ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS & COMMUNICATION ENGINEERING

For

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2018-2019)

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
Narsampet, Warangal – 506 332
Telangana State, India

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS)
ELECTRONICS & COMMUNICATION ENGINEERING
COURSE STRUCTURE

(Applicable from the batch admitted during 2018-19 and onwards)

I YEAR **I SEMESTER**

S.No.	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J1001	Mathematics-I	30	70	3	1	0	4
2	J1011	English	30	70	2	0	0	2
3	J1204	Network Theory	30	70	3	1	0	4
4	J1501	Programming for Problem Solving	30	70	3	1	0	4
5	J1012	English Language and Communication Skills Lab	30	70	0	0	2	1
6	J1502	Programming for Problem Solving Lab	30	70	0	0	3	1.5
7	J1304	Engineering & IT workshop	30	70	1	0	3	2.5
		Total Credits			**12**	**03**	**08**	**19**

I YEAR **II SEMESTER**

S.No.	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J2002	Mathematics-II	30	70	3	1	0	4
2	J2503	Object Oriented Programming	30	70	3	0	0	3
3	J2007	Engineering Physics	30	70	3	1	0	4
4	J2008	Engineering Chemistry	30	70	3	1	0	4
5	J2302	Engineering Graphics	30	70	1	0	4	3
6	J2009	Engineering Physics & Chemistry Lab	30	70	0	0	3	1.5
7	J2504	Object Oriented Programming Lab	30	70	0	0	3	1.5
		Total Credits			**13**	**03**	**10**	**21**

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II YEAR **I SEMESTER**

S.No	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J3003	Transforms and Complex Variables	30	70	3	1	0	4
2	J3401	Electronic Devices and Circuits	30	70	3	0	0	3
3	J3208	Electrical Technology	30	70	3	0	0	3
4	J3402	Signals and Systems	30	70	3	0	0	3
5	J3403	Probability Theory and Stochastic Process	30	70	3	0	0	3
6	J3404	Electronic Devices and Circuits Lab	30	70	0	0	3	1.5
7.	J3405	Basic Simulation Lab	30	70	0	0	3	1.5
	J3209	Electrical Technology Lab	30	70	0	0	3	1.5
8	JMC01	**Mandatory Course** : Environmental Science	30	70	3	0	0	0
		Total Credits			**18**	**01**	**09**	**20.5**

II YEAR **II SEMESTER**

S.No	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J4406	Analog Communications	30	70	3	0	0	3
2	J4407	Pulse and Digital Circuit	30	70	3	0	0	3
3	J4408	Electronic Circuit Analysis	30	70	3	0	0	3
4	J4409	Digital System Design	30	70	3	0	0	3
5	J4410	Electromagnetic Waves and Transmission Lines	30	70	3	0	0	3
6	J4411	Pulse and Digital Circuits Lab	30	70	0	0	3	1.5
7	J4412	Electronic Circuit Analysis Lab	30	70	0	0	3	1.5
8	J4413	Analog Communications Lab	30	70	0	0	3	1.5
9	JMC02	**Mandatory Course** : (Gender Sensitization)	100	-	3	0	0	0
		Total Credits			**18**	**00**	**09**	**19.5**

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III YEAR **I SEMESTER**

S.No	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J5414	IC Applications	30	70	3	0	0	3
2	J5415	Digital Signal Processing	30	70	3	0	0	3
3	J5455	Digital Communications	30	70	3	0	0	3
4	J5416 J5217 J5418	**Professional Elective – I** 1.Antennas and Wave propagation 2.Power Electronics 3.Bio Medical Electronics	30	70	2	1	0	3
5	J5419	**Open Elective – I**	30	70	3	0	0	3
6	J5420	IC Applications Lab	30	70	0	0	2	1
7	J5421	Digital Signal Processing Lab	30	70	0	0	3	1.5
8	J5456	Digital Communications Lab	30	70	0	0	3	1.5
8	JMC03	**Mandatory Course** (Constitution of India)	30	70	3	0	0	0
9	J5480	**Internship**	100	--	0	0	2	1
		Total Credits			**17**	**01**	**10**	**20**

III YEAR **II SEMESTER**

S.No	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J6422	Linear Control Systems	30	70	3	0	0	3
2	J6423	VLSI Technology	30	70	3	0	0	3
3	J6424	Microprocessors & Microcontrollers	30	70	3	0	0	3
4	J6425	Electronic Measurements and Instrumentation	30	70	3	0	0	3
5	J6426 J6427 J6428	**Professional Elective- II** 1. Information Theory and Coding 2. Speech and Audio Processing 3. Nano Electronics	30	70	3	0	0	3
6		**Open Elective – II**	30	70	3	0	0	3
7	J6429	e-CAD & VLSI Lab	30	70	0	0	2	1
8	J6430	Microprocessors and Microcontrollers Lab	30	70	0	0	2	1
		Total Credits			**17**	**1**	**4**	**20**

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IV YEAR **I SEMESTER**

S.No	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J7431	Microwave and Optical Communications	30	70	2	1	0	3
2	J7526	Computer Networks	30	70	3	0	0	3
3	J7432 J7433 J7434	**Professional Elective – III** 1.Adaptive Signal Processing 2.Mobile Communication Networks 3.Image and Video Processing	30	70	3	0	0	3
4	J7435 J7436 J7437	**Professional Elective – IV** 1. High Speed Electronics 2. Wavelet 3. Embedded systems	30	70	3	0	0	3
5	J7438 J7439 J7440	**Professional Elective – V** 1. Error Correcting Codes 2. Introduction to MEMS 3. RF circuit Design	30	70	3	0	0	3
6	J7441	Microwave & Optical Fiber Communication Lab	30	70	0	0	2	1
7	J7481	Mini project	100	--	0	0	8	4
		Total Credits			**14**	**1**	**10**	**20**

IV YEAR **II SEMESTER**

S.No	Subject code	Subject	Marks		L	T	P	Credits
			Internal	External				
1	J8443 J8444 J8445	**Professional Elective- VI** 1. CMOS Design 2. Scientific Computing 3. Radar Systems	30	70	3	0	0	3
2	J8446 J8447 J8448	**Professional Elective – VII** 1. Mixed Signal Design 2. Wireless sensor Networks 3. Satellite Communication	30	70	3	0	0	3
3		**Open Elective – III**	30	70	3	0	0	3
4	J8482	**Technical Seminar**	100	--	0	0	2	1
5	J8483	**Comprehensive Viva-Voce**	100	--	0	0	4	2
6	J8484	**Major project**	30	70	0	0	16	8
		Total Credits			**09**	**0**	**22**	**20**
7	J8485	**NSS***			0	0	0	2*

*** Academic Regulations, Item No 1(ii) for NSS**

List of Open Electives offered by Dept.of ECE

S.No	Course Code	Name of the Open Elective	Credits	Preferred Semester
1.	J4410	Electromagnetic Waves and Transmission Lines	3	III/IV
2.	J4409	Digital System Design	3	III/IV
3.	J3402	Signals and Systems	3	III/IV
4.	J5419	Computer Organization	3	V/VI
5.	J5420	IC Applications	3	V/VI
6.	J5415	Digital Signal Processing	3	V/VI
7.	J6424	Microprocessors and Microcontrollers	3	V/VI
8.	J6422	Linear Control Systems	3	V/VI
9.	J5462	Microprocessors and Interfacing	3	V/VI
10.	J7437	Embedded Systems	3	VII/VIII
11.	J8447	Wireless Sensor Networks	3	VII/VIII
12.	J5418	Bio medical Electronics	3	VII/VIII
13.	J7434	Image and Video Processing	3	VII/VIII

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PROFESSIONAL ELECTIVES

S.No	Subject Code	Professional Elective	Credits	Preferred semester
1.	J5416 J5217 J5418	**Professional Elective – I** 1. Antennas and Wave propagation 2. Power Electronics 3. Bio Medical Electronics	3	V
2.	J6426 J6427 J6428	**Professional Elective- II** 1. Information Theory and Coding 2. Speech and Audio Processing 3. Nano Electronics	3	VI
3.	J7432 J7433 J7434	**Professional Elective – III** 1. Adaptive Signal Processing 2. Mobile Communication Networks 3. Image and Video Processing	3	VII
4.	J7435 J7436 J7437	**Professional Elective – IV** 1. High Speed Electronics 2. Wavelet 3. Embedded systems	3	VII
5.	J7438 J7439 J7440	**Professional Elective – V** 1. Error Correcting Codes 2. Introduction to MEMS 3. RF circuit Design	3	VII
6.	J8443 J8444 J8445	**Professional Elective- VI** 1. CMOS Design 2. Scientific Computing 3. Radar Systems	3	VIII
7.	J8446 J8447 J8448	**Professional Elective – VII** 1. Mixed Signal Design 2. Wireless sensor Networks 3. Satellite Communication	3	VIII

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(J1001)MATHEMATICS - I

B.Tech. I Year I Sem: Common to All Branches **L T P C**
3 1 0 4

Objectives: To learn

- 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 eigenvalues and eigenvectors 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-Jordanmethod; 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 Eigenvectors 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.

Course outcomes:

After learning the contents of this paper the student must be able to

- Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
- Find the Eigen values and Eigen vectors
- Reduce the quadratic form to canonical form using orthogonal transformations.
- Analyse the nature of sequence and series.
- Solve the applications on the mean value theorems.
- Evaluate the improper integrals using Beta and Gamma functions
- Find the extreme values of functions of two variables with/ without constraints.

Text Books:

- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36thEdition, 2010
- Erwin kreyszig, Advanced Engineering Mathematics, 9thEdition, John Wiley &Sons,2006.
- G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition,Pearson, Reprint, 2002.

References

- N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, LaxmiPublications, Reprint, 2008.
- Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi,11thReprint, 2010.

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ENGLISH

		L	T	P	C
B.Tech. I Year I Sem: EEE & ECE	**(J1011)**				
B.Tech. I Year II Sem: ME, CE & CSE	**(J2011)**	**2**	**0**	**0**	**2**

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. The students should be encouraged to read the texts leading to reading comprehension and different 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.

Course Outcomes: Students should be able to

- Use English Language effectively in spoken and written forms.
- Comprehend the given texts and respond appropriately.
- Communicate confidently in various contexts and different cultures.
- Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

SYLLABUS
UNIT –I

'The Raman Effect' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary Building: The Concept of Word Formation --The Use of Prefixes and Suffixes.

Grammar: Identifying Common Errors in Writing with Reference to Articles and Prepositions.

Reading: Reading and Its Importance- Techniques for Effective Reading.

Basic Writing Skills: Sentence Structures - Use of Phrases and Clauses in Sentences- Importance of Proper Punctuation- Techniques for writing precisely – **Paragraph writing** –

Types, Structures and Features of a Paragraph - Creating Coherence-Organizing Principles of Paragraphs in Documents.

UNIT –II

'Ancient Architecture in India' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Synonyms and Antonyms.

Grammar: Identifying Common Errors in Writing with Reference to Noun-pronoun Agreement and Subject-verb Agreement.

Reading: Improving Comprehension Skills – Techniques for Good Comprehension

Writing: Format of a Formal Letter-**Writing Formal Letters** E.g.., Letter of Complaint, Letter of Requisition, Job Application with Resume.

UNIT –III

'Blue Jeans' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Acquaintance with Prefixes and Suffixes from Foreign Languages in English to form Derivatives-Words from Foreign Languages and their Use in English.

Grammar: Identifying Common Errors in Writing with Reference to Misplaced Modifiers and Tenses.

Reading: Sub-skills of Reading- Skimming and Scanning

Writing: Nature and Style of Sensible Writing- **Defining- Describing** Objects, Places and Events – **Classifying**- Providing Examples or Evidence

UNIT –IV

'What Should You Be Eating' from the prescribed textbook 'English for Engineers' published by Cambridge University Press.

Vocabulary: Standard Abbreviations in English

Grammar: Redundancies and Clichés in Oral and Written Communication.

Reading: Comprehension- Intensive Reading and Extensive Reading

Writing: Writing Practices--Writing Introduction and Conclusion - Essay Writing-Précis Writing.

UNIT –V

'How a Chinese Billionaire Built Her Fortune' from the prescribed textbook 'English for Engineers' published by Cambridge University Press. Vocabulary: Technical Vocabulary and their usage

Grammar: Common Errors in English

Reading: Reading Comprehension-Exercises for Practice

Writing: **Technical Reports**- Introduction – Characteristics of a Report – Categories of Report Formats- Structure of Reports (Manuscript Format) -Types of Reports - Writing a Report.

Prescribed Textbook:

1. **Sudarshana, N.P. and Savitha, C. (2018). English for Engineers. 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.

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(J1204) NETWORK THEORY

B.Tech: I Year I Sem: ECE **L T P C**
3 1 0 4

Course objectives:

- To introduce electric circuits and its analysis.
- To impart knowledge on solving circuit equations using network theorems.
- To introduce the phenomenon of resonance in coupled circuits.
- To educate on obtaining the transient response of circuits.
- To introduce Phasor diagrams and analysis of three phase circuits.

UNIT I

BASIC CIRCUITS ANALYSIS

Resistive elements-Ohm's Law Resistors in series and parallel circuits–Kirchoffs laws–Mesh current and node voltage-methods of analysis.

Principle of AC voltage waveforms and basic definition, RMS and Average values, Form factor and Peak factor, Concept of reactance, Impedance, susceptance and admittance, Phase and phase difference pharos

UNIT II

NETWORK REDUCTION AND THEOREMS FOR DC AND AC IRCUITS

Network reduction: voltage and current division, source transformation star delta conversion. Thevenins and Norton Theorems , Superposition Theorem–Maximum power transfer theorem–Reciprocity Theorem–Millman's theorem.

UNIT III

TRANSIENT RESPONSE ANALYSIS

L and C elements-Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. sinusoidal input.

UNIT IV

THREE PHASE CIRCUITS

A.C. circuits–Average and RMS value- Phasor Diagram–Power, Power Factor and Energy.-Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & un balanced–phasor diagram of voltages and currents–power measurement in three phase circuits.

UNIT V

RESONANCE AND COUPLED CIRCUITS

Series and parallel resonance–their frequency response–Quality factor and Bandwidth-Self and mutual inductance –Coefficient of coupling–Tuned circuits–Single tuned circuits.

Course Outcomes:

- Ability to analyse electrical circuits
- Ability to apply circuit theorems
- Ability to analyse transients
- Ability to analyse Three Phase Circuits
- Ability to analyse Resonance And Coupled Circuits

TEXT BOOKS:

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers,edition, New Delhi, 2013.
2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits",Second Edition, McGraw Hill, 2013.
3. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

REFERENCES

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, 1999.
2. Jegatheesan, R., "Analysis of Electric Circuits," McGraw Hill, 2015.
3. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, McGraw-Hill, New Delhi, 2010.
4. M E Van Valkenburg, "Network Analysis",Prentice-Hall of India Pvt Ltd, New Delhi,2015.
5. Mahadevan, K., Chitra, C., "Electric Circuits Analysis," Prentice-Hall of India Pvt Ltd.,New Delhi, 2015.

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(AUTONOMOUS)

(J1501) PROGRAMMING FOR PROBLEM SOLVING

B.Tech : I Year I Sem: ECE,CSE,EEE,	**L T P C**
I Year II Sem: MECH, CIVIL	**4 0 0 4**

Course Objectives:

1.To introduce the basics of computers and information technology.

2.To educate problem solving techniques.

3.To impart programming skills in C language.

4.To practice structured programming to solve real life problems.

5.To study the concepts of Assembler, Macro Processor, Loader and Linker

UNIT-I

History and Classifications of Computers – Components of a Computer – Working Principle of Computer – Hardware – Software and its Types – Applications of Computers –Network and its Types – Internet and its services – Intranet– Extranet – Generations of Programming Languages – Introduction to Number System .

UNIT-II

Problem solving techniques – Program development life-cycle – Algorithm – Complexities of Algorithm – Flowchart – Pseudo code. Introduction to C –C Program Structure – C tokens: Keyword, Identifiers, Constants, Variable, Data types (simple and user-defined) – Operators and its types – Operator Precedence – Expression Evaluation – Type Conversion – Input/output operations.

UNIT-III

Branching Statements – Looping Statements – Arrays – Multidimensional arrays. Functions: Function Prototype, Passing Arguments to Function – Call by Value and Call by Reference – Nested function call – Library Functions – User-defined Functions – Recursion. Strings – String I/O functions, String Library functions – Storage classes

UNIT-IV

Structures – Arrays and Structures – Nested structures – Structure as Argument to functions– Union Pointers – Declaration, Initialization and Accessing Pointer variable – Pointers and arrays – pointers as argument and return value – Pointers and strings - pointers and structures.

UNIT-V

Introduction to File Concepts in C – File types – I/O operations on files – File modes – Random access to files – Command line arguments. Dynamic Memory Allocation: MALLOC, CALLOC, FREE, REALLOC Introduction to preprocessor – Macro substitution directives – File inclusion directives –Compiler Control directives – Miscellaneous directives.

Text Books:

1. J. B. Dixit, "Computer Fundamentals and Programming in C", Firewall Media, 2009.
2. Balagurusamy. E, "Programming in ANSI C", Tata McGraw Hill, Sixth edition, 2012.

Reference Books:

1. Ashok N Kamthane, "Computer Programming", Pearson education, Second Impression, 2008.
2. Venugopal.K and Kavichithra.C, "Computer Programming", New Age International Publishers, First Edition, 2007.
3. Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill, 2006.
4. Dromey R.G., "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007.
5. Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006.

Course Outcomes:

1. Know the fundamentals of computers
2. Understand applying logical skills for problem solving
3. Learn C programming language concepts
4. Apply C programming language concepts for problem solving
5. Gain knowledge in using memory management techniques in c programming

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ENGLISH LANUAGE COMMUNICATION SKILLS LAB

		L	T	P	C
B.Tech. I Year-I Sem: ECE & EEE	**(J1012)**	**0**	**0**	**2**	**1**
B.Tech. I Year-II Sem: ME, CE & CSE	**(J2012)**				

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

Course Objectives:

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

Learning Outcomes: Students will be able to attain

- Better understanding of nuances of English language through audio- visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking skills with clarity and confidence which in turn enhances their employability skills.

Syllabus:

The language Lab shall have two parts:

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

<u>Listening Skills:</u>

Objectives:

- To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
- To equip students with necessary training in listening, so that they can comprehend 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, to distinguish between them to mark stress and recognize and use the right intonation in sentences.
- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives:

- To make students aware of the role of speaking in English and its contribution to their success.
- To enable students to express themselves fluently and appropriately in social and professional contexts.
- Oral practice
- Describing objects/situations/people
- Role play
- Just A Minute (JAM) Sessions.

Reading Skills:

Objectives:
To develop an awareness in the students about the significance of silent reading and comprehension.

- To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
- Skimming and Scanning the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features

NOTE: *The students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.*

Writing Skills:
Objectives:

- To develop an awareness in the students about writing as an exact and formal skill
- To equip them with the components of different forms of writing, beginning with the lower order ones. Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making

- Formal and informal letter writing

The following course content is prescribed for the Lab.

Exercise – I
CALL Lab:
Understand: Listening Skill- Its importance – Purpose- Process- Types- Barriers of Listening.
Practice: Introduction to Phonetics – Speech Sounds – Vowels and Consonants.
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: Interview Skills.
Practice: Mock Interviews.

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Minimum Requirement of infrastructural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab has to accommodate 40 students with 40 systems, with one Master Console, LAN facility and English language learning software for self- study by students.

System Requirement (Hardware component):

Computer network with LAN facility (minimum 40 systems with multimedia) with the following specifications:

i) Computers with Suitable Configuration

ii) High Fidelity Headphones

2. Interactive Communication Skills (ICS) Lab: A Spacious room with movable chairs and audio-visual aids with a Public-Address System, a LCD and a projector etc.

Prescribed Lab Manuals:

- *ELCS Lab Manual – A Workbook for CALL and ICS Lab Activities*. Hyderabad, Orient Black Swan Pvt. Ltd. 2016. Print.
- Hart, Steve. Nair, Aravind R. and Bhambhani, Veena. *EMBARK- English for Undergraduates*. Delhi. Cambridge University Press. 2016. Print.

Suggested Software:

- Cambridge Advanced Learner's dictionary with CD, Fourth edition.
- Oxford Advanced Learner's Compass, 8th Edition, with CD.
- Hancock, Mark. *English Pronunciation in Use: Intermediate*. United Kingdom. Cambridge University Press, 2007.
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS).

References:

- Mohanraj, Jayashree. *Let Us Hear Them Speak.* New Delhi: Sage Texts. 2015. Print.
- Hancock, M. *English Pronunciation in Use. Intermediate Cambridge*. Cambridge University Press. 2009. Print.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(J1502) PROGRAMMING FOR PROBLEM SOLVING LAB

Common To
B.Tech., I Year I Sem: CSE ,ECE,ME,CE

L	T	P	C
0	0	3	1.5

Course Objectives:

1.To study and understand the use of OS commands
2.To expose the undergraduate students to the practical implementation of C Programming concepts
3.To improve students capability in applying C Programming for problem solving.
4. To make students use effective memory management techniques in programming
5. To expose students to modular programming concepts in problem solving

Week 1:Study of OS commands
Week 2:Study of Compilation and execution of simple C programs
Week 3. Basic C Programs
a. Arithmetic Operations
b. Area and Circumference of a circle
c. Swapping with and without Temporary Variables
Week 4. Programs using Branching statements
a. To check the number as Odd or Even
b. Greatest of Three Numbers
c. Counting Vowels
d. Grading based on Student's Mark
Week 5. Programs using Control Structures
a. Computing Factorial of a number
b. Fibonacci Series generation
c. Prime Number Checking
d. Computing Sum of Digit
Week 6. Programs using String Operations
a. Palindrome Checking
b. Searching and Sorting Names
Week 7. Programs using Arrays
Week 8. Programs using Functions
a. Computing nCr
b. Factorial using Recursion
c. Call by Value and Call by Reference

Week 9. Programs using Structure
a. Student Information System
b. Employee Pay Slip Generation
c. Electricity Bill Generation

Week 10. Programs using Pointers
a. Pointer and Array

b. Pointer to function
c. Pointer to Structure

Week 11. Programs using File Operation
a. Counting No. of Lines, Characters and Black Spaces
b. Content copy from one file to another
c. Reading and Writing Data in File

Text Books:

1. J. B. Dixit, "Computer Fundamentals and Programming in C", Firewall Media, 2009.
2. Balagurusamy. E, "Programming in ANSI C", Tata McGraw Hill, Sixth edition, 2012.

Course Outcomes:
1. Learn practical implementation of C programming language concepts.
2. Debug and document programs in C.
3. Know usage of logical skills in developing C programs.
4. Apply effective memory management techniques for problem solving
5. Understand the file management techniques

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS, AFFILIATED TO JNTUH)
(J1304) ENGINEERING & IT WORKSHOP

B.TECH. I YEAR – I SEM: ECE **L T P C**
1 0 3 2.5

COURSE OBJECTIVES:

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: (Ten exercises are required to perform from the following trades)

1. Carpentry
2. Fitting
3. Tin – Smithy
4. House Wiring
5. Plumbing
6. Soldering

.

UNIT – II

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.

TEXTBOOKS:

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. Know the fundamental knowledge of various trades and their usage in real time applications.
2. Gain knowledge of Welding, Black smithy, Fitting, and house wiring.
3. Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering.
4. Use basic concepts of computer hardware for assembly and disassembly.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

MATHEMATICS-II
(J2002) ODE's and Multivariable Calculus
(Common to all branches)

B.Tech. I Year II Semester

Objectives:

To learn

- Methods of solving the differential equations of first and higher order.
- Evaluation of multiple integrals and their applications
- The physical quantities involved in engineering field related to vector valued functions

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 polynomials in , and ; 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)

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

Course outcomes:

After learning the contents of this paper the student must be able to

- Identify whether the given differential equation of first order is exact or not
- Solve higher differential equation and apply the concept of differential equation to real world problems
- Evaluate the multiple integrals and apply the concept to find areas and volumes,

Evaluate the line, surface and volume integrals and converting them from one to another

Text Books

- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
- Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley &Sons,2006 G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition,Pearson, Reprint, 2002.

References

- Paras Ram, Engineering Mathematics, 2nd Edition, CBS Publishes
- S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(J2503) OBJECT ORIENTED PROGRAMMING

Common To
B.Tech. I Year II Sem: CSE, ECE, EEE

L	T	P	C
3	0	0	3

Course Objectives:

1. To expose the students to the concepts of Object-Oriented Paradigm
2. To improve students capability in applying object oriented programming concepts in problem solving.
3. To improve students expertise in implementing object oriented concepts using C++ Programming
4. To enable students to understand concepts of templates and exceptional handling
5. To study the concepts of Assembler, Macro Processor, Loader and Linker

Syllabus

UNIT- I
Principles of Object Oriented Programming: Procedure Vs Object Oriented, Paradigm, Basic concepts, benefits, Applications and Object Oriented Languages.
Introduction: Program structure, Creating, Compiling and Linking of C++ program.
Token, Expression and Control Structures: Tokens, Keywords, Identifiers and Constants, Data Types, Operators, Precedence, Type Compatibility, Control Structures, New Features of C++. **Functions:** Function Prototype and Parameter Passing, Inline Functions, Default, Constant Arguments, Recursion, Function Overloading, Function Template.

UNIT - II
Classes and Objects: Defining classes and Member functions, Arrays, Static Members, Friend Functions. **Constructors and Destructors:** Type of Constructors, Dynamic Initialization of Objects, Destructors.
UNIT - III C++ operator overloading: Fundamentals, restrictions, overloading unary / binary operators, overloading ++ and --, Manipulation of Strings. **C++ Inheritance:** Defining derived classes, Types of Inheritance, Virtual Base class Abstract Class, Nesting of classes.
UNIT- IV Pointers and Polymorphism: Pointers and Generic pointer, Pointer to Objects and Derived Classes, this pointer, Virtual Functions, Virtual Destructors. **C++ Stream Input/Output:** Streams, Stream classes, Formatted and Unformatted operations, Manipulators. **Files:** Classes for file Stream operations, Sequential and Random access operations, Command line Arguments
UNIT-V C++ Templates: Introduction, class templates, member function template, overloading template functions. **C++ Exception Handling:** Try, throw, catch

Text Books:
1. E. Balagurusamy **"**Object Oriented Programming with C++" , McGraw-Hill Education (India), 6th Edition 2013
2. Bjarne Stroustrup "The C++ Programming Language", Pearson Education, 5th Edition (2013)
3. Robert Lafore **"**Object-Oriented Programming in C++ " 4th Edition Sams Publishing, 2002

Reference Books:
1. K.R. Venugopal, Rajkumar, T.Ravishankar, "Mastering C++", McGraw-Hill Education India Pvt.Ltd, Second Edition, ISBN: 0-07-463454-2, 1997.

2. Timothy Bud, "An Introduction to Object Oriented Programming", Pearson Education, Second Edition, ISBN 81-7808-228-4, 2004.

Course Outcomes:

1. Know the differences between procedural language and object-oriented languages
2 .Gain knowledge of Object-Oriented Paradigm for problem solving
3.Will be able to gain practical knowledge of OOP concepts using C++
4.Apply reusability concepts like inheritance, polymorphism in application development
5.Use generic programming concepts and modular programming

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
ENGINEERING PHYSICS

	L	T	P	C
B.Tech I Year I Sem: (ECE ,CSE &ME) (J1007)				
B.Tech I Year II Sem: (EEE, CE) (J2007)	**3**	**1**	**0**	**4**

Objectives:

1. Enable the student to connect the historical development of quantum mechanics and learn the basic principles of quantum mechanics and employs the Bloch's theorem to draw the band structure of solids on the basis of Kronig Penny model.
2. The students learn basic theory of semiconductors and principles and operations of optoelectronic devices.
3. The Students to understand the basic properties of light, Concepts of LASER and it's engineering applications
4. Enable the students to learn the basic principles of dielectrics, magnetic superconductors and their engineering applications and also learn the preparation, dimensional characteristics of nano materials along with their engineering applications
5. Enable the students to learn about the types of oscillation, mechanics, which helps in analyzing and solving the engineering problems.

UNIT-I: Quantum Mechanics

Introduction to quantum mechanics**,** Wave nature of the particle, de-Broglie's hypothesis, Davisson and Germer's experiment, GP Thompson experiment, Heisen berg's uncertainty principle, Schrodinger time independent wave equation, Particle in one dimensional box.

Band theory of Solids: Electron in periodic potential – Bloch theorem**,** Kronig–Penny Model, Brillion zone concept, Effective mass of an electron, Origin of energy band formation- Classification of materials.

UNIT-II: Semiconductor Physics:

Introduction to intrinsic and extrinsic semiconductors, Carrier concentration in conduction band and valancy band of intrinsic and extrinsic semiconductor, Fermi level, Effect of carrier concentration and temperature on Fermi level, Hall Effect- Applications of semiconductors.

Semiconductor Optoelectronics: Radative and Non-radative recombination mechanisms in semiconductors, Formation of PN junction diode-V-I characteristics, Zener diode - characteristics, Solar cell and LED- Construction and working mechanism .

UNIT-III: Optics

Huygens' principle, Superposition of waves and interference of light by wave front splitting and amplitude splitting; Young's double slit experiment, Newton's rings, Michelson interferometer, Farunhofer diffraction from a single slit, Diffraction grating and resolving power.

LASERS

Introduction-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, Semiconductor diode laser, applications of lasers in science, Engineering and Medicine

UNIT-IV: Dielectric Materials

Introduction-Types of Polarizations, derivation for electronic and ionic polarizabilities, internal fields in solids, Clausius Mossotti equation, Ferro electricity, structure of $BaTiO_3$, piezo-electricity.

Magnetic Materials

Introduction-origin of magnetic moment, Bohr Magneton, classification of Dia, Para and Ferro magnetic materials, Hysteresis curve, Soft and hard magnetic materials; Superconductivity-properties, BCS theory, Type –I &II Superconductors-Applications.

UNIT-V: Oscillations, waves

Simple harmonic motion, Damped and forced simple harmonic oscillator, damped harmonic oscillator – heavy, critical and light damping quality factor, forced mechanical oscillators, mechanical impedance, steady state motion of forced damped harmonic oscillator.

Mechanics

Motion of a rigid body in the plane; Rotation in the plane; Kinematics in a coordinate system rotating and translating in the plane; Angular momentum about a point of a rigid body in planar motion; Euler's laws of motion, their independence from Newton's laws, and their necessity in describing rigid body motion.

Outcomes:

1. The student learns about solving engineering solutions employing the quantum mechanical concepts
2. The students learns about the physics of semiconductor materials and along with their applications in science and engineering
3. The student learns about the construction, working and applications of LASER in engineering.
4. The students get exposure to dielectric and magnetic materials and their engineering applications.
5. The students learn about theory of waves and oscillation and mechanics of rigid bodies for engineering applications.

Text Books:

1. Introduction to Quantum Physics-Eisberg and Resnick
2. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Inc.
3. H.J. Pain, The Physics of vibrations and waves
4. Quantum Mechanics- Decker
5. Ian G. Main, Oscillations and waves in physics

REFERENCE

1. Engineering Physics, P.K Palanisamy, Scitech Publications.
2. Applied Physics- Dr. N Chandra Shaker and P. Appal Naidu
3. Applied Physics for Engineers- P. Madhusudana rao, Academic Publishing Company.
4. Engineering Physics, V. Rajandran, Tata mc. Graw Hill Book Publishers
5. Introduction to Mechanics — MK Verma

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
ENGINEERING CHEMISTRY

	L	T	P	C
B.Tech I year II sem.: EEE,ECE & CE(J2008)	**3**	**1**	**0**	**4**

Course Objectives:

- To achieve the knowledge about various kinds of Orbitals & Splitting patterns.
- To know about the water quality and its parameters, learning the knowledge in the assessment of water quality and purification.
- To achieve the knowledge about various kinds of Electrochemical cells and batteries and corrosion phenomenon.
- To understand the reactions, mechanism and stereochemistry of organic molecules.
- Understand the principle, instrumentation and applications of Spectroscopic techniques.

Unit-1: Molecular structure and Theories of Bonding: (9)

Atomic and Molecular orbitals. Linear Combination of Atomic Orbitals (LCAO), molecular orbitals of diatomic molecules, molecular orbital energy level diagrams of N_2,O_2 and F_2 molecules. π molecular orbitals of butadiene and benzene.

Crystal Field Theory (CFT): Salient Features of CFT – Crystal Field Splitting of transition metalion d-orbitals in Tetrahedral, Octahedral and square planar geometries. Band structure of solids and effect of doping on conductance.

Unit-2: Water and its treatment: (9)

Introduction – hardness of water – Causes of hardness - Types of hardness: temporary and permanent – expression and units of hardness – Estimation of hardness of water by complexometric method. Potable water and its specifications. Steps involved in treatment of water – Disinfection of water by chlorination and ozonization. Boiler feed water and its treatment – Calgon conditioning, Phosphate conditioning and Colloidal conditioning. External treatment of water – Ion exchange process. Desalination of water – Reverse osmosis. Numerical problems.

Unit-3: Electrochemistry and corrosion: (9)

Electro chemical cells – electrode potential, standard electrode potential, types of electrodes – calomel, Quinhydrone and glass electrode. Nernst equation Determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Numerical problems. Potentiometric titrations. Batteries – Primary (Lithium cell) and secondary batteries (Lead – acid storage battery and Lithium ion battery).

Causes and effects of corrosion – theories of chemical and electrochemical corrosion – mechanism of electrochemical corrosion, Types of corrosion: Galvanic, water-line and pitting corrosion. Factors affecting rate of corrosion, Corrosion control methods- Cathodic protection – Sacrificial anode and

impressed current cathodic methods. Surface coatings – metallic coatings – methods of application. Electroless plating of Nickel.

Unit-4: Stereochemistry, Reaction Mechanism and synthesis of drug molecules: (9)

Introduction to representation of 3-dimensional structures, Structural and stereoisomers, configurations, symmetry and chirality. Enantiomers, diastereomers, optical activity and Absolute configuration. Conformation alanalysis of n- butane.

Substitution reactions: Nucleophilic substitution reactions: Mechanism of S_N1, S_N2 reactions. Electrophilic and nucleophilic addition reactions: Addition of HBr to propene. Markownikoff and anti Markownikoff's additions. Grignard additions on carbonyl compounds. Elimination reactions: Dehydro halogenation of alkylhalides. Saytzeff rule. Oxidation reactions: Oxidation of alcohols using $KMnO_4$ and chromic acid.

Reduction reactions: reduction of carbonyl compounds using $LiAlH_4$& $NaBH_4$. Hydroboration of olefins. Structure, synthesis and pharmaceutical applications of Paracetamol and Aspirin.

Unit-5: Spectroscopic techniques and applications: (9)

Principles of spectroscopy, selection rules and applications of electronic spectroscopy. vibrational and rotational spectroscopy. Basic concepts of Nuclear magnetic resonance Spectroscopy, chemical shift. Introduction to Magnetic resonance imaging.

Course Outcomes:

- Students will gain the basic knowledge of atomic and molecular orbitals & Splitting patterns.
- They can understand the basic properties of water and its usage in domestic and industrial purposes.
- To gain the knowledge about the Electrochemical cells, batteries and corrosion phenomenon.
- They learn about organic reactions and the stereochemistry of organic molecules.
- They can predict potential applications of spectroscopy and practical utility in order to become good engineers and entrepreneurs.

Text books:

- Text Book of Engineering Chemistry by A.Jayashree, Wiley publications, New Delhi.
- Engineering Chemistry by P.C. Jain and M. Jain, Dhanpatrai Publishing Company, New Delhi (2010) .
- Text Book of Engineering Chemistry by Shashi Chawla.
- Engineering Chemistry by Rama Devi, Venkata Ramana Reddy and Rath,Cengage learning, New Delhi. (2016).
- Text Book of Engineering Chemistry by C. Parameshwara Murthy. B.S. Publications.
- Text Book of Engineering Chemistry by Y. Bharathi kumari and Jyotsna Cherikuri, VGS Publications.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS, AFFILIATED TO JNTUH)
(J2302) ENGINEERING GRAPHICS

B.TECH. I YEAR – II SEM: ME, CIVIL & ECE	**L**	**T**	**P**	**C**
	1	**0**	**4**	**3**

Pre-requisites: Nil

Course objectives:

1. To Use various engineering drawing instruments along with learn the basics of drawings, dimensioning, scales and conic sections like ellipse, parabola and hyperbola.
2. To Learn projections of points, lines and plane viewed in different positions.
3. To Learn projections of solids and sections of solids in different positions.
4. To impart knowledge of development of surfaces and intersections is most useful of real time applications in industry.
5. Attain the concept of isometric, orthographic projections.

UNIT – I

Introduction to Engineering Drawing: Principles of Engineering Graphics and their Significance, Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid and Hypocycloid, Scales – Plain & Diagonal.

UNIT- II

Orthographic Projections: Principles of Orthographic Projections – Conventions – Projections of Points and Lines, Projections of Plane regular geometric figures.—Auxiliary Planes.

UNIT – III

Projections of Regular Solids – Auxiliary Views - Sections or Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views – Sections of Sphere

UNIT – IV

Development of Surfaces of Right Regular Solids – Prism, Cylinder, Pyramid and Cone, Intersection of Solids: Intersection of – Prism vs Prism- Cylinder Vs Cylinder

UNIT – V

Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of Spherical Parts. Conversion of Isometric Views to Orthographic Views and Vice-versa –Conventions

Introduction to CAD: (For Internal Evaluation Weightage only): Introduction to CAD Software Package Commands.- Free Hand Sketches of 2D- Creation of 2D Sketches by CAD Package

TEXTBOOKS:

1. Engineering Drawing N.D. Bhatt / Charotar
2. Engineering Drawing / N. S. Parthasarathy and Vela Murali/ Oxford

REFERENCE BOOKS:

1. Engineering Drawing / Basant Agrawal and McAgrawal/ McGraw Hill
2. Engineering Drawing/ M. B. Shah, B.C. Rane / Pearson.
3. Computer Aided Engineering Drawing – K Balaveera Reddy et al – CBS Publishers

Course Outcomes:

1. Select, construct and interpret appropriate drawing scales as per the situation and able to draw simple curves.
2. Graduates are able to draw orthographic projections of points ,lines and planes.
3. Able to draw the orthographic projections of solids and sections of solids.
4. Layout development of solids for practical situations along with able to draw sections of solids.
5. Comprehend the isometric projections.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)
ENGINEERING PHYSICS AND CHEMISTRY LAB

	L	T	P	C
B.Tech I Year I Sem: (ME, CE & CSE) (J1009)				
B.Tech I Year II Sem: (EEE, ECE) (J2009)	**0**	**0**	**3**	**1.5**

OBJECTIVES:

This course on Physical Sciences lab has been designed with 18 experiments in Physics and Chemistry. The objective of the course is that the student will have exposure to various experimental skills which is very essential for an engineering student. The experiments are selected from various areas of physics and chemistry like Physical Optics, Lasers, Fiber optics, waves and oscillations, semiconductors, Electricity, Conductometry, Potentiometry, etc... The student is also exposed to various tools like Screw Gauge, Vernier callipers, Physical balance, Spectrometer, Microscope, Viscometer, and stalagmometer, etc…

PHYSICS LAB (CYCLE-1)

(Any Six Experiments compulsory)

- Determination of Eenergy gap of semiconductor material of p-n junction diode.
- Determination of frequency of electrical vibrator by using Melde's experiment.
- Determination of wavelength of LASER by using diffraction grating.
- Determination of rigidity modulus of a given wire using Torsional pendulum.
- R-C circuit analysis.
- Determination of Numerical aperture of a given optical fiber.
- Determination of the radious of curvature of plano-convex lens by forming Newton's rings
- LED-characteristics

CYCLE-2
CHEMISTRY LAB

- Determination of total hardness of water by complexometric method using EDTA
- Estimation of an HCl by Conductometric titrations
- Estimation of Acetic acid by Conductometric titrations
- Estimation of HCl by Potentiometric titrations
- Determination of rate constant of acid catalysed hydrolysis of methyl acetate
- Synthesis of Aspirin and Paracetamol
- Thin layer chromatography calculation of R_f values. egortho and para nitro phenols
- Verification of freundlich adsorption isotherm-adsorption of acetic acid on charcoal
- Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.
- Determination of surface tension of a give liquid using stalagmometer.

Laboratory Manuals:

- Laboratory Manual Of Engineering Physics By Dr. Y.Aparna And Dr K. Venkateswara Rao (V.G.S Publishers)
- Practical Engineering Chemistry by K. Mukkanti, etal' B'S' Publications, Hyderabad.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(J2506) OBJECT ORIENTED PROGRAMMING LAB

	L	T	P	C
B.Tech. I Year II-SEM: CSE, ECE, EEE	**0**	**0**	**3**	**1.5**

Course Objectives:

1. To expose the students to the practical implementation of Object-Oriented concepts using C++ programming language
2. To improve students capability of object oriented programming for problem solving
3. This course provides in-depth coverage of object-oriented programming principles and techniques using C++.
4. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features.
5. To make students capable of using reusability and generic programming concepts in developing applications

LIST OF EXPERIMENTS:

Experiment-I

1. Read 10 numbers and displays them in sorted order.
2. Write functions to swap two numbers using pointers and references.
3. Write a program that prints the sizes of the fundamental types, a few pointer types and a few enumeration of your choice. Use the size of operator.

Experiment-II

4. Write a function that counts the number of occurrences of pair of letters in a string, for example the pair "ab" appears twice in "xabaacbaxabb".
5. Find LCM of two, three and four numbers using function overloading.
6. Create a structure for storing students details (sno, sname, course, Array of five subject's marks) provide the functions for printing the total marks, calculating percentage and the result. (Note: Include the functions within the structure).

Experiment-III

7. Write a macro to find square (A+B)-square (C+D).
8. Create a class for complex number and provide methods for addition, subtraction, multiplication and division. Display the output in "a+ib" form.
9. Create a Distance class and provide methods for addition and subtraction of two distances.

Experiment-IV

10. Create a complex number class with default, parameterized, copy constructors and a destructor.
11. Create a class which provides a method to count the number of objects that are created for that class. (Use static method).
12. Create a class INT that behaves exactly like an int. (Note: overload +, -, *, /, %).

Experiment-V

13. Create a string class and overload + to concatenate two Strings, overload () to print substring and overload <, <=, >, >=, = = operators to compare two string objects.
14. Create Date class and overload ++ to print next date and overload -- to print previous date.

Experiment-VI

15. Create a user defined array class Array and overload + to add two arrays, overload * to multiply two arrays, overload to access given position element and also to use left side of an assignment operator.
16. Create a complex number class and overload +, -, * operators using friend functions.
17. Program to perform Matrix operations using operator overloading with friend functions.

Experiment-VII

18. Programs to demonstrate Single, Multiple, Multilevel, Hierarchical, Hybrid and Multipath inheritance.
19. Programs to demonstrate constructors in inheritance.

Experiment-VIII

20. Create a Shape class with methods perimeter, area. Derive classes Circle, Square and Triangle from Shape class. Provide implementation for perimeter, area in the derived classes. (Declare perimeter, area as pure virtual functions).
21. Implement Multipath inheritance by declaring pointers to base class and access the derived class methods using base class pointers.
22. Program to demonstrate of manipulators

Experiment-IX

23. Write a function template to overload max method, which can find maximum of any data type.
24. Create function template to sort an array, which can sort array of any type.
25. Create a Generic calculator class to perform +, -, *, / operations on any type.
26. Create a Generic class for array of variable size and provide sorting, searching on any type.

Experiment-X

27. Find the roots of a quadratic equation. Handle exception for divide by zero.
28. Handle the Array Index out of Bounds Exception when accessing the elements of Arrays.
29. Create a text file of student information and display the contents of file.

Experiment-XI

30. Write a program to read a text file and remove all white space characters and replace each alphanumeric character with next character in the alphabet (Replace z by a and 9 by 0).
31. Copy the contents of one file into another except the blank lines using command line arguments.
32. Create a file with floating point numbers. Read pair of floating numbers from the file and write into another file.

Experiment-XII

33. Read the contents of three files concatenate them and display it.
34. Write complex numbers into a file in binary format and in character format.
35. Create a class with integers and overload << to place integer into a file and overload >> to read an integer.

Course Outcomes:

After completion of the course, the student will be able to…

1: gain knowledge of implementing Object-Oriented Programming concepts using C++
2: know the application of Object-Oriented Programming concepts for developing applications
3: debug and document programs in C++
4: develop applications using modularization technique
5: apply reusability and generic programming concepts in application development

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

(J3003) Transforms and Complex variables
(Common for EEE &ECE)

B.Tech. II Year I Semester

Objectives:

To learn

- Concept, properties of Laplace transforms
- Solving ordinary differential equations using Laplace transforms techniques.
- Expressing a periodic function by Fourier series and a non-periodic function by Fourier transforms
- Differentiation and integration of complex valued functions.
- Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem.
- Expansion of complex functions using Taylor's and Laurent's series.

Evaluation of the real integrals and transformations of one plane to another plane.

UNIT-I: Laplace Transforms

Laplace Transforms; Laplace Transform of standard functions; first shifting theorem; Laplace transforms of functions when they are multiplied and divided by't'. Laplace transforms of derivatives and integrals of function; Evaluation of integrals by Laplace transforms; Laplace transforms of Special functions; Laplace transform of periodic functions.

Inverse Laplace transform by different methods, convolution theorem (without Proof), solving ODEs by Laplace Transform method.

UNIT-II: Fourier series &Fourier transforms

Fourier series, Dircherlet's Conditions, Half-range Fourier series. Fourier Transforms, Fourier Sine and cosine transforms, Inverse Fourier transforms

UNIT-III: Complex Variables (Differentiation)

Limit, Continuity and Differentiationof Complex functions. Cauchy-Riemann equations (without proof), Milne- Thomson methods, analytic functions, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties

UNIT-IV: Complex Variables (Integration)

Line integrals, Cauchy's theorem, Cauchy's Integral formula, Liouville's theorem, Maximum-Modulus theorem (All theorems without proof); zeros of analytic functions, singularities, Taylor's series, Laurent's series; Residues, Cauchy Residue theorem (without proof)

UNIT-V: Evaluation of real integrals and conformal transformation

Evaluation of Real Integrals using Residues: ,

Introduction, linear and inverse Transformations, Bilinear Transformations, Conformal mapping

Course outcomes:

After learning the contents of this paper the student must be able to

- Use the Laplace transforms techniques for solving ODE's
- Express any periodic function in terms of sines and cosines.

- Express a non-periodic function as an integral representation.
- Analyse the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
- Taylor's and Laurent's series expansions of complex function

Evaluate the real integrals and transformations of one plane to another plane

Text Books

- B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36thEdition, 2010.
- S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.

J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., Mc-Graw Hill, 2004.

References

- M. K. Jain, SRK Iyengar, R.K. Jain, Numerical methods for Scientific and Engineering Computations , New Age International publishers.
- Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley &Sons,2006.

JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS)

(J3401) ELECTRONIC DEVICES AND CIRCUITS

B.Tech. II Year I Sem: ECE & EEE **L T P C**

3 0 0 3

Objectives:

This is a fundamental course, which provides basic knowledge and essential to be learned by every circuit branch student. This course will focus:

1. to understand the principles and working of PN Diode as a Rectifier and Circuit element a Regulator.
2. to understand basic principles and working of BJT,FET and Special Devices.
3. to understand basic principles and working of different types of FETs.
4. to understand Biasing and stabilization concepts of BJT.
5. to understand Special purpose devices such as Solar cells, LED, UJT & SCR

UNIT - I:

P-N JUNCTION DIODE:

Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Current Equation, Volt- Ampere Characteristics,Static and Dynamic Resisitance, Diffusion and Transition capacitance Diode Equivalent Circuits,

RECTIFIERS AND FILTERS: Half Wave and Full Wave Rectifiers, Rectifier with L, C,L-Section and Pi-Section filters, Regulators.

UNIT-II:

BIPOLAR JUNCTION TRANSISTOR :

The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, Transistor Configurations, Limits of Operation, Comparison of CB, CE and CC Amplifier Configurations.

UNIT-III:

TRANSISTOR BIASING AND STABILIZATION:

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Bias Compensation using Diodes and Thermistors, Thermal Runaway, Thermal Stability

UNIT-IV:

FIELD EFFECT TRANSISTOR:

Construction, principle of operation, symbol and Volt-Ampere characteristics of JFET and MOSFET.

Special Purpose Devices and Their Operations: Breakdown Mechanisms. Zener Diode Characteristics.Varactor Diode, Tunnel Diode, Photo Diode, LED, Solar Cell ,UJT & SCR.

UNIT-V

Single stage amplifiers: Classification of Amplifiers, Analysis of transistor amplifier using exact hybrid model & simplified hybrid Model, Miller's Theorem, Design of Single Stage CE Amplifier.

TEXT BOOKS:

1. Electronic Devices and Circuits – David A. Bell, Oxford University Press
2. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, TMH.
3. Semiconductor Physics and Devices – D.Neamen, D. Biswas, McGrawhill Education Publications

REFERENCE BOOKS:

1. Electronic Devices and Circuits – J. Millman, C.C. Halkias, Satyabratha Jit,TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, , PEI/PHI.
3. Electronic Devices and Circuits - K. Lal Kishore, BSP.

COURSE OUTCOMES:

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

1. Understand and Analyse the different types of diodes, operation and its characteristics.
2. Design and analyse the DC bias circuitry of BJT and FET.
3. Design biasing circuits using diodes and transistors.
4. To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.
5. To analyze and understand the special purpose diodes and their application in industry.

JAYMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS)

(J3208) ELECTRICAL TECHNOLOGY

II Year B. Tech. ECE I- Semester

L	T	P	C
3	0	0	3

Course Objectives:

1. To Analyze Concept and Design of various types of passive Filters
2. To study the basic concepts Magnetic Circuits, and their use in the circuit theory.
3. To study the basic concepts of Transformers.
4. To study the different types of D.C Machines Characteristics.
5. To study the different types of A.C Machines Characteristics

UNIT - I:

Locus diagrams and Magnetic Circuits:
Locus diagrams – Series and Parallel RL, RC, RLC circuits with variation of various parameters

Magnetic Circuits: Basic definitions, analogy between electric and magnetic circuits Magnetization characteristics of Ferro magnetic materials, self-induction and mutual inductance, energy in linear magnetic systems, coils connected in series, attracting force of electromagnets.

UNIT - II:
Transformers:
Principle of operation, Constructional details, ideal Transformer and practical Transformer, Losses, Transformer Tests, Efficiency and Regulation calculations (simple problems)

UNIT-III:
DC Machines:
Principle of operation and operation of DC Generator, EMF equation, Types, Losses and Efficiency, Magnetization and Load Characteristics of DC Generators.

UNIT - IV:DC Motors-Principle of operation, Types, Characteristics, Losses and Efficiency, Swinburne's Test, Speed control of DC Shunt Motor-Flux and Armature voltage control methods.

UNIT - V:
A.C Machines:
Three phase induction motor, principle of operation, slip and frequency, torque (simple problems)
Synchronous machines: Principles of operation, EMF equation (Simple problems on EMF).

Synchronous motor principle and operation (Elementary treatment only)

TEXT BOOKS:

1. A Text book of Electrical Technology by B.L Theraja and A.K Theraja, S.Chand publications
2. Electrical Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
3. Network Analysis - N.C Jagan and C. Lakhminarayana, BS publications.
4. Basic Concepts of Electrical Engineering - PS Subramanyam, BS Publications.

REFERENCE BOOKS:

1. Engineering Circuits Analysis - William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 7th Edition.
2. Basic Electrical Engineering - S.N. Singh PUI.
3. Electrical Circuits - David A. Bell, Oxford Printing Press.
4. Principles of Electrical Engineering by V.K Mehta, Rohit Mehta, S.Chand publications.
5. Electrical Circuit Analysis - K.S. Suresh Kumar, Pearson Education.

Course Outcomes:

After going through this course the student gets a thorough knowledge on:

1. Filters and attenuators
2. Basic magnetic circuits
3. The operation of Transformers,
4. The operation DC machines
5. The operation AC Machines

With which he/she can able to apply the above conceptual things to real world problems and applications.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

(J3402) SIGNALS AND SYSTEMS

B.Tech II Year I Sem: ECE

L	T	P	C
3	0	0	3

OBJECTIVE:

1. The course will provide strong foundation on signals Properties and Analysis which will be useful for creating foundation of communication and signal processing.
2. The students will learn basic continuous time and discrete time signals and systems.
3. Student will understand application of various transforms for analysis of signals and systems both continuous time and discrete time.
4. Students will also explore power and energy signals and spectrum.
5. Students will also learn convolution and correlation functions.

UNIT I :
SIGNAL ANALYSIS
Analogy between vector and signals, Orthogonal signal space, signals approximation using orthogonal function, Mean square Error, Closed or Complete set of orthogonal functions, Orthogonality Complex function.
Continuous-Time (CT) and Discrete-Time (DT)Classifications of signals, Exponential and sinusoidal signals, Properties of Signals: Addition, Multiplication, time shifting ,Amplitude scaling, Folding, Concepts of Impulse function, Unit Step function, Signum function, CT & DT Systems Basic Systems Properties.

UNIT II:
FOURIER SERIES AND FOURIER TRANSFORMS
Fourier Series:
Representation of Fourier series, Continuous time periodic signals, Properties of Fourier series, Dirchlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier Spectrum.
Fourier Transforms:
Deriving Fourier Transform from Fourier series, Fourier Transform of arbitrary signal, Fourier Transform of Standard signal, Fourier Transform of Periodic signal, properties of Fourier Transform, Fourier transform involving impulse function and Signum function

UNIT III:
LAPLACE TRANSFORMS AND Z-TRANSFORM
Laplace Transforms: Laplace Transforms & Inverse Laplace Transform, Concept of Region of Convergence (ROC) for Laplace Transforms, Relation between Laplace Transform and Fourier transform of a signal, Applications of Laplace Transform to various signal.

Z Transforms: Concept of Z-Transforms of Discrete Sequence, ROC, Inverse Z-Transform, Properties of Z-Transform. Distinction between Laplace, Fourier and Z-Transforms

UNIT IV:

Sampling: Sampling theorem-Graphical and analytical proof Band Limited Signals, Types of Sampling – Impulse Sampling, Natural and Flat Top Sampling, Reconstruction of signal from its samples, Effect of under sampling-Aliasing.

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS

Linear Systems, Impulse Response, Response of a Linear Systems, Linear Time Invariant(LTI) System, properties of LTI systems , Linear Time Variant(LTV) Systems, Transfer function of a LTI Systems, Filter characteristics of Linear Systems ,Distortion less transmission through a system, Signal bandwidth, System bandwidth. Ideal LPF,HPF and BPF characteristics, Causality and Paley-wiener criterion for physical realization,.

UNIT V:

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transform, Correlation and Auto Correlation of function Properties of Correlation function, Energy density spectrum, Parsevals'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 Signals – 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. Signals and Systems-A Anand Kumar-2012 PHI.

COURSE OUTCOMES:

After learning the course the students should be able to:

1. Understand about various types of signals & system, classify them, analyze them, and perform various operations on them.
2. Express periodic signals in terms of Fourier series and express their spectrum and express arbitrary signals as Fourier Transform .
3. Study the continuous and discrete relation and relation between Fourier Transform, Laplace Transform and Z-Transform.
4. Understand the principle of linear systems filter characteristics of a systems and its bandwidth.
5. Understand the applications of autocorrelation and cross correlation in Communication.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(J3403) PROBABILITY THEORY AND STOCHASTIC PROCESSES

B.Tech. II Year I Sem.ECE **L T P C**
3 0 0 3

OBJECTIVES:

The primary objective of this course is:

1. To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of probability theory, as well as solve probabilistic problems in signal processing and Communication Engineering.
2. To introduce students to the basic methodology of "probabilistic thinking" and to apply it to problems;
3. To understand basic concepts of probability theory and random variables, how to deal with multiple random variables, Conditional probability and conditional expectation, joint distribution and independence, mean square estimation.
4. To understand the difference between time averages and statistical averages Analysis of random process and application to the signal processing in the communication system.
5. To teach students how to apply sums and integrals to compute probabilities, means, and expectations.

UNIT-I:

PROBABILITY AND RANDOM VARIABLE

Probability: Probability introduced through Sets and Relative Frequency, Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bye's Theorem, Independent Events.

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

UNIT -II:

DISTRIBUTION & DENSITY FUNCTIONS AND OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS

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

Operation on One Random Variable – Expectations: Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Non-monotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable.

UNIT-III:

MULTIPLE RANDOM VARIABLES AND OPERATIONS

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

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

UNIT-IV:

STOCHASTIC PROCESSES – TEMPORAL CHARACTERISTICS:

The Stochastic Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence, First-Order Stationary Processes, Second-Order and Wide-Sense Stationarity, Nth Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes.

Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance and its Properties, Linear System Response of Mean and Mean-squared Value, Gaussian Random processes, Poisson Random Process.

UNIT-V:

STOCHASTIC PROCESSES – SPECTRAL CHARACTERISTICS:

Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Spectral Density of Input and Output of a Linear system**.**

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, 4Ed., 2001, TMH.
2. Probability and Random Processes – Scott Miller, Donald Childers, 2 Ed, Elsevier, 2012.

REFERENCE BOOKS:

1. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, 4 Ed., TMH.
2. Theory of Probability and Stochastic Processes- Pradip Kumar Gosh, University Press
3. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W. Woods, 3 Ed., PE
4. Probability Methods of Signal and System Analysis - George R. Cooper, Clave D. MC Gillem, 3 Ed., 1999, Oxford.
5. Statistical Theory of Communication - S.P. Eugene Xavier, 1997, New Age Publications.

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(Autonomous)

(J3404) ELECTRONIC DECVICES AND CIRCUITS LAB

II Year I Sem B.Tech: ECE & EEE

L	T	P	C
0	0	3	1.5

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.
3. Study and operation of
   i. Digital Multimeters
   ii. Function Generator
   iii. Regulated Power Supplies
   iv. CRO.

PART B:

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.
7. Calculation of h-Parameters from CE characteristics.
8. FET characteristics.
9. UJT Characteristics.
10. Frequency Response of Single Stage CE Amplifier.

PART C: Equipment required for Laboratories:

1. Regulated Power supplies (RPS) -0-30 V
2. CRO- (20MHz)
3. Function Generators -0-1 MHz.
4. Multimeters
5. Ammeters(0-200µA, 0-20mA)
6. Voltmeters (0-20V)
7. Electronic Components -Resistors, Capacitors, BJTs.

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(UGC- AUTONOMOUS)

(J3405) BASIC SIMULATION LAB

II B.Tech I Sem.: ECE

L	T	P	C
0	0	3	1.5

List of Experiments:

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit Impulse, unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd parts of Signal/Sequence and Real and Imaginary parts of Signal.
5. Convolution between Signals and sequences.
6. Auto Correlation and Cross Correlation between Signals and Sequences.
7. Verification of Linearity and Time Invariance Properties of a given Continuous/Discrete System.
8. Computation of Unit sample, Unit step and Sinusoidal responses of the given LTI system and verifying its physical realiazability and stability properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given signal and plotting its magnitude and phase Spectrum.
11. Waveform Synthesis using Laplace Transform.
12. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane and Z-Plane for the given transfer function.
13. Generation of Gaussian noise (Real and Complex), Computation of its mean, M.S. Value and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.
15. Removal of noise by Autocorrelation / Cross correlation.
16. Extraction of Periodic Signal masked by noise using Correlation.
17. Verification of Weiner-Khinchine Relations.
18. Checking a Random Process for Stationarity in Wide sense.

Requirements :

1. MATLAB Tool Box
2. Computer Systems

(AUTONOMOUS)

(J3209) ELECTRICAL TECHNOLOGY LAB

II Year B. Tech. ECE I- Semester

L	T	P	C
0	0	3	1.

List of Experiments:

1. Verification of Kirchhoff's Laws.
2. Verification of RMS value of complex wave.
3. Series and Parallel Resonance.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of Maximum power transfer theorem.
6. Verification of Thevenin's and Norton's theorems.
7. Magnetization characteristics of DC Shunt Generator.
8. Speed Control of a DC Shunt Motor.
9. Swinburne's test on DC Shunt Machine.
10. Brake test on DC shunt motor.
11. OC & SC test on single phase Transformer.
12. Load Test on single phase Transformer.
13. Brake Test on 3- phase Induction Motor.

(JMC01) ENVIRONMENTAL STUDIES

B.Tech.- II Yr I Sem: Common to all **L T P C**
3 0 0 0

COURSE OBJECTIVES:

2. Understanding the importance of ecological balance for sustainable development.
3. Understanding the impacts of developmental activities and mitigation measures.
4. 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.

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. **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. Threats to biodiversity: habital 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 quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waster:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary.

UNIT-V

Global Environmental Problems 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 Montreal Protocol.

SUGGESTED TEXT BOOKS:

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

REFERENCE BOOKS:

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. The syllabus of Environmental Studies prescribed by UGC/JNTUH is approved for adoption.

COURSE OUTCOMES

After undergoing the course the student would be able to know about

1. Understanding of Ecosystem,
2. Natural resources
   Depletion of natural resources & prevention of natural resources.
3. Biodiversity
   Protection, sharing of the biodiversity.
4. Environmental pollution
   Understanding of water, soil, noise, air pollutions and their control measurements.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(J4406) ANALOG COMMUNICATIONS

II Year B.Tech. II-Sem: ECE **L T P C**
3 0 0 3

COURSE OBJECTIVES:

This course aims at:

1. Developing and understanding of the design of analog communication system.
2. Establishing a firm foundation for the understanding of communications systems, and the relationship among various technical factors when such systems are designed.
3. Able to learn the different modulation techniques such as AM, FM and PM
4. Able to learn modulation techniques for Transmission and Reception with certain noise component
5. Different Pulse modulation techniques.

UNIT I:
AMPLITUDE MODULATION

Introduction to communication system, Need for modulation, Amplitude Modulation, Time domain and frequency domain description, Generation and Detection of AM waves.

Double side band suppressed carrier modulation: time domain and frequency domain description of DSB-SC, Generation and Detection of DSB-SC Waves.

UNIT II:
SSB MODULATION

Introduction to Hilbert Transform, Frequency domain and Time domain description Generation and Detection of SSB Wave.

Vestigial side band modulation: Frequency and Time domain description, Generation and Detection of VSB Modulated wave, Comparison of AM Techniques, Applications of different AM Systems.

UNIT III:
ANGLE MODULATION

Basic concepts, Frequency Modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave, Generation and Detection of FM Waves Comparison of FM and AM, Frequency Division Multiplexing.

UNIT IV:
NOISE

Resistive Noise Source (Thermal), Arbitrary Noise Sources, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks, Narrow Band noise, Quadrature representation of narrow band noise & its properties.Noise in Analog communication System, Threshold effect in Angle Modulation System, Pre-emphasis and de-emphasis.

UNIT V:

RECEIVERS

Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.

PULSE MODULATION: Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation and demodulation of PWM, PPM, Generation and demodulation of PPM, Time Divison Multiplexing.

TEXTBOOKS:

1. Communication Systems by Simon Haykins John Wiley & Sons , 2 nd Edition.
2. Electronics & Communication System – George Kennedy and Bernard Davis , TMH 2004.

REFERENCES:

1. Analog and Digital Communication – K. Sam Shanmugam, Willey ,2005
2. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5th Edition,2009,PHI.
3. Communication Systems – B.P.Lathi,BS Publications,2004.
4. Priciples of Communication Systems – H Taub and D.Schilling.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to

1.Conceptually understand the baseband signal & system.
2. Identify various elements, processes, and parameters in communication systems and describe their functions, effects, and interrelationship.
3. Understand basic knowledge of AM, FM transmission & reception.
4.Understand various noise component in different communication Schemes.
5.Understands concept of receivers and the various pulse communication techniques.

(UGC AUTONOMOUS)

II B.Tech II Sem: ECE

L T P C
3 0 0 3

(J4407) PULSE AND DIGITAL CIRCUITS

COURSE OBJECTIVE:

The main objectives are:

1. To explain the complete response of R – C and R-L-C circuits.
2. To explain clippers, clampers, switching characteristics of transistors and sampling gates.
3. To construct various multivibrators using transistors, design of sweep circuits and sampling gates.
4. To discuss realize logic gates using diodes and transistors.
5. To learn Multivibrator circuits and their applications.

UNIT-I:

LINEAR WAVE SHAPING:

Low pass and high pass RC circuits and their response for sinusoidal, step, pulse, square and ramp inputs, Differentiators and integrators circuits, Attenuators and its applications, RL and RLC circuits and their responses for step input.

UNIT-II:

NON LINEAR WAVE SHAPING:

Diode and Transistor clippers, Two level clippers, Clamping operation, Clamping circuit theorem, practical clamping circuits and taking source and diode resistances into account, comparators and its applications.

UNIT-III:

MULTIVIBRATORS:

Switching characteristics and switching times of BJT‟s and FET‟s, Analysis and design of Astable, monostable, bi-stable multivibrators and Schmitt triggers using transistors.

UNIT-IV:

SWEEP CIRCUITS:

Principles and methods of generating Time base waveforms, Miller and bootstrap.

SYNCHRONIZATION AND FREQUENCY DIVISION:

Principles of synchronization, frequency division in sweep circuit, and stability of relaxation devices, astable and monostable relaxation circuits, and synchronization of a sweep circuit with symmetrical signals, sine wave frequency division with a sweep circuit.

UNIT-V:

SAMPLING GATES:

Basic operating principle of gates, Unidirectional and Bi-directional gates using diodes and transistors

REALIZATION OF LOGIC GATES:

AND, OR, and NOT gates using diodes and transistors, DCTL, RTL, DTL, TTL and CMOS logic families and its comparison.

TEXT BOOKS:

1. Millman‟s Pulse, Digital and Switching Waveforms- J. Millman, H. Taub and Mothiki S. Prakash Rao, 2 Ed., 2008 TMH.
2. Solid State Pulse Circuits- David A. Bell, 4 Ed., 2002 PHI.
3. Pulse and Digital Circuits- A. Anand Kumar, 2005 PHI

REFERENCE BOOKS:

1. Wave Generation and Shaping- L. Strauss.
2. Fundamentals of Pulse and Digital Circuits- Ronald J. Tocci, 3 Ed., 2008.

OUTCOMES:

At the end of the course, the students will be able to:

1. Understand the applications of diode as integrator, differentiator, clipper and clamper circuits.
2. Learn various switching devices such as diode, transistor.
3. Difference between logic gates and sampling gates.
4. Design multivibrators for various applications, synchronization.
5. Understand and apply multivibrator circuits in real time applications

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS)

(J4408) ELECTRONIC CIRCUIT ANALYSIS

B.Tech. II Year II SEM: ECE **L T P C**

3 0 0 3

COURSE OBJECTIVE:

To familiarize the student with the

1. Analysis and design of basic transistor amplifier circuits using Hybrid model
2. Amplifier frequency response characteristics
3. Analysis of FET amplifiers and feedback amplifiers
4. Classification and frequency of oscillations of LC & RC oscillators
5. Large signal amplifiers and tuned amplifies.

UNIT I:

FET Amplifiers: Analysis of CG, CS and CD Amplifiers.

MULTI STAGE AMPLIFIERS

Multi stage amplifiers: Analysis of Cascaded RC Coupled BJT amplifiers, Cascode Amplifier, Darlington Pair, different Coupling Schemes used in Amplifiers - RC Coupled, Transformer Coupled & Direct Coupled Amplifiers.

UNIT II:

BJT AMPLIFIERS - FREQUENCY RESPONSE

General frequency considerations, Frequency response of BJT Amplifier, Analysis at Low and High frequencies, Effect of coupling & Bypass capacitors.

The Hybrid π- CE Transistor Model, CE Short circuits current Gain, Current Gain with Resistive Load, Gain - Bandwidth Product.

UNIT III:

FEEDBACK AMPLIFIERS

Feedback Amplifiers: Concept of Feedback, Classification of Feedback Amplifiers, Effect of Negative Feedback on Amplifier Characteristics, Voltage Series, Voltage Shunt, Current Series and Current Shunt Feedback Configurations.

UNIT IV: OSCILLATORS

LC Oscillators: Classification of Oscillators, Conditions for Oscillations, Generalized analysis of LC oscillations - Hartley and Colpitt's Oscillators,

RC Oscillators: RC phase shift Oscillator, Wien - Bridge & Crystal Oscillators.

UNIT V:

Large signal amplifiers: Classification, Class A Direct coupled & Transformer Coupled Power Amplifier, Class - B Push - Pull Amplifier & Complementary Symmetry power Amplifiers, and their Efficiencies, Distortion in Power Amplifier.

Tuned amplifiers: Introduction, Q - Factor, classification, Small Signal single Tuned tuned Amplifier, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Stagger tuned Amplifiers.

TEXT BOOKS :

1. Integrated Electronics – J. Millman and C. C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits - S. Salivahan, N.Suresh Kumar, A Vallavaraj, 2 Ed., 2009, TMH.

REFERENCE BOOKS:

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, 9 Ed., 2008 PE.
2. Electronic Circuit Analysis and Design – Donald A. Neaman, Mc Graw Hill.
3. Electronic Circuit Analysis – K. Lal Kishore, BS Publications, 2004.

COURSE OUTCOMES:

Upon completion of the subject, student will be able to:

1. Analyze and design the basic transistor amplifier circuits using Hybrid model
2. Analyze Amplifier frequency response characteristics
3. Analyze FET amplifiers and feedback amplifiers
4. Understand the principle of frequency of oscillations of LC & RC oscillators
5. Understand the concepts of large signal amplifiers and tuned amplifies.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(J4409) DIGITAL SYSTEM DESIGN

II Year I Sem.: CSE **L T P C**
II Year II Sem.: ECE **3 0 0 3**

COURSE OBJECTIVE

1. This Subject exposes the students to learn Digital Fundamentals
2. Student will be able to Design, Analyze and Interpret Combinational Digital Circuits.
3. Student will be able to Design, Analyze and Interpret Sequential Digital Circuits.

4. Learn logic principles to various combinational and sequential circuits.
5. Understands the concepts of logic families

UNIT- I: NUMBER SYSTEMS & BOOLEAN ALGEBRA

Binary Numbers, Number base Conversion, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Boolean Algebra basic theorems and properties, Boolean functions, canonical and standard forms.

UNIT-II: GATE LEVEL IMPLEMENTATION AND MINIMIZATION

Basic Logic gates and Universal gates, Simplification of functions using Karnaugh map (Four & Five Variable) and Quine McCluskey Method, Boolean function Implementation, Gate level Implementation.

UNIT-III: COMBINATIONAL LOGIC DESIGN

Combinational Circuit, Analysis Procedure, Design Procedure, Examples of Combinational Digital Circuits(Adders, Subtractor, Adder-Subtractor etc.) Serial and parallel adders, BCD Adder. Comparators, Multiplxers, Demultiplexer, Encoder, Decoder. Hazards in Combinational Circuits, Hazards free realization.

UNIT-IV: SEQUENTIAL LOGIC DESIGN

Introduction to sequential Circuits: Latches and Flip-Flops (RS,JK, D, T and Master Slave), Design of Clocked Flip-Flop, Flip-Flop Conversion, Ripple and Synchronous Counters, Shift Registers, Finite State Machine Design and Analysis

UNIT-V: Introduction to Logic Families: TTL, ECL, CMOS, PAL, PLA, PLD, FPGA, CPLD etc.

TEXT BOOKS :

1. Maris Mano: "Digital Design" Prentice Hall 1993.
2. RP Jain : Modern Digital Electronics Tata McGraw Hill 4th Edition 2009

REFERENCE BOOKS:

1. Charles H.Roth : Digital System Design using VHDL
2. Zvi Kohavi : Switching and Finite Automata Theory, CAMBRIDGE 3rd Edition.

Course Outcomes:

1. Student understands Digital logic Principles, Number systems etc.
2. Understands the Binary logic principles in implementing Gate level Design

3. Understands and applying the Combinational Circuits
4. Understands and applying the sequential circuit logic in applications of Memeories, Registers, Flip-Flops and counters.
5. Understands and applying the Various logic level in Logic families.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(J4410) ELECTROMAGNETIC WAVES & TRANSMISSION LINES

B.Tech. II YEAR II SEM: ECE **L T P C**

3 0 0 3

COURSE OBJECTIVES:

1. Understand basic fundamental theory concept of electromagnetic waves and transmission lines and their applications

2. Understand the time varying Maxwell equations and their applications in electromagnetic waves.
3. To study the relationship between the time varying electric and magnetic field
4. To learn and analyze basic transmission line parameters in Phasor domain
5. To know how waves propagate in dielectric and lossy media

UNIT-I

ELECTROSTATIC FIELDS:
Coulomb‟s law, Field due to different Charge Distributions, Gauss „law in Integral and Point Form, Concept of Electric Flux Density, Potential Gradient, Conductors & Dielectrics, Concept of Polarization, Energy stored in Electrostatic field, Poisson's and Laplacian Equations and their Applications, ; Capacitance - Parallel plate, Coaxial, Spherical Capacitors, illustrative Problems.

UNIT-II

MAGNETOSTATIC FIELDS:
Steady current, Current distributions, Biot–Savart law, Ampere‟s Circuital law in Integral and Differential form, Force on Current Elements, Magnetic Potentials, Concept of Magnetic Flux Density, Energy stored in Magnetic Field, Fields in Magnetic Materials – Concept of Magnetization, Self and Mutual Inductances.

Maxwell's Equations (Time Varying Fields): Faraday‟s Law and Transformer EMF, inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary surface: Dielectric-Dielectric and Dielectric- Conductor interfaces illustrative Problems.

UNIT-III

EM WAVE CHARACTERISTICS-I:
Wave Equations for Conducting and perfect Dielectric Media, Uniform Plane waves - Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics - Characterization, Wave propagation in Good Conductors and Good Dielectrics, Polarization, lllustrative Problems.

EM Wave Characteristics-II: Reflection and Refraction of Plane Waves- Normal and Oblique incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total internal Reflection, Surface impedance, Poynting Vector and Poynting Theorem - Applications, Power Loss in a Plane Conductor., illustrative Problems.

UNIT-IV
TRANSMISSION LINES-I:
Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic impedance, Propagation Constant, Phase and Group Velocities, infinite Line Concepts, Lossless/Low Loss Characterization, Distortion - Condition for Distortion less and Minimum Attenuation, Loading - Types of Loading, Illustrative Problems.

UNIT-V

TRANSMISSION LINES-II:

Input impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements Lines - , λ/8, λ/4, λ/2, lines impedance Transformations, Significance of Zmin and Zmax, Smith Chart - Configuration and Applications, Single and Double Stub

TEXTBOOKS:

1. Engineering Electromagnetics, W. H. Hayt Jr., McGraw Hill – New York, 5th edition
2. EM Waves and Radiating Systems, E. C. Jordan, Pearson education, 2nd edition,2007
3. Elements of Electromagnetics, M.N.O.Sadiku, Oxford Press, 2002.

REFERENCES:

1. Transmission Lines and Networks- UmeshSinha, SatyaPrakashan, 2001,fl-ech. india Publications), New Delhi.
2. Electromagnetics with Applications, Kraus and Fleisch, McGraw Hill, 1999.

Course Outcomes:

1. Study time varying Maxwell equations and their applications in electromagnetic waves
2. Determine the relation ship between time varying electric and magnetic field
3. Analyze basic transmission line parameters in phasor domain.
4. Using Maxwell equation describing the propogation of electromagnetic waves in vacuum
5. To learnt waves propogating dielectric and lossy media

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B.Tech II Year II Sem.: ECE **L T P C**
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(J4411) PULSE AND DIGITAL CIRCUITS LAB

List of experiments:

Minimum eight experiments to be conducted:

1. Linear wave shaping

a. RC Low pass circuit for different time constants
b. RC High pass circuit for different time constants.

2. Non Linear Wave Shaping
   a. Transfer characteristics and response of clippers:
      i) Positive and negative clippers.
      ii) clipping at two independent levels.
   b. The steady state output waveform of clampers for a square wave input
      i) Positive and negative clampers.
      ii) Clamping at reference voltage.
3. Switching characteristics of a Transistor.
4. Design of Bistable multivibrator.
5. Design of Monostable multivibrator.
6. Design of Astable multivibrator.
7. Observe the response of Schmitt Trigger and calculate hysteresis Voltage
8. Design of UJT Relaxation Oscillator and calculate sweep time.
9. Plot the ouput voltage waveform of Boot strap sweep circuit and calculate sweep time.
10. Plot the ouput voltage wave form of Miller sweep circuit and calculate sweep time

Equipment required for the Laboratory:

1. Regulated power supply – 0 – 30 V
2. Fixed power supply line connected.
3. CRO's - 0 – 20M Hz
4. Function Generators -- 0 – 1M Hz

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

II Year II Sem.: ECE **L T P C**
0 0 3 1.5

(J4412) ELECTRONIC CIRCUIT ANALYSIS LAB

List of experiments

Minimum eight experiments to be conducted:

I) Design and simulation in simulation Laboratory using any simulation software
(Minimum six Experiments)

1. Single stage Common Emitter Amplifier
2. Two stage RC Coupled Amplifier

3. Common source amplifier
4. Cascode amplifier
5. RC phase shift oscillator using transistors
6. Colpitt's oscillator.
7. Class A Power amplifier
8. Class B complementary symmetry Amplifier
9. Voltage series feedback amplifier
10. Class C tuned amplifier

II) Testing in the Hardware Laboratory (Minimum two Experiments)
1. Hartley oscillators
2. Colpitt's oscillators
3. RC coupled amplifier
4. Class B power amplifier

Equipment Requirements:

1. Open Source Tina Pro Software
2. Computer Systems
3. Trainer Kits for Hardware experiments

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(J4413) ANALOG COMMUNICATIONS LAB

II B.TECH II SEM: ECE **L T P C**
0 0 3 1.5

Analog Communication Experiments

1. Amplitude Modulation and Demodulation
2. DSB-SC Modulation and Demodulation
3. SSB-SC Modulation and Demodulation
4. Frequency Modulation

5. Pre-Emphasis and De-Emphasis
6. Sampling Theorem
7. Frequency Synthesizer
8. AGC Characteristics
9. Phase Locked Loop
10. Study of Spectrum Analyzer

Equipment Required:

1. Trainer Kits for the above said experiments
2. Cathode Ray Oscilloscope
3. Function Generator
4. Spectrum Analyzer.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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Narsampet, Warangal.

(JMC02) Gender Sensitization

	L	T	P	C
B.Tech. II Year: All Branches	**2**	**0**	**0**	**0**

Course Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.

- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

UNIT – I UNDERSTANDING GENDER:
Gender: Why Should We Study It? (Towards a World of Equals: Unit -1) Socialization: Making Women, Making Men (Towards a World of Equals: Unit -2) Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

UNIT – II GENDER AND BIOLOGY Missing Women:
Sex Selection and Its Consequences (Towards a World of Equals: Unit-4) Declining Sex Ratio. Demographic Consequences. Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit -10) Two or Many? Struggles with Discrimination.

UNIT – III GENDER AND LABOUR Housework:
the Invisible Labour (Towards a World of Equals: Unit -3) "My Mother doesn't Work." "Share the Load." Women's Work: Its Politics and Economics (Towards a World of Equals: Unit -7) Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

UNIT – IV ISSUES OF VIOLENCE Sexual Harassment:
Say No! (Towards a World of Equals: Unit -6) Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "Chupulu". Domestic Violence: Speaking Out (Towards a World of Equals: Unit -8) Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice. Thinking about Sexual Violence (Towards a World of Equals: Unit -11) Blaming the Victim-"I Fought for my Life…." – Additional Reading: The Caste Face of Violence.

UNIT – V GENDER : CO – EXISTENCE Just Relationships:
Being Together as Equals (Towards a World of Equals: Unit -12) Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Additional Reading: Rosa Parks-The Brave Heart.

Prescribed Textbook : All the five Units in the Textbook, "Towards a World of Equals: A Bilingual Textbook on Gender" written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad,Telangana State in the year 2015.

Note: Since it is an Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

REFERENCE BOOKS:

- Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
- Abdulali Sohaila. "I Fought For My Life…and Won."Available online at:
- http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/

Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCEINCES
(UGC-AUTONOMOUS)

B.Tech III Year. I-Sem.ECE

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(J5414) IC Applications

Course Objectives:

The main objectives of the course are:

1. To Study the basic building blocks of Linear integrated circuits.

2. To Study the applications of Operational amplifiers.
3. To Study the Timers and Phase Locked Loops.
4. To Study the theory of ADC and DAC.
5. To understand the working of basic digital Integrated Circuits.

UNIT I:

INTEGRATED CIRCUITS: Introduction, Classification of Integrated Circuits, Fabrication Techniques of ICs

INTRODUCTION TO OP-AMP: Introduction, Internal blocks of Op-Amp, Ideal and Practical Op-Amp, Op-amp characteristics-DC and AC Characteristics.741 Op-Amp and its Features, Modes of operation- inverting, non-inverting.

UNIT II:

APPLICATIONS OF OP-AMPS:

Basic Applications- Summing Ampifier, Instrumentation Amplifier, AC Amplifier, V to I and I to V Converters, Sample & Hold Circuits, Differentiators and Integrators.

Comparators and waveform Generators- Comparators, Schmitt Trigger & its applications Multivibrators (Monostable and Astable).

UNIT III:

ACTIVE FILTERS

Introduction,First Order Low Pass, High Pass and Band Pass Filters, Active Band Reject and All Pass Filters.

TIMERS & PHASE LOCKED LOOPS

Introduction to 555 Timer, Functional Diagram, Monostable and Astable Operations and Applications, Schmitt Trigger, PLL- Introduction, Block Schematic, Principles and Description of individual Blocks of 565, VCO.

UNIT IV:

D-A AND A- D CONVERTERS

Introduction, Basic DAC Techniques- Weighted Resistor Type. R-2R Ladder Type, inverted R-2R Type and IC 1408 DAC.

Different types of ADCs - Parallel Comparator Type, Counter Type, Successive Approximation Register Type and Dual Slope Type DAC and ADC Specifications.

UNIT-V:

Digital ICs: Classifications, Standard TTL NAND Gate-Analysis & Characteristics, TTL Open Collector Outputs. Tristate TTL, MOS & CMOS open drain and tristate outputs.

Comparison of Various Logic Families. IC interfacing- TTL driving CMOS & CMOS driving TTL.

TEXT BOOKS:

1. Linear Integrated Circuits -D. Roy Chowdhury, New Age International (p)Ltd.
2. Op-Amps & Linear ICs - Ramakanth A. Gayakwad.

REFERENCE BOOKS:

1. Op-Amps and Linear Integrated Circuits, R.F. Coughlin & Fredrick F. Driscoll, PHI.

2. Operational Amplifiers and Liner Integrated Circuits: theory & applications, Denton J. Daibey, TMH

3. Design with operational amplifiers &Analog Integrated Circuits, Serigo Franco. McGraw Hill.

4. Digital Fundamentals - Floyd and Jain, Pearson Education.

Course Outcomes:

After completion of this course, students will have….

1. A thorough understanding of Operational amplifiers with Linear Integrated Circuits.
2. Understanding of the Different families of Digital Integrated Circuits and their characteristics.
3. Also student will able to design circuits using Operational amplifiers for various applications such Timers and Filters.
4. Understands ADC & DAC along with types for Real world problems
5. Learned the concepts on Digital ICs for VLSI Technology and Design

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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B.Tech. III Year I Sem: **ECE** **L T P C**

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(J5415) DIGITAL SIGNAL PROCESSING

Course Objectives:

1. To learn the fundamental concepts of Digital Signal Processing.
2. To explore the properties of DFT in mathematical problem solving. To illustrate FFT calculations mathematically and develop FFT based DSP algorithms.
3. To learn the Physical realization of Digital Filters.
4. To study the Design of IIR &FIR filters Mathematically.
5. To introduce DSP applications, Multirate Signal Processing.

UNIT-I :

Introduction: Introduction to Digital Signal Processing

Classification of Signals, The Representation of discrete –time signals and sequences, Block Diagram of Processing system, Signal Manipulations, Linear Time Invariant Systems, Stability, Causality, Linear constant coefficient difference equation, frequency domain representation of DTS& Signals.

UNIT-II:

Discrete Fourier Transform: Introduction , DFT and its properties, FFT algorithms

8-Point DFT using radix-2 FFT Decimation In Time, Decimation in Frequency , Linear convolution of sequences using DFT, Circular convolution of sequence using DFT, Computation of DFT :Overlap-add Method, Over-lap save Method, Relation between DTFT,DFS,DFT and Z-transform.

UNIT-III:

Realization of Digital Filters : Classification of filter on the their pole zero diagram, Realization of IIR systems by Direct form-I, Direct form-II, Cascade and Parallel. Realization of FIR systems by Direct form, cascade and linear phase system.

UNIT-IV:

DigitalFilterDesignTechniques:Designof IIR filter Methods IIT and BLT. Design of But terworth and Chebyshev type -I IIR filter. FIR filter Design : Design of FIR filter by using Different Windowing Technique by using Frequency Sampling. Comparison of IIR &FIR filters.

UNIT-V

Applications of DSP: Multirate signal processing: Decimation, Interpolation, Sampling rate conversion by a rational factor – Adaptive Filters: Introduction, Applications of adaptive filtering to equalization. Applications to Speech Processing, Radar signal Processing ,Bio-medical signal processing.

Text Books:

1.Digital signal processing-P.Ramesh Babu Second edition.

2.Digital signal Processing-A.Anand Kumar.

Reference Books :

1. Proakis Manolakis, 'Digital Signal Processing : Principles, Algorithms and Applications' Fourth 2007, Pearson Education, ISBN 81-317-1000-9.

2. Digital signal processing- Nagoor Khani, TMG,2012.

3. Emmanuel C. Ifeachor, Barrie W. Jervis, "Digital Signal Processing: A Practical Approach", Pearson Education ISBN 0-201-59619- 9

Course Outcomes: Learner will be able to…

1. To understand the concept of DT Signal and perform signal manipulation.
2. Understand the Properties of DFT in mathematical problem solving, and FFT Algorithms.
3. Understand the Physical Realization of Digital filters.
4. Understand Design of Digital filters.
5. Understand the Multirate DSP Techniques and applications.

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III B.Tech. I-Sem : ECE

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(J5455) DIGITAL COMMUNICATIONS

Prerequisite: Analog Communications

Course Objectives:

- To understand the functional block diagram of Digital communication system.
- To understand the need for source and channel coding.
- To study various source and channel coding techniques.

- To understand a mathematical model of digital communication system for bit error rate analysis of different digital communication systems.
- To study the advantages of spread spectrum techniques and performance of spread spectrum.

UNIT I:

Elements of Digital Communication Systems: Model of Digital Communication Systems, Digital Representation of Analog Signal, Certain Issues in Digital Transmission, Advantages of Digital Communication Systems, Sampling Theorem, Types of Sampling – Impulse Sampling , Natural Sampling , Flat – Top Sampling. Introduction to Baseband Sampling.

Pulse Code Modulation: PCM Generation and Reconstruction, Quantization Noise, Non Uniform Quantization and Companding, DPCM, Adaptive DPCM, DM and Adaptive DM, Noise in PCM and DM.

UNIT II:

Digital Modulation Techniques: Introduction, ASK, ASK Modulator, Coherent ASK Detector, Non-Coherent ASK Detector

Frequency Shift Keying: Bandwidth and Frequency Spectrum of FSK, Non Coherent FSK Detector, Coherent FSK Detector, FSK Detection using PLL, BPSK, Coherent PSK Detection, QPSK, Differential PSK.

UNIT III:

Baseband Transmission and Optimal Reception of Digital Signal: A Baseband Signal Receiver, Probability of Error, Optimum Receiver, Coherent Reception, Signal Space Representation and Probability of Error, Eye Diagrams, Cross Talk.

Information Theory:

Entropy, Information rate, Source coding: Huffman coding, Shannon Fano coding, Mutual information, Channel capacity of discrete channel, Shannon-Hartley law; Trade -off between bandwidth and SNR

UNIT IV:

Error Control Codes

Linear Block Codes: Matrix Description of Linear Block Codes, Error Detection and Error Correction Capabilities of Linear Block Codes.

Cyclic Codes: Algebraic Structure, Encoding, Syndrome Calculation, Decoding.

Convolution Codes: Encoding, Decoding using State, Tree and Trellis Diagrams, Decoding using Viterbi Algorithm, Comparison of Error Rates in Coded and Un coded Transmission.

UNIT V:

Spread Spectrum Modulation:

Use of Spread Spectrum, Direct Sequence Spread Spectrum, Code Division Multiple Access, Frequency Hopping Spread Spectrum.

PN Sequence: Generation and Characteristics, Synchronization in Spread Spectrum Systems.

TEXT BOOKS:

1. Principles of Communication Systems - Herbert Taub, Donald L Schiling, Goutam Saha, 3rd Edition, Mcgraw-Hill, 2008.
2. Digital and Analog Communication Systems – Sam Shanmugam, John Wiley, 2005.

REFERENCES:

1. Digital Communications – John G. Proakis , Masoud Salehi – 5th Edition, Mcgraw-Hill, 2008.
2. Digital Communication – Simon Haykin, Jon Wiley, 2005.
3. Digital Communications – Ian A. Glover, Peter M. Grant, 2nd Edition, Pearson Edu., 2008.
4. Communication Systems – B.P. Lathi, BS Publication, 2006.

Course Outcomes:

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

- Understand basic components of Digital Communication Systems.
- Design optimum receiver for Digital Modulation techniques.
- Analyze the error performance of Digital Modulation Techniques.
- Understand the redundancy present in Digital Communication by using various source coding techniques.
- Know about different error detecting and error correction codes like block codes, cyclic codes and convolution codes and to understand advantage of spread spectrum

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III B.Tech I Sem: ECE

L	T	P	C
3	0	0	3

(J5416) ANTENNAS AND WAVE PROPAGATION
(Professional Elective – I)

COURSE OBJECTIVES:

1. Understand basic terminology and concepts of Antennas.

2. Understand the design issues, operation of fundamental antennas like Yagi-Uda, Horn antennas and helical structure and also their operation methodology in practice.
3. To learn special antennas such as frequency independent and broad band antennas.
4. To study antenna arrays and antenna measurements.
5. To create awareness about the different types of propagation of radio waves at different frequencies.

UNIT- I: Fundamentals of radiation

Antenna Basics: Introduction, Basic Antenna Parameters - Patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivty-Gain-Resolution, Antenna Apertures, Effective Height. Related Problems.

Thin Linear Wire Antennas Radiation from Small Electric Dipole, Quarterwave Monopole and Halfwave Dipole – Current Distributions, Field Components, Radiated Power, Radiation Resistance, Beamwidths, Directivity, Effective Area and Effective Height. Natural current distributions, fields and patterns of Thin Linear Center-fed Antennas of Different Lengths, Illustrative Problems. Loop Antennas - Introduction, Small Loop, Comparison of Far Fields of Small Loop and Short Dipole, Radiation Resistances and Directivities of Small and Large Loops (Qualitative Treatment).

UNIT - II:
VHF, UHF AND Microwave Antennas - I: Arrays with Parasitic Elements, Yagi - Uda Arrays, Folded Dipoles & their characteristics, Helical Antennas - Helical geometry, Helix Modes, Practical Design Considerations for Monofilar Helical Antenna in Axial and Normal Modes. Horn Antennas - Types, Fermat's Principle, Optimum Horns, Design Considerations of Pyramidal Horns, Illustrative Problems.
UNIT - III:
VHF, UHF AND Microwave Antennas - II: Microstrip Antennas - Introduction, Features, Advantages and Limitations, Rectangular Patch Antennas - Geometry and Parameters, Characteristics of Microstrip Antennas. Impact of Different Parameters on Characteristics, Reflector Antennas - Introdcution, Flar Sheet and Corner Reflectors, Paraboloidal Reflectors - Geometry, Pattern Characteristics, Feed Methods, Reflector Types - Related Features, Illustrative Problems. Radiation from a traveling wave on a wire. Analysis of Rhombic antenna. Design of Rhombicantennas.
Lens Antennas - Introduction, Geometry of Non-metallic Dielectric Lenses, Zoning, Tolerances, Applications.
UNIT - IV: ANTENNA ARRAYS AND MEASUREMENTS
Antenna Arrays: Point Sources - Definition, Pattern, arrays of 2 Isotropic Sources - Different Cases, Principle of Pattern Multiplication, Uniform Linear Arrays - Broadside Arrays, Endfire Arrays, EFA with Increased Directivity, Derivation of their Characteristics and Comparision, BSAs with Non-unitform Amplitude Distributions - General Considerations and Binomial Arrays, Illustrative Problems.
Antenna Measurements: Introduction, Concepts - Reciprocity, Near and Far Fields, Coordinate System, Sources of Errors. Patterns to be Measured, Pattern Measurement Arrangement, Directivity Measurement, Gain Measurements (by Comparision, Absolute and 3-Antenna Methods
UNIT V PROPAGATION OF RADIO WAVES

Modes of propagation , Structure of atmosphere , Ground wave propagation , Tropospheric propagation ,M-Curves and Duct propagation, Troposcatter propagation , Flat earth and Curved earth concept Sky wave propagation – Virtual height, critical frequency , Maximum usable frequency ,LUF,OF,Skip distance, Fading , Multi hop propagation. Radio noise of terrestrial and extra terrestrial origin. Multipath fading of radio waves. Antennas and propagation for body centric communications.

TEXT BOOK:

1. Antennas for All Applications – John D. Kraus and R. J. Marhefka, and Ahmad S. Khan TMH, New Delhi, 4th ed., (Special Indian Edition) 2010.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

REFERENCES:

1.Edward C.Jordan and Keith G.Balmain" Electromagnetic Waves and Radiating Systems" Prentice Hall of India, 2006
2.Antennas – John D. Kraus, McGraw-Hill (International Edition), 2nd Ed. 1988.
S. Drabowitch, "Modern Antennas" Second Edition, Springer Publications, 2007.
3.R.E.Collin,"Antennas and Radiowave Propagation", Mc Graw Hill 1985.
4.Constantine.A.Balanis "Antenna Theory Analysis and Design", Wiley Student Edition, 2006.
5.Rajeswari Chatterjee, "Antenna Theory and Practice" Revised Second Edition New Age International Publishers, 2006.
6. 7.Robert S.Elliott "Antenna Theory and Design" Wiley Student Edition, 2006.
8.H.Sizun "Radio Wave Propagation for Telecommunication Applications", First Indian Reprint, Springer Publications, 2007.

OUTCOMES: Upon completion of the course, students will be able to:

1. Explain the various types of antennas and wave propagation.
2. Write about the radiation from a current element.
3. Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad band
4. Understands about the propagation of waves
5. Measure the Antenna parameters for designing applications.

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II B.Tech. EEE II-Sem

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(J5221)POWER ELECTRONICS

(Professional Elective – I)

Pre requisites: To learn this course student should have the concepts on the following subjects: Electrical Circuits-I & II, Electronic Devices and Circuits

Course Objective:

1. To study the Characteristics Power Semi Conductor Devices and Commutation Circuits
2. To study and design the Single phase Half wave and Full wave Controlled Converter
3. To study the Three phase converters with R and RL load and RLE loads
4. To study the Operational Characteristics of AC Voltage Controllers And Cyclo Converters
5. To study the operation of Choppers and Various types of inverters

UNIT – I: Power Semi Conductor Devices and Commutation Circuits

Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and Turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times -Salient points.

Two transistor analogy of SCR – R,RC,UJT firing circuits– Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's, BJT, IGBT - Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT – II: Single Phase Half Wave Controlled Converters

Phase control technique – Single phase Line commutated converters – Half wave controlled converters with Resistive, RL load and RLE load– Derivation of average load voltage and current -Active and Reactive power inputs to the converters without and with Freewheeling Diode –Numerical problems

Single Phase Fully Controlled Converters

Fully controlled converters, Midpoint and Bridge connections with Resistive, RL loads and RLE load– Derivation of average load voltage and current – Line commutated inverters , semi-converters, active and Reactive power inputs to the converters , Effect of source inductance – Expressions of load voltage and current – Numerical problems.

UNIT – III: Three Phase Line Commutated Converters

Three phase converters – Three pulse and six pulse converters and bridge connections with R, RL load voltage and current with R and RL load and RLE loads – Semi Converters, Effect of Source inductance–Dual converters Waveforms –Numerical Problems.

UNIT – IV: AC VOLTAGE CONTROLLERS and CYCLO CONVERTERS

AC voltage controllers – Single phase two SCR's in anti parallel with R and RL loads , modes of operation of TRIAC – TRIAC with R and RL loads – Derivation of RMS load voltage, current and power factor- wave forms , Numerical problems.

Cyclo Converters: Single phase midpoint cyclo converters with resistive and inductive loads, Bridge Configuration of cyclo converters- Waveforms.

UNIT – V: Choppers & Inverters

Choppers – Time ratio control and Current limit control strategies – Step down choppers- Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression and Problems,D.C Jones Chopper,AC Chopper ,Problems

Inverters – Single phase inverter – Waveforms, Three Phase Inverters (180,120 degrees modes of operation), Voltage control techniques for inverters- Pulse width modulation techniques – Numerical problems.

TEXT BOOKS:

1. P.S.Bhimbra , "Power Electronics ", Khanna publications.

2. M. H. Rashid, Power Electronics : Circuits, Devices and Applications,– Prentice Hall of India, 2nd edition, 1998.
3. Power electronics: converters, applications, and design By Ned Mohan, Tore M. Undeland, John Wiley & Sons,2009.

REFERENCE BOOKS:

1. Power Electronics, Vedam Subramanyam, New Age International (P) Limited, Publishers.
2. Elements of Power Electronics, Philip T. Krein, Oxford University Press.
3. Power Electronics, M. S. Jamil Asghar, PHI Private Limited.
4. Power Electronics, P.C.Sen,Tata Mc Graw-Hill Publishing.

Course Outcomes:

At the end of the course, the students to gets a thorough knowledge on,

1. Distinguish between different types of power semiconductor devices and their characteristics.
2. Analyze single Phase Half wave and full wave controlled converters.
3. Analyze the Three Phase Line Commutated Converters
4. Analyze the AC voltage controllers and Cyclo converters.
5. Analyze DC –DC Choppers and analyze DC-AC Inverters.

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III B.Tech I Sem: ECE **L T P C**
3 0 0 3

(J5418) BIO MEDICAL ELECTRONICS

(Professional Elective – I)

Unit- I

Brief introduction to human physiology. Biomedical transducers: displacement, velocity, force, acceleration, flow, temperature, potential, dissolved ions and gases.

Unit-II
Bio-electrodes and biopotential amplifiers for ECG, EMG, EEG, etc.

Unit- III
Measurement of blood temperature, pressure and flow. Impedance plethysmography.

Unit-IV
Ultrasonic, X-ray and nuclear imaging.

Unit- V
Prostheses and aids: pacemakers, defibrillators, heart-lung machine, artificial kidney, aids for the handicapped. Safety aspects.

Text/Reference Books:
1. W.F. Ganong, Review of Medical Physiology, 8th Asian Ed, Medical Publishers, 1977.
2. J.G. Websster, ed., Medical Instrumentation, Houghton Mifflin, 1978.
3. A.M. Cook and J.G. Webster, eds., Therapeutic Medical Devices, Prentice-Hall, 1982.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:
1. Understand the application of the electronic systems in biological and medical applications.
2. Understand the practical limitations on the electronic components while handling bio substances.
3. Understand and analyze the biological processes like other electronic processes.
4. Understand the Diagnosing system by different techniques
5. Understand the Prostheses and aids

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III B.Tech. I - Sem :ECE **L T P C**
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(J5420) IC Applications Lab

Part - I: Linear IC Experiments

1. OP AMP Applications – Adder, Subtractor, Comparators.
2. Integrator and Differentiator Circuits using IC 741.
3. Active Filter Applications – LPF, HPF (first order)
4. IC 741 Waveform Generators - Sine, Square wave and Triangular waves.
5. IC 555 Timer - Monostable and Astable Multivibrator Circuits.
6. Schmitt Trigger Circuits - Using IC 741
7. IC 565 - PLL Applications.
8. Voltage Regulator using IC 723, Three Terminal Voltage Regulators - 7805, 7809, 7912.

EQUIPMENT REQUIRED:

1. 20 MHz Cathode Ray Oscilloscope.
2. 1 MHz Function Generator (Sine, Square, Triangular and TTL).
3. Bus Connection to all the tables
4. Regulated Power supply- 1No
5. Fixed 5V DC Power supply – 1No.
6. Multimeter / Volt Meter.

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III B. Tech. I Sem : **ECE**

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(J5421) DIGITAL SIGNAL PROCESSING LAB

OBJECTIVES: The student should be made to:

1. **To generate various signals**
2. To implement Linear and Circular Convolution
3. The student will be able to demonstrate the applications of FFT and DFT
4. To implement FIR and IIR filters

5. To demonstrate Finite word length

List of experiments:

Cycle-I Experiments using MATLAB:

1. Generation of Signals
2. Correlation, Linear and circular convolution of two sequences
3. Spectrum Analysis using DFT
4. Calculation of FFT of a signal
5. To find Frequency Response of a given system in (Transfer Function/Differential Equation form)

Cycle-II Experiments:

6. Design of FIR filters (LPF, HPF, BPF) for a given sequence using windows
7. Design of IIR filters (LPF, HPF, BPF, BSF)
8. Implementation of Decimation
9. Implementation of Interpolation
10. Impulse Response of First Order and second order systems
11. Noise removal :Add 3khz and then remove, interference suppression using 400Hz
12. Finite Word length effects
13. Calculating the fundamental frequency from an audio signal .
14. Adaptive Filter

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Equipment Required:

1. Simulation Package : Matlab
2. Hardware : DSP Processor Trainer Kits
3. Cathode Ray Oscilloscope
4. Function Generator

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(J4413) DIGITAL COMMUNICATION LAB

II B.TECH II SEM: ECE **L T P C**
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Digital Communication Experiments

1. Pulse Amplitude Modulation and Demodulation(PAM)
2. Pulse width Modulation and Demodulation(PWM)
3. Pulse Position Modulation and Demodulation(PPM)

4. Pulse Code Modulation and Demodulation(PCM)
5. Time Division Multiplexing
6. Delta Modulation and Demodulation
7. Frequency Shift Keying
8. Amplitude Shift Keying
9. Phase Shift Keying
10. Differential Phase Shift keying

Equipment Required:

5. Trainer Kits for the above said experiments
6. Cathode Ray Oscilloscope
7. Function Generator
8. Spectrum Analyzer

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(JMC03)Constitution of India

Course Objectives:

1. The Constitution is the basic and fundamental law
2. To introduce concepts and salient features of the constitution Indian
3. Analyze the Preamble of the Constitution and identify the core values reflected in it;

4. Appreciate the core constitutional values that permeate the salient features of the
5. Indian Constitution; and examine the nature of the Indian federal system and the parliamentary form of govern

Course outcome

1. It also tells us about the rights and also the duties of its citizens.
2. They know about the role, powers of members of local sabha and raj sabha
3. It lays down the rules to govern the country
4. Role and function of election commissioner
5. Power and duties of elected represented s for panchayatraj , ZP, corporation and Importance of democracy

Unit I

Introduction to Constitution' meaning of the term,, Indian Constitution: Sources and constitutional history, Features: Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy.

Unit II

Union Government and its Administration Structure of the Indian Union: Federalism, Centre-State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha

Unit III

State Government and its Administration Governor: Role and Position, CM and Council of ministers, State Secretariat: Organisation, Structure and Functions

Unit IV

Local Administration District's Administration head: Role and Importance, Municipalities:Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, Pachayatiraj: Introduction, PRI: Zila parishadh, Elected officials and their roles, CEO Zila parishadh: Position and role, Block level: Organizational Hierarchy (Different departments) village level: Role of Elected and Appointed officials,Importance of grass root democracy

Unit V

Election Commission Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC and women.

REFERENCES

1. Books. Recommended
2. Indian Polity' by Laxmikanth
3. Indian Administration' by Subhash Kashyap
4. 'Indian Constitution' by D.D. Basu.

5. ‘Indian Administration’ by Avasti and Avasti

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III B.Tech. I-Sem. ECE

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(J6421) LINEAR CONTROL SYSTEMS

Objective: In this course it is aimed to introduce to

1. The students the principles and applications of control systems in everyday life.
2. The basic concepts of block diagram reduction.
3. Time domain analysis solutions to time invariant systems.

4. Deals with the different aspects of stability analysis of systems in frequency domain and time domain.
5. Concept on 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, Feed-Back Characteristics, Effects of feedback.

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TRANSFER FUNCTION REPRESENTATION:

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.
3. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

REFERENCE BOOKS:

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 Publictions,1992.

OUTCOMES:

After going through this course, the student gets knowledge on

1. Open loop and closed loop systems, concept of feedback in control systems, mathematical modeling and transfer function derivations of translational and rotational systems and transfer functions of servomotors and concepts of synchros.
2. Transfer function representation through block diagram algebra and signal flow graphs,
3. Time response analysis of different ordered systems through their characteristic equation and time-domain specifications.
4. Stability analysis of control systems in s-domain through R-H criteria and root-locus techniques.
5. Frequency response analysis through bode diagrams.

With which he/she can be able to apply the above conceptual things to real world electrical and Electronic problems and applications.

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III B.Tech II Sem.: ECE

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(J6423) VLSI TECHNOLOGY

Course Objectives:

The course is designed

1. To provide an introduction to the fundamental principles and techniques in VLSI technology
2. To provide techniques related to design and layout Tools.

3. To know the process of design and manufacturing.
4. To provide knowledge related to Integrated circuits design rules and design procedure.
5. To provide the knowledge about advanced MOSFET design process

UNIT –I:

Introduction to MOS Technologies:

MOS, CMOS, BiCMOS Technology. Basic Electrical Properties of MOS, CMOS & BiCMOS Circuits: Ids – Vds relationships, Threshold Voltage VT, Gm, Gds and ωo, Pass Transistor, MOS, CMOS & Bi CMOS Inverters, Zpu/Zpd, MOS Transistor circuit model, Latch-up in CMOS circuits.

UNIT –II:

Layout Design and Tools:

Transistor structures, Wires and Vias, Scalable Design rules, Layout Design tools.

Logic Gates & Layouts:

Static Complementary Gates, Switch Logic, Alternative Gate circuits, Low power gates, Resistive and Inductive interconnect delays.

UNIT –III:

Fabrication process

Overview of semiconductor industry, Stages of Manufacturing, Process and product trends, Crystal growth, Basic wafer fabrication operations, process yields, Semiconductor material preparation, Basic wafer fabrication operations, Yield measurement, Contamination sources, Clean room construction.

Oxidation and Photolithography, Doping and Depositions, Metallization. Ten step patterning process, Photo resists, physical properties of photo resists, Storage and control of photo resists, photo masking process, Hard bake, develop inspect, Dry etching Wet etching, resist stripping

UNIT –IV

Doping and depositions: Diffusion process steps, deposition, Drive-in oxidation, Ion implantation-1, Ion implantation-2, CVD basics, CVD process steps, Low pressure CVD systems, Plasma enhanced CVD systems, Vapour phase epitaxy, molecular beam epitaxy.

UNIT –V

Design rules

Design rules and Scaling, BICMOS ICs: Choice of transistor types, pnp transistors, Resistors, capacitors,

Packaging: Chip characteristics, package functions, package operations

TEXT BOOKS:

1. Peter Van Zant, Microchip fabrication, McGraw Hill, 1997.

2. C.Y. Chang and S.M. Sze, ULSI technology, McGraw Hill, 2000

REFERENCE BOOKS:

1. Micro Electronics circuits Analysis and Design 2nd Edition, Muhammad H Rashid, CENAGE Learning2011.
2. Eugene D. Fabricius, Introduction to VLSI design, McGraw Hill, 1999
3. Wani-Kai Chen (editor), The VLSI Hand book, CRI/IEEE press, 2000
4. S.K. Gandhi, VLSI Fabrication principles, John Wiley and Sons, NY, 1994

Course Outcomes

Upon completing the course, the student will be able to:

1. Understand the fundamentals of VLSI design flow.
2. Understand the fundamentals behind integrated circuit design and manufacturing process.
3. Understand the basic principles of design rules and scaling standards.
4. Apply the acquired knowledge to projects at work.
5. Take advanced courses in this area.

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(J6424) MICRO PROCESSORS AND MICRO CONTROLLERS

COURSE OBJECTIVES:

6. Understanding the importance of micro processors and micro controllers
7. Understanding the application development skills by using various instructions
8. Understanding the interfacing of devices with processors and controllers
9. Understanding the development of basic Real Time Operating System.
10. Understanding the advanced micro processors and controllers

UNIT-I

Introduction to 8085 Architecture

8086 Architecture: 8086 Architecture-Functional diagram, Register Organization, Memory Segmentation, Programming Model, Memory addresses, Physical Memory Organization, Pin Configuration of 8086.

UNIT-II

Instruction Set and Assembly Language Programming of 8086: Instruction formats, Addressing modes, Instruction Set, Assembler Directives, Macros, and Simple Programs involving Logical, Branch and Call Instructions, Sorting, String Manipulations.

UNIT -III:

I/O Interface : 8255PPI, Various modes of operation and Interfacing to 8086(Keyboard, Display, ADC & DAC).

Interrupt structure of 8086 :8259 PICU, Vector Interrupt Table, Interrupt Service Routine.

Communication Interface: Serial Communication Standards, Serial Data Transfer Schemes, 8251 USART architecture and interfacing

UNIT –IV:

Introduction to Microcontrollers: Overview of 8051 Microcontroller, Architecture, I/O Ports, Memory Organization, Addressing Modes and Instruction set of 8051.

8051 Real Time Control: Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Programming 8051 Timers and Counters

UNIT –V:

ARM Architecture: ARM Processor fundamentals, ARM Architecture – Register, CPSR, Pipeline, exceptions and interrupts interrupt vector table, ARM instruction set – Data processing, Branch instructions, load store instructions, Software interrupt instructions, Program status register instructions, loading constants, Conditional execution, Introduction to Thumb instructions.

TEXT BOOKS:

1. Micro Processor Architecture Programming and Applications with the 8085-Ramesh Goankar, 5th Edition,Penram International Publishing.
2. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandani, TMH, 2nd Edition 2006.
3. The 8051 Microcontroller, Kenneth. J. Ayala, Cengage Learning, 3rd Ed.
4. ARM System Developers guide, Andrew N SLOSS, Dominic SYMES, Chris WRIGHT, Elsevier, 2012

REFERENCE BOOKS:

1. Microprocessors and Interfacing, D. V. Hall, TMGH, 2nd Edition 2006.
2. Introduction to Embedded Systems, Shibu K.V, TMH, 2009

3. The 8051Microcontrollers, Architecture and Programming and Applications -K.Uma Rao, Andhe Pallavi, Pearson, 2009.
4. ARM Reference Manuals

Course Outcomes:

upon completion of this course :

1. The student will learn internal architecture and organization of 8085 and 8086.
2. The student will learn instruction set, Addressing Modes and Assembly level language programming
3. The student understands how to interface the various I/O and Communication interface modules.
4. The student will learn the internal Architecture, Register Organization and instruction set of 8051 microcontrollers and their interfacing.
5. Understands advance microcontrollers and their importance in the field of Embedded systems and IOT.

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(J6425) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

COURSE OBJECTIVES:

11. To understand the basic functional elements of instrumentation
12. Understanding the signal generators and wave analyzers
13. To understand various storage and display devices
14. To introduce various transducers and the data acquisition systems
15. To use the different bridges measuring techniques and the measurement of different physical parameters

UNIT-I

Basic Measurement Concepts:

Functional Elements of Measuring System, Performance Characteristics-static & dynamic, Errors in Measurements, Statistical Analysis, PMMC, DC Voltmeters, DC Ammeters, DMM, Ohmmeter, True RMS Responding Voltmeter, Meter Protection, DVMs-Successive Approximation, Linear Ramp, Dual Slope

UNIT-II

Signal Generators and Analyzers:

AF and RF Generators, Function Generator, Pulse and Square Wave Generators, Sweep Frequency Generator
AF and HF Wave Analyzers, Harmonic Distortion Analyzer, Heterodyne Wave Analyzers, Spectrum Analyzer

UNIT -III:

Oscilloscopes: CRO, CRT, Time Base Circuits, Delay Line, Lissajous Figures, CRO Probes, Dual Trace CRO, Dual Beam CRO, Sampling Oscilloscope, Storage Oscilloscope-Analog & Digital, Applications of Oscilloscopes

UNIT –IV:

Transducers: Classification, Resistive, Capacitive, Inductive, Piezoelectric, Photoelectric RTD, Thermocouples, Hotwire Anemometer, LVDT, Synchros, Data Acquisition Systems, Interfacing Transducers

UNIT –V:

Bridges: Wheatstone, Kelvin, Maxwell, Hay, Anderson, Schering

Measurement of Non Electrical Quantities: Force, Velocity, Displacement, Humidity, Moisture, Liquid Level

TEXT BOOKS:

5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw Hill, 1995.

6. Modern Electronic Instrumentation and Measurement Techniques:A.D.Helbincs,W.D. Cooper:PHI 5th Edition 2003

REFERENCE BOOKS:

5. D.V.S. Moorthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd,
6. David A. Bell, Electronic Instrumentation and measurements, Prentice Hall of India
7. Industrial Instrumentation: T.R.Padmanabham Springer 2009

8. A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2004.

Course Outcomes:

Upon a successful completion of this course, the student will be able to.

1. Describe the fundamental concepts and principles of instrumentation.
2. Explain the operations of the various instruments required in measurements.
3. Apply the measurement techniques for different types of tests.
4. To select specific instrument for specific measurement function.
5. Learners will apply knowledge of different oscilloscopes like CRO, DSO.Students will understand functions, specification, and applications of signal analyzing instruments.

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III B.Tech. II Sem. ECE **L T P C**
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(J6426) INFORMATION THEORY AND CODING

(Professional Elective-II)

Unit-I

Basics of information theory, entropy for discrete ensembles; Shannon's noiseless Coding theorem; Encoding of discrete sources.

Unit-II

Markov sources; Shannon's noisy coding theorem and converse for discrete channels; Calculation of channel capacity and bounds for discrete channels; Application to continuous channels.

Unit-III

Techniques of coding and decoding; Huffman codes and uniquely detectable codes; Cyclic codes, Convolutional arithmetic codes.

Unit-IV

Text/Reference Books:

1. N. Abramson, Information and Coding, McGraw Hill, 1963.
2. M. Mansurpur, Introduction to Information Theory, McGraw Hill, 1987.
3. R.B. Ash, Information Theory, Prentice Hall, 1970.
4. Shu Lin and D.J. Costello Jr., Error Control Coding, Prentice Hall, 1983.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand the concept of information and entropy
2. Understand Shannon's theorem for coding
3. Calculation of channel capacity
4. Apply coding techniques

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(Autonomous)

(J6427) SPEECH AND AUDIO PROCESSING

(Professional Elective – II)

III B.Tech II Sem.: ECE **L T P C**

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Unit-I

Introduction- Speech production and modeling - Human Auditory System; General structure of speech coders; Classification of speech coding techniques – parametric, waveform and hybrid ; Requirements of speech codecs –quality, coding delays, robustness.

Unit-II

Speech Signal Processing- Pitch-period estimation, all-pole and all-zero filters, convolution; Power spectral density, periodogram, autoregressive model, autocorrelation estimation. Linear Prediction of Speech- Basic concepts of linear prediction; LinearPrediction Analysis of non-stationary signals – prediction gain, examples; Levinson-Durbin algorithm; Long term and short-term linear prediction models; Moving average prediction.

Unit-III

Speech Quantization- Scalar quantization–uniform quantizer, optimum quantizer, logarithmic quantizer, adaptive quantizer, differential quantizers; Vector quantization – distortion measures, codebook design, codebook types.

Unit-IV

Scalar Quantization of LPC- Spectral distortion measures, Quantization based on reflection coefficient and log area ratio, bit allocation; Line spectral frequency – LPC to LSF conversions, quantization based on LSF. Linear Prediction Coding- LPC model of speech production; Structures of LPCencoders and decoders; Voicing detection; Limitations of the LPC model.

Unit-V

Code Excited Linear Prediction-CELP speech production model; Analysis-by-synthesis; Generic CELP encoders and decoders; Excitation codebook search – state-save method, zero-input zerostate method; CELP based on adaptive codebook, Adaptive Codebook search; Low Delay CELP and algebraic CELP.

Speech Coding Standards-An overview of ITU-T G.726, G.728 and G.729standards

Text/Reference Books:

1. "Digital Speech" by A.M.Kondoz, Second Edition (Wiley Students_ *Edition), 2004.*
2. "Speech Coding Algorithms: Foundation and Evolution of Standardized Coders", W.C. Chu, WileyInter science, 2003.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Mathematically model the speech signal
2. Analyze the quality and properties of speech signal.
3. Modify and enhance the speech and audio signals.
4. Analyze LPC model
5. Understand different coding standards

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(Autonomous)

(J6428) NANO ELECTRONICS

(Professional Elective – II)

III B.Tech II Sem.: ECE **L T P C**
3 0 0 3

Unit-I

Introduction to nanotechnology, meso structures,Basics of Quantum Mechanics: Schrodinger equation,

Unit-II

Density of States. Particle in a box Concepts, Degeneracy. Band Theory of Solids. Kronig-Penny Model. Brillouin Zones. Shrink-down approaches: Introduction, CMOS Scaling.

Unit-III

The nanoscale MOSFET, Finfets, Vertical MOSFETs, limits to scaling, system integration limits (interconnect issues etc.).

Unit-IV

Resonant Tunneling Diode, Coulomb dots, Quantum blockade, Single electron transistors,Carbon nanotube electronics,

Unit-V

Bandstructure and transport, devices, applications, 2D semiconductors and electronic devices, Graphene, atomistic simulation.

Text/ Reference Books:

1. G.W. Hanson, Fundamentals of Nanoelectronics, Pearson, 2009.
2. W. Ranier, Nanoelectronics and Information Technology (Advanced Electronic Materialand Novel Devices), Wiley-VCH, 2003.
3. K.E. Drexler, Nanosystems, Wiley, 1992.
4. J.H. Davies, The Physics of Low-Dimensional Semiconductors, Cambridge University Press, 1998.
5. C.P. Poole, F. J. Owens, Introduction to Nanotechnology, Wiley, 2003.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand various aspects of nano-technology and the processes involved in making nano components and material.
2. Leverage advantages of the nano-materials and appropriate use in solving practical problems.
3. Understand various aspects of nano-technology and the processes involved in making nano components and material.
4. Leverage advantages of the nano-materials and appropriate use in solving practical problems.
5. Applications of Nano Electronics

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

III B.Tech I-sem : ECE **L T P C**
0 0 2 1

(J6429) e-CAD and VLSI Laboratory

List of Experiments:

Design and implementation of the following CMOS digital/analog circuits using Xilinx/Tanner Tools.

e-CAD

1. HDL code to realize all the logic gates

2. Design of 2-to-4 decoder
3. Design of 8-to-3 encoder (without and with priority)
4. Design of 8-to-1 multiplexer and 1-to-8 demultiplexer
5. Design of 4 bit binary to gray code converter
6. Design of 4 bit comparator
7. Design of Full adder using 3 modeling styles
8. Design of flip flops: SR, D, JK, T
9. Design of 4-bit binary, BCD counters (synchronous/ asynchronous reset) or any sequence counter
10. Finite State Machine Design

VLSI Program

1. Basic logic gates
2. CMOS inverter
3. CMOS NOR/ NAND gates
4. CMOS XOR and MUX gates
5. Static / Dynamic logic circuit (register cell)
6. Latch
7. Pass transistor
8. Layout of any combinational circuit (complex CMOS logic gate).

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(J6430) MICRO PROCESSORS AND MICRO CONTROLLERS LAB

III B.Tech. II Sem: ECE

L T P C
0 0 2 1

Cycle 1: Using 8086 Processor Kits and/or Assembler (10 Weeks)

1. Write and execute an Assembly language Program (ALP) to 8086 processor to add, subtract and multiplication.
2. Write and execute an Assembly language Program (ALP) to 8086 processor to divide a 32 bit unsigned Number.

3. Write and execute an Assembly language Program (ALP) to 8086 processor to sort the given array of Numbers.
4. Write and execute an Assembly language Program (ALP) to 8086 processor to Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations.
5. Write and execute an Assembly language Program (ALP) to 8086 processor to pick the median from the given String.
6. Write and execute an Assembly language Program (ALP) to 8086 processor to find the length of a given string.
7. Write and execute an Assembly language Program (ALP) to 8086 processor to reverse the given string.
8. Write and execute an Assembly language Program (ALP) to 8086 processor to verify the password.
9. Write and execute an Assembly language Program (ALP) to 8086 processor to insert or delete a character?
10. Write and execute an Assembly language Program (ALP) to 8086 processor to call a delay subroutine and display the character on the LED display.
11. Interface a keypad to 8086 microprocessor and display the key number pressed on the 7- segment display which is also interfaced to 8086.
12. Write an interrupt service routine to 8086 whenever there is an interrupt request on interrupt pin, which displays "hello" on a LCD.
13. Interface an 8086 microprocessor trainer kit to PC and establish a communication between them through RS 232.
14. Interface DMA controller to 8086 and transfer bulk data from memory to I/O device.
15. Interface a stepper motor to 8086 and operate it in clockwise and anti-clock wise by choosing variable step-size.
16. Interface an 8 bit ADC to 8086 and generate digital output and store it in memory for the given square/ ramp/ triangle wave form inputs.

Cycle 2: Using 8051 Microcontroller Kit (6 weeks)

- Introduction to Keil IDE
  1. Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions
  2. Time delay Generation Using Timers of 8051.
  3. Serial Communication from / to 8051 to / from I/O devices.
  4. Program Using Interrupts to Generate Square Wave 10 KHZ Frequency on P2.1 Using Timer0 8051 in 8bit Auto reload Mode and Connect a 1HZ Pulse to INT1 pin and Display on Port0.Assume Crystal Frequency as 11.0592MHZ

Equipment Required:

1.8086 Microprocessor Trainer Kits
2.8051 Microcontroller Trainer Kits
3. Interfacing Modules : ADC,DAC,Temparature Controllers etc.
4. Interfacing Cards : 8255, 8529, 8257.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS)

B.Tech. IV Year I Sem.: ECE **L T P C**
2 1 0 3

(J7431) MICRO WAVE AND OPTICAL COMMUNICATION ENGINEERING

Course Objectives:

- To understand the Micro-wave communication system.
- To understand the need of S Parameters.

- To study prapogation of light through Optical fiber.
- Understand the working principle of optical sources, detector.
- To study the various optical modulation techniques..

UNIT I

MICROWAVE AMPLIFIERS AND OSCILLATORS

Introduction to microwave frequency spectrum and bands- Application and limitation–Klystron amplifier–Reflex Klystron Oscillator–TWT amplifiers–Magnetron Oscillator–Gunn oscillator.

UNIT II

MICROWAVE COMPONENTS

Rectangular Waveguide, field expressions TE/TM and expression for frequency wavelength and phase constants,Cutoff Frequency and Dominant Modes, S parameters, Directionalcoupler–EplaneTee-H-planeTee–MagicTee-Circulators–Isolators Attenuators–PhaseShifters–Avalanchebreakdown devices-PINdiode and TUNNEL diode Power,VSWR- Impedance Measurements.

UNIT III

INTRODUCTION TO OPTICAL FIBERS AND TRANSMISSION CHARACTERISTICS

Evolution of fiber optic system-Element of an Optical Fiber Transmission link--Total internal reflection ,The propagation of light in optical waveguides–Classification of optical fibers–Numerical aperture, Step index and Graded index fiber–Modes in cylindrical fiber–Linearly polarized modes, Attenuation: Absorption, Scattering, Bending losses. Modal dispersion and chromatic dispersion–Single mode fiber-waveguide dispersion.

UNIT IV

OPTICAL TRANSMITTERS AND RECEIVERS

Optical Sources:-Light source materials–LED homo and hetero structures–surface and edge emitters–Quantum efficiency–Injection Laser Diode–Modes and threshold condition–Structures and Radiation Pattern. Optical detectors:–Physical principles–PIN and APD diodes–Photo detector noise.

UNIT V

OPTICAL COMMUNICATION SYSTEMS AND DESIN

Transmittermodule:Signal formats–Electronicdrivingcircuit-Modulationcircuit external modulators. Amplifier,EDFA,Semiconductor ,Optical Amplifier,

Receiver Module: Opticalfrontend–Quantizer–Decision circuit. Optical Link Design: Point-to-point links–System considerations–Link Power budget–Rise time budget.

Text book(s) and/or required materials

1. Samuel Y. Liao, “Microwave Devices and Circuits”, 3rd edition, Pearson education, 2011 reprint.

2. Keiser G, “Optical Fiber Communication Systems”, 4th edition, Tata McGraw Hill. Edition, 2010.
3. Collin.R.E, “Foundations for Microwave Engineering”, 2nd edition, Tata McGraw Hill, 2006.
4. Djafar. K. Mynbaev Lowell and Scheiner,“Fiber Optic Communication Technology”, Pearson Education Asia, 9thimpression, 2011.
5. John Powers, “An Introduction to Fiber optic Systems”, 2nd edition, Tata McGraw Hill, 2010

Course Outcomes:

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

- Understand basic components of Micro-Wave Communication Systems.
- Understand S Parameters for different Micro-Wave Devices.
- Undestand basics of Optical Fiber.
- Understand the working principle of optical sources, detector.
- Understand various Optical Modulation techiniques

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(J7528) COMPUTER NETWORKS

B.Tech. III Year II-SEM CSE
B. Tech. IV Year I Sem ECE

L	T	P	C
2	1	0	3

Course Objectives:

This course will develop students' knowledge in/on
1.Computer network architecture and reference model
2.Different types of data link and medium access control protocols
3.Developing routing algorithms and internetworking
4.Network protocols for real time applications
5.Protocols used in Transport and Application layers

Syllabus:

UNIT - I
Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.
Physical Layer: Guided transmission media, wireless transmission media.
Data Link Layer - design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol
UNIT - II
Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.
UNIT - III
Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.
UNIT - IV
Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP.
Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.
UNIT - V
The Internet Transport Protocols UDP-RPC, Real Time Transport Protocols,
The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.
Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH

Text Books:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

References Books:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.

3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.
4. Computer Networks, L. L. Peterson and B. S. Davie, 4th edition, ELSEVIER.
5. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

Course Outcomes:

Upon completion of this course, students will be able to…

1.Demonstrate computer network architecture, OSI and TCP/IP reference models
2.Determine types of data link and medium access control protocols
3.Use Routing algorithms and internetworking
4.Design network protocols for real time application
5.Understand internals of main protocols such as HTTP, FTP, SMTP, TCP, UDP, IP

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES (UGC-AUTONOMOUS)

IV B.Tech I Sem: ECE **L T P C**
3 0 0 3

(J7432) ADAPTIVE SIGNAL PROCESSING

(Professional Elective-III)

Unit-I

General concept of adaptive filtering and estimation, applications and motivation, Review of probability, random variables and stationary random processes, Correlation structures, properties

of correlation matrices.

Unit-II

Optimal FIR (Wiener) filter, Method of steepest descent, extension to complex valued The LMS algorithm (real, complex), convergence analysis, weight error correlation matrix, excess mean square error and mis-adjustment

Unit-III

Variants of the LMS algorithm: the sign LMS family, normalized LMS algorithm, block LMS and FFT based realization, frequency domain adaptive filters, Sub-band adaptive filtering. Signal space concepts - introduction to finite dimensional vector space theory, subspace, basis, dimension, linear operators, rank and nullity, inner product space, orthogonality, Gram- Schmidt orthogonalization, concepts of orthogonal projection, orthogonal decomposition of vector spaces.

Unit-IV

Vector space of random variables, correlation as inner product, forward and backward projections, Stochastic lattice filters, recursive updating of forward and backward prediction errors, relationship with AR modeling, joint process estimator, gradient adaptive lattice.

Unit-V

Introduction to recursive least squares (RLS), vector space formulation of RLS estimation, pseudo-inverse of a matrix, time updating of inner products, development of RLS lattice filters, RLS transversal adaptive filters. Advanced topics: affine projection and subspace based adaptive filters, partial update algorithms, QR decomposition and systolic array.

Text/Reference Books:

1. S. Haykin, Adaptive filter theory, Prentice Hall, 1986.
2. C.Widrow and S.D. Stearns, Adaptive signal processing, Prentice Hall, 1984.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand the non-linear control and the need and significance of changing the control parameters w.r.t. real-time situation.
2. Mathematically represent the ‘adaptability requirement’.
3. Understand the mathematical treatment for the modeling and design of the signal processing systems.
4. Understand the Joint process estimator and gradient adaptive lattice
5. Understand and apply RLS algorithms to different signal estimators

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS)

IV B.Tech I Sem: ECE **L T P C**
3 0 0 3

(J7433) MOBILE COMMUNICATION NETWORKS

(Professional Elective- III)

Unit-I

Cellular concepts- Cell structure, frequency reuse, cell splitting, channel assignment, handoff, interference, capacity, power control; Wireless Standards: Overview of 2G and 3G cellular standards.

Unit-II

Signal propagation-Propagation mechanism- reflection, refraction, diffraction and scattering, large scale signal propagation and lognormal shadowing. Fading channels-Multipath and small scale fading- Doppler shift, statistical multipath channel models, narrowband and wideband fading models, power delay profile, average and rms delay spread, coherence bandwidth and coherence time, flat and frequency selective fading, slow and fast fading, average fade duration and level crossing rate. Capacity of flat and frequency selective channels.

Unit-III

Antennas- Antennas for mobile terminal monopole antennas, PIFA, base station antennas and arrays. Multiple access schemes-FDMA, TDMA, CDMA and SDMA. Modulationschemes- BPSK, QPSK and variants, QAM, MSK and GMSK, multicarrier modulation, OFDM.

Unit-IV

Receiver structure- Diversity receivers- selection and MRC receivers, RAKEreceiver, equalization: linear-ZFE and adaptive, DFE. Transmit diversity-Altamonte scheme. MIMO and space time signal processing, spatial multiplexing, diversity/multiplexing tradeoff.

Unit-V

Performance measures- Outage, average snr, average symbol/bit error rate. System examples- GSM, EDGE, GPRS, IS-95, CDMA 2000 and WCDMA.

Text/Reference Books:

1. WCY Lee, Mobile Cellular Telecommunications Systems, McGraw Hill, 1990.
2. WCY Lee, Mobile Communications Design Fundamentals, Prentice Hall, 1993.
3. Raymond Steele, Mobile Radio Communications, IEEE Press, New York, 1992.
4. AJ Viterbi, CDMA: Principles of Spread Spectrum Communications, Addison Wesley,1995.
5. VK Garg &JE Wilkes, Wireless & Personal Communication Systems, Prentice Hall,1996.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand the working principles of the mobile communication systems.
2. Understand the relation between the user features and underlying technology.
3. Analyze mobile communication systems for improved performance

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(AUTONOMOUS)

B.Tech IV Year I-sem.ECE

L	T	P	C
3	0	0	3

(J7434) IMAGE AND VIDEO PROCESSING
(Professional Elective - III)

Course objectives:

This course will develop the knowledge in / on

1. Basic steps of image processing, pixels.
2. Image enhancement methods such as spatial and frequency domain enhancement.
3. Image segmentation Image compression fundamentals and compression models.

4. 2-D motion estimation and coding techniques.
5. Basic steps of video processing and 3-D motion models.

UNIT –I:

Fundamentals of Image Processing:

Basic steps of Image Processing System Sampling and Quantization of an image, Basic relationship between pixels.

UNIT –II:

Image Enhancement:

Spatial domain methods: Histogram processing, Fundamentals of Spatial filtering, Smoothing spatial
filters, Sharpening spatial filters.

Frequency domain methods: Basics of filtering in frequency domain, image smoothing, image sharpening, Selective filtering.

UNIT –III:

Image Segmentation:

Segmentation concepts, Point, Line and Edge Detection, Thresholding, Region based segmentation

Image Compression: Image compression fundamentals -Coding Redundancy, Spatial and Temporal redundancy

Compression models: Lossy & Lossless, Huffman coding, , Bit plane coding, Transform coding, Predictive coding, Wavelet coding, Lossy Predictive coding, JPEG Standards.

UNIT –IV:

2-D Motion Estimation:

Optical flow, General Methodologies, Pixel Based Motion Estimation, Block-Matching Algorithm, and Mesh based Motion Estimation, Global Motion Estimation; Region based Motion Estimation, Multi resolution motion estimation,
Waveform based coding, Block based transform coding, Predictive coding, Application of motion estimation in Video coding.

UNIT -V:

Basic Steps of Video Processing:

Analog Video, Digital Video. Time-Varying Image Formation models: Three-Dimensional Motion Models, Geometric Image Formation,
Photometric Image Formation, Sampling of Video signals, Filtering operations.

TEXT BOOKS:

1.Digital Image Processing –Gonzalez and Woods, 3rdEd., Pearson.
2.Video Processing and Communication –Yao Wang, Joem Ostermann and Ya–quin Zhang. stEd.,PH Int.

REFRENCE BOOKS:

1.Digital Image Processing and Analysis-Human and Computer Vision Application with CVIP Tools - Scotte Umbaugh, 2ndEd, CRC Press, 2011.
2.Digital Video Processing –M. Tekalp, Prentice Hall International.
3.Digital Image Processing –S.Jayaraman, S.Esakkirajan, T.Veera Kumar –TMH, 2009.
4.Multidimentional Signal, Image and Video Processing and Coding –John Woods, 2ndEd, Elsevier.
5.Digital Image Processing with MATLAB and Labview –Vipula Singh, Elsevier.
6.Video Demystified –A Hand Book for the Digital Engineer –Keith Jack, 5thEd., Elsevier.

Course outcomes:

Upon completion of the subject student will be able to

1. Understand the basic steps of image processing, pixels .
2. Familiarize Image enhancement methods such as spatial and frequency domain enhancement
3. Understand the Image Segmentation, Image compression fundamentals and compression models
4. Understand the 2-D motion estimation and coding techniques
5. Understand the basic steps of video processing and 3-D motion models

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS)

IV B.Tech I-sem: ECE

L	T	P	C
3	0	0	3

(J7435) HIGH SPEED ELECTRONICS

(Professional Elective - IV)

Unit-I

Transmission line theory (basics) crosstalk and nonideal effects; signal integrity: impact of packages, vias, traces, connectors; non-ideal return current paths, high frequency power delivery

Unit-II

methodologies for design of high speed buses; radiated emissions and minimizing system noise; Noise Analysis: Sources, Noise Figure, Gain compression, Harmonic distortion,

Intermodulation,Cross-modulation, Dynamic range Devices: Passive and active, Lumped passive devices (models), Active (models,low vs highfrequency)

Unit-III

RF Amplifier Design, Stability, Low Noise Amplifiers, Broadband Amplifiers (and Distributed) Power Amplifiers, Class A, B, AB and C, D E Integrated circuit realizations, Cross-over distortion Efficiency RF power output stages

Unit-IV

Mixers –Upconversion Downconversion, Conversion gain and spurious response. Oscillators Principles.PLL Transceiver architectures

Unit-V

Printed Circuit BoardAnatomy, CAD tools for PCB design, Standard fabrication, Microvia Boards. Board Assembly: Surface Mount Technology, Through Hole Technology, Process Control and Design challenges.

Text/Reference Books:

1. Stephen H. Hall, Garrett W. Hall, James A. McCall "High-Speed Digital System Design: A Handbook of Interconnect Theory and Design Practices", August 2000, Wiley-IEEE Press
2. Thomas H. Lee, "The Design of CMOS Radio-Frequency Integrated Circuits", CambridgeUniversity Press, 2004, ISBN 0521835399.
3. Behzad Razavi, "RF Microelectronics", Prentice-Hall 1998, ISBN 0-13-887571-5.
4. Guillermo Gonzalez, "Microwave Transistor Amplifiers", 2nd Edition, Prentice Hall.

5. Kai Chang, "RF and Microwave Wireless systems", Wiley.

6. R.G. Kaduskar and V.B.Baru, Electronic Product design, Wiley India, 2011

Course Outcomes:

At the end of the course, students will demonstrate the ability to:
1. Understand significance and the areas of application of high-speed electronics circuits.
2. Understand the properties of various components used in high speed electronics
3. Design High-speed electronic system using appropriate components.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(Autonomous)

IV B.Tech I Sem.: ECE

L	T	P	C
3	0	0	3

(J7436) WAVELETS

Unit- I:

Introduction to time frequency analysis; the how, what and why about wavelets, Short-time Fourier transform, Wigner-Ville transform.

Unit-II:

Continuous time wavelet transform, Discrete wavelet transform, tiling of the time-frequency plane and wave packet analysis, Construction of wavelets.

Unit-II:

Multiresolution analysis. Introduction to frames and biorthogonal wavelets, Multirate signal processing and filter bank theory.

Unit-IV

Application of wavelet theory to signal denoising, image and video compression, multi-tone digital communication, transient detection.

Text/Reference Books:

1. Y.T. Chan, Wavelet Basics, Kluwer Publishers, Boston, 1993.
2. I. Daubechies, Ten Lectures on Wavelets, Society for Industrial and Applied Mathematics, Philadelphia, PA, 1992.
3. C. K. Chui, An Introduction to Wavelets, Academic Press Inc., New York, 1992.
4. Gerald Kaiser, A Friendly Guide to Wavelets, Birkhauser, New York, 1995.
5. P. P. Vaidyanathan, Multirate Systems and Filter Banks, Prentice Hall, New Jersey, 1993.
6. A.N. Akansu and R.A. Haddad, Multiresolution signal Decomposition: Transforms, Subbands and Wavelets, Academic Press, Oranld, Florida, 1992.
7. B.Boashash, Time-Frequency signal analysis, In S.Haykin, (editor), Advanced Spectral Analysis, pages 418--517. Prentice Hall, New Jersey, 1991.

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand time-frequency nature of the signals.
2. Apply the concept of wavelets to practical problems.
3. Mathematically analyze the systems or process the signals using appropriate wavelet functions.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS)

B.Tech.IV Year I SEM: ECE

L	T	P	C
3	0	0	3

(J7437) EMBEDDED SYSTEMS

(Professional Elective-IV)

Course Objective:

For embedded systems, the course will enable the students to:

1. Understand the basics of an embedded system
2. Program of an embedded system

3. To learn the method of designing an embedded system for any type of applications
4. To understand operating systems concepts, types and choosing RTOS
5. 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 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, Task Synchronization Techniques and issues, Device drivers, How to choose an RTOS.

Text Books:

1.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 and design embedded systems
2. Learn basic of OS and RTOS
3. Understand types of memory and interfacing to external world
4. Understand embedded firmware design approaches.
5. Understands different operating systems for Embedded Systems

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV B.Tech I Sem: ECE **L T P C**
3 0 0 3

(J7438) ERROR CORRECTING CODES
(Professional Elective-V)

Unit-I

Linear block codes: Systematic linear codes and optimum decoding for the binary symmetric channel; Generator and Parity Check matrices, Syndrome decoding on symmetric channels;

Unit-II

Hamming codes; Weight enumerators and the McWilliams identities; Perfect codes, Introduction to finite fields and finite rings;factorization of (X^n-1) over a finite field;

Unit-III
Cyclic Codes. BCH codes; Idempotents and Mattson-Solomon polynomials; Reed-Solomon codes, Justeen codes, MDS codes, Alterant, Goppa and generalized BCH codes; Spectral properties of cyclic codes. ;

Unit-IV
Decoding of BCH codes: Berlekamp's decoding algorithm, Massey's minimum shift register synthesis technique and its relation to Berlekamp's algorithm. A fast Berlekamp - Massey algorithm.

Unit-V
Convolution codes; Wozencraft's sequential decoding algorithm, Fann's algorithm and other sequential decoding algorithms; Viterbi decoding algorithm.

Text/Reference Books:
1. F.J. McWilliams and N.J.A. Slone, The theory of error correcting codes, 1977.
2. R.E. Balahut, Theory and practice of error control codes, Addison Wesley, 1983.

Course Outcomes:
At the end of the course, students will demonstrate the ability to:
1. Understand the error sources
2. Understand error control coding applied in digital communication
3. Understand the spectral properties of cyclic code
4. understand the decoding algorithms
5. Understand and analyze the convolution codes

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

IV B.Tech I Sem: ECE **L T P C**
3 0 0 3

(J7439) INTRODUCTION TO MEMS
(Professional Elective-V)

Unit-I
Introduction and Historical Background, Scaling Effects. Micro/Nano Sensors,

Unit-II

Actuators and Systems overview: Case studies. Review of Basic MEMS fabrication modules: Oxidation, Deposition Techniques, Lithography (LIGA), and Etching.

Unit-III
Micromachining: Surface Micromachining, sacrificial layer processes, Stiction; Bulk Micromachining, Isotropic Etching and Anisotropic Etching, Wafer Bonding.

Unit-IV
Mechanics of solids in MEMS/NEMS: Stresses, Strain, Hookes's law, Poisson effect, Linear Thermal Expansion, Bending; Energy methods,.

Unit-V
Overview of Finite Element Method, Modeling of Coupled Electromechanical Systems.

Text/Reference Book:
1. G. K. Ananthasuresh, K. J. Vinoy, S. Gopalkrishnan K. N. Bhat, V. K. Aatre, Micro and Smart Systems, Wiley India, 2012.
2. S. E.Lyshevski, Nano-and Micro-Electromechanical systems: Fundamentals of Nano-and Microengineering (Vol. 8). CRC press, (2005).
3. S. D. Senturia, Microsystem Design, Kluwer Academic Publishers, 2001.
4. M. Madou, Fundamentals of Microfabrication, CRC Press, 1997.
5. G. Kovacs, Micromachined Transducers Sourcebook, McGraw-Hill, Boston, 1998.
6. M.H. Bao, Micromechanical Transducers: Pressure sensors, accelerometers, and Gyroscopes, Elsevier, New York, 2000.

Course Outcomes:
At the end of the course the students will be able to
1. Appreciate the underlying working principles of MEMS and NEMS devices.
2. Design and model MEM devices.
3.Understand the concept of Micromatching
4.Understands the MEMS/NEMS
5. Understand the Finite Element method.

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IV B.Tech. I Sem: ECE **L T P C**
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(J7440) RF CIRCUIT DESIGN
(Professional Elective – V)

Course Objectives:
- To understand the Micro-wave communication system.
- To understand the advanced amplifier.

- To study the basics of RFID.
- To study the basics of Various Sensors.
- To study the various integrated circuits..

UNIT I

Review of basic RF/microwave theory and techniques

Micro-wave network parameters, basics of active devices, transmission line theory, passive and active RF components, RF transceiver infrastructure, wireless communications and standards.

UNIT II

ADVANCED HIGH EFFICIENCY POWER AMPLIFIER

Analysis of power, efficiency and linearity, transistor technologies of BJT, LDMOS, MESFET, HBT, SiC and MOSFET, modulation systems in wireless Comminication, and review of class-ABCDEFGH, Doherty, Chireix out phasing power amplifiers

UNIT III

RADIO FREQUENCY IDENTIFICATION(RFID)

RFID basic and standards, tags, readers, miniaturization, near field communication(NFC).

UNIT IV

WIRELESS NETWORK FOR SENSORS

Sensor basics and circuit, sensor technology for different application, and wireless connectivity.

UNIT V

RADIO FREQUENCY INTEGRATED CIRCUITS

Integrated circuit technology, key components in IC, basic RF circuits, and system on GaAs and CMOS, difference between hybrid circuits an integrated circuits, trends and challenges.

Text books:

1W A Davis and K K Agarwal: Radio Frequency Circuit Design, (John Wiley, New York, 2001)
2.Andrei Samuel Y. Liao, "Microwave Devices and Circuits", 3rd edition, Pearson education, 2011 reprint.

References :

1..Grebennikov: RF and microwave power amplifier design, (New York : McGraw-Hill, c2005)
2. Nemai Chandra Karmakar:Advanced RFID Systems,Security, and Application

Course Outcomes:

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

- Understand basic components of Micro-Wave Communication Systems.
- Understan basics of advanced amplifiers.
- Undestand basics of RFID Systems.
- Understand the Varous Optical Sources.
- Understand various integrated circuits.

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IV B.Tech I Sem: ECE

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(J7441) MICROWAVE ENGINEERING & OPTICAL COMMUNICATION LAB

LIST OF EXPERIMENTS

MICROWAVE EXPERIMENTS

1. To study Microwave components.
2. Studyof the characteristics of the klystron tube.
3. Study of Characteristics of Gunn Diode.
4. Measurement of frequency of microwave source and demonstrate relationship among frequency, free space wavelength and guided wavelength.
5. Measurement of coupling factor and directivity of directional coupler.
6. Measurement of Scattering Parameter of three port circulator.

OPTICAL EXPERIMENTS

1. DC Characteristics of LED and PIN Photo diode.
2.Measurement of Numerical Aperture of fiber.
3.Losses measurement in optical fiber.
4.Eye pattern Measurement.
5..BER measurement.
6.Displacement Measurement.

Equipment Required:

1. Microwave Bench setup with Klystron Power Supply
2. Microwave Bench setup with Gunn Power Supply
3. Multimeter
4. VSWR meter
5. Microwave Components
6. Optical Fiber Trainer Kit

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(J8443)CMOS DESIGN
(Professional Elective-VI)

IV Year II Sem: ECE **L T P C**
3 0 0 3

Unit-I:

Review of MOS transistor models, Non-ideal behavior of the MOS Transistor. Transistor as a

switch.

Unit-II:

Inverter characteristics, Integrated Circuit Layout: Design Rules, Parasitics. Delay: RC Delay model, linear delay model.

Unit-III:

logical path efforts. Power, interconnect and Robustness in CMOS circuit layout.

Unit-IV:

Combinational Circuit Design: CMOS logic families including static, dynamic and dual rail logic.

Unit-V:

Sequential Circuit Design: Static circuits. Design of latches and Flip-flops.

Text/Reference Books:

1. N.H.E. Weste and D.M. Harris, CMOS VLSI design: A Circuits and Systems Perspective, 4thEdition, Pearson Education India, 2011.
2. C.Mead and L. Conway, Introduction to VLSI Systems, Addison Wesley, 1979.

3. J. Rabaey, Digital Integrated Circuits: A Design Perspective, Prentice Hall India, 1997.

4. P. Douglas, VHDL: programming by example, McGraw Hill, 2013.
5. L. Glaser and D.Dobberpuhl, The Design and Analysis of VLSI Circuits, Addison Wesley, 1985

Course Outcomes:

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

1. Design different CMOS circuits using various logic families along with their circuit layout.
2. Use tools for VLSI IC design.
3. Know CMOS circuits design paths.
4. Design Combinational circuits using CMOS
5. Design Sequential circuits using CMOS

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IV B.Tech II-sem : ECE

L	T	P	C
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(J8444)SCIENTIFIC COMPUTING
(Professional Elective -VI)

Unit-I

Introduction: Sources of Approximations, Data Error and Computational, Truncation Error and Rounding Error, Absolute Error and Relative Error, Sensitivity and Conditioning, Backward Error Analysis, Stability and Accuracy.

Unit-II

Computer Arithmetic: Floating Point Numbers, Normalization, Properties of Floating Point System, Rounding, Machine Precision, Subnormal and Gradual Underflow, Exceptional Values, Floating-Point Arithmetic, Cancellation System of liner equations: Linear Systems, Solving Linear Systems, Gaussian elimination, Pivoting, Gauss-Jordan, Norms and Condition Numbers, Symmetric Positive Definite Systems and Indefinite System, Iterative Methods for Linear Systems.

Unit-III

Linear least squares: Data Fitting, Linear Least Squares, Normal Equations Method, Orthogonalization Methods, QR factorization, Gram-Schmidt Orthogonalization, Rank Deficiency, and Column Pivoting Eigenvalues and singular values:Eigenvalues and Eigenvectors, Methods for Computing All Eigenvalues, Jacobi Method, Methods for Computing Selected Eigenvalues, Singular Values Decomposition, Application of SVD.

Unit-IV

Nonlinear equations: Fixed Point Iteration, Newton's Method, Inverse Interpolation Method Optimization: One-Dimensional Optimization, Multidimensional Unconstrained Optimization, Nonlinear Least Squares.

Unit-V

Interpolation: Purpose for Interpolation, Choice of Interpolating, Function, Polynomial Interpolation, Piecewise Polynomial Interpolation Numerical Integration And Differentiation: Quadrature Rule, Newton-Cotes Rule, Gaussian

Text/ Reference Books:

1. Heath Michael T., "Scientific Computing: An Introductory Survey" , McGraw-Hill, 2nd Ed., 2002
2. Press William H., Saul A. Teukolsky, Vetterling William T and Brian P. Flannery, "Numerical Recipes: The Art of Scientific Computing", Cambridge University Press, 3rd Ed., 2007
3. Xin-she Yang (Ed.)., "Introduction To Computational Mathematics", World Scientific Publishing Co., 2nd Ed., 2008
4. Kiryanov D. and Kiryanova E., "Computational Science", Infinity Science Press, 1st Ed., 2006
5. Quarteroni, Alfio, Saleri, Fausto, Gervasio and Paola, "Scientific Computing With MATLAB And Octave", Springer, 3rd Ed., 2010

Course Outcomes:

At the end of the course, students will demonstrate the ability to:

1. Understand the significance of computing methods, their strengths and application areas.
2. Perform the computations on various data using appropriate computation tools.
3. Understands about linear least equations
4. understand and apply Non linear Equations for engineering problems
5. understand the concept of Interpolation

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IV B.Tech ECE II-Sem

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(J 8445) RADAR SYSTEMS

(Professional Elective – VI)

Course Objective:

The objectives of the course are to:

6. Radar fundamentals and analysis of the radar signals.
7. To understand various technologies involved in the design of radar transmitters and receivers.
8. To learn various radars like MTI, Doppler and tracking radars and their comparison.
9. To learn different tracking techniques and tracking range of radars
10. To understand the different navigational systems using satellite and principle of operations.

UNIT I:

Basics of Radar:

Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications. Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, Illustrative Problems.

Radar Equation: SNR, Envelope Detector- False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (Simple targets-sphere, cone-sphere), Transmitter Power, PRF and Range Ambiguities, System Losses (Qualitative treatment), Illustrative Problems.

UNIT II:

CW and Frequency Modulated Radar

Doppler Effect, CW Radar- Block Diagram, Isolation between Transmitter and Receivers, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar. Illustrative Problems.

FM-CW Radar: Range and Doppler Measurement, Block Diagram and Characteristics, FM-CW altimeter, Multiple Frequency CW Radar.

UNIT III:

MTI and Pulse Doppler Radar:

Introduction, Principle, MTI Radar with- Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers- Filter Characteristics, Blind Speeds, Double Cancellation, Staggered PRFs. Range Gated Doppler Filters. MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler Radar.

UNIT-IV

Tracking Radar:

Different types of Tracking Techniques, Tracking in Range, Tracking in Doppler, Search Acquisition radar, Comparison of Trackers. Targets and Interference: Noise and false alarms, Detection of one sample with noise, Integration of pulse trains, Detection of fluctuating targets, CFAR.

UNIT-V

Introduction to Pulse Compression Radar:

Height finding radars, Air traffic control Radars and data handling, Atmospheric effects of radar, Electromagnetic compatibility aspects, Airborne Radars, Synthetic Aperture Radar, Secondary surveillance Radars

TEXTBOOKS:

1. Merrill I. Skolnik ," Introduction to Radar Systems", 3rd Edition Tata Mc Graw-Hill 2003.

2. N.S.Nagaraja, "Elements of Electronic Navigation Systems", 2nd Edition, TMH, 2000.

REFERENCES:

1. Peyton Z. Peebles:, "Radar Principles", John Wiley, 2004 2. J.C Toomay," Principles of Radar", 2nd Edition –PHI, 2004

Course Outcomes:

Upon completion of the course, students will be able to:

1. Understand the principle of radar system and derive the Range equation and the nature of detection
2. Understand various technologies involved in the design of radar transmitters and receivers.
3. To learn various radars like MTI, Doppler and tracking radars and their comparison.
4. Explain principles of navigation, in addition to approach and landing aids as related to navigation.
5. Describe about the navigation systems using the satellite.

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IV- B.TECH -II Sem: ECE

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(J8446) MIXED SIGNAL DESIGN

(Professional Elective – VII)

Course Objectives:

1. To Study the basics of CMOS Digital circuits
2. To study the concepts of designing CMOS Analog circuits
3. To study the switched capacitor circuits
4. To design Data converters
5. To design phased lock loop circuits

UNIT-I

Combinational Logic Circuits: CMOS logic gates –NOR & NAND gates, Complex Logic circuits design –Realizing Boolean expressions using NMOS and CMOS gates , AOI and OIA gates, CMOS full adder, CMOS transmission gates.

Sequential Logic Circuits: Behavior of bistable elements, SR Latch, Clocked latch and flip flop circuits, CMOS D latch and edge triggered flip flop.

UNIT-II

CMOS Device Modeling: Simple MOS Large-Signal Model, Other Model Parameters, Small-Signal Model for the MOS Transistor, Computer Simulation Models, Sub-threshold MOS Model.

Analog CMOS Sub-Circuits: MOS Switch, MOS Diode/Active Resistor, Current Sinks and Sources, Current Mirrors, Current and Voltage References, Band gap Reference.

UNIT-III

Switched Capacitor Circuits: Introduction to Switched Capacitor circuits-basic building blocks, Operation and Analysis, Non-ideal effects in switched capacitor circuits, Switched capacitor integrators, first order filters, Switch sharing, biquad filters.

UNIT-IV

Nyquist Rate D/A Converters: Decoder based converters, Binary-Scaled converters, Thermometer-code converters, Hybrid converters

Nyquist Rate A/D Converters: Successive approximation converters, Pipelined A/D converters , Flash converters,Two-step A/D converters, Interpolating A/D converters, Folding A/D converters,Time-interleaved converters.

UNIT-V

Phased Lock Loop (PLL): Basic PLL topology, Dynamics of simple PLL, Charge pump PLLs-Lock acquisition, Phase/Frequency detector and charge pump, Basic charge pump PLL, Non-ideal effects in PLLs-PFD/CP non-idealities, Jitter in PLLs, Delay locked loops, applications

TEXT BOOKS:

1. CMOS Digital Integrated Circuits Analysis and Design – Sung-Mo Kang, Yusuf Leblebici,TMH, 3rd Ed., 2011.

2. CMOS Analog Circuit Design- Philip E. Allen and Douglas R. Holberg, Oxford University Press, International Second Edition/Indian Edition, 2010.

REFERENCE BOOKS:

1. Analog Integrated Circuit Design-David A. Johns,Ken Martin, Wiley Student Edition, 2013

2. CMOS Mixed-Signal Circuit Design - R. Jacob Baker, Wiley Interscience, 2009.
3. CMOS Integrated Analog-to-Digital and Digital-to-Analog converters-Rudy Van De Plassche, Kluwer Academic Publishers, 2003

Course out comes:

1. To understand the designing of combinational and sequential logic circuits
2. To understand the Analog CMOS modeling
3. To understand the basic building blocks of switched capacitor
4. To understand the designing of A/D and D/A converters
5. To understand PLL circuits

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IV B.Tech II-sem : ECE

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(J8447)WIRELESS SENSOR NETWORKS
(Professional Elective -VII)

Course objectives:

This course will develop the knowledge in / on

1. Concept of sensor networks, challenges and architectures of sensor networks
2. Networking technologies and MAC protocols for wireless sensor networks
3. Different routing, transport layer and security protocols in WSN
4. Infrastructure establishment and security issues in WSN
5. Sensor network platforms tools and applications of WSN's

UNIT I

OVERVIEW OF WIRELESS SENSOR NETWORKS:

Key definitions of sensor networks, Advantages of sensor Networks, Unique constraints an challenges, Driving Applications, Enabling Technologies for Wireless Sensor Networks.

ARCHITECTURES:

Single-Node Architecture -Hardware Components, Energy Consumption of Sensor Nodes, Operating Systems and Execution Environments, Network Architecture -Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT II

NETWORKING Technologies: Physical Layer and Transceiver Design Considerations, Personal area networks (PANs), hidden and exposed node problem, Topologies of PANs, MANETs, WANETs.

MAC Protocols for Wireless Sensor Networks:

Issues in Designing a MAC protocol for Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks, Classifications of MAC Protocols, Contention -Based Protocols, and with reservation Mechanisms, Contention –Based MAC Protocols with Scheduling Mechanisms, MAC Protocols that use Directional Antennas, Other MAC Protocols.

UNIT-III

ROUTING PROTOCOLS:

Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table –Driven Routing Protocols, On –Demand Routing Protocols, Hybrid Routing Protocols, Routing Protocols with Efficient Flooding Mechanisms, Hierarchical Routing Protocols, Power –Aware Routing Protocols, Proactive Routing

TRANSPORT LAYER AND SECURITY PROTOCOLS:

Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocol for Ad Hoc Wireless Networks.

UNIT IV

INFRASTRUCTURE ESTABLISHMENT:

Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

SECURITY IN WSNs: Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management, Secure Routing in Ad Hoc Wireless Networks.

UNIT-V

SENSOR NETWORK PLATFORMS AND TOOLS:

Sensor Node Hardware –Berkeley Motes, Programming Challenges, Node-level software platforms, Node-level Simulators, State-centric programming.

APPLICATIONS of WSN: Ultra wide band radio communication, Wireless fidelity systems. Future directions, Home automation, smart metering Applications

TEXT BOOKS:

1. Ad Hoc Wireless Networks: Architectures and Protocols -C. Siva Ram Murthy and B.S.Manoj, 2004, PHI

2.Wireless Ad-hoc and Sensor Networks: Protocols, Performance and Control – Jagannathan Sarangapani, CRCPress
3.Holger Karl & Andreas Willig,"Protocols And Architectures for Wireless Sensor Networks", John Wiley, 2005.

REFERENCES:

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "WirelessSensorNetworksTechnology, Protocols, and Applications", John Wiley, 2007.
2. Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks-An Information Processing Approach", Elsevier, 2007.
3. Ad-Hoc Mobile Wireless Networks: Protocols & Systems, C.K. Toh ,1 ed. Pearson Education.
4. Wireless Sensor Networks -C.S. Raghavendra, Krishna M. Sivalingam, 2004,Springer
5. Wireless Sensor Networks -S Anandamurugan , Lakshmi Publication

Course outcomes:

Upon completion of the subject student will be able to

1. Understand the Concept of sensor networks, challenges and architectures of sensor networks
2. Analyze the Networking technologies and MAC protocols for wireless sensor networks
3. Understand the the different routing, transport layer and security protocols in WSN
4. Analyze the Infrastructure establishment and security issues in WSN
5. Understand the Sensor network platforms tools and applications of WSN's

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B.Tech IV Year. II Sem.ECE **L T P C**
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(J8448) SATELLITE COMMUNICATIONS
(Professional Elective-VII)

COURSE OBJECTIVES:

1. To understand the basics of satellite communication principles.
2. To understand the satellite segment and earth segment.
3. To analyze the various methods of satellite access.
4. To understand the applications of satellites**.**
5. To understand the satellite navigation and global positioning system**.**

UNIT- I :

COMMUNICATION SATELLITE: History of satellite communication, satellite systems**,** Kepler‟s Laws, Newton‟s law, orbital period, orbital parameters, orbital perturbations, effects of orbital inclination, Azimuth and Elevation, station keeping, geo stationary and non Geo-stationary orbits – Look Angle Determination–eclipse-Sub satellite point –Sun transit outage-Launching Procedures – launch vehicles and propulsion, applications.

UNIT-II

SPACE SEGMENT AND SATELLITE LINK : Spacecraft Technology- Structure, Primary power, Attitude and Orbit control, Thermal control and Propulsion, communication subsystems, Telemetry, Tracking and command. Satellite uplink and downlink Analysis and Design, link budget, - Propagation Characteristics and Frequency considerations- System reliability and design lifetime.

UNIT - III

EARTH SEGMENT : Introduction ,Receive ,Only home TV systems ,Outdoor unit – Indoor unit for analog (FM) TV ,Master antenna TV system ,Community antenna TV system , Transmit ,Receive earth stations ,Power test methods, Free-space transmission, Link power budget equation – System noise ,Antenna noise, Effects of rain ,Uplink rain,Fade margin ,Downlink rain ,Fade margin ,Combined uplink and downlink C/N ratio

Satellite Navigation and Global Positioning Systems: Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers, GPS C/A Code Accuracy, Differential GPS.

UNIT -IV

SATELLITE ACCESS : Modulation and Multiplexing: Voice, Data, Video, Analog – digital transmission system, Digital video Brocast, multiple access: FDMA, TDMA,DAMA, CDMA, Assignment Methods, Spread Spectrum transmission and reception .**Propagation effects**: Atmospheric Absorption, Tropospheric and Ionospheric scintillation and low angle fading, Rain induced attenuation, rain induced cross polarization interference.

UNIT -V

SATELLITE APPLICATIONS :INTELSAT Series, INSAT, VSAT, Mobile satellite services: GSM, GPS, INMARSAT, LEO, MEO, Satellite Navigational System. Direct Broadcast satellites (DBS)- Direct to home Broadcast (DTH), Digital audio broadcast (DAB)- Worldspace services, Business TV(BTV), GRAMSAT, Specialized services – E –mail, Video conferencing, Internet.

Text books:

1. Satellite communications-Timothy Pratt, Charles Bostian ,JeremyAllnutt,2nd Edition,2003, John Wiley & Sons.

2. Satellite communication-Dennis Roddy Mc-Grawhill International,4th Edition 2006.

Reference books:

1.Wilbur L. Pritchard, Hendri G. Suyderhoud, Robert A. Nelson, 'Satellite Communication Systems Engineering', Prentice Hall/Pearson, 2007

2. Satellite communications:Design principles-M.Richcharia,2nd Ed.,BSP,2003.

OUTCOMES: Learners will be able to:

1. Analyze the satellite orbits.
2. Analyze the earth segment and space segment.
3. To understand the satellite access methods.
4. To understand the earth station technology.
5. To Design various satellite applications.