift Registers.

UNIT-IV:
Sequential Circuits-I:
Introduction, State Diagram, Analysis of Synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, synthesis of synchronous sequential circuits, serial binary adder, Sequence Detector, Parity-bit Generator, Design of Asynchronous & Synchronous Counters, Design of Synchronous Modulo N –Counters.
UNIT-V:
Sequential Circuits-II:

Finite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines.
Algorithmic State Machines: Salient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

Text Books:
1. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rdEdition, Cambridge.
2. Switching Theory and Logic Design – A Anand Kumar, PHI,2013.

Reference Books:
1. Digital Design- Morris Mano, PHI, 3rd Edition.
2. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & Sons Inc.
3. Digital Fundamentals – A Systems Approach – Thomas L. Floyd, Pearson, 2013.
4. Digital Logic Design - Ye Brian and HoldsWorth, Elsevier
5. Fundamentals of Logic Design- Charles H. Roth, Cengage LEanring, 5th, Edition, 2004.
6. Digital Logic Applications and Design- John M. Yarbrough, Thomson Publications, 2006.
7. Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.

Course Outcomes: After the completion of this course, the students should be able to:

1. Utilize and explain the functionality of logic gates (AND, NAND, OR, NOR, XOR, XNOR, NOT).
2. Design different combinational circuits using minimization techniques.
3. Explain various flip flops, and design of registers and counters.
4. Apply the design procedures to design basic sequential circuits.
5. Analyze and design of small sequential circuits and to use standard sequential functions/building blocks to build more complex circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC47) PULSE DIGITAL AND LINEAR INTEGRATED CIRCUITS LAB

B. TECH- IV SEM. (EEE) **L/T/P/C**
0/0/3//1.5

Prerequisites: Pulse Digital and Linear Integrated Circuits

Course Objectives
- To design and construct the R-C circuits, clippers, clampers.
- To design and analyse of adder, subtractor using IC741.
- To understand the operations of differentiator and integrator using IC 741.
- To design and analyses of active filer.
- To construct and understand of the different multivibrator using IC 555.
- To construct and analyses different waveform generators IC741.
- To understand the operation of VCO using IC 566.

List of Experiments

1. Linear Wave Shaping
2. Non Linear Wave Shaping-Clippers, Clampers
3. OP AMP Applications – Adder, Subtractor, Comparators.
4. Integrator and Differentiator Circuits using IC 741.
5. Instrumentation Amplifier using op-Amp
6. Active Filter Applications – LPF, HPF (first order)
7. IC 741 Waveform Generators – Sine, Squarewave and Triangular waves.
8. IC 555 Timer – Monostable and Astable Multivibrator Circuits.
9. Schmitt Trigger Circuits – Using IC 741
10. PLL Using 1C 565
11. Design of VCO using IC 566
12. 4 bit DAC using OP AMP

Course Outcomes: After the completion of this course, the student should be able to

1. Understand the applications of diode as integrator, differentiator, clippers and clamper circuits.
2. Design circuits using operational amplifiers for various applications.
3. Analyze the VCO & PLL circuits.
4. Understand and implement DAC conversions using OP AMP.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE16) ELECTRICAL MACHINES LAB-I

B. TECH- IV SEM. (EEE) **L/T/P/C**
0/0/3/1.5

Prerequisites:
Electrical Circuits I & II,
Electro Magnetic Fields,
Electrical Machines – I.

Course Objectives:

1. To introduces concept of rotating machines and principle of the Electromechanical energy conversion
2. To understand functioning of different types of dc machines.
3. To estimate losses and estimation of various dc machines.

List of Experiments

1. Magnetization characteristics of DC shunt generator, determination of critical field resistance and critical speed.
2. Load test on DC shunt generator, determination of its characteristics.
3. Load test on DC series generator, determination of its characteristics.
4. Load test on DC compound generator, determination of its characteristics.
5. Hopkinson's test on DC shunt machines, predetermination of efficiency.
6. Fields test on DC series machines, determination of efficiency.
7. Swinburne's test on DC Shunt Machine, predetermination of its efficiency.
8. Speed control of DC shunt motor.
9. Brake test on DC compound motor, determination of performance curves.
10. Brake test on DC shunt motor, determination of performance curves.

Course Outcomes: After the completion of this course, the student should be able to

1. Select range of apparatus based on the ratings of DC Machines.
2. Determine Characteristics of DC machines by conducting tests.
3. Evaluate the efficiency of the machine by analyzing test results.
4. Study speed control methods for dc machines.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE17) ELECTRICAL MACHINES-III

B. TECH-V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Electrical Machines-I
Electrical Machines-II

Course Objectives:
1. It deals with the detailed analysis of Synchronous Generators and Motors which are prime source of Electrical power generation and utilities.
2. Also covers different types of single phase motors which are having significant applications in household appliances and control systems.

UNIT-I:
Construction and Principle of operation of synchronous machine:
Constructional features of round rotor and salient pole machines, Armature windings: Integral slot and fractional slot windings; Distributed and concentrated windings Distribution Pitch and windings factors, E.M.F Equation.
Harmonics in generated E.M.F. Superposition of harmonics, Armature reaction, Leakage reactance, Synchronous reactance and impedance, Experimental determination, Phasor diagram, Load characteristics.

UNIT-II:
Regulation of Synchronous generator:
Regulation by synchronous impedance method, MMF. Method, Z.P.F. method and A.S.A methods, Salient pole alternators. Two reaction analysis, Experimental determination of X_d and X_q (Slip test) Phasor diagrams, Regulation of salient pole alternators.

UNIT-III:
Parallel operation of Synchronous generators:
Synchronizing alternators with infinite bus bars, Synchronizing power torque, Parallel operation and load sharing, Effect of change of excitation and mechanical power input, Analysis of short circuit current waveform, Determination of subtransient, Transient and steady state reactances.

UNIT-IV:
Synchronous motors- principle of operation:
Theory of operation, Phasor diagram, Variation of current and power factor with excitation synchronous condenser, Mathematical analysis for power developed
Power circles: Excitation and power circles - Hunting and its suppression, Methods of starting, synchronous induction motor.

UNIT-V:
Single phase motors Special machines:
Single phase Motors: Single phase induction motor- Constructional features Double revolving field theory, Cross Field theory Equivalent Circuit - Split phase motors – Capacitor start Capacitor run motors, shaded pole motor. Principle of A.C. Series motor-Universal motor, Stepper motor, Schrage Motor, BLDC Motor, PMDC and Reluctance Motor. (Qualitative Treatment only).

Text Books:

1. Electrical Machines – by P.S. Bimbra, Khanna Publishers.
2. Electric Machines- by I.J. Nagrath & D.P. Kothari, Tata Mc Graw-Hill Publishers, 3rd Edition 2006.

Reference Books:

1. Performance and Design of AC Machines, MG. Say, BPB Publishers
2. Electrical Machines by Mulukutla S.Sarma, Mukesh K. Pathak, Cengage Learning, 2009.
3. Electric Machinery – by A.E. Fitzgerald, C.Kingsley and S.Umans,Mc Graw-Hill Companies, 5th edition, 1990.

Course Outcomes:

After the completion of this course, the student should be able to

1. Demonstrate basic concepts of AC machines.
2. Analyze the concepts of regulation of synchronous generators.
3. Evaluate performance characteristics of synchronous machines.
4. Analyze the operating characteristics of synchronous motors.
5. Identify the Construction, operation and characteristics of single-phase motor and special machines

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE18) POWER SYSTEM PROTECTION

B. TECH- V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Power system I
Power system II

UNIT I:
Introduction to Circuit Breakers
Circuit Breakers: Elementary principles of Arc Interruption, Arc Phenomena, Restriking Voltage and Recovery voltages. - Restriking Phenomenon, Average and Max. RRRV, Numerical Problems - Current Chopping and Resistance Switching - CB Ratings and Specifications: Types and Numerical Problems. – Auto Reclosures. Description and Operation of following types of circuit breakers: Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit breakers.

UNIT II:
Electromagnetic and Static Relays
Basic principle of electromagnetic Relay Operation, Types of Over Current Relays: Instantaneous, DMT and IDMT types. Application of relays: Over Current/ Under Voltage Relays, Direction Relays, Differential Relays and Percentage Differential Relays. Universal torque equation, Distance relays: Impedance, Reactance and Mho and Offset Mho relays, Characteristics of Distance Relays and Comparison. Static Relays: Static Relays verses Electromagnetic Relays. Introduction to Numerical Relays.

UNIT III:
Protection of Generators and Transformers
Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter-turn fault Protection. Numerical Problems on % Winding Unprotected. Protection of transformers: Percentage Differential Protection, Numerical Problem on Design of CT s Ratio, Buchholz relay Protection.

UNIT IV:
Protection of Transmission lines and bus bar
Protection of Lines: Over Current, Carrier Current and Three-zone distance relay protection using Impedance relays. Translay Relay. Protection of Busbars – Differential protection

UNIT V:
Neutral grounding and protection against over voltages
Grounded and Ungrounded Neutral Systems:- Effects of Ungrounded Neutral on system performance, Arcing Grounds Methods of Neutral Grounding: Solid, Resistance, Reactance – Peterson Coil, Generation of Over Voltages in Power Systems.-Protection against Lightning Overvoltages – Valve type and Zinc-Oxide Lightning Arresters.

Text Books:
1. Paithankar and S.R.Bhide, Fundamentals of Power System Protection, PHI, 2003.
2. C R Mason, Art & Science of Protective Relaying – Wiley Eastern Ltd.

Reference:
1. B.L.Soni, Gupta, Bhatnagar, Chakrabarthy, A Text book on Power System Engineering, Dhanpat Rai & Co.

Course Outcomes:
After the completion of this course, the student should be able to

1. Understand the basic construction and principle of arc interruptions in Circuit Breaker and its types.
2. Understand the basic principle of electromagnetic Relay Operation and its various types to different applications.
3. Explore the various schemes of protecting generator and transformers.
4. Explore various relaying operation in protecting the transmission line and bus bar.
5. Learn the necessity of neutral grounding and protection against overvoltage.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE19) POWER ELECTRONICS

B. TECH: V-SEMESTER **L/T/P/C**
3/1 /0 /4

Prerequisite:
Electrical Circuits
Electronic Devices and Circuits

UNIT-I
Power Switching Devices :
Power Diode, Thyristors–Silicon controlled rectifiers (SCR's) –Basic theory of operation of SCR– Static characteristics and Dynamic characteristics of SCR – Turn on and turn off methods— Snubber circuit design– Characteristics of power MOSFET and power IGBT–Basic requirements of gating circuits for SCR, IGBT and MOSFET.

UNIT–II
Single-Phase AC-DC Converters :
Single-phase half wave-controlled rectifiers – R load and RL load with and without freewheeling diode – Single-phase full wave-controlled rectifiers – center tapped configuration and bridge configuration- R load and RL load with and without freewheeling diode – RLE load with rectification mode and inversion mode – Single-phase semi -controlled rectifiers. Effect of source inductance in single-phase fully controlled bridge rectifier with continuous conduction.

UNIT–III
Three Phase AC-DC Converters :
Three-phase half wave-controlled rectifier with R and RL load – Three-phase fully controlled rectifier with R and RL load – Three-phase semi controlled rectifier with R and RL load. Effect of source inductance in three-phase fully controlled bridge rectifier with continuous conduction. Basics of Dual Converters.

UNIT–IV
DC–DC Converters:
Time-Ratio and Current Limit control- Analysis of Buck, Boost and Buck-Boost converters in Continuous Conduction Mode (CCM) and Discontinuous Conduction Modes (DCM) – Output voltage equations using volt-sec balance in CCM & DCM output voltage ripple & inductor current, ripple for CCM only.

UNIT – V
DC–AC Converters and AC-AC Regulators:
DC–AC Converters
Single- phase half bridge and full bridge inverters with R and RL loads – three-phase square wave inverters – 120^0 conduction and 180^0 conduction modes of operation – PWM inverters – Quasi-square wave pulse width modulation – Sinusoidal pulse width modulation – Introduction to basic series and parallel Inverters.

AC-AC Regulators

Static V-I characteristics of TRIAC and modes of operation – Single-phase AC-AC regulator phase angle control with R and RL load – For continuous and discontinuous conduction- Introduction to single-phase cyclo-converter.

Text Books:

1. M. H. Rashid, "Power Electronics: Circuits, Devices, and Applications", Pearson Education India,2009.
2. N. Mohan and T. M. Undeland, "Power Electronics: Converters, Applications and Design",JohnWiley& Sons, 2007.

References:

1. R. W. Erickson and D. Maksimovic, "Fundamentals of Power Electronics", Springer Science & Business Media, 2007.
2. P. S. Bhimbra "Power Electronics", Khanna Publications,2012.
3. L. Umanand, "Power Electronics: Essentials and Applications", Wiley India, 2009.
4. M.D. Singh & K.B. Kanchandhani "Power Electronics", Tata Mc Graw Hill, 2017.

Course Outcomes:

After the completion of this course, the student should be able to

1. Understand the differences between signal level and power level devices.
2. Examine single phase-controlled rectifier circuits.
3. Understand three phase-controlled rectifier circuits.
4. Learn the operation of DC-DC choppers.
5. Study the operation of DC-AC converters and AC-AC voltage regulators.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE20) ELECTRIC MACHINE DESIGN
(PROFESSIONAL ELECTIVE-I)

B. TECH- V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Electrical Machines-I
Electrical Machines-II
Electrical Machines-III

Course Objectives:
This Course will develop student's knowledge in/on

1. To impart knowledge on principles and design of static and rotating electrical machines.
2. To give a basic idea about computer aided design (CAD) and finite element method.

UNIT-I
Basic Considerations:
Basic concept of design, Limitation in design, Standardization, modern trends in design and Manufacturing techniques, Classification of insulating materials. Modes of heat dissipation & temperature rise time curves. Methods of cooling ventilation (induced & forced, Radial & axial), Direct cooling & quantity of cooling medium. Calculation of total mmf and magnetizing current. Specific permeance and leakage reactance.

UNIT-II
Design of DC Machines:
Output equation, choice of specific loading and choice of number of poles, Design of Main dimensions of DC machines, Design of armature slot dimensions, Commutator and brushes, Magnetic circuit – estimation of ampere turns, Design of yoke and poles- main and inter poles, Field windings-shunt, Series and inter poles.

UNIT-III
Design of Transformers (Single Phase):
Output equation for single phase, Choice of specific loadings, Expression for volts/turn, determination of main dimensions of the core, types of windings and estimation of number of number of turns and conductor cross sectional area of primary and secondary windings, estimation of no load current, Expression for leakage reactance and voltage regulation.
Design of Transformers (Three Phase):
Output equation for three phase transformers, Choice of specific loadings, expression for volts/turn, Determination of main dimensions of the core, Types of windings and estimation of number turns and conductor cross sectional area of primary and secondary windings, Estimation of no load current, expression for leakage reactance and voltage regulation. Design of tank and cooling tubes (round and rectangular).

UNIT-IV
Design of Induction Motors:
Output equation, choice of specific loadings, Main dimensions of three phase induction motor, Stator winding design, Choice of length of the air gap, estimation of number of slots for the squirrel cage

rotor, Design of Rotor bars and end ring, Design of Slip ring induction motor, Estimation of No load current and leakage reactance, and Circle diagram.

UNIT-V Design of Synchronous Machines:
Output equation, Choice of specific loadings, Short circuit ratio, Design of main dimensions, Armature slots and windings, Slot details for the stator of salient and non- salient pole synchronous machines. Design of rotor of salient pole synchronous Magnetic circuits, Dimensions of the pole body, Design of the field winding, and Design of rotor of non- salient pole machine, Introduction to computer aided design.

Text Book:

1. A K Sawhney, "A Course in Electrical Machine Design", Dhanpat rai *and* sons, Delhi.
2. Generalized theory of electrical machines-Dr.P.S.Bhimbhra

References:

1. M. V. Deshpande, " Design and Testing of Electrical Machines", Wheeler Publishing.
2. Generalized theory of electrical machines-Dr.P.S.Bhimbhra
3. R. K. Agarwal, " Principles of Electrical Machine Design", Essakay Publications, Delhi.
4. Ramamoorthy M, "Computer Aided Design of Electrical Equipment", East-West Press.
5. M. N. O. Sadiku, " Numerical techniques in Electromagnetics", CRC Press Edition-2001

Course Outcome: After the completion of this course, the student should be able to

1	Understand the basic design consideration, standards. Study the heat dissipation, cooling characteristics and electrical characteristics of various dielectric materials.
2	Understand the design, choice of materials and specifications in DC machines
3	Understand and design the main dimensions of each parts of a transformers
4	Design the constructional features of induction motors and estimate their currents and reactance
5	Design the constructional features of synchronous motors

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE21) ELECTRICAL DISTRIBUTION SYSTEMS
(PROFESSIONAL ELECTIVE-I)

B. TECH-V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Power Systems- I
Power Systems-II

Course Objectives:
- To study the fundamental principles and various parts/components of power distribution systems.
- To identify the various Electric loads & their characteristics
- Impart knowledge of Distribution system protection.
- Understanding protective devices coordination.
- Power factor improvement & Voltage control.

UNIT – I
General Concepts :
Introduction to distribution systems, Load modelling and characteristics. Coincidence factor, contribution factor loss factor - Relationship between the load factor and loss factor. Classification of loads (Residential, commercial, Agricultural and Industrial) and their characteristics.
Distribution Feeders
Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, voltage levels, feeder loading; basic design practice of the secondary distribution system.

UNIT – II
Substations:
Location of Substations: Rating of distribution substation, service area within primary feeders. Benefits derived through optimal location of substations. Bus bar arrangements in Sub-Stations: single bus bar, sectionalized single bus bar, main and transfer bus bar system with relevant diagrams.
System Analysis
Voltage drop and power-loss calculations: Derivation for voltage drop and power loss in lines, manual methods of solution for radial networks, three phase balanced primary lines.

UNIT – III
Protection:
Objectives of distribution system protection, types of common faults and procedure for fault calculations. Protective Devices: Principle of operation of Fuses, Circuit Reclosures, line sectionalizers, and circuit breakers
Coordination:
Coordination of Protective Devices, General coordination procedure.

UNIT – IV
Compensation for Power Factor Improvement :

Basics of Capacitive compensation for power-factor control. Different types of power capacitors, shunt and series Capacitors, effect of shunt capacitors (Fixed and switched), Power factor correction, capacitor allocation Economic justification - Procedure to determine the best capacitor location.

UNIT – V

Voltage Control :

Voltage Control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR, line drop Compensation.

D.C. Distribution Systems:

Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

A.C. Distribution Systems:

Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

Text book:

1. Electric Power Distribution system, Engineering – by Turan Gonen, Mc Graw-hill Book Company.
2. Electric Power Distribution – by A.S. Pabla, Tata Mc Graw-hill Publishing Company, 4th edition 2008.

Reference book:

1. Electrical Power Distribution and Automation by S.Sivanagaraju, V.Sankar, Dhanpat Rai & Co, 2006
2. Electrical Power Distribution Systems by V.Kamaraju, Right Publishers.

Course Outcomes:

After the completion of this course, the students should be able to

1. Understand design of various loads
2. Analyze the need of substations and there erection and site selection
3. Understand protection of distribution system.
4. Acquire knowledge of power factor improvement.
5. Calculate the distribution voltage drop calculations.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC03) SIGNALS AND SYSTEMS
(PROFESSIONAL ELECTIVE-I)

B. TECH- V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre Requisites: None

Course Objective:
This is a core subject, basic knowledge of which is required by all the engineers. This course focuses on:

- To get an in-depth knowledge about signals, systems and analysis of the same using various transforms.

UNIT-I:
Signal Analysis and Fourier Series
Signal Analysis: Analogy between Vectors and Signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions, Mean Square Error, Closed or complete set of Orthogonal functions, Orthogonality in Complex functions, Exponential and Sinusoidal signals, Concepts of Impulse function, Unit Step function, Signum function.
Fourier Series: Representation of Fourier series, Continuous time periodic signals, Properties of Fourier Series, Dirichlet's conditions, Trigonometric Fourier Series and Exponential Fourier Series, Complex Fourier spectrum.

UNIT-II:
Fourier Transforms
Fourier Transforms: Deriving Fourier Transform from Fourier Series, Fourier Transform of arbitrary signal, Fourier Transform of standard signals, Fourier Transform of Periodic Signals, Properties of Fourier Transform, Fourier Transforms involving commonly used functions Introduction to Hilbert Transform.

UNIT- III:
Laplace Transforms
Laplace Transforms: Review of Laplace Transforms (L.T), Concept of Region of Convergence (ROC) for Laplace Transforms, Partial fraction expansion, Inverse Laplace Transform, Constraints on ROC for various classes of signals, Properties of L.T, Relation between L.T and F.T of a signal, Solution Of Differential Equation Using Laplace Transform, Circuit Analysis Using Laplace Transform

UNIT-IV:
Signal Transmission Through Linear Systems: Classification of Systems, Impulse response, Response of a Linear System, Linear Time Variant (LTV) System, Transfer function of a LTI system, Filter characteristics of Linear Systems, Ideal LPF, HPF and BPF characteristics, Distortion less transmission through a system, Signal bandwidth, System bandwidth, Causality and Paley-Wiener criterion for physical realization, Relationship between Bandwidth and Rise time.

UNIT-V:
Convolution and Correlation of Signals: Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transforms, Cross

Correlation and Auto Correlation of functions, Properties of Correlation function, Energy density spectrum, Parseval's Theorem, Power density spectrum, Relation between Auto Correlation function and Energy/Power spectral density function, Relation between Convolution and Correlation, Detection of periodic signals in the presence of Noise by Correlation, Extraction of signal from noise by filtering.

Text Books:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.

Reference Books:

1. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2 Ed.
2. Signals and Systems – Iyer and K. Satya Prasad, Cengage Learning
3. Signals and Systems – A.Rama Krishna Rao – 2008, TMH.
4. Introduction to Signal and System Analysis – K.Gopalan 2009, Cengage Learning.
5. Fundamentals of Signals and Systems - Michel J. Robert, 2008, MGH International Edition.
6. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, 3 Ed., 2004, PE.

Course Outcomes:
After the completion of this course, the students should be able to:

1. Apply the knowledge of vectors, orthogonal basis to signals. Analyze the spectral characteristics of continuous-time periodic signals using Fourier series.
2. Demonstrate and apply Fourier transform on various signals.
3. Apply the Laplace transform and Fourier transform for the analysis of continuous-time signals.
4. Analyze systems based on their properties and determine the response of LTI system.
5. Understand the concepts of convolution and correlation of signals.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS04) DATABASE MANAGEMENT SYSTEMS
(OPEN ELECTIVE-I)

B. TECH- V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Course Objectives:

This Course:

1. Provides an emphasis on how to organize, maintain and retrieve information efficiently and effectively from a Database and
2. Presents an introduction to database management systems (DBMS) and relational data model.
3. introduces the concepts of transactions and transaction processing and the issues and techniques relating to concurrency and recovery in multi-user database environments

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UNIT- I (15%)

Introduction - Database system Applications - Database System versus File Systems - View of Data– Instances and schema - Data Models - Database Languages -DDL-DML - Database Users and Administrator –Transaction Management - Database System Structure-Application Architectures – History of Database Systems.**(Text book1 Chapter 1:-Refer Pg.No 1-24 & 27-30)**

UNIT- II (20%)

Database Design and ER model – Basic concepts - Entity sets and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram- Weak Entity Sets - Extended E-R Features - Designing of an E-R Database Schema-Reduction of an E-R Schema to Tables.
(Text book1 Chapter 7:-Refer Pg.No 259-271 & 274-303)

UNIT – III (20%)

Introduction to the Relational Model – Structure of Relational Databases - Relational Algebra – Relational Calculus – Domain relational Calculus , Tuple Relational Calculus - Integrity and Security –Domain Constraints ,Referential Integrity Constraints-Triggers-security and Authorization – SQL-Basic Structure, Set operations ,Aggregate Operations –Null values- Nested Sub queries – Views – Modification of Database- Joined relations ,Data Definition Language. **(Text book1 Chapter 2:-Refer Pg.No 39-45,Chapter 6:-Refer Pg.No 217-247, Chapter 3:-Refer Pg.No 57-103)**

UNIT – IV(20%)

Informal Design guidelines for Relation Schema-Functional Dependencies– Normal Forms based on Primary Keys-Decomposition – Desirable properties of Decomposition – First Normal Form,Second Normal Form–Third Normal Form- Boyce- Codd Normal Form - Multivalued Dependency-Fourth Normal Form-Fifth Normal Form-Transactions-Transaction Concept- Transaction state-Implementation of atomicity and Durability- Concurrent Executions – Serializability, Recoverability-Implementation of Isolation **(Text Book 2 Chapter 14:-Refer Pg.No 489-520 ,Text Book 1 Chapter 14:-Refer Pg.No 627-649)**

UNIT-V (25%)

Concurrency Control-Lock Based Protocols, Dead Lock Handling ,Multiple Granularity ,Time-stamp Based Protocols, Validation Based Protocols.

Recovery System: Failure Classification, Storage Structure , Recovery and Atomicity,Log Based recovery ,Shadow Paging, Recovery with concurrent transactions.

Storage and File Structure - File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices,B+Tree Index files, B- tree index files – Static Hashing – Dynamic Hashing – Comparison of Indexing and Hashing.
(Text book1 Chapter 15:-Refer Pg.No 661-668, Chapter 16:-Refer Pg.No 721-755, Chapter 10:-Refer Pg.No 429-463, Chapter 11:-Refer Pg.No 475-523)

TEXTBOOKS

1. Database System Concepts, Silberschatz, Korth , sixth Edition, McGraw hill.
2. Database Systems,Ramez Elmasri Shamkant B.Navathe Pearson Education,6th edition

REFERENCES :

1. Database Management Systems, Raghuramakrishnan, Johannes Gehrke, TATA Mc Graw Hill
2. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
3. Database Systems ,The Complete Book, Hector Garcia-Molina, Jeffrey Ullman,Jennifer Widom.
4. An Introduction to Database Systems, C.J. Date ,Eighth edition

COURSE OUTCOMES:
After the completion of this course, the student should be able to

1. Understand the fundamental concepts of database management and analyze database models & Entity Relationship models and to draw the E-R diagram for the given case study.
2. Apply relational Database Theory, and be able to write relational algebra expressions for queries and Utilize the knowledge of basics of SQL and construct queries using SQL.
3. Apply Normalization Process to construct the database. Explain Basic Issues of transaction processing
4. Understand Concurrency control and Recovery strategies of DBMS.
5. Compare the basic Database storage structures and access techniques: File Organization, indexing methods including B- Tree and Hashing.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC12) COMPUTER ORGANIZATION
(OPEN ELECTIVE-I)

B. TECH-V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre Requisites:

Course Objectives:

- To understand basic components of computers.
- To explore the I/O organizations in depth.
- To explore the memory organization.
- To understand the basic chip design and organization of 8086 with assembly language programming.

UNIT I

Basic Structure Of Computers : Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating - Point Representation. Error Detection codes.
Computer Arithmetic : Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating - point Arithmetic operations. Decimal Arithmetic unit Decimal Arithmetic operations.

UNIT II

Register Transfer Language And Microoperations : Register Transfer language.Register Transfer Bus and memory transfers, Arithmetic Mircrooperatiaons, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions-Instruction cycle,Memory - Reference Instructions. Input - Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT III

Micro Programmed Control : Control memory, Address sequencing, microprogram example, design of control unit, Hard wired control. Microprogrammed control.

UNIT IV

The Memory System : Basic concepts of semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage. Introduction to RAID.
Input-Output Organization : Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer Priority Interrupt Direct memory Access, Input -Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT V

Pipeline And Vector Processing: Parallel processing, pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline Vector Processing, Array Processors.
Multiprocessors: characteristics or multiprocessors Interconnection Structures, Interprocessor Arbitration. Inter Processor Communication and Synchronization Cache Coherance. Shared Memory Multiprocessors.

Text Books:

1. Computer Organization – Carl, Hamacher, Zvonko Vranesic, Sofwatzaky, 5th Edition Mcgram hill.
2. Computer Systems Architecture – M. Morris Mano III rd Edition Pearson.

References:

1. Computer Organization and Architecture-William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization - Andrew S. Tanenbaum,4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, Sivaraama Dandamudi springer Int, Edition
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

Course Outcome:

After the completion of this course, the student should be able to

1. Explain the I/O and memory organization in depth.
2. Develop assembly language programs for various applications.
3. Estimate the basic components of computers and extend the design of Digital Logic Circuits and apply to Computer Organization.
4. Analyze the memory organization and evaluate the performance of Computer systems.
5. Understand the basic chip design and organization of 8086 with assembly language programming and Compare RISC and CISC Architectures.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS40) INTERNET OF THINGS
(OPEN ELECTIVE-I)

B. TECH- V SEM. (EEE) **L/T/P/C**
3/0/0 /3

Course Objectives:

- To introduce the terminology, technology and its applications
- To introduce the concept of M2M (machine to machine) with necessary protocols
- To introduce the Python Scripting Language which is used in many IoT devices
- To introduce the Raspberry PI platform, that is widely used in IoT applications
- To introduce the implementation of web based services on IoT devices

UNIT I

Introduction to Internet of Things –Definition and Characteristics of IoT , Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs, IoT enabaled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates, Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

UNIT II

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT, Basics of IoT System Management with NETCOZF, YANG- ETCONF, YANG, SNMP NETOPEER

UNIT III

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML , HTTPLib , URLLib , SMTPLib .

UNIT IV

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C)
Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT V

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Web server – Web server for IoT, Cloud for IoT, Python web application framework Designing a REST ful web API

TEXT BOOKs:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti,Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD),2014, ISBN: 9789350239759

Course Outcome After the completion of this course, the student should be able to

1. Interpret the vision of IOT from a global context.
2. Perceive building blocks of Internet of Things and its characteristics.
3. Learn the basic concepts of Python.
4. Implement the python programming using Raspberry.
5. Design a REST

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE22) ELECTRICAL MACHINES – II LAB

B. TECH- V SEM. (EEE) **L/T/P/C**
0/0/3/1.5

Pre-Requisites:
Electrical Machines-II

Course Objectives:
This course is aimed
1. To evaluate the Principles and working of all static and rotating AC machines
2. To understand testing of transformers.
3. To estimate the performance of AC machines and identify their applications.

List of Experiments:
1. Open Circuit & Short Circuit tests on single phase Transformer.
2. Sumpner's test on a pair of single phase Transformers.
3. Brake test on three phase Induction Motor.
4. No Load & Blocked rotor tests on three phase Induction Motor.
5. Regulation of three phase Alternator by synchronous impedance and MMF methods
6. 'V' & inverted 'V' curves of a three phase Synchronous Motor.
7. Equivalent circuit of a single phase Induction Motor.
8. Determination of Xd & Xq of a Salient pole Synchronous Machine.
9. Scott connection of Transformers.
10. Load test on a three phase Alternator

Course Outcomes:
After the completion of the course students can be able to
1. Select range of apparatus based on the ratings.
2. Draw the Equivalent circuits and analyze various AC machines
3. Determine performance and Characteristics of AC machinery
4. Evaluate the efficiency of the machine by analyzing test results.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE23) ELECTRICAL MEASUREMENTS & INSTRUMENTATION LAB

B. TECH- V SEM. (EEE) **L/T/P/C**
0/0/3/1.5

Pre-Requisites:
Electrical Measurements & Instrumentation

Course Objectives:

- This course introduces the basic principle of all measuring instruments
- It also deals with the measurements of RLC parameters
- It also deals with the measurement voltage, current, power, power factor & energy

List of Experiments:

1. Calibration and Testing of single phase Energy meter.
2. Calibration of Dynamometer power factor meter.
3. Kelvin's double bridge – Measurements of resistance – Determination of Tolerance.
4. Measurement of Capacitance and Inductance using Schering & Anderson Bridge.
5. Measurement of 3-phase Reactive power with single phase Wattmeter.
6. Measurement of parameters of Choke coil using 3-voltmeter& 3-ammeter methods.
7. Calibration LPF wattmeter – by Phantom Loading.
8. Measurement of 3-phase power with single wattmeter and 2 C.T.'s.
9. Resistance strain gauge – strain measurements and calibration.
10. LVDT and capacitance pickup – characteristics and calibration.

Course Outcomes:
After the completion of this course, the student should be able to

1. Compare performance of MC, MI and Dynamometer types of measurements, Energy meter.
2. Determine the circuit parameters using AC and Dc bridges.
3. Compute the errors CT's and PT's.
4. Understand the performance of industrial instruments

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE24) CONTROL SYSTEMS LAB

B. TECH- V SEM. (EEE) **L/T/P/C**
0/0/2/1

Pre-Requisites:
Control Systems

Course Objectives:

1. This course introduces the time domain specifications and analysis of various systems
2. Design of various time domain controllers and frequency domain compensators
3. Performance study of the systems with and without controllers and comparison.

List of Experiments:

1. Time response of Second order system
2. Characteristics of Synchros.
3. Programmable Logic Controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4. Effect of feedback on DC Servo Motor
5. Transfer function of DC Motor
6. Effect of P, PD, PI, PID Controller on a second order systems
7. Lag and Lead Compensation – Magnitude and Phase plot
8. Transfer function of DC Generator
9. Characteristics of Magnetic Amplifiers
10. Characteristics of AC Servo Motor

Course Outcomes: After the completion of this course, the student should be able to

1. Analyze the time & Frequency response of control systems
2. Evaluate the performance of feedback control systems.
3. Examine the response of PID controllers.
4. Identify the Performance of AC & DC servo motors

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MC09) HUMAN VALUES AND PROFESSIONAL ETHICS

B. TECH- V SEM. (EEE) **L/T/P/C**
2/0/0/0

Pre-requisites: NONE
Course Objectives:

- To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Value based living in a natural way.

Unit-I Human Values: Morals, values, ethics – integrity – work ethics – service learning – civic virtue – respect for others – living peacefully – Caring – sharing – honesty – courage – valuing time – cooperation – commitment – empathy – self-confidence – spirituality – character.
Unit II Professional Ethics: Profession and professionalism – Two models of professionalism – Professional etiquette – Three types of Ethics or morality Responsibility in Engineering standards – Engineering Ethics – Positive and Negative faces.
Unit III Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis-congeniality, collegiality and loyalty. Respect for authority – conflicts of interest – occupational crime.
Unit IV Professional Rights: Professional rights and employee rights communicating risk and public policy – Whistle blowing – Collective bargaining. Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership-
Unit V Ethics in global context: Global issues in MNCs-Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts.
Course Outcomes:
After the completion of this course, the students should be able to

- Perceive the importance of ethics and values in life and society.
- Develop moral responsibility and mould them as best professionals.
- Create ethical vision and achieve harmony in life.
- Provide a critical perspective on the socialization of men and women.
- Perceive the important issues related to gender in contemporary India.

TEXT BOOK:

1. Aryasri, *Human Values and Professional Ethics*, Maruthi Publications.

REFERENCE BOOKS:

1. S B George, *Human Values and Professional Ethics*, Vikas Publishing.
2. KR Govindam & Saenthil Kumar *Professional Ethics and Human Values*, Anuradha Publications.
3. S K Chakraborthy & D Chakraborthy: *Human Values and Ethics*, Himalaya.
4. M. Govindarajan, S. Natarajan, & V.S. Senthilkumar: *Engineering Ethics (Includes Human Values)*, HI Learning Pvt. Ltd., New Delhi -110001.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE25) POWER SYSTEM OPERATION AND CONTROL

B. TECH-VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

UNIT-I:

Economic Operation of Power Systems

Optimal Operation of Generators in Thermal Power Stations, Heat Rate Curve, Cost Curve, Incremental Fuel and Production Costs, Input-Output Characteristics of Steam Unit, Optimum Generation Allocation with line losses neglected. Optimum Generation Allocation including the effect of Transmission Line Losses, Loss Coefficients Transmission Line Loss Formula - Numerical problems.

UNIT-II:

Hydrothermal Scheduling

Optimal Scheduling of Hydrothermal system, Hydroelectric Power Plant Models, types of Scheduling Problems, short term Hydrothermal Scheduling Problem. Numerical Problems.

UNIT-III:

Load Frequency Control :

Modelling of Speed Governing System, Steam Turbine, Hydro Turbine and Generator. Necessity of keeping frequency constant, definitions of Control Area, Single Area Control Block diagram representation of an Isolated Power System, Steady State Analysis, Dynamic Response, Proportional Plus Integral Control of single area and its block diagram representation, Steady State Response.
Load Frequency Control of 2- area system, Tie-Line Bias Control Comparison between Load Frequency Control and Economic Dispatch Control.

UNIT-IV:

Power Factor and Voltage Control :

Causes of low P.F, methods of improving P.F, Static Capacitor and Synchronous Condensers
Phase Advancers, most Economical P.F. for constant KW load and constant KVA type loads
Voltage Control, Shunt Capacitors, Series Capacitors and their location in the Power System

UNIT-V:

Reactive Power Control :

Overview of Reactive Power Control, Reactive Power Compensation in Transmission Systems, advantages and disadvantages of different types of Compensating Equipment for Transmission Systems, Load Compensation, specifications of Load Compensator, Uncompensated and Compensated Transmission Lines, Shunt And Series Compensation. Brief introduction to role of FACTS devices for Reactive power Control.

Text books:

1. Power system stability and control by Prabha Kundur TMH Publishers
2. Modern Power System Analysis by I.J.Nagrath& D.P.Kothari TMH Publishers, 2nd edition.

Reference books:

1. Power System Analysis and Design by J.Duncan Glover and M.S.Sarma., Thomson Publishers,3rd Edition.
2. Generation of electrical energy by B. R. Gupta, S. Chand and Company.
3. Power System Analysis by Grainger and Stevenson, TMH Publishers.
4. Power System Analysis by Hadi Saadat, TMH Publishers.

Course Outcomes

After the completion of this course, the students should be able to

1. Analyse economic operation of power system.
2. Understand the working of hydrothermal coordination.
3. Analyse load frequency control of Single area and Two area power system.
4. Understand power factor and voltage control
5. Acquire knowledge on reactive power control.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MB01) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

B. TECH-VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Course Objective:

To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations namely: demand and supply, production function, cost analysis, markets, forms of business organizations, capital budgeting and financial accounting and financial analysis.

Unit I
Introduction & Demand Analysis.

Definition, Nature and Scope of Managerial Economics. Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

Unit II
Production & Cost Analysis: Production Function-
lsoquants and lsocosts, MRTS, Least Cost Combination of lnputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

Unit III
Markets & New Economic Environment:
Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Objectives and Policies of Pricing. Methods of Pricing. Eusrness; Features and evaluation of different forms of Business Organization: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, New Economic Environment Changing Business Environment in Post-liberalization scenario.

Unit IV
Capital Budgeting:
Capital and its significance, Types of Capitat, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital - Trading Forecast, Capital Budget, Cash Budget. Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

Unit V

Introduction to Financial Accounting & Financial Analysis:

Accounting concepts and conventions - Introduction IFRS - Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance sheet with simple adjustments).

Financial, Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios. Du Pont Chart'

Text books:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand' 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age international Publishers, Hyderabad 2013'

References:

3. M' Kasi Reddy & Saraswathi, Managerial Economics and Financial Analysis, PHI New Delhi, 2012.
4. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi. 2012.

Course Outcomes:

After the completion of this course, the students are able to:

1	Understand the nature, scope and importance of Managerial Economics.
2	Know what is demand, analyze demand and how elasticity of demand is used for pricing decisions and to evaluate methods for forecasting demand.
3	Know how production function is carried out to achieve least cost combination of Inputs and how to analyze cost.
4	Understand the characteristics of different kinds of markets and outline different form of business organization and analyze how capital budgeting techniques are used for investment decisions.
5	Know how to prepare final accounts and how to interpret them, analyze and interpret financial statements using ratio analysis.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE26) POWER SEMICONDUCTOR DRIVES

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Prerequisite:
Electrical Machines
Power Electronics

UNIT–I

Controlled Converter Fed DC Motor Drives :

Fundamentals of Electric Drives- Single-phase half and fully controlled converter fed separately excited and series DC motor drive – Output voltage and current waveforms – Speed-torque expressions – Speed-torque characteristics (Continuous conduction mode only).

Four-quadrant operation-Principle of operation of dual converters and dual converter fed DC motor drives - Braking methods: Dynamic – Plugging – Regenerative methods. Numerical problems.

UNIT–II

DC–DC Converters Fed DC Motor Drives :

Single quadrant – Two quadrant and four quadrant DC-DC converter fed separately excited and self-excited DC motors – Continuous current operation– Output voltage and current waveforms – Speed–torque expressions – Speed–torque characteristics –Four quadrant operation – Closed loop operation (qualitative treatment only).

UNIT–III

Stator Side Control of 3-phase Induction MotorDrive :

Stator voltage control using 3-phase AC voltage regulators – Waveforms –Speed torque characteristics– Variable Voltage Variable Frequency control of induction motor by PWM voltage source inverter – Closed loop v/f control of induction motor drives (qualitative treatment only).

UNIT–IV

Rotor Side Control of 3-phase Induction Motor Drive :

Static rotor resistance control – Slip power recovery schemes – Static Scherbius drive – Static Kramer drive – Performance and speed torque characteristics – Advantages –Applications.

UNIT–V

Control of Synchronous Motor Drives :

Separate control & self-control of synchronous motors – Operation of self-controlled synchronous motors by VSI– Closed Loop control operation of synchronous motor drives (qualitative treatment only). –Variable frequency control–Pulse width modulation.

Text Books:

1. G. K. Dubey, "Power Semiconductor Controlled Drives", Prentice Hall, 1989.
2. R. Krishnan, "Electric Motor Drives: Modeling, Analysis and Control", Prentice Hall, 2001.

References:

1. G. K. Dubey, "Fundamentals of Electrical Drives", Narosa, 2002.
2. B. K. Bose, "Modern Power Electronics and AC Drives", Prentice Hall,2001.
3. W. Leonhard, "Control of Electric Drives", Springer Science & Business Media, 2001.
4. S. Sivanagaraju, M. Balasubba Reddy and A. Mallikarjuna Prasad "Power Semiconductor Drives", Prentice Hall, 2009.

Course Outcomes:

At the end of this course students are able to

1. Analyze the operation of converter fed dc motors and four quadrant operations of dc motors using dual converters.
2. Describe the chopper fed dc motors in various quadrants of operation.
3. Know the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters.
4. Differentiate the stator side control and rotor side control of three phase induction motor.
5. Explain the speed control mechanism of synchronous motors.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE27) RENEWABLE ENERGY SYSTEMS
(PROFESSIONAL ELECTIVE-II)

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre Requisites:
Applied Physics
Engineering Chemistry,
Power Systems-I
Thermal & Hydro prime movers

Course Objectives:
To make the student
1. Introduce to the technology of renewable sources of energy
2. Learn about the solar radiation, its applications and radiation measuring instruments
3. Study the Geothermal biomass energy resources ,biomass systems
4. Learn the methods of energy extraction from the wind and oceans
5. Learn to the technology of direct energy conversion methods

UNIT – I
Principles of Solar Radiation :
Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation and sunshine, solar radiation data for India.

UNIT-II
Solar Energy Collection:
Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors, tracking CPC and solar swing
Solar Energy Storage And Applications: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, applications of PV system-PV hybrid systems

UNIT-III
Wind Energy:
Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria, analysis of aerodynamic forces acting on blade, applications.
Biomass: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Biogas digesters, gas yield, combustion characteristics of biogas, utilization for cooking, biomass resource development in India.

UNIT-IV
Geothermal Energy:
Structure of earth's interior- geothermal sites- earthquakes & volcanoes- geothermal resources- hot springs-steam ejection- principle of working- types of geothermal station with schematic representation site selection for geothermal power plants
Ocean Energy:
OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT-V

Direct Energy Conversion:

Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, seebeck, peltier and joule Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law, thermodynamic aspects, selection of fuels and operating condition

Text books:

1. Non-Conventional Energy Sources by G.D. Rai, Khanna Publishers, fourth edition, 2008
2. Suhas.P.Sukhatma and Nayak.J.K., "solar Energy", TMH, New Delhi, 3rd edition, 2008

Reference books:

1. D.P.Kothari and Rakesh Ranjan and K.C. Singal., " Renewable energy resources and emerging technologies"Prentice Hall of India Pvt.Ltd., 2nd Edition, 2011
2. Non-Conventional Energy Systems / K Mittal /Wheeler

Course outcomes:

At the end of the course, the student will be able to

1. Apply the technology to capture the energy from the renewable sources like sun, wind, ocean, biomass, geothermal.
2. Use different renewable energy sources to produce electrical power.
3. Minimize the use of conventional energy sources to produce electrical energy.
4. Identify the fact that the conventional energy resources are depleted.
5. Explore the direct energy sources.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE28) ELECTRICAL ENGINEERING MATERIALS
(PROFESSIONAL ELECTIVE-II)

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Applied Physics

Course Objectives:

1. To import the knowledge on Electrical Engineering materials Classification and their applications
2. Performance characteristics of various Semiconducting, Dielectric & Insulation Materials

UNIT-I

Classification of Materials:
Introduction, Atomic Theory, Inter atomic Bonds

Conducting Materials:
Introduction, Resistivity and factors affecting resistivity, Classification of Conducting materials into low-resistivity and high resistivity materials, Low Resistivity Materials and their Applications ,Resistivity Materials and their applications ,Superconducting Materials.

UNIT-II

Semiconducting Materials:
Introduction ,The Atom, Conductors and Insulators, Semiconductors, Electron Energy and Energy Band Theory, Excitation of atoms, Insulators, Semiconductors and Conductors, Semiconductor Materials, Covalent Bonds, Intrinsic Semiconductors-Type Materials, P Type Materials, Majority and Minority Carriers, Semiconductors Materials, Applications of Semiconductor Materials.

UNIT-III

Dielectric Materials:
Introduction, Dielectric constant of Permittivity, Polarization, Dielectric Losses, Electric Conductivity of Dielectrics and their Break Down, Properties of Dielectrics, Applications of Dielectrics.

UNIT-IV

Insulating Materials:
Introduction, General properties of insulating materials, Classification, Properties, Insulating Gasses.

Magnetic Materials:
Introduction, Classification, Magnetization curve, Hysteresis, Eddy Currents, Curie point, Magnetostriction, Soft and Hard Magnetic materials,

UNIT-V

Materials for special purposes:
Introduction, Structural materials, Protective materials, Other Materials.

Electronic Components:
Resistors, Capacitors, Inductors, Transformers.

Text books:

1. S.K.Bhattacharya "Electrical Engineering Materials" S.K.Kataria & Sons.

Reference books:

1. A.J.Dekker "Electrical Engineering Materials" PHI

Course Outcomes:
After completion of the course, the student should be able to

1	Impart the knowledge on electrical engineering materials classification and their applications
2	Study the performance characteristics of various semiconducting, dielectric and insulation materials and their applications in design of electrical and electronic devices.
3	Identify various magnetic materials and their classification
4	Learn various special purpose of materials
5	Design various electronic components

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC16) DIGITAL SIGNAL PROCESSING
(PROFESSIONAL ELECTIVE-II)

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre Requisites: Signals and systems

Course Objectives:

- To provide background and fundamental material for the analysis and processing of digital signals.
- To familiarize the relationships between continuous time and discrete time signals and systems.
- To study fundamentals of time, frequency and Z-plane analysis and to discuss the inter-relationships of these analytic method.
- To study the designs and structures of digital (IIR & FIR) filters from analysis to synthesis for a given specifications.
- The impetus is to introduce a few real-world signal processing applications.
- To acquaint in FFT algorithms, multi-rate signal processing techniques and finite word length effects.

Unit I Theory of discrete time linear systems
Introduction, Classification of Signals and Systems, Discrete Time systems, Linearity, Time Invariance, Causality, Stability, Difference equations, Z-transform, Inverse Z transforms. Transfer function of linear discrete systems, Impulse response, Recursive, Non-recursive filters, Digital filter realization – Direct, canonic, cascade, parallel and ladder realizations

Unit II Discrete fourier transforms
Discrete Fourier Transform (DFT) definition, Properties of discrete Fourier transform, Convolution of sequences - linear convolution. **FFT algorithms:** Introduction to Radix 2 Fast Fourier transform (FFT), Properties of Radix 2 FFT, Decimation in time FFT, Data shuffling and Bit reversal, Decimation in frequency FFT Algorithms, Computing Inverse DFT by doing a direct DFT.

Unit III Theory and design of digital non recursive filters
Design characteristics of FIR filters with linear phase, Frequency response of linear phase FIR filters, Design of FIR filters using window functions.

Unit IV Theory and design of digital recursive filters
Review of design techniques for analog low pass filter, frequency transformation, Properties of IIR filter, IIR filter design, Different methods of IIR filter design.

Unit V General purpose digital signal processors
Introduction, Computer architectures for signal processing- Harvard architecture, Pipelining, Hardware multiplier, accumulator, replication, On chip memory/cache and Extended paralleslism. General-purpose
digital signal processors-Fixed point and floating point DSP. Selecting digital signal processors, .Implementation of DSP algorithms on general purpose DSP, FIR digital filtering.

Text Books

1. J.G.Proakis , D.G. Manolakis and D. Sharma, Digital Signal Processing - Principles, Algorithms and Applications, Pearson Education, 2006
2. Simon Haykin & Barry van veen, Signals and Systems, 2nd edition, John Wiley publication, 2004/2005

Reference Books

1. Oppenhiem V.A. and Schaffer, Discrete - time Signal Processing, Prentice Hall of India,2005
2. Leudeman L.C, Fundamentals of Digital Signal Processing, Harper & Row Publication,2006
3. Emmanuel C.Ifeachor, Digital Signal Processing -A Practical Approach , Pearson Education, 2006
4. Andreas Antoniou, Digital Signal Processing, Tata McGraw-Hill,-2006

Course Outcomes:

On completion of this subject, the student should be able to:

1. Explain the time domain and frequency domain representation of the signals.
2. Identify the different types of the systems and their responses.
3. Understand the inter relationship between DFT and various transforms and fast computation of DFT and appreciate the FFT processing.
4. Classify the different types of windowing techniques.
5. Design a digital filters for a given specifications and Apply the knowledge to real world processing applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE29) ADVANCED POWER ELECTRONICS
(PROFESSIONAL ELECTIVE-III)

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Prerequisite:

Power Electronics

Unit-I

Introduction

Review of power semiconductor devices: Thyristor, IGBT, MOSFET, IGCT, GTO and their driver circuits

Unit-II

Multi-Pulse Converters

Three-phase converters, effect of load and source impedances; Dual converter, multi-pulse converters, transformer utilization; Multi-pulse converters using delta/ zigzag/ Polygon transformers, analysis.

Unit-III

Resonant Converters

Need of resonant converters, Classification of resonant converters, Load resonant converters, Resonant switch converters, zero voltage switching dc-dc converters, zero current switching dc-dc converters.

Unit-IV

DC-AC Converters

Review of three-phase voltage source inverters, voltage and frequency control. Harmonic reduction techniques, PWM inverters, Space Vector Modulation. Current source inverters, commutation circuits.

UNIT-V

Multilevel Inverters

Multi-level inverters, advantages, configurations: Diode clamped, flying capacitor and cascade multilevel inverters, applications.

Text Books:

1. M. H. Rashid, “Power electronics: circuits, devices, and applications”, Pearson Education India,2009.
2. N. Mohan and T. M. Undeland, “Power Electronics: Converters, Applications and Design”,John Wiley & Sons, 2007.

References:

1. R. W. Erickson and D. Maksimovic, “Fundamentals of Power Electronics”, Springer Science &
Business Media, 2007.

2. Daniel W. Hart "Power Electronics", Tata McGraw-Hill Education, 2011.
3. Bin Wu "High-Power Converters and AC Drives", Wiley IEEE-Press,2005
4. L. Umanand, "Power Electronics: Essentials and Applications", Wiley India, 2009.
5. M.D. Singh & K.B. Kanchandhani "Power Electronics", Tata Mc Graw Hill, 2017.

Course Outcomes: At the end of this course students are able to

1. Classify driver circuits for various power semiconductor devices.
2. Analyze the operation of multi-pulse converters.
3. Understand the operation of resonant converters.
4. Know the differences between VSI and CSI.
5. Gain knowledge on the operation of multilevel inverters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE30) ADVANCED CONTROL SYSTEMS
(PROFESSIONAL ELECTIVE-III)

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Control Systems
Electrical Circuits-I
Electrical Circuits- II

Course Objectives:
- This course is gives a knowledge of various function analysis phase-plane analysis Stability Analysis.
- Provides knowledge on formulating optimal control problem

UNIT – I:
Describing Function Analysis:
Introduction to nonlinear systems, Types of nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT-II:
Phase-Plane Analysis:
Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase-plane analysis of nonlinear control systems.

UNIT-III:
Stability Analysis:
Stability in the sense of Lyapunov, Lyapunov's stability and Lyapunov's instability theorems. Direct method of Lyapunov for the Linear and Nonlinear continuous time autonomous systems.

UNIT – IV:
Modal Control:
Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.
Calculus of Variations
Minimization of functionals of single function, constrained minimization. Minimum principle. Control variable inequality constraints. Control and state variable inequality constraints. Euler Lagrangine Equation.

UNIT –V:
Optimal Control
Formulation of optimal control problem. Minimum time, Minimum energy, minimum fuel problems. State regulator problem. Output regulator problem. Tracking problem, Continuous-Time Linear Regulators.

Text books:

1. Modern Control System Theory – by M. Gopal, New Age International Publishers, 2nd edition, 1996
2. Modern Control Engineering – by K. Ogata, Prentice Hall of India, 3rd edition, 1998

Reference books:

1. Control Systems Engineering by I.J. Nagarath and M.Gopal, New Age International (P) Ltd.
2. Digital Control and State Variable Methods – by M. Gopal, Tata Mc Graw-Hill Companies, 1997.
3. Systems and Control by Stainslaw H. Zak, Oxford Press, 2003.

Course Outcomes:

Students will be able to

1. Understand different non linearities and their describing functions.
2. Describe the methods of Phase-plane trajectory of nonlinear control systems.
3. Apply various theorems for stability analysis of linear and nonlinear systems.
4. Implement modal control and calculus of variations.
5. Formulate and solve optimal control problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE31) HIGH VOLTAGE ENGINEERING
(PROFESSIONAL ELECTIVE-III)

B. TECH- VI SEM. (EEE) **L/T/P/C**
3/0/0 /3

Pre-Requisites:
Power Systems-II
Electrical Measurements & Instrumentation
Switchgear and protection

Course Objectives:
1. Various types of over voltages in power system and protection schemes discussed.
2. This subject deals with the detailed analysis of Breakdown occurring in gaseous, liquids and solid dielectrics.
3. Information about generation and measurement of High voltage and current.
4. In addition High voltage testing methods and Insulation coordination are also discussed.

UNIT-I:
Over voltage in Electrical Power System:
Causes of over voltage and its effects on power system-Lightning, switching surges and temporary over voltages, Corona and its effect – Bewely lattice diagram Protection against over voltages.

UNIT- II:
Dielectric Breakdown :
Properties of Dielectric materials – Gaseous Breakdown in uniform and non-uniform fields Vacuum breakdown – Conduction and breakdown in pure and commercial liquids – Breakdown mechanism in solid and composite dielectric – Applications of insulating materials in electrical equipments.

UNIT – III:
Generation Of High Voltage And High Currents :
Generation of High DC Voltages: Rectifier , voltage multiplier van de graaff generator Generation of impulse voltage: single and multistage marx circuit – Generation of High AC voltages: cascaded transformer resonant transformer and tesla coil- generation of switching surges- generation of impulse currents – Triggering and control of impulse generator.

UNIT–IV:
Measurement of High Voltage And High Currents :
High Resistance with series ammeter – Divider, Resistance, capacitance and mixed divider – Peak voltmeter and Generating voltmeter – Capacitance Voltage Transformer, Electrostatic Voltmeters – Sphere Gaps – High current shunts.

UNIT – V:
High Voltage Testing And Insulation Coordination :
Testing of Insulators and bushings, Testing of Isolators and circuit breakers, testing of cables, Testing of Transformers, Testing of Surge Arresters, and Insulation coordination.

Text books:
1. M.S.Naidu and V. Kamaraju , High Voltage Engineering by– TMH Publications, 3rd Edition

2. E.Kuffel, W.S.Zaengl, J.Kuffel, High Voltage Engineering: Fundamentals by Elsevier, 2nd Edition.

Reference books:

1. C.L.Wadhwa , High Voltage Engineering by, New Age Internationals (P) Limited, 1997.
2. Ravindra Arora, Wolfgang Mosch, High Voltage Insulation Engineering by, New Age International (P) Limited, 1995.
3. Mazen Abdel Salam, Hussein Anis, Ahdan El-Morshedy, Roshdy Radwan, Marcel Dekker High Voltage Engineering, Theory and Practice.

Course Outcomes: After the completion of this course, the student should be able to

1. Understand Transients in power system.
2. Acquire the knowledge on breakdown in solid, Liquid and gaseous dielectrics.
3. Understand the generation of high voltage and current.
4. Identify the measurement of high voltage and current.
5. Analyze power apparatus and insulation coordination.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE32) POWER ELECTRONICS LAB

B. TECH-VI SEM. (EEE) **L/T/P/C**
0/0/2/1

Pre-Requisites:
Power Electronics
Electrical Machines-I
Electrical Machines-II

Course Objectives:

1. This course introduces the basic concept of powers semiconductor devices.
2. This course introduces working of all the types of converters and analysis.
3. Performance and control of DC and AC Motors with power electronic converters.

List of Experiments

1. Study of Characteristics of SCR, MOSFET & IGBT.
2. Single Phase fully controlled bridge converter with R and RL loads.
3. Single Phase half-controlled converter with R and RL Loads.
4. Operation of Dual Converter with R and RL Load
5. Single Phase AC Voltage Controller with R and RL Loads.
6. Single Phase Cycloconverter with R and RL loads.
7. MOSFET based Stepup & Stepdown Chopper.
8. Single Phase Parallel Inverter with R and RL Loads.
9. Single Phase Series Inverter with R and RL Loads.
10. Single-phase PWM Inverter with R and RL loads.

Course Outcomes:

At the end of the course the students would be able to

1. Study Characteristics of various Power Semiconductor devices.
2. Analyze AC/AC and AC/DC Converters.
3. Analyze the behavior of various DC/DC and DC/AC converters.
4. Understand types of Power Electronic converters and identify their applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE33) POWER SYSTEMS LAB

B. TECH- VI SEM. (EEE) **L/T/P/C**
0/0/2/1

Pre-Requisites:
Electrical Circuits-II
Power System-I
Power System-II

Course Objectives:
This course is aimed to gain knowledge on

1. Performance of Transmission Line.
2. Operation and Performance of Over/Under Voltage and Over Current relays.
3. Calculation of Sequence Impedances of 3-Φ Transformer.
4. Operation of Electromagnetic type IDMT Over Current Relay.
5. Fault analysis of Feeder and Alternator.

List of Experiments:

1. Performance and testing of Transmission Line Model.
2. Characteristics of Under Voltage Relay.
3. Characteristics of Over Voltage Relay.
4. Characteristics of IDMT Over Current Relay.
5. Performance and testing of Feeder protection system
6. Characteristics of Static Negative Sequence Relay.
7. Fault analysis of an Alternator- Line to Ground Fault.
8. Fault analysis of an Alternator- Line to Line Fault.
9. Determination of Sequence Impedances of 3-Φ Transformer.
10. Differential Protection of 1-Φ Transformer.

Course Outcomes:
After the completion of this course, the student should be able to

1. Calculate Transmission line parameters, efficiency and regulation.
2. Evaluate the Performance analysis of Over/Under Voltage Relay.
3. Understand the Analysis and performance testing of Feeder Protection System.
4. Calculate Sequence Reactances of 3-Φ Transformer.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
(B18EE34) ELECTRONICS DESIGN LAB

B. TECH- VI SEM. (EEE) **L/T/P/C**
1/0/2 /2

Pre-Requisites:
Electrical Circuits
Power Electronic

Course Objectives:
This course is aimed to gain knowledge on
1. Design of linear regulated power supplies.
2. Development of analog control boards for power converter applications.

List of Experiments:
1. Design of fixed and adjustable unipolar linear regulated power supply.
2. Design of bipolar linear regulated power supply.
3. Design of Resistance triggering circuit for SCR.
4. Design of Resistance-Capacitance triggering circuit for SCR.
5. Design of UJT triggering circuit for SCR.
6. Design of pulse generation for buck/boost converter by using 555 TIMER.
7. Design of voltage/current sensor scaling circuit for DSP applications.
8. Design of isolated driver circuit for MOSFET/IGBT triggering.
9. Generation of sinusoidal pulse width modulation with linear ICs.
10. Design of Buck Converter.

Course Outcomes:

After the completion of this course, the student should be able to
1. Design the various regulated power supplies for control boards.
2. Gain knowledge on designing of various triggering circuits for SCR.
3. Develop scaling and conditioning circuits for various sensors.
4. Develop PWM control and gate driver circuits for various power electronic applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MC05) LOGICAL REASONING AND QUANTITATIVE APTITUDE

B. TECH- VI SEM. (EEE) **L/T/P/C**
2/0/0/0

Objectives:

The purpose of this course ensure the students

- To improve logical thinking with general applications using mathematical concepts like sequences, series, number theory and probability.
- It also features students to analyze data interpretation and able of improve their mathematical skills in various general aspects like coding and decoding, Time and Work puzzles solving blood relations etc.

Unit – I: Logical Reasoning

1. Coding and Decoding
2. Distance and Directions
3. Classifications
4. Odd man out and series
5. Clocks and Calendars etc.

Unit – II: Logical ability

1. Blood relations
2. Seating Arrangements
3. Figure Analysis
4. Puzzles etc.

Unit – III: Number systems

1. LCM and HCF
2. Ratio and proportion
3. Simple interest and compound interest
4. Profit and Loss etc.

Unit – IV: Arithmetic ability

1. Time and work
2. Partnerships
3. Time speed and distance
4. Problems on Trains etc.

Unit – V: Mathematical ability

1. Sequence and series
2. Permutations and combination
3. General probability etc.

Text books

1. A modern approach to verbal and non-verbal reasoning by Dr. R.S. Aggarwal.
2. Quantitative Aptitude by Abhijit Guha Tata Mc Graw-Hill Company Limited.

References

1. Quantitative Aptitude by P.A. Anand (Wiley)
2. Quantitative Aptitude by Dr. R.S. Agarwal.
3. Objective Arithmetic by S.L. Gulati.

Course Outcomes

After the completion of this course, the student should be able to

1. Improve their logical thinking in terms of general and mathematical concepts.
2. Compete in academic as well as competitive levels through which students are able to solve the real world problems.
3. Analyze the number systems
4. Make quick decisions to face the critical arithmetic problems.
5. Analyze the mathematical problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE35) COMPUTER METHODS IN POWER SYSTEMS

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-requisites:
Power system I
Power System II
Computational Mathematics
Electrical Circuits

Unit I: Incidence and Network Matrices
Introduction, graphs, incidence matrices, primitive matrices, types of network matrices, formation of network matrix, π- representation of off-nominal tap transformers, Y-bus formation by singular transformation, Formation of Y-bus by inspection method- Numerical examples.

Unit II: Power Flow Analysis
Importance of power flow analysis in planning and operation of power systems - statement of power flow problem - classification of buses - development of power flow model in complex variables form - iterative solution using Gauss-Seidel method - Q-limit check for voltage controlled buses – power flow model in polar form - iterative solution using Newton-Raphson method. Newton's Decoupled load flow method and Fast Decoupled load flow method- Numerical Problems.

Unit IV: Fault Analysis-I
Introduction to symmetrical components - Symmetrical Component Transformation, Positive, Negative and Zero sequence components: Voltages, Currents and Impedances. Sequence Networks: Positive, Negative and Zero sequence Networks, Numerical Problems. Unsymmetrical Fault Analysis: LG, LL, LLG faults with and without fault impedance, Numerical Problems.

Unit III: Fault Analysis-II
Introduction to short circuit analysis –short circuit current-MVA calculations, fault levels, applications of series reactors- Z-bus building algorithm - fault analysis using Z-bus Open Circuit and Short Circuit faults.

Unit V: Stability Analysis
concepts of stability (steady state and transient), swingequation, equal area criterion, critical clearing angle and time for transient stability,step by step method of solution, factors affecting transient stability.

Text Books:
1. Stagg and El Abiad, Computer methods in power system analysis, MH.
2. MA Pai, Computer techniques in power Systems, TMH.

Reference books:
1. Electric Energy Systems Theory, Elgerd Olle.
2. Modern Power System Analysis, Nagrath, I. J., and Kothari, D. P, TMH,4th edition, 2003.

Course outcomes:

After the completion of this course, the students should be able to

1. Learn to differentiate the incidence and primitive matrices of a network and form Ybus for network calculations
2. Perform load flow to evaluate the complex voltage at all nodes in the power system
3. Understand the faulted power system using Zbus of the system
4. Analyse symmetrical components.
5. Know the stability of the power system for small and large disturbance.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC20) MICROPROCESSORS AND MICROCONTROLLERS

B. TECH-VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Computer Organization

Course Objectives:
The course objectives are:

1. To develop an in-depth understanding of the operation of microprocessors and microcontrollers,
2. To learn machine language programming & interfacing techniques.

Unit-I Architecture of Microprocessors
Introduction to Microprocessors & Microcontrollers. Overview of 8086 microprocessor. Signals and pins of 8086 microprocessor. Physical memory organization, maximum mode & minimum mode with timing diagrams.

Unit-II Assembly language of 8086
Machine language Instruction format, addressing modes, Instruction set of 8086, Assembler Directives and Operators, Assembly software programs with algorithms

Unit-III Interfacing with 8086
Interfacing with RAMs, ROMs Interfacing with peripheral ICs like 8255, 8279, etc. Interfacing with key boards, ADCs, and DACs serial data transfer schemes USART 8251 serial data communication, interrupt vector table, interrupt structure with 8259 etc.

Unit-IV introduction to microcontrollers: overview of 8051 microcontroller, architecture, Input ports, memory organization, addressing modes and instruction set of 8051, simple programs

Unit-V 8051 Real time control: programming timer interrupts, programming external hardware interrupts, programming the serial communication interrupt, programming 8051 timers and counters.

Text Books:

1. D. V. Hall, Microprocessors and interfacing, TMGH, 2nd Edition 2006
2. Kenneth. J. Ayala, The 8051 microcontroller, 3rd ed.,cengage learning.

Reference Books

1. Ramesh S.Gaonkar, "Microprocessor - Architecture, Programming and Applications with the 8085", Penram International publishing private limited, fifth edition.
2. Doughlas V Hall, "Digital Systems and Microprocessors", McGraw Hill. 3rd Edition 2003
3. A.K. Ray & K.M.Bhurchandi, "Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing", TMH, 2002 reprint.
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, "The 8051 microcontroller and embedded systems", Pearson education, 2004.

Course Outcomes:

Upon completion of the course:

1. Illustrate the internal organization of popular 8086/8051 microprocessors/microcontrollers.
2. Contrast hardware and software interaction and integration.
3. Design microprocessors and microcontrollers-based systems and develop microcontroller-based systems for real time applications.
4. Develop knowledge about microcontroller 8051 and its programming.
5. Explain the Memory organization, classification and their applications and Assess programming, interfacing etc of various devices with microprocessors and external world.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE36) SOFT COMPUTING TECHNIQUES
(PROFESSIONAL ELECTIVE-IV)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites: None

Objectives:

1. To introduce with soft computing concepts like neural networks, supervised learning and unsupervised learning techniques, concepts of neural network basics and its types and understand the features of fuzzy sets and its relations.
2. To familiarize the applications of neural networks and fuzzy logic member function features and to know the real time applications of internet search techniques and fuzzy

Unit I: Introduction of SOFT computing

Concept of computing systems, "Soft" computing versus "Hard" computing, Characteristics of Soft computing, some applications of Soft computing techniques

Unit II: Fuzzy Logic

Introduction to Fuzzy logic, Fuzzy sets and membership functions, Operations on Fuzzy sets, Fuzzy relations, rules, propositions, implications and inferences, Defuzzification techniques, Fuzzy logic controller design, Some applications of Fuzzy logic.

Unit III: Artificial Neural Network

Biological neurons and its working, Simulation of biological neurons to problem solving, Different ANNs architectures, Training techniques for ANNs, Applications of ANNs to solve some real-life problems.

Unit IV: Genetic Algorithm

Concept of "Genetics" and "Evolution" and its application to proablistic search techniques, Basic GA framework and different GA architectures, GA operators: Encoding, Crossover, Selection, Mutation, etc, Solving single-objective optimization problems using GAs.

Unit V: Multi-objective optimization problem solving

Concept of multi-objective optimization problems (MOOPs) and issues of solving them, Multi-Objective Evolutionary Algorithm (MOEA), Non-Pareto approaches to solve MOOPs, Pareto-based approaches to solve MOOPs, Some applications with MOEAs.

Text Books:

1. Fuzzy Logic: A Practical approach, F. Martin, Mc neill, and Ellen Thro, AP Professional, 2000.
2. Fuzzy Logic with Engineering Applications (3rd Edn.), Timothy J. Ross, Willey, 2010.

References:

1. Foundations of Neural Networks, Fuzzy Systems, and Knowldge Engineering, Nikola K. Kasabov, MIT Press, 1998.
2. Fuzzy Logic for Embedded Systems Applications, Ahmed M. Ibrahim, Elesvier Press, 2004.
3. S.N.Sivanandam And S.N.Deepa, "Principles Of Soft Computing", Wiley India Pvt Ltd, 2011.

Course outcomes: After the completion of this course, the student should be able to

1. Learn the basic concepts of soft computing and differentiate it from hard computing
2. Explore the fuzzy logic sets and fuzzy logic controller application to its real time problems
3. Understand various architecture of ANNs and explore its applications of ANNs to solve some real-life problems.
4. Learn the basic concepts of GA and its different architecture to solve single objective optimization problem
5. Understand the concept of multi-objective optimization problems (MOOPs) and issues of solving it.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE37) ADVANCED ELECTRICAL DRIVES
(PROFESSIONAL ELECTIVE-IV)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Prerequisite:
Electrical Machines
Power Electronics

UNIT I Three Phase Converter Fed DC Motor Drives
Three-phase half and fully controlled converter fed separately excited and series DC motor drive – Output voltage and current waveforms – Speed-torque expressions – Speed-torque characteristics (Continuous conduction mode only)**.**

UNIT II VSI and CSI Fed Induction Motor Control
AC voltage controller fed induction machine operation – Energy conservation issues – V/f operation theory – requirement for slip and stator voltage compensation. CSI fed induction machine – Operation and characteristics - PWM controls.

UNIT III Vector Control of Induction Motor drives
Field oriented control of induction machines – Theory – DC drive analogy – Direct or Feedback vector control - Indirect or Feed forward vector control – Flux vector estimation - Space Vector Modulation control.

UNIT IV Direct Torque Control of Induction Motor drives
Direct torque control of Induction Machines – Torque expression with stator and rotor fluxes, DTC control strategy – optimum switching vector selection – reduction of torque ripple methods.

UNIT-V Vector control of PMSM drives
Types of PM Synchronous motors - Torque developed by PMSM - Implementation of vector control for PMSM – introduction to BLDC drives.

Text Books:
1. G. K. Dubey, “Power Semiconductor Controlled Drives”, Prentice Hall, 1989.
2. R. Krishnan, “Electric Motor Drives: Modeling, Analysis and Control”, Prentice Hall, 2001.

References:
1. Vedam Subramanyam, “Electric Drives – Concepts and Applications”, Tata McGraw Hill, 2000.
2. W. Leonhard, “Control of Electric Drives”, Springer Science & Business Media, 2001.
3. Austin Hughes, “Electric Motors and Drives – Fundamentals, Types and Applications”, Elsevier, 2006.
4. B. K. Bose, “Modern Power Electronics and AC Drives”, Prentice Hall,2001.

Course Outcomes: At the end of this course students are able to

1. Analyse the operation of three phase converter fed dc motors.
2. Describe the VSI and CSI fed induction motor operation.
3. Know the concept of vector control of induction motor drive.
4. Understand the concept of direct torque control for three phase induction motor.
5. Gain knowledge on vector control of PMSM drives and introduction to BLDC drives.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE38) HVDC and FACTS
(PROFESSIONAL ELECTIVE-IV)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Power Electronics
Power Systems

Course Objective
This subject deals with the

1. Understand the importance of HVDC transmission,
2. Analyze the HVDC converters, Harmonics and Filters, Reactive power control and Power factor improvements of the system.
3. Learn the basic FACTS concepts, static shunt and series compensation and combined compensation techniques.

UNIT-I
Introduction: Comparison of AC and DC transmission systems, application of DC transmission, types of DC links, layout of a HVDC converter station. HVDC converters, pulse number, analysis of Gratez circuit with and without overlap, converter bridge characteristics, equivalent circuits or rectifier and inverter configurations of twelve pulse converters.

UNIT-II
Converter & HVDC System Control: Principles of DC Link Control — Converters Control Characteristics — system control hierarchy, firing angle control, current and extinction angle control, starting and stopping of DC link.

UNIT-III
Harmonics, Filters and Reactive Power Control: Introduction, generation of harmonics, AC and DC filters. Reactive Power Requirements in steady state, sources of reactive power, static VAR systems.
Power Flow Analysis in AC/DC Systems: Modeling of DC/AC converters, Controller Equations-Solutions of AC/DC load flow —Simultaneous Method-Sequential method.

UNIT-IV
Introduction to FACTS: Flow of power in AC parallel paths and meshed systems, basic types of FACTS controllers, brief description and definitions of FACTS controllers.
Static Shunt Compensators: Objectives of shunt compensation, methods of controllable VAR generation, static VAR compensators, SVC and STATCOM, comparison between SVC and STATCOM.

UNIT-V

Static Series Compensators: Objectives of series compensation, variable impedance type-thyristor switched series capacitors (TCSC), and switching converter type series compensators, static series synchronous compensator (SSSC)-power angle characteristics-basic operating control schemes.

Combined Compensators: Introduction, unified power flow controller (UPFC), basic operating principle, independent real and reactive power flow controller, control structure.

TEXT BOOKS

1. HVDC Transmission, S. Kamakshaiah, V. Kamaraju, The Mc — Graw Hill Companies.
2. Understanding FACTS, Concepts and Technology of Flexible AC Transmission Systems, Narain. G. Hingorani, Laszlo Gyugyi, IEEE Press, Wiley India.

REFERENCE BOOKS

1. HVDC and Facts Controllers Applications of Static Converters in Power Systems, Vijay K. Sood, Kiuwer Academic Publishers.
2. HVDC Power Transmission Systems: Technology and system Interactions, K.R.Padiyar, New Age International (P) Limited.
3. Thyristor — Based Conrollers for Electrical Transmission Systems, R.Mohan Mathur, Rajiv K. Varma.Wiley India.
4. FACTS Modeling and Simulation in Power Networks, Enrique Acha, Wiley India Distributed by BSP Books Pvt. Ltd.

Course Outcomes:

After going through this course, the student be able to

1. Understand the basic knowledge on converters control schemes of HVDC system.
2. Apply harmonics filters for reactive power control.
3. Analyze power flow analysis in HVDC systems.
4. Understand basic concepts and necessity of FACTS controllers.
5. Design various shunt and series compensators.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE39) ELECTRICAL AND HYBRID VEHICLES
(PROFESSIONAL ELECTIVE-V)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Prerequisite:
Power Electronics

UNIT-I Introduction to Electric Vehicles:
Introduction, EV components, EV advantages, Vehicle mechanics- Roadway fundamentals, Vehicle kinetics, Dynamics of vehicle motion, Propulsion Power-Force-velocity characteristics, Maximum Gradability, Velocity and Acceleration.

UNIT-II Battery
Basics-Types- Li and Nickle batteries, Parameters- capacity, discharge rate, state of charge and discharge, depth of discharge, Technical characteristics, Battery pack design, Properties of batteries, Fuel cells- Types, characteristics, Super Capacitors and Ultra Capacitors.

UNIT-III Power Electronics and Motor Drives:
DC Motor- Brushless DC Motor, AC Motor- Induction Motor, Optimization of Induction motors for Electric vehicles, Electric drive components, two –quadrant chopper, Open-loop drive- steady state analysis of quadrant-I, ripple reduction and I_a, Acceleration in CCM, DCM and Uncontrollable mode, Braking Operation (CCM in steady state), Regenerative power.

UNIT-IV Electric Vehicle drive Train
EV transmission configuration, Components-gears, differential, clutch, brakes, regenerative braking, Motor sizing.

UNIT-V Hybrid Electric Vehicles
Types-Series and Parallel EHVs, Advantages and disadvantages, Types of internal combustion engines, Design of an HEV-hybrid drive trains, sizing of components.

Text Books:
1. Iqbal Husain, “Electric and Hybrid Vehicles-Design Fundamentals”, second edition, CRC press ,2011
2. James Larminie , “ Electric vehicle technology explained” . John wiley& sons,2003

References:
1. Mehrdad Ehsani, Yimin Gao, Ali Emadi, “Modern Electric, Hybrid Electric & Fuel cell Vehicles: Fundamentals, Theory & Design”, CRC press, 2010.
2. Sandeep Dhameja, “Electric Vehicle Battery Systems”, Newnes, 2000
3. http://nptel.ac.in//courses//108103009

Course Outcomes: After the completion of this course, the students should be able to

1. Gain the knowledge on basic concepts of Electric Vehicles.
2. Acquire and interpret fundamental concepts of advanced batteries and super capacitors.
3. Identify various Motor drives used for Electric Vehicles.
4. Understand various concepts of Electric Train.
5. Acquire knowledge on series and parallel connections of EHV.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE40) POWER QUALITY
(PROFESSIONAL ELECTIVE-V)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Power Systems-I
Power Systems- II
Power Electronics

Course Objectives:
1. To study, understand and analyze various power quality issues.
2. To be able to address power quality problems with various mitigation techniques.

UNIT-I: Power quality problems and definitions
Voltage sag, Voltage swells, Voltage spikes, Voltage notches, Voltage fluctuations, Over/Under voltages, Interruptions, transients, unbalance and Harmonics. Causes and effects of power quality disturbances on various power system equipments. Overview of power quality phenomenon and compensation techniques.

UNIT-II: Single phase circuits: power definitions and its components
Power terms in a single-phase systems- Active power, Reactive power, Apparent power, Non active power, Distortion power and power factor- for sinusoidal voltage source supplying non-linear load current, Non-sinusoidal voltage supplying non-linear loads.

UNIT III: Three phase balanced/unbalanced sinusoidal/non-sinusoidal circuits: power definitions and its components
Three-phase sinusoidal system: Three-phase instantaneous active and reactive power, power invariance in *abc* and $\alpha\beta 0$ coordinates.
Three-phase non-sinusoidal balanced system: Three-phase instantaneous active, reactive powers and oscillatory powers, Symmetrical components, Effective apparent power, positive sequence powers and unbalance power. Neutral current, Line to Line voltage, apparent power with budeanu resolution for balanced distortion case. Effective apparent power for balanced non-sinusoidal systems
Three phase unbalanced non-sinusoidal system: Three-phase instantaneous powers, Arithmetic and Vector Apparent Power with Budeanu's Resolution, Effective apparent power.

UNIT-IV: Analysis of power quality events
Power outages: System average interruption frequency index (SAIFI), Customer average interruption frequency index (CAIFI), System average Interruption duration index (SAIFI), Customer average interruption duration index (CAIDI), Momentary average interruption frequency index (MAIFI)
Unbalance: Symmetrical components of phasor quantities, Instantaneous symmetrical components, Instantaneous real and reactive powers.
voltage sag: Voltage sag energy, Voltage sag lost energy index (VSLEI), and Distortions,

UNIT-V: Passive compensation and power filters

Passive Compensators: Introduction, Classification of passive shunt and series compensators, Principle of operation, Analysis and design of shunt compensators for single-phase/three-phase power factor correction and zero voltage regulation.

Passive power filters: Introduction, classification of passive filters, Principle of operation, Analysis and design of shunt passive power filters, parallel resonance and its mitigation.

Text Books:

1. Ghosh, Arindam, and Gerard Ledwich. *Power quality enhancement using custom power devices*. Springer Science & Business Media, 2012.
2. Singh, Bhim, Ambrish Chandra, and Kamal Al-Haddad. *Power quality: problems and mitigation techniques*. John Wiley & Sons, 2014.

Reference book:

1. Bollen, Math HJ. "Understanding power quality problems." *Voltage sags and Interruptions*. IEEE press, 2000.
2. Chattopadhyay, Surajit, Madhuchhanda Mitra, and Samarjit Sengupta. "Electric power quality." *Electric Power Quality*. Springer, Dordrecht, 2011. 5-12.

Course Outcomes:

After completion of the course, the student should be able to

1. Know the terminology, and definitions of various power quality problems.
2. Define and understand the components of current/power in sinusoidal/non-sinusoidal single-phase supply/load systems.
3. Define and understand the components of current/power in sinusoidal/non-sinusoidal three-phase supply/load systems.
4. Analyze the power outages, unbalance, voltage sag and distortions in power systems.
5. Design the passive shunt/series compensators and power filters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE41) DIGITAL CONTROL SYSTEMS
(PROFESSIONAL ELECTIVE-V)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Control Systems

Course Objectives:

1. To equip the students with the basic knowledge of A/D and D/A conversion
2. To understand the basics of Z- Transform
3. To study the stability analysis of digital control system
4. Analyze digital control systems using state-space methods.
5. Analyze digital control systems using transform techniques (frequency response) and state-space methods (pole-assignment).

UNIT I: Introduction to Digital Control Systems And Z-Transforms
Introduction - Merits and Demerits of Digital Control Systems - Practical aspects of the choice of sampling rate and Multirate sampling - Basic discrete time signals - Quantization – Sampling Theorem - Data Conversions and Quantization - Sampling process - Mathematical Modeling - Data Reconstruction and Filtering of sampled signals – Zero - Order Hold (ZOH).
z- Transform and Inverse z-Transform, Relationship between s - plane and z - plane - Difference equation - Solution by recursion and z-Transform - Pulse Transfer Functions of the ZOH and relationship between G(s) and G(z)– Bilinear Transformation.

UNIT II: Input/output Analysis of Digital Control Systems
Pulse transfer function - z transform analysis of open loop, closed loop systems - Modified z Transform - transfer function - Stability of linear digital control systems - Stability tests – Jury Stability test. Root loci - Frequency domain analysis - Bode plots - Gain margin and phase margin.

UNIT III: Design of Controllers For I/O Model Digital Control Systems
Cascade and Feedback Compensation by continuous data controllers - Digital controllers - Design using Bilinear Transformation - Realization of Digital PID controllers, Design of Digital Control Systems based on Root Locus Technique.

UNIT IV: State Space Analysis and State Feedback Control Design of Digital Control Systems
State Equations of discrete data systems, solution of discrete state equations, State Transition Matrix: Computation methods for State Transition Matrix: z - transform method. Relation between State Equations and Pulse Transfer Functions. Concepts on Controllability and Observability - Pole placement design by state feedback.

UNIT V: Digital State Observer and Stability Analysis
Design of the full order and reduced order state observer, Design of Dead-beat Controller - some case studies - Stability analysis of discrete time systems based on Lyapunov approach.

Text books:

1. K. Ogata, Discrete Time Control Systems, PHI/Addison - Wesley Longman Pte. Ltd., India, Delhi, 1995.
2. B.C Kuo, Digital Control Systems, 2nd Edition, Oxford Univ Press, Inc., 1992.

Reference books:

1. F. Franklin, J.D. Powell, and M.L. Workman, Digital control of Dynamic Systems, Addison - Wesley Longman, Inc., Menlo Park, CA, 1998.
2. M. Gopal, Digital Control and State Variable Methods, Tata McGraw Hill, India, 1997.
3. C. H. Houpis and G.B. Lamont, Digital Control Systems, McGraw Hill, 1985.
4. John S. Baey, Fundamentals of Linear State Space Systems, Mc. Graw – Hill, 1st edition.
5. Bernard Fried Land, Control System Design, Mc. Graw – Hill, 1st edition.
6. Dorsay, Continuous and Discrete Control Systems, McGraw - Hill.

Course Outcomes: After the completion of this course, the student should be able to

1	Acquire a strong foundation in sampling and reconstruction Z-transforms.
2	Apply knowledge of Mathematics, Z-plane analysis to discrete time control systems.
3	Replace the conventional control system with Digital control system.
4	Evaluate and apply Z-plane analysis of discrete time control systems
5	Apply state feedback controllers and observers

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MB02) MANAGEMENT SCIENCE
(OPEN ELECTIVE-II)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/-/- /3

Pre-requisites: None

Objectives: This course is intended

1. To familiarize the students with the framework for the managers and leaders available for understanding and making decisions relating to issues related organizational structure, production operations, marketing, human resource management, product management and strategy.

UNIT - I:

Introduction to Management and Organization: Concepts of Management and organization-nature, importance and Functions of Management, Systems Approach to Management - Taylor's Scientific Management Theory- Fayal's Principles of Management- Maslow's theory of Hierarchy of Human Needs- Douglas McGregor's Theory X and Theory Y - Hertzberg Two Factor Theory of Motivation - Leadership Styles, Social responsibilities of Management, Designing Organizational Structures: Basic concepts related to Organization - Departmentation and Decentralization, Types and Evaluation of mechanistic and organic structures of organization and suitability.

UNIT - II:

Operations and Marketing Management: Principles and Types of Plant Layout-Methods of Production(Job, batch and Mass Production), Work Study - Basic procedure involved in Method Study and Work Measurement - Business Process Reengineering(BPR) - Statistical Quality Control: control charts for Variables and Attributes (simple Problems) and Acceptance Sampling, TQM, Six Sigma, Deming's contribution to quality, Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Store Records - JIT System, Supply Chain Management, Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT - III:

Human Resources Management (HRM): Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating - Capability Maturity Model (CMM) Levels - Performance Management System.

UNIT - IV:

Project Management (PERT/ CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).

UNIT - V:

Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

TEXT BOOKS:

1. Aryasri: Management Sciences, 2/e, TMH, 2005.
2. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi, 2004.

REFERENCE BOOKS:

1. Kotler Philip and Keller Kevin Lane: Marketing Management, Pearson, 2012.
2. Koontz and Weihrich: Essentials of Management, McGraw Hill, 2012.
3. Thomas N. Duening and John M. Ivancevich Management - Principles and Guidelines, Biztantra, 2012.
4. Kanishka Bedi, Production and Operations Management, Oxford Uiversity Press, 2012.
5. Samuel C. Certo: Modern Management, 2012.
6. Schermerhorn, Capling, Poole and Wiesner: Management, Wiley, 2012.
7. P. Vijay Kumar, N. Appa Rao and Ashnab, Chnalill, Cengage Learning India, 2012.

Course Outcomes:

After the completion of this course, the student should be able to

1. Plan an organizational structure for a given context in the organization carry out production operations through Work study.
2. Carry out production operations through Work study.
3. Understand the markets, customers and competition better and price the given products appropriately.
4. Ensure quality for a given product or service.
5. Plan and control the HR function better.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS52) OOPS TROUGH JAVA
(OPEN ELECTIVE-II)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Data Structures through C++

Objectives:

Modern Computerization methods have matured in the problem-solving aspects and presently use the concepts of object-oriented treatment of issues.

1. To use data sets with more functional aspects using the concept of classes and objects with a distinct programming methodology which has become predominant.
2. To learn many other important software development techniques are based upon the fundamental ideas employed in object-oriented programming.
3. To introduce Java and OOPs programming at a higher platform.

UNIT-I

OOP Concepts: Data Abstraction, Encapsulation, Inheritance, Benefits of inheritance, Polymorphism, Classes and Objects, Procedural and Object-oriented Programming paradigms.

Java Programming: History of Java, Comments, Data Types, Variables, Constants, Scope and Life Time of Variable, Operators, Operator Hierarchy, Expressions, Type Conversion and Casting, Enumerated Types, Control Flow-Block Scope, Conditional Statements, loops, break, continue statements, simple java standalone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and Constructors, recursion, garbage collection, Nested Classes, Inner Classes.

UNIT-II

Inheritance: Inheritance hierarchies super and sub classes, Member access rules, super keyword, method over riding, preventing Inheritance: final classes and methods, the Object class and its methods.

Interfaces- Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

Packages- Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing Packages.

UNIT-III

Exception Handling- Dealing with Errors, benefits of Exception Handling, the classification of exceptions-exception Hierarchy, checked exceptions and unchecked exceptions, Usage of try, catch, throw, throws and finally, re-throwing exceptions, exception specification, built in exceptions, creating own exception sub classes. (TextBook-1: PageNumber:207-225)

Files- streams-byte streams, character streams, text Input/output, binary input/output random access file operations, File management using File class, exploring String Class.

UNIT-IV

Collection Framework in Java- Introduction to Java Collections, Overview of Java Collection Frame work, Generics, Commonly used Collection Classes-Array List, Vector, Hash Table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, calendar and Properties.

Multi-Threading- Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern.

UNIT-V

GUI Programming with Java- The AWT class Hierarchy, Introduction to Swing, Swing vs. AWT, Hierarchy for Swing Components, Containers- JFrame, JApplet, JDialog, JPanel, Overview of some swing components- JButton, JLabel, JTextField, JTextArea, simple swing applications, Layout Management-Layout manager types-border, grid and flow. (TextBook-1 PageNumbers: 735-820, 965-990).

Event Handling- Events, Event Sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Examples: handling a button click, handling mouse events, Adapter classes. (TextBook-1 PageNumbers: 707-729).

Applets: Inheritance hierarchy for applets, differences between applets and applications, Life Cycle of an applet, passing parameters to applets, applet security issues.

TEXT BOOKS:

1. Java the Complete Reference, 8th Edition. Hebert Schildt. Indian edition.
2. Java for Programmers, P.J. Dietel and H.M Dietel,Peearson Education (OR) JAVA: How to Program P.J. Dietel and H.M. Dietel, PHI.

REFERENCE BOOKS:

1. Object Oriented Programming through Java, P. Radha Krishna, University Press.
2. Thinking in Java, Bruce Ecel, Pearson Education
3. Programming in Java, S. Malhotra and S. Choudary, Oxford Univ. Press.

Course Outcomes: After the completion of this course, the student should be able to

1. Describe the concepts of Java Programming language
2. Demonstrate the concepts of Polymorphism and Inheritance
3. Develop robust applications using Exception handling.
4. Develop multithreaded applications with synchronization.
5. Design GUI based applications and Applets for web applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC21) VLSI DESIGN
(OPEN ELECTIVE-II)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Electronic Devices and Circuits
Linear & Digital IC Applications

Course Objectives

1. Give exposure to different steps involved in the fabrication of ICs using MOS transistor, CMOS/BICMOS transistors and passive components.
2. Explain electrical properties of MOS and BICMOS devices to analyze the behavior of inverters designed with various loads.
3. Give exposure to the design rules to be followed to draw the layout of any logic circuit.
4. Provide concept to design different types of logic gates using CMOS inverter and analyze their transfer characteristics. Provide design concepts to design building blocks of data path of any system using gates.
5. Understand basic programmable logic devices and testing of CMOS circuits.

UNIT –I:
Introduction: Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS
Basic Electrical Properties: Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, Figure of merit ωo; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT -II:
VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 m CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

UNIT –III:
Gate Level Design: Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Time delays, Driving large capacitive loads, Wiring capacitance, Fan – in, Fan – out, Choice of layers.

UNIT -IV:
Data Path Subsystems: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.
Array Subsystems: SRAM, DRAM, ROM, Serial Access Memories.

UNIT -V:
Programmable Logic Devices: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach, Parameters influencing low power design.

CMOS Testing: CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques.

Text Books:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition
2. CMOS VLSI Design – A Circuits and Systems Perspective, Neil H. E Weste, David Harris, Ayan Banerjee, 3rd Ed, Pearson, 2009.

Reference Books

1. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
2. CMOS logic circuit Design - John .P. Uyemura, Springer, 2007.
3. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
4. VLSI Design- K .Lal Kishore, V. S. V. Prabhakar, I.K International, 2009.
5. Introduction to VLSI – Mead & Convey, BS Publications, 2010.
6. VLSI Design – M. Michael Vai, 2001, CRC Press.

Course Outcomes

Upon successfully completing the Course, the student should be able to:

1. Understand IC technology and basic electrical properties of MOS and BiCMOS.
2. Discuss the design process of VLSI circuit.
3. Develop and design the gate level circuits.
4. Gain the knowledge to design data path subsystems like Adders, Shifters, ALUs etc.
5. Illustrate different programmable logic devices and CMOS testing.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18CS37) BUSINESS INTELLIGENCE AND BIG DATA
(OPEN ELECTIVE-II)

B. TECH- VII SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Database Management System
Data Warehousing and Data Mining
Object Oriented Programming Through Java.

Course Objectives:
1. Understand the key technologies such as manipulating, storing, and analyzing big data. The students understand details of Hadoop.
2. Learn the tools required to manage and analyze big data like Hadoop, NoSql Map-Reduce, principles in achieving big data analytics with scalability and streaming capability.
3. To acquire skills that helps them to solve complex real-world problems in for decision support.

UNIT -I
Introduction to Big Data Analytics: Grasping the fundamentals of Bigdata, Examining BigData types, **Technology Foundation of Big Data:** Big Data Technology, Digging into Big Data Technology components, Virtualization and Big Data ,Examining Cloud and Big Data, Information Management in Big Data**. (Text Book 1 part 1, Pg No. 7-36)**

UNIT-II
Big Data Management: Operational Databases, Map Reduce Fundamentals, Exploringworld of Hadoop , Hadoop Foundation and ecosystem , Appliances and Big Data Warehouses. **(Text Book 1 part 3, Pg No. 83-138)**

UNIT-III
The Map Reduce and Software Stack: Algorithms using Map Reduce, Extensions to MapReduce, The communication Cost Model, The Complexity Theory for Map Reduce. (**Text Book 1, Pg No. 200-229).**

UNIT-IV
Big Data Solutions in Real World: The importance of Bigdata to Business, Analyzing Datain Motion: A Real-World View, Improving Business Processes with Big Data Analytics: A Real-World View, Data Privacy and Ethics in Big Data. **(Text book 1, Pg No. 235-262)**

UNIT-V
Ethics of Big Data: Big Data Big Impact, Values and Actions, Current practices, AligningValues and Actions. **(Text book 2, Pg No. 1-62)**

Text Books:

1. Big Data for Dummies by Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman, John Wiley & Sons

2. Ethics of Big Data: Balancing Risk and Innovation By Kord Davis, O'reilly Media 4) Mining of Massive Datasets by Anand Rajaraman, Jure Leskovec, Jeff rey D. Ullman, Cambridge University Press.

References:

1. Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses (Wiley CIO) By Michael Minelli, Michele Chambers, Ambiga Dhiraj John Wiley & Sons
2. Hadoop: The Definitive Guide, 3rd Edition, By Tom White, O'reilly Media
3. Big Data Now: 2012 Edition Publisher: O'Reilly Media.
4. Too Big to Ignore: The Business Case for Big Data (Wiley and SAS Business Series) By Phil Simon, Wiley.

Course Outcomes: After the completion of this course, the student should be able to

1. Learn the basics concepts and fundamentals of big data analysis and examine its various types.
2. Understand the key technologies such as manipulating, storing, and analyzing big data.
3. Understand the concept of map reduce and explore its extensions
4. Explore various big data solutions to real world problems
5. Understand the ethics and practices of big data analysis in the real world.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC29) MICROPROCESSORS AND MICROCONTROLLERS LAB

B. TECH- VII SEM. (EEE) **L/T/P/C**
0/0/2/1

Pre- Requisites:
Switching Theory and Logic Design

Course Objectives:

- To develop an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques.

List of Experiments:

1. Programs for 16-bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessors using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify Timer/ Counter in 8051.
12. Program and verify Interrupt handling in 8051
13. UART Operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/ Keyboard to 8051.
17. Data Transfer from Peripheral to Memory through DMA controller 8237 / 8257.

Note: Minimum of 12 experiments are to be conducted.
The above programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

Course Outcomes After the completion of this course, the student should be able to

1. Demonstrate experimentally basic programming of Microprocessor.
2. Exhibit microprocessor interfacing with various peripherals for various applications.
3. Demonstrate experimentally basic programming of microcontroller.
4. Exhibit microprocessor interfacing with various peripherals for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE42) ELECTRICALSIMULATION LAB

B. TECH- VII-SEM. (EEE) **L/T/P/C**
0/0/2/1

Pre-Requisites:
Control Systems
Power Electronics
Power Systems-I
Power Systems-I

Course Outcomes:
To get the Simulation Knowledge about

- Concepts on Time Response & frequency response Analysis
- Concepts on Load Flow analysis

List of Experiments:

1. Write Program and simulate dynamical system of following models:
   i) I/O Model
   ii) State Variable Model
   Also Identify time domain specifications of each.
2. Determine stability of a given dynamical system using following methods:
   i) Root Locus
   ii) Bode plot
   iii) Nyquist Plot
   iv) Liapunous stability criteria
3. Obtain model matrix of a given system. obtain it's diagonalize form if exists
   Or obtain Jordan canonical form of system.
4. Design a compensator for a given systems for required specifications
5. Develop a simulink model for a single area load frequency problem and simulate the same
6. Develop a simulink model for a two area load frequency problem and simulate the same
7. PSPICE Simulation of Single phase full converter using RL and E Loads
8. PSPICE Simulation of Three phase full converter using RL and E Loads
9. PSPICE Simulation of Single phase AC Voltage controller using RL Load
10. PSPICE Simulation of Three Phase Inverter with PWM controller

Course Outcomes:
After learning this course, the student can able to

1	Get the basic simulation knowledge on electrical subjects
2	Learn the time response and frequency response analysis
3	Conduct load flow analysis
4	Gain working knowledge on PSPICE software

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EN03) ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B. TECH- VII- SEM. (EEE) **L/T/P/C**
0/0/2/1

Pre-Requisites:
English Language Communication Skills Lab

Introduction

The introduction of the Advanced English Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalized context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

COURSE OBJECTIVES:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

Syllabus:

The following course content to conduct the activities is prescribed for the Advanced English Communication Skills (AECS) Lab:

1. **Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations and Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations and usage of vocabulary.

2. **Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.

3. **Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing* – planning for writing – improving one's writing.

4. **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/ e-mails/assignments etc.

5. **Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference and video-conference and Mock Interviews.

Minimum Requirement:

The Advanced English Communication Skills (AECS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

Prescribed Lab Manual: A book titled ***A Course Book of Advanced Communication SkillsLab*** published by Universities Press, Hyderabad.

Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- Oxford Advanced Learner's Compass, 8th Edition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- The following software from 'train2success.com'
  - Preparing for being Interviewed
  - Positive Thinking
  - Interviewing Skills
  - Telephone Skills
  - Time Management
  - Skillmate

- Presentation skills, Cambridge (with VCD)

Text Books :

1. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.

Reference Books:

1. **The Basics of Communication:A Relational Perspective**. Steve Duck & David T. McMahan. Sage South Asia Edition. Sage Publications. 2012.
2. **English Vocabulary in Use** series, Cambridge University Press 2008.
3. **Management Shapers Series** by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
4. **Handbook for Technical Communication** by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
5. **Communication Skills** by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
6. **Handbook for Technical Writing** by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
7. **Job Hunting** by Colm Downes,Cambridge University Press 2008.
8. **Master Public Speaking** by Anne Nicholls, JAICO Publishing House, 2006.
9. **English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.**
10. Books on **TOEFL/GRE/GMAT/CAT/IELTS** by Barron's/DELTA/Cambridge University Press.
11. **International English for Call Centres** by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.
12. **Towards Career Advancement** - Excerpts from a Professor's Folio by **P. SatyanarayanaProf. of English,Vaagdevi College of Engineering** , published by Vaagdevi Group of Colleges Engineering , Warangal (T.S.) India, 2015.

Course Outcomes: After the completion of this course, the student should be able to

1. Develop sound vocabulary and its proper use contextually.
2. Inculcate flair for Writing and felicity in written expression.
3. Enhance job prospects.
4. Acquire effective speaking abilities.

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE45) NEURAL NETWORKS AND FUZZY SYSTEMS
(PROFESSIONAL ELECTIVE-VI)

B. TECH- VIII- SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Mathematics-I

Course Objective:
- The aim of this course is to provide students with an understanding of the fundamental theory of neural networks and fuzzy systems.
- The objective is intended for students to apply neural networks and fuzzy systems to model and solve complicated practical problems such as recognition.
- To cater the knowledge of Neural Networks and Fuzzy Logic Control and use these in developing Artificial intelligence-based control of real time systems

UNIT – I: Introduction to Neural Networks
Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.
Essentials of Artificial Neural Networks: Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application.

UNIT–II: Feed Forward Neural Networks
Single Layer Feed Forward Neural Networks: Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.
Multilayer Feed Forward Neural Networks
Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT III: Associative Memories
Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory).Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem .Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network.

UNIT – IV: Classical and Fuzzy Sets

Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT V: Fuzzy Logic System

Fuzzification, Membership value assignment, development of rule base and decision-making system, Defuzzification to crisp sets, Defuzzification methods.

Text books:

1. Kosko, B, "Neural Networks and Fuzzy Systems: A Dynamical Approach to Machine Intelligence", PrenticeHall, NewDelhi,2004.
2. Timothy J Ross, "Fuzzy Logic with Engineering Applications", John Willey and Sons, West Sussex, England, 2005.

Reference books:

1. Jack M. Zurada, "*Introduction to Artificial Neural Systems*",
2. PWS Publishing Co., Boston, 2002.
3. S. Kumar, "Neural Networks: A Classroom Approach," McGraw Hill, 2005.
4. Rajasekharan and Pai, Neural Networks, Fuzzy logic, Genetic algorithms: synthesis andapplications– PHI Publication.
5. Satish Kumar, Neural Networks, TMH, 2004.

Course Outcomes: After the completion of this course, the student should be able to

1. Understand the concepts of feed forward neural Networks
2. Acquire adequate knowledge about feedback networks.
3. Get knowledge about the concept of fuzziness involved in various systems and about fuzzy set theory.
4. Gain knowledge of fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
5. Explore knowledge of application of fuzzy logic control to real time systems in engineering.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE46) UTILIZATION OF ELECTRICAL ENERGY
(PROFESSIONAL ELECTIVE-VI)

B. TECH- VIII-SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
Applied Physics
Electrical Machines-I
Electrical Machines-II

Course Objective:
1. This subject deals with the fundamentals of illumination and its classification and the electric heating and welding.
2. It gives the detailed study of all varieties of Electric drives and their application to electrical traction systems.

UNIT-I: Electric Drives
Type of electric drives, choice of motor, starting and running characteristics, speed control, temperature rise, particular applications of electric drives, types of industrial loads, continuous, intermittent and variable loads, load equalization.

UNIT-II: Electric Heating
Advantages and methods of electric heating, resistance heating induction heating and dielectric heating.

Electric Welding
Electric welding, resistance and arc welding, electric welding equipment, comparison between A.C. and D.C. Welding.

UNIT-III: Illumination
Introduction, terms used in illumination, laws of illumination, polar curves, photometry, Integrating sphere, sources of light. Various Illumination Methods. Discharge lamps, MV and SV lamps comparison between tungsten filament lamps and fluorescent tubes, Basic principles of light control, Types and design of lighting and flood lighting.

UNIT-IV: Electric Traction-I
System of electric traction and track electrification. Review of existing electric traction Systems in India. Special features of traction motor, methods of electric braking-plugging rheostat braking and regenerative braking. Mechanics of train movement. Speed-time curves for different services – trapezoidal and Quadrilateral speed time curves.

UNIT-V: Electric Traction-II
Calculations of tractive effort, power, specific energy consumption for given run, effect of varying acceleration and braking retardation, adhesive weight and coefficient of adhesion.

Text Books:
1. E. Openshaw Taylor, Utilisation of Electric Energy – by University press.

2. Partab, Art & Science of Utilization of electrical Energy –Dhanpat Rai & Sons.

Reference Books:

1. N.V.Suryanarayana, Utilization of Electrical Power including Electric drives and Electric traction, New Age International (P) Limited, Publishers, 1996.
2. C.L. Wadhwa, Generation, Distribution and Utilization of electrical Energy, New Age International (P) Limited, Publishers, 1997.

Course Outcomes:

After completing the course, the student shall be able to.

1. Choose a right drive for a particular application.
2. Identify Heating and welding schemes for given application.
3. Explain the basics of lighting and methods of illumination and its parameters
4. Understand the different schemes of traction systems, its characteristics and its main components.
5. Analyze electrical energy consumption for traction system.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EE47) SMART GRIDS
(PROFESSIONAL ELECTIVE-VI)

B. TECH- VIII-SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre-Requisites:
None

Course Objective:
1. This subject deals with the fundamentals of smart grids.
2. It gives the detailed study of various technologies involved in smart grids.

Unit I: Introduction to Smart Grid: Introduction to Smart Grid - Working definitions of Smart Grid and associated Concepts – Smart Grid Functions – Traditional Power Grid and Smart Grid – Standards for Smart Grid – Advantages – Indian Smart Grid –National Smart Grid mission (NSGM) by Govt. of India - Key Challenges for Smart Grid in India.

Unit II: Smart Grid Architecture: Components and Architecture of Smart Grid Design – Review of theproposed architectures for Smart Grid. The fundamental components of Smart Grid designs – Transmission Automation – Distribution Automation – Substation automation – Renewable Integration.

Unit III: Communication Technologies: Introduction to Communication Technology –Supervisory control and data acquisition (SCADA), energy management system (EMS), Synchro-Phasor Measurement Units (PMUs) – Wide Area Measurement Systems (WAMS).

Unit IV: Smart Distribution Technologies: Outage Management Systems (OMS), Automated Meter Reading (AMR), Automated Metering Infrastructure (AMI), Fault Location Isolation and Service Restoration (FLISR) – Distributed energy resources (DERs), smart appliances, Net Metering. Low Voltage DC (LVDC) distribution in homes / buildings, Home Energy Management System (HEMS), Building to Grid B2G, Vehicle to Grid V2G, Solar to Grid, Energy Storage Technologies.

Unit V: Regulations and Market Models for Smart Grid: Demand Response, Tariff Design, Time of the Day pricing (TOD), Time of Use pricing (TOU), Consumer privacy and data protection, consumer engagement etc. Cost benefit analysis of smart grid projects.

Text Books
1. Clark W Gellings, “The Smart Grid, Enabling Energy Efficiency and Demand Side Response”- CRC Press, 2009.
2. Stuart Borlase, “Smart Grids, Infrastructure, Technology and Solutions”, CRC Press,2013

References

1. Janaka Ekanayake, Kithsiri Liyanage, Jianzhong. Wu, Akihiko Yokoyama, Nick Jenkins, "Smart Grid: Technology and Applications"- Wiley, 2012.
2. Jean Claude Sabonnadière, Nouredine Hadjsaïd, "Smart Grids", Wiley-ISTE, IEEE Press, May 2012.
3. A.G. Phadke and J.S. Thorp, "Synchronized Phasor Measurements and their Applications", Springer Edition, 2010.
4. Gil Masters, "Renewable and Efficient Electric Power System", Wiley–IEEE Press, 2004.
5. T. Ackermann, "Wind Power in Power Systems", Hoboken, NJ, USA, John Wiley,2005
6. James Momoh, "Smart Grid: Fundamentals of Design and Analysis" – Wiley, IEEE Press, 2012.
7. India Smart Grid Knowledge Portal
8. NPTEL course on Smart Grids

Course Outcomes:

At the end of this course students are able to

1. Understand technologies for smart grid and features of Smart Grid in the context of Indian Grid.
2. Assess the role of automation in Transmission/Distribution/substation.
3. Know various communication technologies involved in smart grids and importance of PMUs, EMS, WAMS, SCADA
4. Classify various Smart Distribution Technologies
5. Clarify the regulations and market models for smart grid and various tariffs

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MB03) ENTERPRENEURSHIP DEVELOPMENT
(OPEN ELECTIVE-III)

B. TECH- VIII-SEM. (EEE) **L/T/P/C**
3/0/0/3

Course Objective: The objective of the course is to make students understand the nature of entrepreneurship, and to motivate the student to start his/her own enterprise. The objective of the course is to enlighten with the fragrance of Corporate Good Governance and Business Ethics, so that they would become the best entrepreneurs / managers of the corporate world.

Unit – I

Nature of Entrepreneurship; Characteristics – Qualities and skills of an Entrepreneur – Functions of entrepreneur – Entrepreneur scenario in India and Abroad. Forms of Entrepreneurship: Small Business – Importance in Indian Economy – Types of ownership – Sole trading – Partnership – Joint stock company and other forms. First – Mover disadvantages, Risk Reduction strategies, Market scope strategy, Imitation strategies and Managing Newness

Unit – II

Aspects of Promotion: Generation of new entry opportunity, SWOT Analysis,Technological Competitiveness, legal regulatory systems, patents and trademarks, Intellectual Property Rights-Project Planning and Feasibility Studies- Major steps in product development. Financial Aspects: Sources of raising Capital, Debt-Equity, Financing by Commercial Banks, Government Grants and Subsidies, Entrepreneurship Promotion Schemes of Department of Industries (DIC), KVIC, SIDBI, NABARD, NSIC, APSFC, IFCI and IDBI. New Financial Instruments.

Unit - III

Introduction to Business Ethics: Necessity for Business Ethics-Need for Ethical guideline –Salient Issues in Ethics and Commerce- Ethics as a Luxury – Earlier attempts at Ethics in Industry – Justification for Ethics – Effect of Migration of National Character – Shadow Economy – Basic Principles in Ethics – Corporate Climate and corporate climate audits – Political Issues – Nature and theory of Ethics – The Naturalistic fallacy - G.E.Moore's Philosophy.

Unit – IV

Understanding Corporate Governance: Corporate Governance- Capitalism at crossroads – Historical perspective of Corporate Governance – Issues of Corporate Governance – Theoretical basis of Corporate Governance – Corporate Governance mechanisms – Indian Model of Governance – Good Corporate Governance – Corporate Governance committees – OECD Principles – Indian Committee and guidelines – The confederation of Indian Industry's initiative. Corporate Governance Models, Corporate Social Responsibility.

Unit – V

Corporate Social Responsibility: System Concept of Business Society – SocialResponsibility – Social Responsibility tools – approaches to Ethics – Corporate Social Accountability - Business in a

Social World – Ethics and Social Responsibility – professional ethics – Ethics of practicing company secretaries- Ethical investing.

Text Books:

1. Robert D Hisrich, Michael P Peters, Dean A Shepherd: Entrepreneurship, TMH, 2009
2. Vasanth Desai: Entrepreneurship, HPH, 2009
3. C.S.V.Murthy: Business Ethics & Corporate Governance, Himalaya, 2009.

References:

1. Bholanath Dutta: Entrepreneurship Text and Cases, Excel, 2009
2. David Martin: Corporate Governance, Viva, 2009
3. H. Nandan: Fundamentals of Entrepreneurship, PHI, 2009.
4. Barringer: Entrepreneurship, Pearson,2009.
5. Ronald D Francis & Mukti Mishra: Business Ethics, TMH, 2009
6. RK Mishra,Gitarani: Corporate Governance, Excel,2009
7. A.C.Frenando: Corporate Governance, Pearson, 2006
8. V.Balachandran &V.Chandrasekaran: Corporate Governance & Social Responsibility, PHI, 2009
9. A.C.Fernando: Business Ethics, Pearson, 2009
10. Laura P Hartman & Abha Chatterjee: Business Ethics, TMH, 2009
11. Tripat Kaur: Values and Ethics in Management, 2/e, Paragon International,2009.

Course Outcomes: After the completion of this course, the student should be able to

1. Understand the qualities and skills of entrepreneurship
2. Explore various aspects that promotes entrepreneur in the society
3. Understand the necessity of ethical guidelines in business
4. Understand the basics of corporate governance and its mechanism
5. Understand the impact of social responsibility of a entrepreneur

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18EC31) EMBEDDED SYSTEMS
(OPEN ELECTIVE-III)

B. TECH- VIII-SEM. (EEE) **L/T/P/C**
3/0/0/3

Pre- Requisites: None

Course Objectives

For embedded systems, the course will enable the students to:

- Understand the basics of an embedded system
- Program an embedded system
- To learn the method of designing an Embedded System for any type of applications.
- To understand operating systems concepts, types and choosing RTOS.
- Design, implement and test an embedded system.

UNIT -I

Introduction to Embedded Systems: Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems.

UNIT-II

Typical Embedded System: Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off- The-Shelf Components (COTS), Memory: ROM, RAM, Memory according to the type of Interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: Onboard and External Communication Interfaces.

UNIT -III

Embedded Firmware: Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages.

UNIT -IV

RTOS Based Embedded System Design: Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

UNIT -V

Task Communication: Shared Memory, Message Passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication/ Synchronization Issues, Task Synchronization Techniques, Device Drivers, How to Choose an RTOS.

Text Book

- Introduction to Embedded Systems – Shibu K.V, Mc Graw Hill.

Reference Books

1. Embedded Systems Raj Kamal, TMH.
2. Embedded System Design – Frank Vahid, Tony Givargis, John Wiley.
3. Embedded Systems — Lyla, Pearson, 2013
4. An Embedded Software Primer – David E. Simon, Pearson Education.

Course Outcomes

Upon completion of this course, the student will be able to:

1	Understand the basics of an embedded system.
2	Learn the method of designing an embedded system for any type of applications.
3	Understand the operating systems concepts, types and choosing RTOS.
4	Understand types of memory and interacting to external world.
5	Learn embedded firmware design approaches.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18ME36) POWER PLANT ENGINEERING
(OPEN ELECTIVE-III)

B. TECH- VIII-SEM. (EEE) **L/T/P/C**
3/0/0/3

COURSE OBJECTIVES:

1. Understand the sources of energy, nature and role of energy in India. To recognize and understand the different types of power plants, equipment and Layouts
2. Understand the working principle of Steam power plant, equipment, Coal handling systems, ash handling systems.
3. Understand working principle of Diesel power plant and Gas Turbine power plant.
4. Know components of Hydro-Electric Power plant, Typical Layouts, Types of Dams
5. Know various nuclear fuels, various types of Nuclear Reactors.
6. Understand Power plant Economics, Load Curves, Effluents from various power plants, Environmental standards

UNIT – I
INTRODUCTION TO THE SOURCES OF ENERGY
Resources and Development of Power in India.
Steam Power Plant: Plant Layout, Working of different Circuits, Fuel and handling equipment, types of coals, coal handling, choice of handling equipment, coal storage. Ash handling systems.
Combustion process: Properties of coal – overfeed and underfeed fuel beds, traveling grate stokers, spreader stokers, retort stokers, pulverized fuel burning system and its components, combustion needs and draught system, cyclone furnace, design and construction. Dust collectors, cooling towers and heat rejection. Corrosion and fed water treatment.

UNIT – II
INTERNAL COMBUSTION ENGINE PLANT
DIESEL POWER PLANT: Introduction – IC engines, types, construction. Plant layout with auxiliaries. Fuel supply system, air starting equipment, lubrication and cooling system, super charging.
Gas Turbine Plant: Introduction – classification – construction – Layout with auxiliaries – Principles of working of closed and open cycle gas turbines. Combined Cycle Power Plants and comparison.
Direct Energy Conversion: Solar energy, fuel cells, Thermo electric and Thermo ionic, NHD generation.

UNIT – III
HYDRO ELECTRIC POWER PLANT
Water power – Hydrological cycle/flow measurement – drainage area characteristics – Hydrographs – storage and Pondage – classification of dams and spill ways.

Hydro Projects and Plant: Classification – Typical layouts – plant auxiliaries – plant operation pumped storage plants. Application of Hydro power plant, safety measures in Hydro power station, performance of water turbine, comparison of Hydro electric power plant and steam power plant.

UNIT – IV

NUCLEAR POWER STATION

Nuclear fuel – breeding and fertile materials – Nuclear reactor – reactor operation.

Types of Reactors: Pressurized water reactor, Boiling water reactor, sodium-graphite reactor, fast Breeder Reactor, Homogeneous reactor, Gas cooled reactor, Radiation hazards and shielding – radioactive waste disposal.

UNIT – V

POWER PLANT ECONOMICS AND ENVIRONMENTAL CONSIDERATIONS

Capital cost, investment of fixed charges, operating costs, general arrangement of power distribution. Load curves, load duration curve. Definitions of connected load. Maximum demand, demand factor, average load, load factor, diversity factor – related exercises. Effluents from power plants and Impact on environment – Pollutants and pollution standards – Methods of Pollution control.

TEXT BOOKS

1. P.C.Sharma, "Power Plant Engineering", S.K.Kataria Publication, 2013, ISBN-13: 9788189757205.
2. Arora and S.Domkundwar, "A course in Power Plant Engineering", 2nd Edition TMH, ISBN: 9780070435995.

REFERENCE BOOKS

1. Rajput, "A text book of Power Plant Engineering", Laxmi Publications, ISBN No.: 978-81-318-0255-7.
2. Ramalingam, "Power Plant Engineering", SciTech Publishers, ISBN-13:
3. P.K.Nag, "Power Plant Engineering": II Edition, TMH, ISBN Number: 978-0070648159.
4. Elanchezhian, "Power Plant Engineering", I.K. International Publications, ISBN-13: 978-8189866303.

COURSE OUTCOMES:

This course helps the students to

1. Understand the layout of power generation units for different energy sectors.
2. Identify different subsystem and systems of power generation sector.
3. Compare existing and emerging alternative energy sources
4. Analyze the opportunities in contributing towards the solving of energy crisis.
5. Discuss general arrangement of power distribution.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(B18MB06) INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE-III)

B. TECH- VIII- SEM. (EEE) **L/T/P/C**
3/0/0/3

Course Objectives:

1. In the interest of the national economic growth the innovations and improvements are to be owned and used for the production and distribution process.
2. The students of technology will be benefited by knowing the process of obtaining recognition of their innovations. This course will enable them to know the legal process of registering the innovations.

UNIT – I

INTRODUCTION TO INTELLECTUAL PROPERTY: Introduction, types of intellectual property,International organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

TRADE MARKS: Purpose and function of trade marks, acquisition of trade mark rights, protectable matter,selecting and evaluating trade mark, trademarks registration processes.

UNIT – III

LAW OF COPY RIGHTS: Fundamental of copy right law, originally of material, rights of reproduction,rights of perform the work publicity, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

LAW OF PATENTS: Foundation of patent law, patent searching process ownership rights and transfer.

UNIT- IV

TRADE SECRETS: Trade secrete law, determination of trade secrete status, liability for misappropriations oftrade secrets, protection for submission trade secrete litigation.

UNIT-V

NEW DEVELOPMENT OF INTELLECTUAL PROPERTY: New developments in trade mark law: Copy right law, patent law, intellectual property audits.

TEXT BOOOKS :

1. Intellectual property rights, Deborah, E. Bouchux, cengage learing
2. Intellectual property right – Unleashing the knowledge economy, prabuddha ganguli, Tate Mc Graw Hill Publishing company ltd.,

Course Outcomes: After the completion of this course, the student should be able to

1. Understand the basics and importance of intellectual property rights.
2. Explore the Purpose and function of trade marks and related processes
3. Understand the importance of copy right and the issues involved in its violation
4. Analyze the trade secrets and its associated laws
5. Explore the new developments in IPR

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