SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Bachelor of Technology

Department of Electronics and Communication Engineering

I B. Tech. – I Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P/Drg	C
1.	16HS601	Functional English	3	-	-	3
2.	16HS602	Engineering Mathematics-I	3	1	-	3
3.	16HS604	Engineering Chemistry	3	1	-	3
4.	16CS501	Computer Programming	3	1	-	3
5.	16ME302	Engineering Graphics	-	-	6	3
6.	16HS607	English Language and Communication Skills Lab	-	-	4	2
7.	16HS609	Engineering Chemistry Lab	-	-	4	2
8.	16CS502	Computer Programming Lab	-	-	4	2
Contact Periods / Week			12	03	18	**21**
			Total/Week **33**			

I B. Tech. – II Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P	C
1.	16HS610	Professional English	3	-	-	3
2.	16HS611	Engineering Mathematics-II	3	1	-	3
3.	16HS603	Engineering Physics	3	1	-	3
4.	16HS606	Human Values & Professional Ethics	3	-	-	3
5.	16EE205	Network Analysis	3	1	-	3
6.	16HS608	Engineering Physics Lab	-	-	4	2
7.	16EE206	Network Analysis Lab	-	-	4	2
8.	16ME301	Engineering & IT workshop Lab	-	-	4	2
Contact Periods / Week			15	03	12	**21**
			Total/Week 30			

II B. Tech. – I Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P	C
1.	16HS612	Engineering Mathematics-III	3	1	-	3
2.	16EC401	Basic Electronic Devices	3	1	-	3
3.	16EC402	Switching Theory & Logic Design	3	1	-	3
4.	16EC403	Signals and Systems	3	1	-	3
5.	16EC404	Random Signal & Stochastic Processes	3	1	-	3
6.	16HS605	Environmental Studies	3	-		3
7.	16EC405	Basic Electronic Devices Lab	-	-	4	2
8.	16EC406	Basic Simulation Lab	-	-	4	2
Credit Course						
9.	COE-I	Comprehensive Online Examination-I	-	-	-	1
Audit Course						
10.	16CS503	Data Structures through C	3	-	-	-
Contact Periods / Week			21	05	08	**23**
			Total/Week **34**			

II B. Tech. – II Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P	C
1.	16EC407	Electronic Circuit Analysis	3	1	-	3
2.	16EC408	Computer Organization and Architecture	3	1	-	3
3.	16EC409	Electromagnetic Theory and Transmission Lines	3	1	-	3
4.	16EC410	Pulse & Digital Circuits	3	1	-	3
5.	16EE212	Electrical Technology	3	1	-	3
6.	16EC412	Electronic Circuit Analysis Lab	-	-	4	2
7.	16EC413	Pulse & Digital Circuits Lab	-	-	4	2
8.	16EE213	Electrical Technology Lab	-	-	4	2
Credit Course						
9.	COE-II	Comprehensive Online Examination-II	-	-	-	1
Audit Course						
10.	16HS614	Comprehensive Soft Skills	3	-	-	-
Contact Periods / Week			18	5	12	**22**
			Total/Week **35**			

III B.Tech– I Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P	C
1.	16EC415	Analog Communications	3	1	-	3
2.	16EC416	Electronic Measurements and Instrumentation	3	1	-	3
3.	16EC417	Linear IC Applications	3	1	-	3
4.	16EC418	Antennas & Wave Propagation	3	1	-	3
5.	16EE216	Linear Control Systems	3	1	-	3
6.	16MB750	Managerial Economics & Financial Analysis	3	-	-	3
7.	16EC419	Analog Communications Lab	-	-	4	2
8.	16EC420	Linear IC Applications Lab	-	-	4	2
Credit Course						
9.	COE-III	Comprehensive Online Examination-III	-	-	-	1
Audit Course						
10.	16HS616	Aptitude Practice-I	3	-	-	-
Contact Periods / Week			21	5	08	**23**
			Total/Week 34			

III B.Tech – II Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P	C
1.	16EC421	Digital Communications	3	1	-	3
2.	16EC422	Digital Signal Processing	3	1	-	3
3.	16EC423	Microprocessors & Microcontrollers	3	1	-	3
4.	16EC424	Digital IC Applications	3	1	-	3
5.	16EC425	Microwave Engineering	3	1	-	3
6.	16HS615	Advanced English Language and Communication Skills Lab	-	-	4	2
7.	16EC426	Digital Communications Lab	-	-	4	2
8.	16EC427	Digital IC Applications Lab	-	-	4	2
Credit Course						
9.	COE-IV	Comprehensive Online Examination-IV	-	-	-	1
Audit Course						
10.	16HS617	Aptitude Practice-II	3	-	-	-
Contact Periods / Week			18	5	12	**22**
			Total/Week 35			

IV B.Tech – I Semester (E.C.E)

S.No	Course Code	Subject	L	T	P	C
1.	16MB751	Entrepreneurship Development	3	-	-	3
2.	16EC429	Embedded Systems	3	1	-	3
3.	16EC430	Optical Fiber Communication	3	1	-	3
4.	16EC431	VLSI Design	3	1	-	3
5.	**Department Elective – I**		3	1	-	3
	16EC432	Digital Image processing				
	16EC433	Medical Electronics				
	16EC434	Pattern Recognition& Applications				
6.	**Open Elective**		3	-	-	3
	16CE145	Elements of Road Traffic Safety				
	16EE239	Neural Networks & Fuzzy Logic				
	16ME313	Non-Conventional Energy Resources				
	16CS511	Database Management systems				
	16MB752	Intellectual Property Rights				
7.	16EC435	Microwave & Optical Communications Lab	-	-	4	2
8.	16EC436	Embedded Systems Lab	-	-	4	2
Contact Periods / Week			18	4	8	**22**
			Total/Week 30			

IV B.Tech – II Semester (E.C.E)

S.No.	Course Code	Subject	L	T	P	C
1.	16EC437	Real time operating Systems	3	-	-	3
2.	**Department Elective – II**		3	1	-	3
	16EC438	Radar & Navigational Aids				
	16EC439	Satellite and TV Engineering				
	16EC440	Spread spectrum communications				
3.	**Department Elective – III**		3	1	-	3
	16EC441	Wireless Communication &Networks				
	16CS527	Computer Networks				
	16EC442	Cellular & Mobile Communication				
4.	**Department Elective – IV**		-	-	-	3
	MOOCS	MOOC courses-offered by SWAYAM/ NPTEL/ NISTE-suggested by the Department (online courses)				
5.	16EC444	Seminar	--	--	04	2
6.	16EC445	Project	--	--	20	10
Contact Periods / Week			09	02	24	**24**
			Total/Week 35			

***L-Lecture hours, T-Tutorial, P-Practical, Drg: Drawing, C-Credit**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS601) FUNCTIONAL ENGLISH
(Common to All Branches)

I B. Tech. – I Sem. (E.C.E)	**L**	**T**	**C**
	3	**0**	**3**

Course Objectives:

- To develop communication skills among the students.
- To construct proficiency in academic and social purpose to improve their grammatical accuracy.
- To understand LSRW skills and inculcate the habit of reading for pleasure.
- To obtain study skills and communication skills in formal and informal situations.
- To use appropriate vocabulary

Course Outcomes:

Students will be able to

- Use LSRW skills through the prescribed text and develop their ability to communicate effectively.
- Articulate well among themselves and with Faculty.
- Construct compound sentences using common conjunctions.
- Manage to organize and deliver oral presentations.
- Demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively.

UNIT I

MINDSCAPES (Environmental Consciousness: Pollution - How To Regain Green Cover):

1. Learning English Language through Literature (Secret of work- Swami Vivekananda)
2. Present, Past and Future aspects
3. Introducing oneself

Grammar: Parts of speech-Kinds of sentences-Tenses
Vocabulary: Synonyms & Antonyms-Affixes – Phrasal verbs
Listening & Reading Activities
Writing: Paragraph writing-Note taking & Note making
Phonetics- Syllabification

UNIT II

MINDSCAPES (Emerging Technologies: Solar Thermal Power- Nano Technology):

1. Learning English Language through Literature (Stopping by Woods on a Snowy Evening- Robert Frost)
2. Set in the Past

3. Inter-personal skills Grammar – Articles – Past Events – Voice & Impersonal passive voice – Gerund & -ing forms
to-infinitives
Vocabulary: Phrases – Idioms – word roots
Listening & Reading Activities
Writing: Letter writing-Informal-Formal
Phonetics – Accent

UNIT III

MINDSCAPES (Global Issues: Child Labor- E- Waste):

1. Learning English Language through Literature (What is my Name?-P.Satyavathi)
2. Describing a person, place and object
3. Possibilities

Grammar: Modals – Conditionals – Framing Questions – Compound nouns
Verbs
Vocabulary: One word substitute– Fixed expressions– Clauses
Listening & Reading Activities
Writing: Information transfer
Intonation: Falling & Rising

UNIT IV

MINDSCAPES (Space Trek: Hubble Telescope- Genesis of ISRO):

1. Learning English Language through Literature (Man in Black-Oliver Goldsmith)
2. Analytical thinking
3. Co-operative learning

Grammar: Concord–Reported speech-compare & contrast
Vocabulary: Numerical expressions-definitions-collocations
Listening & Reading
Writing: Summary-Essay writing-Making instructions
JAM

UNIT V

MINDSCAPES (Media Matters: History Of Media- Power of Media- Interviews):

1. Learning English Language through Literature (The Power of Prayer-Abdul Kalam)
2. Exploring creative ideas
3. Synthesis of sentences

Grammar: Simple, compound and complex-Spotting errors
Vocabulary: Discourse markers-Homonyms-Homophones-Homographs
Listening & Reading Activities
Writing: Writing recommendations-scrambled sentences
Convincing others

TEXT BOOKS:

1. *Mindscapes:* English for Technologists and Engineers- Orient Black Swan, 2014.
2. *Paths to Progress in English: Orient Black Swan*

REFERENCES:

1. *Raymond Murphy's Intermediate English Grammar with CD,* Raymond Murphy, Cambridge University Press, 2012.
2. *Communication Skills,* Sanjay Kumar & Pushpalatha, Oxford University Press, 2012.
3. *Writing Tutor*. Advanced English Learners' Dictionary, 9th Edition, Oxford University Press, 2015.
4. *Powerful Vocabulary Builder,* Anjana Agarwal, New Age International Publishers, 2011.
5. *Keep Talking,* F. Klippel, Cambridge University Press, 2013.
6. *Listening Extra*, Miles Craven, Cambridge University Press, 2008.
7. *Reading Extra*, Liz Driscoll, Cambridge University Press, 2004.
8. *Writing Extra*, Graham Palmer, Cambridge University Press, 2004.
9. *Speak Well*, Jayashree Mohanraj et al, Orient Blackswan, 2013.

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16HS602) ENGINEERING MATHEMATICS-I
(Common to all Branches)

I B. Tech. – I Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To train the students thoroughly in Mathematical concepts of ordinary differential equations, multiple integrals, Laplace Transforms and their applications
- To prepare students for lifelong learning and successful careers using mathematical concepts of ordinary differential equations, multiple integrals, Laplace Transforms and their applications
- To develop the skill pertinent to the practice of the mathematical concepts including the student abilities to formulate and modeling the problems, to think creatively and to synthesize information

Course Outcomes:

- The students become familiar with the application of ordinary differential equations, multiple integrals, Laplace Transforms and their applications
- The students attain the abilities to use mathematical knowledge to analyze, formulate and solve problems with engineering applications

UNIT I

DIFFERENTIAL EQUATIONS: Exact and Non-exact (Integrating factors), Linear and Bernoulli differential equations, Applications to first order equations: Orthogonal Trajectories, Newton's Law of Cooling, Natural Law of Growth and Decay. Linear Differential Equations of second and higher order with constant coefficients. Method of variation of parameters. Applications of linear differential equations- Simple electric circuits.

UNIT II

Taylor's and Maclaurin's Series, Functions of several variables, Jacobian, Maxima and Minima of functions of two variables, Lagrange's method of undetermined Multipliers with three variables only. Radius of curvature.

UNIT III

MULTIPLE INTEGRALS: Evaluation of Double and Triple integrals, Change of order of integration, Change of variables. Simple applications to areas.

UNIT IV

Laplace transform I: Laplace transforms of standard functions, First shifting Theorem, Transforms of derivatives and integrals, Unit step function, Second shifting theorem, Laplace transforms of Periodic functions.

UNIT V

LAPLACE TRANSFORM II: Inverse Laplace Transforms,Convolution theorem, Application of Laplace transforms to ordinary differential equations of first and second order.

TEXT BOOKS:

1. *Higher Engineering Mathematics*, B.S.Grewal, Khanna publishers-42nd Edition (2012).
2 *Engineering Mathematics* Volume-I, by T.K.V. Iyengar, S.Chand publication-12thEdition.

REFERENCES:

1. *Engineering Mathematics*, Volume - I, E. Rukmangadachari & E.Keshava Reddy, Pearson Publisher 1st Edition (2010)
2. *Engineering Mathematics*, Volume - I, by G.S.S.Raju, CENGAGE publisher (2013).
3. *Advanced Engineering Mathematics*, by Erwin Kreyszig, Wiley India-10th Edition (2012).
4. *Higher Engineering Mathematic*s, by B.V.Ramana, Mc Graw Hill publishers (2008).
5. *Advanced Engineering Mathematics*, by Alan Jeffrey, Elsevier-1st Edition (2001).

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS604) ENGINEERING CHEMISTRY
(Common to ECE & CSE)

I B. Tech. – I Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- The Engineering Chemistry course for undergraduate students is framed to strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.
- The course main aim is to impart in-depth knowledge of the subject and highlight the role of chemistry in the field of engineering.
- The lucid explanation of the topics will help students understand the fundamental concepts and apply them to design engineering materials and solve problems related to them. An attempt has been made to logically correlate the topic with its application.
- The extension of fundamentals of electrochemistry to energy storage devices such as commercial batteries and fuel cells is one such example.
- After the completion of the course, the student would understand the concepts of chemistry and apply to various materials for engineering applications.

Course Outcomes:

The student is expected to:

- Differentiate between hard and soft water. Understand the disadvantages of using hard water domestically and industrially. Select and apply suitable treatments domestically and industrially.
- Understand the electrochemical sources of energy
- Understand industrially based polymers, various engineering materials.
- Understand characteristics and applications of fuels and Lubricants.

UNIT I

ELECTROCHEMISTRY, CELL & CORROSION: Electrolytes- Strong and Weak electrolytes- Definition- examples. Electrolysis- Industrial applications of electrolysis. Cell- Galvanic cell, Batteries- Rechargeable batteries (Lead acid, Ni-Cd, Lithium Ion Batteries), Fuels cells - (Hydrogen-Oxygen and Methanol-Oxygen). Corrosion- Introduction, type of corrosion (Concentration cell corrosion, Galvanic corrosion), Chemical (Dry) and Electrochemical (Wet) Theory of corrosion, Galvanic series, factors affecting the corrosion (Metal and environment) Prevention- Cathodic protection (Sacrificial anode and impressed current), electroplating (Copper, nickel and chromium) and electroless plating (Copper and nickel).

UNIT II

WATER AND ITS TREATMENT: Hardness of water and its Units, Estimation of hardness by EDTA method.

Troubles of Boilers: Scale & Sludge, Priming and Foaming, and Boiler Corrosion.

Treatment of Boiler Feed water:

Internal Treatment: Colloidal, Phosphate, Carbonate, Calgon and sodium aluminate treatment.

External Treatment: Ion-Exchange and Permutit processes.

UNIT III

FUEL TECHNOLOGY AND LUBRICANTS: Fuel Technology- Introduction, classification, characteristics of a good fuel, calorific value, liquid fuels, petroleum, refining of petroleum, knocking, octane number, cetane number, power alcohol, synthetic petrol, gaseous fuels, important gaseous fuels.

Lubricants- Definition, functions of lubricants, mechanism of lubrication, properties of lubricants –viscosity, flash and fire points, cloud and pour points, aniline points, neutralization number and mechanical strength.

UNIT IV

POLYMERS: Introduction- Basic concepts of polymerization, types of polymerization (Chain Growth –Addition, step growth (Condensation), Mechanism: Cationic , anionic, free radical and coordination covalent.

Plastomers- Thermosetting and thermoplastics, preparation, properties and engineering applications of PVC, Teflon, Bakelite and nylons.

Elastomers-Natural rubber, processing of natural rubbers, compounding of rubber.

Synthetic rubber- Preparation, properties and engineering applications of Buna-S, Buna-N, polyurethane, polysulfide (Thiokol) rubbers.

Conducting polymers- mechanism, synthesis and applications of polyacetyline, polyaniline.

Inorganic polymers: Basic introduction, silicones, polyphospazines applications.

UNIT V

ENGINEERING MATERIALS : Cement- composition of Portland cement, preparation (dry and wet process) setting and hardening of cement.

Refractories- introduction, classification, properties and applications.

Nanomaterials- Introduction-Carbon Nano Tubes, Fullerenes. Semi conductors, superconductors and quantum dots.

TEXT BOOKS:

1. *Engineering Chemistry*, First Edition, Jayaveera KN, Subba Reddy GV and Ramachandraiah C, McGraw Hill Higher Education, New Delhi, 2013.
2. *A Text Book of Enigneering Chemistry*, 15th Edition, Jain and Jain, Dhanapathi Rai Publications, New Delhi, 2013.

REFERENCES:

1. *A Text book of Engineering Chemistry*, 12th Edition, SS Dhara, Uma, S. Chand Publications, New Delhi, 2010.
2. *Engineering Chemistry*, First edition, Chandra Sekhar K B, Das U N and Sujatha Mishra, SCITECH Publications India Pvt. Limited, 2010.
3. *Engineering Chemistry*, First edition, Seshamaheswaramma K and Mridula Chugh, Pearson Education, 2013.
4. *Concise Inorganic Chemistry*, 7th Edn, Lee J.D., Blackwel Science Publications Oxford, London, 2004.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16CS501) COMPUTER PROGRAMMING
(Common to all Branches)

I B. Tech. – I Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To understand the core aspects of computer problem solving techniques
- To understand the programming language constructs
- To understand the programming paradigms

Course Outcomes:

- Able to design the flowchart and algorithm for real world problems
- Able to learn and understand new programming languages
- Able to construct modular and readable programs
- Able to write C programs for real world problems using simple and compound data types

UNIT I

OVERVIEW OF COMPUTERS AND PROGRAMMING: Electronic Computers Then and Now – Computer Hardware - Computer Software - Algorithms - Flowcharts - Software Development Method - Applying the Software Development Method. C Language Elements- Variable Declarations & Data Types Executable Statements – General form of a C Program- Expressions - Precedence and Associativity- Operators and Expression – Type Conversions

UNIT II

DECISION STATEMENTS: If Statement, If-else Statement, Nested- If-else Statement, Else if Ladder, Switch case – break – continue – go to Statements – Example Programs Loop Control Statements – for loop – while loop - do while – Example Programs

UNIT III

ARRAYS: Declaring and referencing Arrays – Array Subscripts, Using for loops for sequential access – Using Array elements as Function arguments – Array arguments – Multidimensional Arrays – Example Programs

STRINGS: Introduction – Declaring and Initializing String variables – Reading Strings from Terminals – Writing Strings to Screen – Arithmetic Operations on Characters – Putting Strings together – Comparison of two Strings – String Handling Functions – Table of Strings- Other Features of Strings.

UNIT IV

FUNCTIONS: Definition – Function without Arguments – Functions with input arguments – Functions with simple output parameters – Communication among Functions – Scope – Storage clauses – Type Qualifiers – Recursion

Pointers: Introduction – Understanding Pointers – Accessing the address of a variable – Declaring Pointers variables- Initialization of Pointer variables – Accessing a variable through its Pointer – Chain of Pointers – Pointer Expressions – Pointer Increment & Scale Factors – Pointers and Arrays – Pointers and Character Strings – Array of Pointers – Pointers as Function Arguments .- Function returning Pointers – Pointers to Function.

UNIT V

STRUCTURES: Introduction – Defining a Structure – Declaring Structure Variables – Accessing Structure Members – Structure Initialization – Copying and Comparing Structure variables – Operations on Individual members – Arrays of Structures – Arrays with in Structures – Structures with in Structures – Structures and Functions – Unions –Bit fields – TYPEDEF – ENUM

File Management in C: Introduction – Types of Files – Defining and Opening a File – Closing a File – Input / Output Operations on Files – Error handling during IO Operations – Random access to files – Command line arguments. Preprocessor - #define and #include.

TEXT BOOKS:

1. Programming in C and Data Structures – Jeri R. Hanly, Elliot B Koffman, Ashok Kamthane, A Anand Rao – Pearson.(UNITS I, II and III)
2. Programming in C and Data Structures – E Balagurusamy - McGrawHill

REFERENCES:

1. Computer Fundamentals and C Programming - Dr. P. Chenna Reddy, ISBN: 9789351045885, Publisher: Pothi.com
2. Programming in C, Second Edition – Pradip Dey, Manas Ghosh, Oxford University Press.
3. “C from Theory to Practice”- George S. Tselikis- Nikolaos D. Tselikas- CRC Press.
4. “Programming with C”- R S Bichkar- University Press.
5. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, Pearson Education. (UNIT-I)

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16ME302) ENGINEERING GRAPHICS
(Common for CSE & ECE)

I B. Tech. – I Sem. (E.C.E)	**L**	**T**	**D**	**C**
	0	**0**	**6**	**3**

Course Objectives:
- To familiarize the students in basic concept of conic sections, projections and developments of Objects.
- To develop the imagination and drafting skills of students.

Course Outcomes:
Students undergoing this course are able to
- Frame ideas based on the conceptual modeling and design
- Provide good understanding of the methods involved in preparing various views in engineering drawings
- Can prepare 2D and 3D diagrams of various objects

INTRODUCTION (**Not to be included for examination)**
Drawing instruments and their use – Lettering - Dimensioning – Simple Geometrical constructions.

UNIT I
CONIC SECTIONS: Construction of Ellipse, Parabola, Hyperbola (General and special methods). Special Curves: Cycloids, Involutes.

UNIT II
POINTS: Projections of points
LINES: Projections of straight lines - Determination of true lengths and true inclinations – line inclined to both reference planes., traces.

UNIT III
PLANES: Projections of planes – Surface inclined to both reference planes
SOLIDS: Projections of simple solids (Prisms, pyramids, cylinder and cone) - Axis inclined to both the planes.

UNIT IV
SECTIONS: Sections of solids (prisms, pyramids, cylinder and cone) in simple vertical position by using cutting plane inclined to one reference plane and perpendicular to the other – true shape of the section.

DEVELOPMENTS: Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinder and cone.

UNIT V

ISOMETRIC AND ORTHOGRAPHIC PROJECTIONS: Principles of Isometric projection- Isometric Scale- Isometric Views- Conversion of Isometric to orthographic views– Isometric projection of simple solids (Cube, Cylinder and Cone)

INTERPENETRATION/INTERSECTIONS OF SOLIDS: Simple solids.

COMPUTER AIDED DRAFTING: Introduction to drafting packages - orthographic views and projections and Isometric projections (demonstration only)

TEXT BOOKS:

1. *Engineering Drawing*, N.D.Bhatt, Charotar Publishers
2. *A text Book of Engineering Drawing*, K.L.Narayana, Kannaiah, Scitech Publishers, 2010
3. *Engineering Graphics with using AutoCAD,2007*. Jeyapoovan.T., Vikas Publishing House

REFERENCES:

1. *Fundamentals of Engineering Drawing*, Warren J. Luzadder and Jon. M.Duff Prentice Hall of India Pvt., Ltd., Eleventh Edition, 2001.
2. *Engineering Graphics,* Bhattacharyya, S.C.Bera, I.K .International Pvt Ltd. 2009.
3. *A text Book of Engineering Drawing and Graphic,* K.Venugopal New Age Publishing New Delhi, 2008,

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16HS607) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(Common to ECE & CSE)

I B. Tech. – I Sem. (E.C.E)	**L**	**P**	**C**
	0	**4**	**2**

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

Course objectives:

- To enable students to learn better pronunciation through stress on word accent, Intonation and rhythm.
- To help the second language learners to acquire fluency in spoken English and neutralize mother tongue influence.
- To train students to use language appropriately in both formal and informal situations.
- To enhance written communication among the students.

Course outcomes:

- To become active participants in the learning process and acquire proficiency in spoken English.
- To speak with clarity and confidence thereby enhances employability skills.
- To prepare effective job application

UNIT I

1. Phonetics -Importance
2. Introduction to Sounds of Speech
3. Vowels and Consonant sounds
4. Phonetic Transcription

UNIT II

5. Word Stress
6. Syllabification
7. Rules of Word Stress
8. Intonation

UNIT - III

9. Situational Dialogues/ Role Play
10. Telephonic Communication
11. JAM

UNIT IV

12. Describing Persons/ places/ things
13. Oral Presentations
14. Debate

UNIT V

15. Group Discussion
16. Job application
17. Interview skills

Minimum Requirements for ELCS Lab:

The English Language Lab shall have two parts:

1. Computer Assisted Language Learning (CALL) Lab: The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.

2. The Communication Skills Lab with movable chairs and audio-visual aids with a P.A. system,

Projector, a digital stereo-audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB

ii) Headphones of High quality

Suggested Software:

1. Clarity Pronunciation Power – Part I (Sky Pronunciation)
2. Clarity Pronunciation Power – part II
3. K-Van Advanced Communication Skills
4. Walden InfoTech Software.

REFERENCES:

1. A Textbook of English Phonetics for Indian Students 2nd Ed T. Balasubramanian. Macmillian),2012.
2. A Course in Phonetics and Spoken English, Dhamija Sethi, Prentice-Hall of India Pvt.Ltd
3. Speaking English Effectively, 2nd Edition Krishna Mohan & NP Singh, 2011. (McMillan).
4. A Hand book for English Laboratories, E.Suresh Kumar, P.Sreehari, Foundation Books, 2011.
5. Spring Board Success, Sharada Kouhik, Bindu Bajwa, Orient Blackswan, Hyderabad, 2010.

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16HS609) ENGNEERING CHEMISTRY LAB
(Common to ECE & CSE)

I B. Tech. – I Sem. (E.C.E)	**P**	**C**
	4	**2**

Course Objectives:

- To provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

Course Outcomes:

On completion of this course, students will have the knowledge in.

- Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
- Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results.

Any 10 of the following experiments has to be performed during the I year I Sem.

List of Experiments:

1. Determination of total hardness of water by EDTA method.
2. Determination of Copper by EDTA method.
3. Estimation of Dissolved Oxygen by Winkler's method.
4. Estimation of iron (II) using diphenylamine indicator (Dichrometry –Internal indicator method).
5. Determination of Alkalinity of Water.
6. Determination of acidity of Water.
7. Preparation of Phenol-Formaldehyde (Bakelite).
8. Determination of Viscosity of oils using Redwood Viscometer I.
9. Determination of Viscosity of oils using Redwood Viscometer II.
10. Determination of calorific value of gaseous fuels by Junker‟s Calorimeter.
11. Conductometric estimation of strong acid using standard sodium hydroxide solution.
12. Determination of Corrosion rate and inhibition efficiency of an inhibitor for mild steel in hydrochloric acid medium.
13. Potentio metric determination of iron using standard potassium dichromate.
14. Colorometric estimation of manganese.
15. pH meter calibration and measurement of pH of water and various other samples.

REFERENCES:

1. *Vogel's Text book of Quantitative Chemical Analysis*, Sixth Edition – Mendham J et al, Pearson Education, 2012.
2. *Chemistry Practical– Lab Manual*, First edition, Chandra Sekhar KB, Subba Reddy GV and Jayaveera KN, SM Enterprises, Hyderabad, 2014.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16CS502) COMPUTER PROGRAMMING LAB
(Common to all Branches)

I B. Tech. – I Sem. (E.C.E)	**P**	**C**
	4	**2**

Course Objectives:

- To make the student learn C Programming language.
- To make the student solve problems, implement those using C & C++ programming languages.
- To strengthen the ability to identify and apply the suitable data structure for the given real world problem.

Course Outcomes:

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

- Apply problem solving techniques of C to find solution.
- Use C language features effectively to implement solutions.
- Use C++ language features effectively to solve problems.
- Identify and develop apt searching and sorting technique for a given problem.
- Identity, design and develop the appropriate data structure for a given problem or application.

LIST OF EXPERIMENTS/TASKS:

1. Practice DOS and LINUX Commands necessary for design of C Programs.
2. Practice programs: Finding the sum of three numbers, exchange of two numbers, maximum of two numbers, to read and print variable values of all data types of C language, to find the size of all data types, to understand the priority and associativity of operators using expressions, to use different library functions of C language.
3. Write a program to find the roots of a Quadratic equation.
4. Write a program to compute the factorial of a given number.
5. Write a program to check whether the number is prime or not.
6. Write a program to find the series of prime numbers in the given range.
7. Write a program to generate Fibonacci numbers in the given range.
8. Write a program to find the maximum and minimum of a set of numbers.
9. Write a program to reverse the digits of a number.
10. Write a program to find the sum of the digits of a number.
11. Write a program to find the sum of positive and negative numbers in a given set of numbers.
12. Write a program to check for number palindrome.
13. Write a program to evaluate the sum of the following series up to n terms

    e^x=1+x+x2/2!+x3/3!+x4/4!+--------
14. Write a program to generate Pascal Triangle.
15. Write a program to read two matrices and print their sum and product in the matrix form.

16. Write a program to read matrix and perform the following operations.
    i. Find the sum of Diagonal Elements of a matrix.
    ii. Print Transpose of a matrix.
    iii. Print sum of even and odd numbers in a given matrix.
17. Write a program to accept a line of characters and print the number of Vowels, Consonants, blank spaces, digits and special characters.
18. Write a program to insert a substring in to a given string and delete few characters from the string. Don't use library functions related to strings.
19. Write a program to split a „file" in to two files, say file1 and file2. Read lines into the file from standard input. File1 should consist of odd numbered lines and file2 should consist of even numbered lines.
20. Write a program to merge two files.
21. Write a program to read a set of strings and sort them in alphabetical order.
22. Write a program to read two strings and perform the following operations without using Built in string Library functions and by using your own implementations of functions.
    i. String length determination ii .Compare Two Strings
    ii. Concatenate them, if they are not equal iv. String reversing
23. Write programs using recursion for finding Factorial of a number, GCD, LCM, and solving Towers of Hanoi problem.
24. Write a program to exchange two numbers using pointers.
25. Write a program to read student records into a file. Record consists of roll no, name and Marks of a student in six subjects and class. Class field is empty initially. Compute the class of a student. The calculation of the class is as per JNTUA rules. Write the first class, second class, third class and failed students lists separately to another file.
26. A file consists of information about employee salary with fields employee id, name, Basic, HRA, DA, IT, other-deductions, Gross and Net salary. Initially only employee id, name, and basic have valid values. HRA is taken as 10% of the basic, DA is taken as 80% of basic, IT is 20% of the basic, other deductions are user specified. Compute the Gross and Net salary of the employee and update the file.
27. Write a program to perform Base (decimal, octal, hexadecimal,…) conversions.
28. Write a program to find the square root of a number without using built-in library function.
29. Write C program to convert a string to number.
30. Write C program to generate multiplication tables from 11 to 20.

REFERENCES:

1. How to Solve it by Computer, R.G. Dromey, Pearson.
2. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Pearson.
3. Let us C Yeswant Kanetkar, BPB publications
4. Pointers in C, Yeswant Kanetkar, BPB publications.
5.Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, Pearson Education.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS610) PROFESSIONAL ENGLISH
(Common to All Branches)

I B. Tech. – II Sem. (E.C.E)	**L**	**T**	**C**
	3	**0**	**3**

Course Description: The course content focuses on LSRW skills and vocabulary building to enrich their command over language. Relevant task based activities are also carried out to enhance their communication skills.

Course Objectives:

- To develop communication skills among the students
- To construct proficiency in academic and social purpose.
- To improve their grammatical accuracy.
- To understand LSRW skills and inculcate the habit of reading for pleasure.

Course Outcomes:

Students will be able to

- Use LSRW skills through the prescribed text and develop their ability to communicate effectively.
- Articulate well among themselves and with Faculty.
- Construct compound sentences using common conjunctions.
- Manage to organize and deliver oral presentations.
- Demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively

UNIT I

MINDSCAPES (Lessons From the past: Importance of the Past)

1. Learning English Language through Literature (*Playing the English Gentleman*-M.K.Gandhi)
2. Oral presentation
3. Effective writing

Grammar: Relative clauses-Adjectives
Vocabulary: Sequencing words
Listening & Reading Activities
Writing: Analytical paragraph writing-Minutes of meeting

UNIT II

MINDSCAPES (Energy: Renewable and Non-renewable Sources - Alternative Sources)

1. Learning English Language through Literature. (*The Portrait of a Lady* -Kushwant Singh)
2. Preparing and presenting slides, Telephone etiquette

3. Making drafts

Grammar: Adverbs - prepositions -cause and effect expressions

Vocabulary: phrasal verbs - Technical vocabulary-Extended definitions

Listening & Reading Activities

Writing: Report writing

UNIT III

MINDSCAPES (Engineering Ethics: Biotechnology - Protection from Natural Calamities)

1. Learning English Language through Literature (*La Belle Dame Sans Mercy*-John Keats)
2. Poster presentation, Debate
3. Technical drafting

Grammar: Using connectives-Gap filling exercise using appropriate tense form

Vocabulary: Acronyms & Abbreviations

Listening & Reading Activities

Writing: Writing projects

UNIT IV

MINDSCAPES (Travel and Tourism: Atithi Devo Bhava- Tourism in India)

1. Learning English Language through Literature (*A Marriage Proposal*-Anton Chekov)
2. Group Discussion
3. Reading comprehension

Grammar: Structure indicating purpose-Subject-verb agreement

Vocabulary: emoticons-cloze test

Listening & Reading

Writing: Intensive and extensive

UNIT V

MINDSCAPES (Getting Job Ready: SWOT Analysis- Preparing for Interviews)

1. Learning from Literature (*Bird Sanctuary* -Sarojini Naidu)
2. Interview etiquette
3. Job application

Grammar: Spotting errors, Gap filling exercises using "gerunds" & present participle forms

Vocabulary: verbal ability

Listening & Reading Activities

Writing: Covering letter, Resume, Curriculum vitae

Convincing others

TEXT BOOKS:

1. *Mindscapes*: *English for Technologists and Engineers*, Orient Blackswan, 2014
2. *Paths to Progress in English:*Orient Black Swan

REFERENCES:

1. *Effective Tech Communication***,** Rizvi,Tata McGraw-Hill Education, 2007.
2. *Technical Communication,* Meenakshi Raman, Oxford University Press.
3. *English Conversations Practice,* Grant Taylor, Tata Mc GrawHill publications,2013**.**
4. *Practical English Grammar,* Thomson and Martinet, OUP, 2010.

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16HS611) ENGINEERING MATHEMATICS-II
(Common to all Branches)

I B. Tech. – II Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To train the students thoroughly in Mathematical concepts of Matrices, Vector calculus, Fourier series, Fourier transforms and Partial differential equations
- To prepare students for lifelong learning and successful careers using mathematical concepts of Matrices, Vector calculus, Fourier series, Fourier transforms and Partial differential equations
- To develop the skill pertinent to the practice of the mathematical concepts including the Student abilities to formulate and modeling the problems, to think creatively and to Synthesize information

Course Outcomes:

- The students become familiar with the application of Matrices, Vector calculus, Fourier series, Fourier transforms and Partial differential equations
- The students attain the abilities to use mathematical knowledge to analyze, formulate and solve problems with engineering applications

UNIT I

MATRICES: Rank of a matrix, Echelon form, Normal form, Consistency of system of linear equations (Homogenous and Non-homogeneous), Eigen values, Eigen vectors, Cayley Hamilton theorem (Only statement) and its applications. Quadratic forms, Diagonolization.

UNIT II

VECTOR CALCULUS: Gradient, Divergence, Curl of a vector and related properties, Line, Surface and Volume integrals, Green's, Stoke's and Gauss divergence theorems (Only statement) and its applications.

UNIT III

FOURIER SERIES: Determination of Fourier coefficients- Fourier series- Even and odd functions, Fourier Series in an arbitrary interval, Periodic function, Half range sine and cosine series, Harmonic Analysis.

UNIT IV

Fourier integral theorem (only statement), Fourier sine and cosine integrals. Fourier transform, Fourier sine and cosine transforms, properties, Inverse transforms, Finite fourier transforms.

UNIT V

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, Method of separation of variables, Solution of one dimensional wave equation, Heat equation and two dimensional Laplace equation under initial and boundary conditions.

TEXT BOOKS:

1. *Higher Engineering Mathematics,* B.S.Grewal, Khanna publishers
2. *Engineering Mathematics Volume-I,* by T.K.V. Iyengar, S.Chand publication
3. *Mathematical Methods* by T.K.V. Iyengar, S.Chand publication

REFERENCES:

1. *Engineering Mathematics*, Volume - I, E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher 1st Edition (2010)
2. *Fourier Series and Integral Transforms*, by S.Sreenadh & S. Ranganatham, S.Chand Publication (2014)
3. *Engineering Mathematics*, Volume - I, by G.S.S.Raju, CENGAGE publisher.(2013)
4. *Advanced Engineering Mathematics*, by Erwin Kreyszig, Wiley India-10th Edition (2012)
5. *Advanced Engineering Mathematics*, by Erwin Kreyszig, Wiley India-10th Edition (2012)
6. *Higher Engineering Mathematics*, by B.V.Ramana, Mc Graw Hill publishers (2008)
7. *Advanced Engineering Mathematics*, by Alan Jeffrey, Elsevier-1st Edition (2001)

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS603) ENGINEERING PHYSICS
(Common to ECE & CSE)

I B. Tech. – II Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To evoke interest on applications of superposition effects like interference & diffraction, the mechanisms of emission of light, achieving amplification of electromagnetic radiation through stimulated emission, study of propagation of light through transparent dielectric wave guides along with engineering applications.
- To enlighten the periodic arrangement of atoms in crystals, direction of Bragg planes, crystal structure determination by X-rays & non-destructive evaluation using ultrasonic techniques.
- To get an insight into the microscopic meaning of conductivity, classical & quantum free electron model & evaluation of band theory to distinguish materials & to understand electron transport mechanism in solids.
- To open new avenues of knowledge & understanding semiconductor based electronic devices, basic concepts and applications of semiconductors & magnetic materials have been introduced which find potential in the emerging micro device applications.
- To give an impetus on the subtle mechanism of superconductors in terms of conduction of electron pairs using BCS theory, different properties exhibited by them & their fascinating applications. Considering the significance of microminiaturization of electronic devices & significance of low dimensional materials, the basic concepts of nanomaterials, their synthesis, properties & applications in emerging technologies are elicited.

Course Outcomes:

- The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fibre optics.
- The important properties of crystals like the presence of long range order and periodicity, structure determination using X-ray diffraction are focused with defects in crystals & ultrasonic non-destructive techniques.
- The discrepancies between the classical estimates & laboratory observations of physical properties exhibited by materials would be lifted through the understanding of quantum picture of subatomic world.
- The electronic and magnetic properties of materials were successfully explained by free electron theory and the bases for the band theory are focused.
- The properties and device applications of semiconducting & magnetic materials are illustrated.
- The importance of superconducting materials and nanomaterials along with their engineering applications are well elucidated.

UNIT I

PHYSICAL OPTICS, LASERS AND FIBRE OPTICS: Physical Optics: Interference - Introduction - Interference in thin films by reflection – Newton's Rings. Diffraction - Introduction- Fraunhofer diffraction due to single slit and diffraction grating.

LASERS: Introduction - Characteristics of laser – Spontaneous and stimulated emission of radiation –-Einstein's relation, Population inversion – Excitation mechanism & optical resonator – ND: YAG laser - He-Ne laser, semiconductor diode laser -Applications of lasers.

FIBRE OPTICS: Introduction– Construction and working principle of optical fiber – Numerical aperture and acceptance angle – Types of optical fibers – Attenuation and losses in fibers -Optical fiber communication system – Applications of optical fibers in communications, sensors and medicine.

UNIT II

CRYSTALLOGRAPHY, ACOUSTICS AND ULTROSONICS: Crystallography**:** Introduction – Space lattice –Unit cell – Lattice parameters –Bravias lattice –Crystal systems – Packing fractions of SC, BCC and FCC-Directions and planes in crystals – Miller indices – Inter planar spacing in cubic crystals – X-ray diffraction - Bragg's law.

Acoustics Intensity – Absorption coefficient and its determination –Reverberation – Reverberation time (qualitative treatment) – Factors affecting acoustics of buildings and their remedies. Ultrasonics Introduction – Production of ultrasonics by piezoelectric method – Properties and detection – Applications in non-destructive testing.

UNIT III

QUANTUM MECHANICS AND FREE ELECTRON THEORY: Quantum Mechanics**:** Introduction to matter waves – de'Broglie hypothesis - Heisenberg's uncertainty principle and its applications - Schrödinger**'**s time independent and time dependent wave equation – Significance of wave function - Particle in a one dimensional infinite potential well .

Free Electron theory: Classical free electron theory - Equation for electrical conductivity - Quantum free electron theory - Origin of bands in solids – Classification of solids into conductors, semiconductors and insulators.

UNIT IV

SEMICONDUCTORS AND MAGNETIC MATERIALS: Semiconductor Physics: Introduction – Intrinsic and extrinsic semiconductors (qualitative treatment), Drift & diffusion currents - Einstein's relation– Hall effect Direct & indirect band gap semiconductors. Magnetic materials: Introduction and basic definitions – Origin of magnetic moments – Bohr magneton – Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials – Hysteresis - Soft and hard magnetic materials and applications.

UNIT V

SUPERCONDUCTIVITY AND PHYSICS OF NANOMATERIALS: Superconductivity: Introduction – Meissner effect - Properties of superconductors- Type I and Type II superconductors- ac and dc Josephson effects BCS theory (qualitative) –Applications of

superconductors. Physics of Nanomaterials: Introduction - Significance of nanoscale - Surface area and quantum confinement –Synthesis of nanomaterials: ball mill, chemical vapour deposition, sol-gel, plasma arcing –applications of nano materials

TEXT BOOKS:

1. *Engineering Physics* – K.Thyagarajan, 5th Edition, MacGraw Hill Publishers, NewDelhi, 2014.
2. *Engineering Physics* - Gaur R.K. and Gupta S.L. Dhanpat Rai Publishers, 2009

REFERENCES:

1. *Engineering Physics* - Mani Naidu S.,Pearson Publications, 2011.
2. *Engineering Physics* - Arumugam K.-PHI Learning Pvt., India, 2009.
3. *Engineering Physics* -Palanisamy P.K, SCITECH Publications, 2011.
4. *Engineering Physics* -Rajagopal K. PHI, New Delhi, 2011.
5. *Engineering Physics* – Dr. M.N. Avadhanulu & Dr. P.G. Kshirsagar, 10th Edition,S.Chand and Company, New Delhi, 2014

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR

(16HS606) HUMAN VALUES AND PROFESSIONAL ETHICS

B.Tech I -I Sem

L	T	P	C
3	0	0	3

Course Objectives:

- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

Course Outcomes:

Students undergoing this course are able to

- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society

.**UNIT I**

Human Values - Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Living peacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self-confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

UNIT II

Engineering Ethics - Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Models of professional roles - Theories about right action – Self-interest – Customs and Religion – Uses of Ethical Theories

UNIT III

Engineering As Social Experimentation - Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV

Safety, Responsibilities And Rights- Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk

Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

UNIT V

Global Issues-Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership –Code of Conduct – Corporate Social Responsibility

TEXTBOOKS:

1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

REFERENCES:

1. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2. Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics – Concepts and Cases", Cengage Learning, 2009
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
4. Edmund G Seebauer and Robert L Barry, "Fundametals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EE205) NETWORK ANALYSIS

I B. Tech. – II Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course objective*:*

- To help students develop an understanding on analyzing electrical circuits using various techniques. To make the student familiarize with the fundamental concepts of coupled circuits, resonance, filters and to analyze the transient response in electric circuits.

Course outcomes:

After completing the course the student should be able to do the following:

- Given a network, find the equivalent impedance by using network reduction techniques
- Determine the current through any element and voltage across any element
- Apply the network theorems suitably

UNIT I

CIRCUIT ANALYSIS TECHNIQUES: Voltage and Current Laws, Basic Nodal and Mesh Analysis, Network Topology-Formation of Incidence Matrix, Tieset and Cutset Matrix formation, Network Theorems-Linearity and Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Milliman, Tellegan's Theorems. Source Transformation.

UNIT II

RL AND RC CIRCUITS: The Source free RL Circuit, The Source free RC Circuit, Properties of Exponential Response, Natural & Forced Response, RLC Circuits, Complete Response of Source free parallel RLC Circuits, Source free Series RLC Circuits.

SINUSOIDAL STEADY STATE ANALYSIS: Characteristics of Sinusoids, Forced Response of Sinusoidal Functions, The Complex forcing Function, The Phasor, Phasor relationships for R, L, and C, Impedance, Admittance.

A.C CIRCUIT POWER ANALYSIS: Instantaneous Power, Average Power, Effective Values of Current and Voltage, Apparent Power, Power Factor, Complex Power.

UNIT III

RESONANCE :Introduction, Definition of 'quality factor **Q**' of inductor and capacitor, Series resonance, Bandwidth of the series resonant circuits, Parallel resonance (or anti-resonance), Conditions for maximum impedance, Currents in parallel resonance, Impedance variation with frequency; universal resonance curves, Bandwidth of parallel resonant circuits, General case of parallel resonance circuit, Anti-resonance at all frequencies, variable phase angle circuit, reactance curves, Impedance Transformation.

MAGNETICALLY COUPLED CIRCUITS: Mutual Inductance, Energy Considerations, The Linear Transformer, The Ideal Transformer

UNIT IV

TWO PORT NETWORKS: Relationship of two port variables, Short circuit Admittance parameters, Open circuit Impedance parameters, Transmission Parameters, Hybrid Parameters, Relationship between parameter sets, Parallel connection of two port networks, State Variable Networks.

STATE VARIABLE ANALYSIS: Introduction to state variables – state variables of circuits, state and output equations, advantages of state variable analysis, Circuit state equations, Proper and improper circuits, Equations for proper circuits, Transform solution of state equations, Illustrative problems.

UNIT V

FILTERS: Introduction, the neper & decibel, Characteristic Impedance of symmetrical networks, Currents & voltage ratios as exponentials; the propagation constant, Hyperbolic trigonometry, Properties of symmetrical networks, Filter fundamentals; pass and stop bands, Behavior of characteristic impedance, The constant – k low pass filter, the constant – k high pass filter, The m derived T section, The m-derived π section, Variation of characteristic impedance over the pass band, Termination with m-derived half sections, Band-pass filters, Band elimination filters, Illustrative problems.

TEXT BOOKS:

1. *Engineering Circuit Analysis,* W H Hayt, J E Kemmerly and S M Durbin, Tata McGraw-Hill, 7th edition, 2010.
2. *Network Analysis* Van Valkenburg, PHI, 3rd Edition, 2011.

REFERENCES:

1. *Networks, Lines, and Fields,* John D. Ryder, PHI publications, Second Edition, 2012.
2. *Circuits & Network Analysis & Synthesis,* A. Sudhakar & Shyam Mohan S.Pillai Tata McGraw Hill , 2nd Edition, 1994
3. *Network Analysis and synthesis* ,Franklin F. Kuo, Wiley India Pvt Ltd, 2nd Edition.
4. *Circuit Theory (Analysis & Synthesis)* by A. Chakrabarti, Dhanpat Rai & Sons, 2010.
5. *Network Analysis- A Simplified Approach,* K.Chenna Venkatesh, D.Ganesh Rao, Elsevier, 2nd Edition 2010

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16HS608) ENGINEERING PHYSICS LABORATORY
(Common to ECE & CSE)

I B. Tech. – II Sem. (E.C.E) **P C**
4 2

Course Objectives:

- Will recognize the important of optical phenomenon like interference and diffraction.
- Will understand the role of optical fibre parameters and signal losses in communication.
- Will recognize the importance of energy gap in the study of conductivity and Hall- Effect in a semiconductor.
- Will understand the application of B-H curve.
- Will acquire a practical knowledge of studying the crystal structure in terms lattice constant.
- Will recognize the application of laser in finding the particle size and its role in diffraction studies.
- Will learn to synthesis of the nanomaterials and recognize its importance by knowing its nano particle size and its impact on its properties.

Course Outcomes:

- Would recognize the importance of optical phenomenon like interference and diffraction.
- Would have acquired the practical application knowledge of optical fiber, semiconductor, dielectric and magnetic materials, crystal structure and lasers by the study of their relative parameters.
- Would recognize the significant importance of nanomaterials in various engineering fields.

Any 10 of the following experiments has to be performed during the I year II Sem.

1. Determination of radius of curvature of a Plano-convex lens by forming Newton's rings.
2. Determination of wavelength of given source using diffraction grating in normal incidence method.
3. Determination of Numerical aperture, acceptance angle of an optical fiber.
4. Determination of the Energy gap of a Semiconductor diode.
5. Hall-Effect – Determination of mobility of charge carriers.
6. B-H curve – Determination of hysteresis loss for a given magnetic material.
7. Determination of Crystallite size using X-ray pattern (Powder) using Debye- Scheerer method.
8. Determination of particle size by using laser source.
9. Determination of dispersive power of a prism.
10. Determination of thickness of the thin wire using wedge Method.
11. Laser: Diffraction due to single slit.

12. Laser: Diffraction due to double slit.
13. Laser: Determination of wavelength using diffraction grating.
14. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
15. Synthesis of nano material by any suitable method.

REFERENCES:

1. *Engineering Physics Practicals* – NU Age Publishing House, Hyderabad.
2. *Engineering Practical Physics* – Cengage Learning, Delhi.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EE206) NETWORK ANALYSIS LAB

I B. Tech. – II Sem. (E.C.E)	**P**	**C**
	4	**2**

1. Verification of KCL & KVL for any network.
2. Verification of Superposition Theorem with analysis.
3. Verification of Thevenin's Theorem with analysis.
4. Verification of Maximum Power Transfer Theorem with analysis.
5. Analysis of RL & RC circuits for pulse excitation.
6. Frequency response of series resonance circuit with analysis and design.
7. Frequency response of parallel resonance circuit with analysis and design.
8. Design and frequency response of constant 'k' low pass & high pass filters.
9. Design and frequency response of Band pass filter.
10. Design and frequency response of Notch filter.
11. Determination of phase of a sinusoidal signal when passed through RL or RC circuits.
12. Impedance transformation through transformer.

Note: - Ten experiments must be conducted in the Sem..

Components & Equipment required: -

1. Bread boards, passive components, R, L, and C with different ratings.
2. Dual power supplies, function generators, CROs.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16ME301) ENGINEERING & IT WORK SHOP LAB

I B. Tech. – II Sem. (E.C.E)	L	T	P	C
	0	0	4	2

Course Educational Objectives:

ENGINEERING WORKSHOP

- The course provides hands-on training in the trades of Carpentry, Fitting, House-wiring, Tin Smithy, Foundry. Overview of metal cutting processes, plumbing and welding is provided through live demonstrations.

IT WORKSHOP

- This course deals with practice sessions on PC hardware, Internet, World Wide Web, MS-Word, Excel, Power Point and Publisher. Demonstrations on installations of system software such as MS-Windows, Linux and device drivers, hardware and software troubleshooting, and protecting the personal computer from viruses and other cyber-attacks are include.

Course Outcomes:

ENGINEERING WORKSHOP

After completion of this course, a successful student will be able to :

- Utilize workshop tools for engineering practice.
- Employ skills for the production a component for real time applications.
- Appreciate the hard work and intuitive knowledge of the manual workers.

IT WORKSHOP

After completion of this course, a successful student will be able to:

- Can install the softwares in the computers
- Utilize skills for the development of application softwares
- Can protect personal computer from virus and other cyber attacks

LIST OF EXPERIMENTS

1. TRADES FOR EXERCISES

a. Carpentry shop: Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, Cross lap joint, Mortise and tenon T joint, Bridle T joint from soft wood stock.

b. Fitting shop: Two joints (exercises) from: Square joint, V joint, Half round joint or Dove tail joint out of 100 x 50 x 5 mm M.S. stock.

c. **Sheet metal shop**: Two jobs (exercises) from: Tray, Cylinder, Hopper or Funnel from out of 22- or 20-gauge G.I. sheet.

d. **House-wiring**: Two jobs (exercises) from: Wiring for ceiling rose and two lamps (bulbs) with independent switch, two-way switch, controls with or without looping, wiring for stair case lamp, wiring for water pump with single phase starter.

e. **Foundry**: Preparation of two moulds (exercises): for a single pattern and a double pattern.

f. **Welding**: Preparation of two welds (exercises): Single V butt joint, Lap joint, Double V butt joint or T fillet joint.

2. TRADES FOR DEMONSTRATION:

a. Plumbing

b. Machine Shop

c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

REFERENCES:

1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009
2. Work shop Manual, P.Kannaiah & K.L.Narayana, SciTech Publishers.
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

IT WORKSHOP

LIST OF EXPERIMENTS

1. Preparing your Computer Knowledge (5 weeks)

2. Learn about Computer: Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.

3. Assembling a Computer: Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working

parts. Student should identify the problem correctly by various methods available (eg: beeps). Students should record the process of assembling and troubleshooting a computer.

4. Install Operating system: Student should install Linux on the computer. Student may install another operating system (including proprietary software) and make the system dual boot or multi boot. Students should record the entire installation process.

5. Operating system features: Students should record the various features that are supported by the operating system(s) installed. They have to submit a report on it. Students should be able to access CD/DVD drives, write CD/DVDs, access pen drives, print files, etc. Students should install new application software and record the installation process.

6 Networking and Internet (4 weeks)

6.1 Networking: Students should connect two computers directly using a cable or wireless connectivity and share information. Students should connect two or more computers using switch/hub and share information. Crimpling activity, logical configuration etc should be done by the student. The entire process has to be documented.

6.2 Browsing Internet: Student should access the Internet for Browsing. Students should search the Internet for required information. Students should be able to create e-mail account and send email. They should get acquaintance with applications like Facebook, skype etc.
If Intranet mailing facility is available in the organization, then students should share the information using it. If the operating system supports sending messages to multiple users (LINUX supports it) in the same network, then it should be done by the student. Students are expected to submit the information about different browsers available, their features, and search process using different natural languages, and creating e-mail account.

7. Antivirus: Students should download freely available Antivirus software, install it and use itto check for threats to the computer being used. Students should submit information about the features of the antivirus used, installation process, about virus definitions, virus engine etc

8. Productivity tools (6 weeks)

8.1 Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the color, including images and tables in the word file, making page setup, copy and paste block of text, images, tables, linking the images which are present in other directory, formatting paragraphs, spell checking, etc. Students should be able to prepare project cover pages, content sheet and chapter pages at the end of the task using the features studied. Students should submit a user manual of the word processor considered.

8.2 Spreadsheet: Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

8.3 Presentations: Creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.

References:

1. Introduction to Computers, Peter Norton, Mc Graw Hill
2. MOS study guide for word, Excel, Powerpoint & Outlook Exams", Joan Lambert, Joyce Cox,PHI.
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. Networking your computers and devices, Rusen, PHI
5. Trouble shooting, Maintaining& Repairing PCs", Bigelows, TMH

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16HS612) ENGINEERING MATHEMATICS-III
(Common to all branches)

II B.Tech. - I Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To train the students thoroughly in Mathematical concepts of Complex Analysis, Interpolation, Curve fitting, Numerical Differentiation and Integration and their applications
- To prepare students for lifelong learning and successful careers using mathematical concepts of Complex Analysis, Interpolation, Curve fitting, Numerical Differentiation and Integration and their applications
- To develop the skill pertinent to the practice of the mathematical concepts including the students abilities to formulate and modeling the problems, to think creatively and to synthesize information

Course Outcomes:

At the end of the course, students would be expected to:

- Have acquired ability to participate effectively in group discussions
- Have developed ability in writing in various contexts
- Have acquired a proper level of competence for employability
- Have acquired computational skills to solve real world problems in engineering

UNIT I

COMPLEX ANALYSIS-I: Analytic functions, Cauchy– Riemann equations, complex integration, Cauchy's theorem, Integral formula, Evaluation of Integrals.

UNIT II

COMPLEX ANALYSIS-II: Singularities, poles, Residues, Residues theorem, Evaluation of real integrals of the types $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$, $\int_{-\infty}^{\infty} e^{imx} f(x)dx$ - conformal mapping – Bilinear transformations- Transformation of e^z, Z^2, Sin z, and Cos z.

UNIT III

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: The Bisection Method, The Method of False Position, Newton-Raphson Method.

INTERPOLATION: Newton's forward and backward interpolation formula, Lagrange's interpolation formula.

UNIT IV

CURVE FITTING: Fitting of a straight line, Second degree curve, Exponential curve, Power curve by method of least squares.

NUMERICAL DIFFERENTIATION AND INTEGRATION: Trapezoidal rule, Simpson's 1/3 Rule, Simpson's 3/8 Rule.

UNIT V

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Solution by Taylor's series, Picard's Method of successive Approximations, Euler's Method, Runge-Kutta second and fourth order methods.

TEXT BOOKS:

1. *Higher Engineering Mathematics,* B.S.Grewal, Khanna publishers.
2. *Advanced Engineering Mathematics,* Peter V.O'Neil, CENGAGE publisher.

REFERENCES:

1. Engineering *Mathematics III* by T.K.V. Iyengar, S.Chand publications.
2. *Mathematical Methods* by T.K.V. Iyengar, S.Chand publications.
3. *Engineering Mathematics, Volume - III,* E. Rukmangadachari & E. Keshava Reddy Pearson Publisher.
4. *Advanced Engineering Mathematics* by M.C. Potter, J.L. Goldberg, Edward F.Aboufadel, and Oxford.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY(AUTONOMOUS)

(16EC401) BASIC ELECTRONIC DEVICES

II B. Tech. – I Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To give understanding on semiconductor physics of the intrinsic, p and n materials, characteristics of the p-n junction diode, applications of diode in electronic circuits, Characteristics of BJT, FET, MOSFET, characteristics of special purpose electronic devices.
- To familiarize students with DC biasing circuits of BJT, FET and analyzing basic transistor amplifier circuits.

Course Outcomes:

Upon completion of the course, students will:

- Analyze the operating principles of major electronic devices, its characteristics and applications.
- Design and analyze the DC bias circuitry of BJT and FET.
- Design and analyze basic transistor amplifier circuits using BJT and FET.

UNIT I

PN JUNCTION DIODE: Energy bands in intrinsic and extrinsic silicon; Carrier transport: diffusion current, drift current, mobility and resistivity; Generation and recombination of carriers; Poisson and continuity equations, Open circuited p-n junction, Biased p-n junction, current components in PN junction Diode, diode equation, V-I Characteristics, temperature dependence on V-I characteristics, Diode resistance, Diode capacitance, energy band diagram of PN junction Diode.

UNIT II

SPECIAL SEMICONDUCTOR DEVICES: Zener Diode: Breakdown mechanisms, applications, LED, LCD, Photo diode, Varactor diode, Tunnel Diode, DIAC, TRIAC, SCR, UJT , Photo transistor, IR Emitters, Solar cell, Schottky Barrier diode - Construction, operation and characteristics.

UNIT III

RECTIFIERS AND FILTERS: Basic Rectifier setup**,** half wave rectifier, full wave rectifier, bridge rectifier, characteristics of rectifiers, rectifier circuits-operation, input and output waveforms, Filters, Inductor filter, Capacitor filter, L- section filter, Π- section filter, Multiple L- section and Multiple Π section filter ,comparison of various filter circuits in terms of ripple factors.

UNIT IV

TRANSISTOR CHARACTERISTICS: BJT: Construction, transistor current components, transistor configurations, transistor as an amplifier, characteristics of transistor in Common Base, Common Emitter and Common Collector configurations, Ebers-Moll model of a transistor, punch through/ reach through, typical transistor junction voltage values.

FET: Types, JFET: construction, operation, characteristics, MOSFET: types, construction, operation, characteristics, comparison between JFET and MOSFET.

UNIT V

TRANSISTOR BIASING AND THERMAL STABILIZATION: Need for biasing, operating point, DC and AC load line analysis, BJT biasing- methods, , fixed bias, collector to base bias, self-bias, Stabilization against variations in V_{BE}, Ic, and β, Stability factors, (S, $S^{'}$, $S^{''}$), Bias compensation, Thermal runaway, Thermal stability. FET Biasing methods.

TEXT BOOKS:

1. *Electronic Devices and Circuits,* J. Millman, C. HalkiasTata Mc-Graw Hill, 4thEdition,2010.
2. *Electronic Devices and Circuits,* David A.Bell, Fifth Edition, Oxford University Press, 2009.
3. *Electronic Devices and Circuits,* R.L. Boylestad and Louis NashelskyPearson Publications,9thEdition,2006

REFERENCES:

1. *Integrated Electronics,* Jacob Millman, C. Halkies, C.D.Parikh, Tata Mc-Graw Hill, 2009.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC402) SWITCHING THEORY & LOGIC DESIGN

II B. Tech. – I Sem. (E.C.E)

L	T	C
3	1	3

Course Objectives:

- The Objective of this course is to familiarize the student with fundamental principles of digital design.
- Acquire the skills to manipulate and examine Boolean algebraic expressions, logical operations, Boolean functions and their simplifications.
- Acquaint with classical hardware design for both combinational and sequential logic circuits.

Course Outcomes:

- Ability to define different Number system and perform Number base conversions.
- Able to simplify the Boolean functions & design using Logic gates
- Understand the gate-level minimization techniques.
- Design sequential and combinational circuits.
- To understand and design memory systems like RAM, ROM, PLA, PAL

UNIT I

BINARY SYSTEMS: Digital Systems, Binary Numbers, Octal and Hexadecimal Numbers, Number Base Conversions, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated circuits.

UNIT II

GATE – LEVEL MINIMIZATION: The Map Method, Four Variable K-Map, Five-Variable K-Map, Product of Sums Simplification, Don‘t-Care Conditions, NAND and NOR Implementation, Other Two Level Implementations, EX-OR Function, Tabular Minimization method.

UNIT III

COMBINATIONAL LOGIC: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, De-Multiplexers.

UNIT IV

SYNCHRONOUS SEQUENTIAL LOGIC: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, Registers, Shift Registers, Ripple counters, Synchronous counters, Ring Counter and Johnson Counter.

UNIT V

FINITE STATE MACHINES AND PROGRAMMABLE MEMORIES: Introduction to FSM, Mealy and Moore models, State Reduction and State Assignment, Design procedure, Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic

TEXT BOOKS:

1. *Switching & Finite Automata theory* – Zvi Kohavi, TMH, 2nd Edition.
2. *Digital Design* – Morris Mano, PHI, 3rd Edition, 2006.
3. *Switching Theory and Logic Design*-A.Anand kumar, 2008, PHI

REFERENCES:

1. *An Engineering Approach to Digital Design* – Fletcher, PHI.
2. *Fundamentals of Logic Design* – Charles H. Roth, 5th Edition, 2004, Thomson Publications.
3. *Digital Logic Applications and Design* – John M. Yarbrough, 2006, Thomson Publications

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC403) SIGNALS AND SYSTEMS

II B. Tech. – I Sem. (E.C.E)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To study about signals and systems.
- To do analysis of signals & systems (continuous and discrete) using time domain & frequency domain methods.
- To understand the stability of systems through the concept of ROC.
- To know various transform techniques in the analysis of signals and systems.

Course Outcomes:

- For integral-differential equations, the students will have the knowledge to make use of Laplace transforms.
- For continuous time and Discrete Time signals the students will make use of Fourier transform and Fourier series.
- For discrete time signals the students will make use of Z transforms.
- The concept of convolution and correlation is useful for analysis in the areas of linear systems and communication theory.

UNIT I

INTRODUCTION TO SIGNALS AND SYSTEMS: Classification of signals – Periodic and Aperiodic, Energy and Power, Deterministic and Random, Complex exponential and Sinusoidal signals. Basic Signals, Operations on signals. Systems: Definition and Classification.

FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS: Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet‘s conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum. Discrete Time Fourier Series-Properties.

UNIT II

FOURIER TRANSFORMS: Deriving Fourier Transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms. Discrete Time Fourier Transform-Properties.

UNIT III

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, impulse response, Response of a linear system, linear time-invariant (LTI) system, linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems.

Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics.

SAMPLING: Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, Effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT IV

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and Frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT V

LAPLACE TRANSFORMS: Review of Laplace transforms (L.T), Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, Constraints on ROC for various classes of signals, Properties of L.T, relation between L.T, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

Z–TRANSFORMS: Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time signals, Concept of z-transform of a discrete sequence, Distinction between Laplace, Fourier and z-transforms, Region of convergence in z-transform, constraints on ROC for various classes of signals, Inverse z-transform, properties of z-transforms.

TEXT BOOKS:

1. *Signals, Systems & Communications* - B.P. Lathi, 2009,BS Publications.
2. *Signals and Systems* - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.

REFERENCES:

1. *Signals and Systems* – A. Ramakrishna Rao - 2008, TMH.
2. *Linear Systems and Signals* – B. P. Lathi, Second Edition, Oxford University press, 2008.
3. *Fundamentals of Signals and Systems* Michel J. Robert, MGH International Edition, 2008.
4. *Signals, Systems and Transforms* - C. L. Philips, J. M. Parr and Eve A. Riskin, Pearson education.3rd Edition

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC404) RANDOM SIGNAL AND STOCHASTIC PROCESSES

II B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To understand the concepts of a Random Variable and operations that may be performed on a single Random variable.
- To understand the concepts of Multiple Random Variables and operations that may be performed on Multiple Random variables.
- To understand the concepts of Random Process and Temporal & Spectral characteristics of Random Processes.

Course Outcomes:

- A student will able to determine the temporal and spectral characteristics of random signal response of a given linear system.

UNIT I

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, Bays' Theorem, Independent Events:
THE RANDOM VARIABLE: Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Raleigh, Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties.

UNIT II

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 III

RANDOM PROCESSES – TEMPORAL CHARACTERISTICS: The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationary and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide-Sense Stationary, (N-Order) and Strict-Sense Stationary, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-Correlation Function and its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

UNIT IV

RANDOM PROCESSES – SPECTRAL CHARACTERISTICS: The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, the Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

UNIT V

LINEAR SYSTEMS WITH RANDOM INPUTS: Random Signal Response of Linear Systems: System Response – Convolution, Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and Output, Band pass, Band-Limited and Narrowband Processes, Properties.

TEXT BOOKS:

1. *Random Variables & Random Signal Principles* Peyton Z. Peebles,"Probability,", TMH, 4th Edition,
2. *Probability, Random Variables and Stochastic Processes,* Athanasios Papoulis and Unnikrishna Pillai, PHI, 4th Edition, 2002.

REFERENCES:

1. *Communication Systems Analog & Digital* R.P. Singh and S.D. Sapre, TMH, 1995.
2. *Probability and Random Processes with Application to Signal Processing* Henry Stark and John W.Woods, Pearson Education, 3rd Edition.
3. *Probability Methods of Signal and System Analysis* George R. Cooper, Clave D. MC Gillem, Oxford, 3rd Edition, 1999.
4. *Statistical Theory of Communication* S.P. Eugene Xavier, Statistical Theory of Communication, New Age Publications, 2003.
5. *Signals, Systems & Communications* B.P. Lathi, , B.S. Publications, 2003.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16HS605) ENVIRONMENTAL STUDIES
(Common to CSE & EEE)

II B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- Students have got an idea about the importance of pollution free air, water, soil and food.
- They know about global environmental problems like Acid Rains, Global Warming, Green House Effects, Ozone layer depletion.
- To understand the impacts of developmental activities and mitigation measures along with the environmental policies and regulations.
- To recognize major concepts in environmental studies and demonstrate in-depth understanding the environment.

Course Outcomes:

- Based on this course, the Engineering Student will be able to understand/evaluate/develop technologies on the basis of Ecological principles and environmental regulations along with Legislation, Laws and Policies which in turn help in sustainable development.
- Take preventive measures to reduce air, water, soil pollutions and contaminants in food.
- Effectively carry out waste disposal at individual level.
- Involve in preservation of natural resources.

UNIT I

INTRODUCTION: Definition, Scope and Importance-Need for Public Awareness

NATURAL RESOURCES: Classification of resources-Forest resources: Use and over-exploitation, deforestation- Mining, dams and their effects on forests and tribal people – Water resources - Use and over utilization of surface and ground water- Floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources –Energy resources: Renewable and Non- Renewable sources of energy- Solar energy, Hydro electrical energy, Wind energy, Nuclear energy, etc.

UNIT II

ECOSYSTEMS: Concept of an ecosystem– structural features of ecosystem- Producers, Consumers and Decomposers–-Biogeochemical cycles- Ecological succession-Food chains, food webs and ecological pyramids – Energy flow in the ecosystem-Types of ecosystems (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems.

UNIT III

BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition, genetic, species and ecosystem diversity, Bio-geographical classification of India, India as a Mega-diversity

Nation, Hot spots of biodiversity, Value of biodiversity, threats to biodiversity, endemic, endangered and extinct species of India, In-Situ and Ex-situ conservation of biodiversity.

UNIT IV

ENVIRONMENTAL POLLUTION AND GLOBAL ENVIRONMENTAL ISSUES: Natural Disasters: Droughts, Floods, Cyclone, Landslides, Earthquake, Pollution episodes: Air pollution, Water pollution, Land pollution, Noise pollution, Automobile pollution and Nuclear pollution –Effects-Global warming, Acid Rain and Ozone layer depletion and controlling measures.

Global Environmental Issues: Population Growth, Urbanizations, Land Management, Water and Waste Water Management. Climate change and impacts on human environment

Solid Waste Management: causes, effects and control measures of Municipal solid wastes – E-waste and management, Role of an individual in prevention of pollution – pollution case studies.

UNIT V

ENVIRONMENTAL LEGISLATION, LAWS, POLICIES FOR SUSTAINABLE DEVELOPMENT: Environmental Legislation, Environmental Protection act – Air Prevention and Control of Pollution act–Water Prevention and control of Pollution act– Wildlife protection act – Forest conservation act – Municipal Solid Waste management, International conventions/Protocols : Earth summit, Kyoto protocol and Montreal Protocol. From Unsustainable to sustainable development, Role of NGO's for Sustainable development, Concepts of Green belt development, Role of IT in Environment-Remote Sensing and GIS methods for Sustainable development.

FIELD WORK: visit to a local area to document environmental assets-river forest grassland/hill, mountain and polluted sites (urban/rural/industrial/Agriculture) - study simple ecosystems (pond/river/hill slopes

TEXT BOOKS:

1. *A Text book on Environmental Sciences* by Kaushik A and Kaushik C P 5th edition, New age international publishers, 2015.
2. *Text Book of Environmental Science and Technology* by Anji Reddy M, BS Publications, 2007.

REFERENCES:

1. *Environmental Studies,* Anil Kumar and Arnab Kumar De, New Age International Publishers, New Delhi, 3rd Edition 2015.
2. *Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards*, R.K. Trivedi, Vol.I and II, Enviro Media.
3. *Environmental Studies* by Mukkanthi K, S.Chand Publishers, 2010.
4. *Environmental Studies-From Crisis to Cure*, Rajagopalan.R Oxford University Press, 2005.
5. *Text Book of Environmental Studies*, Erach Bharucha, University Grants Commission, University Press (India) Pvt.Ltd., Hyderabad, 2010.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC405) BASIC ELECTRONIC DEVICES LAB

II B. Tech -I Sem. (E.C.E.) **P C**
4 2

Course Objectives:

- This Lab provides the students to get an electrical model for various semiconductor devices. Students can find and plot V- I characteristics of all semiconductor devices. Student learns the practical applications of the devices.

Course Outcomes:

- Students able to learn electrical model for various semiconductor devices and learns the practical applications of the semiconductor devices

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCB s
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Low power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, SCR, UJT.
3. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - Study and Operation of CRO.

(For Laboratory examination – Minimum of 10 experiments)

1. Forward and Reverse bias characteristics of PN Junction diode
2. Zener diode characteristics and Zener as Voltage Regulator.
3. Input and Output characteristics of Transistor in CB Configuration.
4. Input and Output characteristics of Transistor in CE Configuration.
5. Half Wave Rectifier With and without filter.
6. Full wave Rectifier With and without filter.
7. FET characteristics
8. Measurement of h parameters of transistor in CB, CE, CC configurations
9. Frequency response of CE Amplifier.
10. Frequency response of CC Amplifier.
11. Frequency response of Common Source FET Amplifier.
12. SCR Characteristics.
13. UJT Characteristics.

Equipment required for Laboratories:

1. Regulated Power supplies (RPS) - 0-30v.
2. CROs - 0-20M Hz.
3. Function Generators - 0-1 M Hz.
4. Multimeters -
5. Decade Resistance and Capacitance Boxes
6. Electronic components
7. Micro Ammeters (Analog or Digital)- 0-20 μA, 0-50μA,0-100μA, 0-200μA.
8. Voltmeters (Analog or Digital) - 0-5V, 0-10V,0-25V.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC406) BASIC SIMULATION LAB

II B. Tech -I Sem. (E.C.E.)	**P**	**C**
	4	**2**

List of Experiments:

(Minimum of Twelve experiments to be conducted)

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 function.
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 or Sequence and Real and Imaginary Parts of Signal.
5. Convolution of Sequences.
6. Autocorrelation and Cross correlation of 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 Verify its Physical Realizability 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. Generation of Gaussian Noise (Real and Complex), Computation of its Mean, M.S.Values and its Skew, Kurtosis, and PSD, Probability Distribution Function.
13. Sampling Theorem Verification.
14. Removal of Noise by Auto Correlation / Cross correlation in a given signal corrupted by noise.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16CS503) DATA STRUCTURES THROUGH C
(AUDIT COURSE)

II B. Tech -I Sem. (E.C.E.) **L 3**

Course Objectives:

- Understand different data structures
- Understand searching and sorting techniques

Course Outcomes:

- At the end of the course, students will be able to:
- Design algorithms to implement various data structures.
- Understand and program stacks and list data structures.
- Write programs to implement different types of queues.
- Understand and make use of hash tables in applications like dictionary, spell checker etc.,
- Understand why height balanced trees are advantageous over other data structures.

UNIT I

INTRODUCTION AND OVERVIEW: One Dimensional array- Multi Dimensional array- pointer arrays. **Linked lists**: Definition- Single linked list- Circular linked list- Double linked list- Circular Double linked list- Application of linked lists.

UNIT II

STACKS: Introduction-Definition-Representation of Stack-Operations on Stacks-Applications of Stacks. **Queues**: Introduction, Definition- Representations of Queues-Various Queue Structures- Applications of Queues.

UNIT III

TREES: Basic Terminologies- Definition and Concepts- Representations of Binary Tree-Operation on a Binary Tree- Types of Binary Trees-Binary Search Tree, Heap Trees

GRAPHS: Introduction- Graph terminologies- Representation of graphs- Operations on Graphs- Application of Graph Structures: Shortest path problem- topological sorting.

UNIT IV

SORTING: Sorting Techniques- Sorting by Insertion: Straight Insertion sort- List insertion sort- Binary insertion sort- Sorting by selection: Straight selection sort- Heap Sort- Sorting by Exchange- Bubble Sort- Shell Sort- Quick Sort-Sorting by Mergin: Simple Merging-Binary Merge-Merge Sort.

UNIT V

SEARCHING: Linear Search Techniques: Linear Search with Array- Linear Search with Linked List- Linear Search with ordered list- Binary Search- Fibonacci Search.

TABLES: Hash Tables: Hashing Techniques- Collision Resolution Techniques- Closed Hashing- Open Hashing.

TEXT BOOKS:

1. *Classic Data Structures*, Second Edition by Debasis Samanta, PHI.
2. *Data Structures A Pseudo code Approach with C*, Second Edition by Richard F. Gilberg, Behrouz A. Forouzan, Cengage Learning.

REFERENCES:

1. *Fundamentals of Data Structures in C* – Horowitz, Sahni, Anderson-Freed, Universities Press, Second Edition.
2. *Outlines – Data Structures* – Seymour Lipschutz – McGrawHill- Revised First Edition.
3. *Data structures and Algorithms using C++*, Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC407) ELECTRONIC CIRCUITS ANALYSIS

II B. Tech -II Sem. (E.C.E.)

L	T	C
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Course Objectives:

- The aim of this course is to familiarize the student with the analysis of Small signal Amplifiers, Multistage amplifiers with compound connections, Feedback amplifiers, Oscillators, Power amplifiers and Tuned amplifiers.
- Design and Develop electronic circuits such as Feedback amplifiers, Oscillators, Power amplifiers and Tuned Amplifiers.
- To study and analyze the frequency response of amplifier circuits.

Course Outcomes:

Upon completion of this course, student will be able to:

- Analyze the frequency response of the BJT, FET amplifiers at low and high frequencies.
- Analyze and design multistage amplifiers with compound connections, feedback amplifiers, oscillators, power amplifiers and tuned amplifiers.

UNIT I

SMALL SIGNAL LOW FREQUENCY TRANSISTOR AMPLIFIER ANALYSIS

BJT: Transistor hybrid model, determination of h-parameters, conversion of h-parameters, generalized analysis of transistor amplifier model using h-parameters, Analysis of CB, CE and CC amplifiers using exact and approximate analysis, Analysis of CE Amplifier with emitter resistance, Emitter follower, and design of single stage RC coupled Amplifier. Comparison of transistor amplifier parameters.

FET: Analysis of Common Source and Common Drain Amplifier circuits at low frequencies.

UNIT II

SMALL SIGNAL HIGH FREQUENCY TRANSISTOR AMPLIFIER ANALYSIS

BJT: Transistor at High Frequencies, Hybrid- π Common Emitter transistor model, Hybrid π conductance's, Hybrid π capacitances, Validity of hybrid π model, determination of high-frequency parameters in terms of low-frequency parameters, CE short circuit current gain, Current gain with resistive load, Cut-off frequencies, Frequency Response and Gain Bandwidth product.

UNIT III

MULTISTAGE AMPLIFIERS: Classification of amplifiers, Methods of coupling**,** Cascade transistor amplifier and its analysis, Cascode amplifier, Darlington pair and its analysis, Boot-strap emitter follower, Effect of cascading on Bandwidth.

UNIT IV

FEEDBACK AMPLIFIERS: Feedback concept, types of feedback, feedback amplifier topologies, Characteristics of negative feedback amplifiers, Generalized analysis of feedback amplifiers, Performance comparison of feedback amplifiers, Analysis of Feedback Amplifiers.

OSCILLATORS: Principle of operation, Barkhausen Criterion, types of oscillators, Analysis of RC-phase shift and Wein bridge oscillators using BJT, Generalized analysis of LC Oscillators, Hartley and Colpitt's oscillators with BJT, Crystal oscillators, Frequency and amplitude stability of oscillators.

UNIT V

POWER AMPLIFIERS: Types, Class A large signal Amplifiers, Second harmonic Distortions, Higher order harmonic Distortion, Transformer Coupled Audio power amplifier-Efficiency, Class B Amplifiers, Efficiency, Complementary Symmetry push pull amplifier, Crossover Distortion, Class AB operation, Thermal stability and Heat sink.

TUNED AMPLIFIERS

Introduction, Small Signal Tuned Amplifier, Double Tuned Amplifiers, Effect of Cascading Single tuned amplifiers on Band width, Staggered tuned amplifiers, Stability of tuned amplifiers.

TEXT BOOKS:

1. *Integrated Electronics,* J. Millman and C.C. Halkias, McGraw-Hill, 1972.
2. *Electronic Circuit Analysis and Design* Donald A. Neaman, , McGraw Hill.
3. *Electronic Devices and Circuits* Salivahanan, N.Suresh Kumar, A. Vallavaraj, Tata McGraw Hill, Second Edition.

REFERENCES:

1. *Introductory Electronic Devices and Circuits* Robert T. Paynter, Pearson Education, 7th Edition
2. *Electronic Devices and Circuits* Robert L. Boylestad and Louis Nashelsky, TheoryPearson/Prentice Hall, 9th Edition, 2006.
3. *Micro Electronic Circuits* Sedra A.S. and K.C. Smith, Oxford University Press, 5th Edition.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC408) COMPUTER ORGANIZATION AND ARCHITECTURE

II B. Tech -II Sem. (E.C.E.)

L	T	C
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Course Objectives:

- To learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design
- To make the students understand the structure and behavior of various functional modules of a computer.
- To understand the techniques that computers use to communicate with I/O devices
- To study the concepts of pipelining and the way it can speed up processing.
- To understand the basic characteristics of multiprocessors

Course Outcomes:

- Ability to use memory and I/O devices effectively
- Able to explore the hardware requirements for cache memory and virtual memory
- Ability to design algorithms to exploit pipelining and multiprocessors

UNIT I

INTRODUCTION TO COMPUTER ORGANIZATION AND ARCHITECTURE: Basic Computer Organization – CPU Organization – Memory Subsystem Organization and Interfacing – I/O Subsystem Organization and Interfacing – A Simple Computer Levels of Programming Languages, Assembly Language Instructions, Instruction Set Architecture Design, A simple Instruction Set Architecture

UNIT II

CPU DESIGN AND COMPUTER ARITHMETIC: Instruction Cycle – Memory – Reference Instructions – Input/output and Interrupt – Addressing Modes – Data Transfer and Manipulation – Program Control.

COMPUTER ARITHMETIC: Addition and Subtraction – Multiplication Algorithms – Division Algorithms– Floating-Point Arithmetic Operations – Decimal Arithmetic unit.

UNIT III

REGISTER TRANSFER LANGUAGE AND DESIGN OF CONTROL UNIT

REGISTER TRANSFER: Register Transfer Language – Register Transfer – Bus and Memory Transfers – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations.

CONTROL UNIT: Control Memory – Address Sequencing – Micro program Example – Design of Control Unit.

UNIT IV

MEMORY AND INPUT/OUTPUT ORGANIZATION

MEMORY ORGANIZATION: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

INPUT/OUTPUT ORGANIZATION: Input-Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access (DMA).

UNIT V

PIPELINE AND MULTIPROCESSORS

PIPELINE: Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction Pipeline.
MULTIPROCESSORS: Characteristics of Multiprocessors – Interconnection Structures – Inter Processor Arbitration – Inter Processor Communication and Synchronization.

TEXT BOOKS:

1. *Computer Systems Organization and Architecture,* John D. Carpinelli, PEA, 2009.
2. *Computer Systems Architecture,* 3/e, M. Moris Mano, PEA, 2007.

REFERENCES:

1. *Computer Organization,* Carl Hamacher, Zvonks Vranesic, SafeaZaky, 5/e, MCG,2002.
2. *Computer Organization and Architecture,* 8/e, William Stallings, PEA, 2010.
3. *Computer Systems Architecture a Networking Approach,* 2/e, Rob Williams.
4. *Computer Organization and Architecture* Ghoshal, Pearson Education, 2011.
5. *Computer Organization and Architecture,* V. Rajaraman, T. Radakrishnan.
6. *Computer Organization and Design,* P. Pal Chaudhuri, PHI.
7. *Structured Computer Organization,* Andrew S. Janenbaum, Todd Austin.
8. *Computer Architecture* Parahmi, Oxford University Press.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC409) ELECTRO MAGNETIC THEORY AND TRANSMISSION LINES

II B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- Understanding and the ability to use vector algebra, and vector calculus.
- Proficiency in the use of vector identities, and various Coordinate systems & transformations.

Course Outcomes:

This course provides the foundational education in static electromagnetic fields, and time varying electromagnetic waves. Through lecture, and out-of-class assignments, students are provided learning experiences that enable them to:

- Analyze and solve the problems of electric and magnetic fields that vary with three dimensional spatial co-ordinates as well as with time.
- Become proficient with analytical skills for understanding propagation of electromagnetic waves in different media.
- Understand the concept of transmission lines & their applications.

UNIT I

ELECTROSTATICS-I: Coulomb‘s Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell‘s Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems.

ELECTROSTATICS-II: Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson‘s and Laplace‘s Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, Illustrative Problems.

UNIT II

MAGNETOSTATICS: Biot-Savart Law, Ampere‘s Circuital Law and Applications, Magnetic Flux Density, Maxwell‘s Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere‘s Force Law, Inductances and Magnetic Energy. Illustrative Problems.

UNIT III

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 IV

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, Illustrative 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 V

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 Distortionless and Minimum Attenuation, Loading - Types of Loading, Illustrative Problems.

TRANSMISSION LINES – II : Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, UHF Lines as Circuit Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations, Significance of Zmin and Zmax , Smith Chart – Configuration and Applications, Single and Double Stub Matching, Illustrative Problems.

TEXT BOOKS:

1. *Elements of Electromagnetics* – Matthew N.O. Sadiku, Oxford Univ. Press, 4th ed., 2008.
2. *Engineering Electromagnetics* – William H. Hayt Jr. and John A. Buck, TMH, 7th ed., 2006.

REFERENCES:

1. *Electromagnetic Waves and Radiating Systems* – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.
2. *Engineering Electromagnetics* – Nathan Ida, Springer (India) Pvt. Ltd., New Delhi, 2nd ed., 2005.
3. *Transmission Lines and Networks* – Umesh Sinha, Satya Prakashan,Tech. India Publications, 2001
4. *Fundamentals of Electromagnetics for Engineering* – Nannapaneni Narayana Rao, Pearson Edu. 2009.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC410) PULSE AND DIGITAL CIRCUITS

II B. Tech -II Sem. (E.C.E.)

L	T	C
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Course Objectives:

- To study various wave shaping circuits and their applications.
- To study different circuits that produce non-sinusoidal waveforms(multivibrators) and their applications
- To study various voltage time base generators and their applications.
- To study different logic families and their comparison.

Course Outcomes:

- Able to design different pulse circuits based on the above concepts.
- Ability to design different logic gates

UNIT I

LINEAR WAVESHAPING: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High Pass RC network as Differentiator, Low Pass RC network as integrator, attenuators and its applications as a CRO probe, RL and RLC circuits and their response for step input, Ringing circuit. Problem solving.

NON-LINEAR WAVE SHAPING: Diode clippers, Transistor clippers, Clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and Diode resistances into account, Clamping circuit theorem, practical clamping circuits, Effect of diode characteristics on clamping voltage, Synchronized Clamping.

UNIT II

SWITCHING CHARACTERISTICS OF DEVICES: Diode as a switch, piecewise linear diode characteristics, Diode Switching Times, Transistor as a switch, Transistor-Switching Times

MULTIVIBRATOR CIRCUITS: Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger circuit using BJT.

UNIT III

TIME BASE GENERATORS: General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor Miller-time base generator, Transistor Bootstrap time base generator, Transistor Current time base generators, Methods of linearity Improvements.

UNIT IV

SAMPLING GATES: Basic operating principles of sampling gates, Unidirectional and Bidirectional sampling gates, Four Diode Sampling Gate, Reduction of pedestal in gate circuits, Six Diode Gate, Application of Sampling Gates.

UNIT V

SYNCHRONIZATION AND FREQUENCY DIVISION: Pulse Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation Devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit.

REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS: AND, OR, & NOT gates using Diodes, and Transistors, DCTL, RTL. DTL, TTL, and CMOS Logic Families, and Comparison between the logic families.

TEXT BOOKS:

1. *Pulse, Digital and Switching Waveforms* Millman's– J.Millman,H.Taub and Mothiki S. Prakash Rao, 2nd Edition, 2008 TMH.
2. *Solid State Pulse Circuits*-David A. Bell, 4th edition, 2002 PHI.
3. *Integrated Electronics* – Jacob Millman, Christos C Halkias

REFERENCES:

1. *Pulse and Digital Circuits* – A. Anand Kumar, PHI, 2005.
2. *Fundamentals of Pulse and Digital Circuits* – Ronald J. Tocci, 3rd edition, 2008.
3. *Pulse Circuits* – Michel
4. *Wave Generation and Shaping* - L. Strauss.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EE212) ELECTRICAL TECHNOLOGY

II B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objective:

- Electrical Technology contains Single phase transformers, Induction motors, DC generators and motors which are widely used in industry are covered and their performance aspects will be studied.

Course Outcome:

- After going through this course the student gets a thorough knowledge on DC Motors & Generators, Transformers and Induction motors with which he/she can able to apply the above conceptual things to real-world problems and applications.

UNIT I

DC GENERATORS: D.C. Generators – Principle of Operation – Constructional Features – E. M.F Equation– Numerical Problems – Methods of Excitation – Separately Excited and Self Excited Generators – Build-Up of E.M.F - Critical Field Resistance and Critical Speed - Load Characteristics of Shunt, Series and Compound Generators- Applications

UNIT II

D.C. MOTORS: D.C Motors – Principle of Operation – Back E.M.F. –Torque Equation – Characteristics and Application of Shunt, Series and Compound Motors-Speed Control of D.C. Motors: Armature Voltage and Field Flux Control Methods. Three Point Starter-Losses – Constant & Variable Losses – Calculation of Efficiency - Swinburne's Test.

UNIT-III

SINGLE PHASE TRANSFORMERS: Single Phase Transformers - Constructional Details-Emf Equation - Operation on No Load and on Load - Phasor Diagrams-Equivalent Circuit - Losses and Efficiency-Regulation-OC and SC Tests – Sumpner's Test - Predetermination of Efficiency and Regulation.

UNIT IV

3-PHASE INDUCTION MOTORS: Polyphase Induction Motors-Construction Details of Cage and Wound Rotor Machines- - Principle of Operation – Slip- Rotor Emf and Rotor Frequency - Torque Equation- Torque Slip Characteristics.

UNIT V

SYNCHRONOUS MACHINES: Principle And Constructional Features of Salient Pole and Round Rotor Machines – E.M.F Equation- Voltage Regulation by Synchronous Impedance Method- Theory of Operation of Synchronous Motor.

OUTCOME: After going through this course the student gets a thorough knowledge on DC Motors & Generators, Transformers and Induction motors with which he/she can able to apply the above conceptual things to real-world problems and applications.

TEXT BOOKS:

1. *Electric Machines* –by I.J.Nagrath & D.P.Kothari,Tata Mc Graw Hill, 7th Edition.2005
2. *Basic Electrical Engineering* –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

REFERENCES:

1. *Electrical and Electronic Technology*, Hughes, Pearson Education.
2. *Electrical Machines*, P. S. Bimbhra, Khanna Publishers, 2011.
3. *Basic Electrical Engineering*, 2nd Edition, V.N. Mittle and Aravind Mittal, Mc Graw hill Education, 2006.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC412) ELECTRONIC CIRCUIT ANALYSIS LAB

II B. Tech -II Sem. (E.C.E.)

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Course Objectives:

- Help students make transition from analysis of electronic circuits to design of electronic circuits.
- To understand the Analysis of transistor at high frequencies.
- To understand the concept of designing of tuned amplifier.
- The student will construct and analyze voltage regulator circuits.
- To understand the circuit configuration and the principle operation of converters, including diode rectifiers, controlled AC-DC converters and DC choppers

Course Outcomes:

- The ability to analyze and design single and multistage amplifiers at low, mid and high frequencies.
- Designing and analyzing the transistor at high frequencies.
- Determine the efficiencies of power amplifiers.
- Determine Frequency response and design of tuned amplifiers.
- Able to Analyze all the circuits using simulation software and Hardware.

List of Experiments (12 experiments to be done):

I) DESIGN AND SIMULATION IN SIMULATION LABORATORY USING ANY SIMULATION SOFTWARE.
(Minimum of 6 Experiments):

1. Common Emitter Amplifier
2. Common Source Amplifier
3. A Two Stage RC Coupled Amplifier.
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. High Frequency Common base (BJT) / Common gate (JFET) Amplifier.

II) TESTING IN THE HARDWARE LABORATORY (6 EXPERIMENTS)
Any three circuits simulated in simulation laboratory

Any Three of the following
Class A Power Amplifier (with transformer load)
Class C Power Amplifier
Single Tuned Voltage Amplifier
Hartley & Colpitt‘s Oscillators.
Darlington Pair.
MOSFET Amplifier.

III) EQUIPMENTS REQUIRED FOR LABORATORIES
For software simulation of Electronic circuits
Computer Systems with latest specifications.
Suitable Simulations software.
For Hardware simulations of Electronic Circuits.
Regulated Power Supply (0-30V)
CRO‘s.
Functions Generators.
Multimeters.
Components.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC413) PULSE & DIGITAL CIRCUITS LAB

II B. Tech -II Sem. (E.C.E.)

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Course Objectives:

- To generate Different types of non-sinusoidal signals.
- To generate and processing of non-sinusoidal signals.
- To learn about Limiting and storage circuits and their applications.
- To learn about Different synchronization techniques, basics of different sampling gates and their uses.
- To obtain Basics of digital logic families.

Course Outcomes:

- Student understands the various design and analysis to generate various types of signals.
- Student can design various digital circuits based on the application and specifications.

Minimum Twelve experiments to be conducted:

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clamper's.
4. Transistor as a switch.
5. Study of Logic Gates & Some applications.
6. Study of Flip-Flops & some applications.
7. Sampling Gates.
8. Astable Multivibrator.
9. Monostable Multivibrator.
10. Bistable Multivibrator.
11. Schmitt Trigger.
12. UJT Relaxation Oscillator.
13. Bootstrap sweep circuit.
14. Constant Current Sweep Generator using BJT.

Equipment required for Laboratories:

1.	RPS	-	0 -- 30 V
2.	CRO	-	0 -- 20 MHz
3.	Function Generators	-	0 – 1 MHz
4.	Components		
5.	Multi Meters		

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EE213) ELECTRICAL TECHNOLOGY LAB

II B.Tech -II Sem. (E.C.E.)

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All Experiments should conduct

1. Magnetization Characteristics of D.C.Shunt Generator. Determination of Critical Field Resistance.
2. Swinburne's Test on DC Shunt Machine (Predetermination of Efficiency of a Given DC Shunt Machine Working as Motor and Generator).
3. Brake Test on DC Shunt Motor. Determination of Performance Characteristics.
4. OC & SC Tests on Single-Phase Transformer (Predetermination of Efficiency and Regulation at Given Power Factors and Determination of Equivalent Circuit).
5. Load Test on Single Phase Transformer.
6. Z & Y parameters of two port network.
7. Transmission and hybrid parameters.
8. Measurement of Active Power for Star and Delta Connected Balanced Loads.
9. Measurement of Reactive Power for Star and Delta Connected Balanced Loads.
10. Measurement of three phase power by two wattmeter method for balanced & unbalanced Loads.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

(16HS614) COMPREHENSIVE SOFT-SKILLS

(AUDIT COURSE)
(Common to All Branches)

II B. Tech -II Sem. (E.C.E.)	**L**	**P**	**C**
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Course Description:
Soft Skills is an intangible idea in which the qualities like attitude, ability, integrity, reliability, positivity, flexibility, dependability, punctuality, management, cooperation, habits and practices are combined proficiently to capitalize on a person's work efficacy. Soft Skills do the work of combining all these components in accurate share into skills and shaping them into competencies. Companies opt for, maintain and prop up persons, who are trustworthy, ingenious, principled and good communicators and who are prepared to work under stress. These lessons are developed with a view to create awareness of the importance of the soft skills and assist the learners to improve them.

Course Objectives:
The main objectives of this course are:
- To help the students understand interpersonal skills.
- To support them in building interpersonal skills.
- To enhance the ability to work with others.

Course Outcomes:
- To know the importance of Soft Skills.
- To apply Soft Skills in the different environment.
- To enrich the different levels of Soft Skills to develop their personality.

UNIT I
Non verbal Communication – Body Cues – Smiling, Posture, Gesture, Eye-contact – Stage appearance – Interpersonal and Intrapersonal skill Telephonic Etiquette – Dos and Don'ts of Telephonic Conversation

UNIT II
Self exploration – Self Discovery – Self acceptance – Self esteem – Self confidence – Personal grooming – Attitudes – Confidence building. Interpersonal relationship in the present context – Kinds of relationships – Team building – Formation of team

UNIT III
Vision and Goal setting – Personal goal – Career goal – Types of Organization – Deep dive of company profiles – Win-win situation – Proactive skills – Entrepreneurial skills and model

start-ups- Developing Mind skills – quizzes – General knowledge – Puzzles – Reading Comprehension - Spell Bee - Seminar – Who is who? – Biographies

UNIT IV

Flight Leadership: Assessing Leadership qualities – Experiential learning of leadership skills exercise in team work Time and Stress Management: Importance of Time Management – The art of prioritizing and scheduling – Stress and Source of Stress Types of Stress – Managing stress

UNIT V

Change: Coping skills – Critical and Adaptive Mindsets – Changes in Career/ Life/ people – Just A Minute – Mock GDs and Mock Interviews

REFERENCES:

1. *Business Communication* ,Aruna Koneru
2. *Effective Tech Communication*, Rizvi, Tata McGraw – Hill Education, 2007.
3. *Reading Extra*, Liz Driscoll, Cambridge University Press, 2004.
4. *Speak Well*, Jayashree Mohanraj et al, Orient Blackswan, 2013.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC415) Analog Communications

III B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- To study the fundamental concepts of the analog communication system.
- To analyze various analog modulation and demodulation techniques.
- To know the working of various transmitters and receivers.
- To understand the influence of noise on the performance of analog communication systems, and to acquire the knowledge about information and capacity.

Learning Outcomes:

This course provides the foundational education in Analog Communication systems, and applications. The students are provided the learning experience through class room teaching and solving assignment & tutorial problems. At the end of course, students should be able to:

- Acquire knowledge on the basic concepts of Analog Communication Systems.
- Analyze the analog modulated and demodulated systems.
- Verify the effect of noise on the performance of communication systems.
- Know the fundamental concepts of information and capacity.

UNIT- I

Introduction: Elements of communication systems, Modulation, Modulation Methods and its need, Frequency mixer, EM Spectrum and its Applications.

Amplitude Modulation & Demodulation: DSB-FC(AM)modulation& its demodulation, Generation of AM signals, sideband and carrier power of AM, Double sideband suppressed carrier (DSB-SC) modulation & its demodulation, Single sideband (SSB) transmission, Time domain representation of SSB signals & their demodulation schemes (with carrier, and suppressed carrier), Generation of SSB signals, Features of Vestigial sideband (VSB)modulation, Comparison of various amplitude modulation techniques, AM Transmitters, Illustrative Problems.

UNIT- II

Angle Modulation & Demodulation: Concept of instantaneous frequency, Generalized concept of angle modulation, Bandwidth of angle modulated waves – Narrow band frequency modulation (NBFM) and Wide band FM (WBFM), Phase modulation, Generation of FM waves – Indirect method, Direct method. Demodulation of FM, Pre-emphasis& De-emphasis filters, Non-linear effects in FM systems, FM Transmitter, Illustrative Problems.

UNIT- III

Noise in Communication Systems: Types of noise, Time domain representation of narrowband noise, filtered white noise, Quadrature representation of narrowband noise, Envelope of narrowband noise plus sine wave, Noise equivalent bandwidth, Effective noise temperature, and Noise figure. Performance analysis (i.e. finding SNR expression) of AM, DSB-SC, SSB-SC, FM, PM in the presence of noise, Illustrative Problems.

UNIT- IV

Analog pulse modulation schemes: Pulse amplitude modulation – Natural sampling, flat top sampling, Sampling theorem and its reconstruction. Pulse amplitude modulation (PAM) & demodulation, synchronization in PAM modulation.

Pulse-Time Modulation – Pulse Duration and Pulse Position modulations, and demodulation schemes, Illustrative Problems.

UNIT- V

Radio Receivers &Information theory: Sensitivity, Selectivity, and Fidelity. Super-heterodyne AM & FM receivers.

Multiplexing systems: Quadrature amplitude modulation (QAM), Frequency division multiplexing (FDM), Time division multiplexing(TDM).

Information theory: Introduction, Information content of message, Entropy, mutual information, and channel capacity theorem, Shannon's encoding algorithm.

Text books:

1. Simon Haykin, "Communication Systems", Wiley-India edition, 2nd edition, 2010.
2. A. Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.

References:

1. Herbert Taub& Donald L.Schilling, "Principles of Communication Systems", Tata McGraw-Hill, 3rd Edition, 2009.
2. R.E. Ziemer& W.H. Tranter, "Principles of Communication-Systems Modulation & Noise", Jaico Publishing House, 2001.
3. George Kennedy and Bernard Davis, "Electronics & Communication System", TMH, 2004.
4. Wayne thomasi "Electronic communication systems fundamentals through advanced",4th edition.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC416) Electronic Measurements and Instrumentation

III B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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***Course Objectives*:**

- Studies on various analyzers and signal generators and can analyze the frequency component of a wave generated and its distortion levels.
- Studies on the difference between the various parameters which are to be measured that are getting out from the different sensors.

***Course Outcomes*:**

- After the completion of the course the students will be able to understand basic principles involved in the meters for measuring voltage, current, resistance, frequency and so on.
- Employ CRO for measuring voltage, current, resistance, frequency and so on.
- Understand principles of measurements associated with different bridges.
- Get complete knowledge regarding working of advanced instruments such as logic analyzers and spectrum analyzers.

UNIT-I

Performance characteristics of Instruments: Static characteristics, Accuracy, Precision, Resolution, Sensitivity, static and dynamic calibration, Errors in Measurement, and their statistical analysis, dynamic characteristics-speed of Response, fidelity, Lag and dynamic error. DC ammeters, DC voltmeters-multirange, range extension/solid state and differential voltmeters, AC voltmeters –multirange, range extension. Thermocouple type RF ammeter, ohm meters, series type, shunt type, multimeter for voltage, current and resistance measurements.

UNIT-II

Oscilloscopes: Standard specifications of CRO,CRT features, derivation of deflection sensitivity, vertical and horizontal amplifiers, horizontal and vertical deflection systems, sweep trigger pulse, delay line, sync selector circuits, probes for CRO – active, passive, and attenuator type, triggered sweep CRO, and Delayed sweep, dual trace/beam CRO, Measurement of amplitude, frequency and phase (Lissajous method).Principles of sampling oscilloscope, storage oscilloscope, and digital storage oscilloscope, Digital frequency counters, time & Period measurements.

UNIT-III

Signal generators-fixed and variable, AF oscillators, function generators, pulse, random noise, sweep, and arbitrary waveform generators, their standards, specifications and principles of working (Block diagram approach).Wave analyzers, Harmonic distortion analyzers, Spectrum analyzers, and Logic analyzers.

UNIT-IV

Review of DC Bridges: Wheatstone bridge, Wein Bridge, errors and precautions in using bridges, AC bridges: Measurement of inductance-Maxwell’s bridge, Anderson Bridge.

Measurement of capacitance- Schearing Bridge.Kelvin Bridge, Q-meter, EMI and EMC, Interference and noise reduction techniques.

UNIT-V

Sensors and Transducers - Active and passive transducers: Measurement of displacement (Resistance, capacitance, inductance; LVDT) Force (strain gauges) Pressure (piezoelectric transducers) Temperature (resistance thermometers, thermocouples, and thermistors), Velocity, Acceleration, Vibration, pH measurement Signal Conditioning Circuits.

TEXT BOOKS:

1. A.D. Helfrick and W.D.Cooper, "Modern Electronic Instrumentation and Measurement Techniques", PHI, 5th Edition, 2002.
2. H.S.Kalsi, "Electronic instrumentation", second edition, Tata McGraw Hill, 2004.
3. K. Lal Kishore, "Electronic Measurements & Instrumentations", Pearson Education, 2009.

REFERENCES:

1. H.S.Kalsi, "Electronic instrumentation", second edition, Tata McGraw Hill, 2004.
2. Ernest O Doebelin and Dhanesh N Manik, "Measurement Systems Application and Design", TMH, 5th Edition, 2009.
3. Oliver and Cage, "Electronic Measurement and Instrumentation", TMH.
4. Robert A.Witte, "Electronic Test Instruments, Analog and Digital Measurements", Pearson Education, 2nd Ed., 2004.
5. David A. Bell, "Electronic Instrumentation & Measurements", PHI, 2nd Edition, 2003.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC417) Linear IC Applications

III B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- To study the architecture of Op-Amp.
- To study and design various linear applications of Op-Amp.
- To study and design various nonlinear applications of Op-Amp.

Course Outcomes:

- Understand the basic building blocks of linear integrated circuits and its characteristics.
- Analyze the linear, non-linear and specialized applications of operational amplifiers.
- Understand the theory of ADC and DAC.
- Realize the importance of Operational Amplifier.

UNIT – I

Differential Amplifiers: Introduction to Differential amplifier configurations, Balanced and unbalanced output differential amplifiers, current mirror, level Translator.

Operational amplifiers: Introduction, Block diagram, Ideal Op-Amp & Characteristics, Equivalent Circuit, Voltage Transfer curve, open loop op-amp configurations, Virtual Ground Concept, Introduction to dual Op-Amp TL082 as a general purpose JFET-input Operational Amplifier.

UNIT-II

Feedback Amplifiers: Introduction, feedback configurations, voltage series feedback, voltage shunt feedback and differential amplifiers, Practical op-amp& Characteristics.

Frequency response: Introduction, compensating networks, frequency response of internally compensated op-amps and non-compensated op-amps, High frequency op-amp equivalent circuit, open loop gain Vs frequency, closed loop frequency response, circuit stability, slew rate.

UNIT-III

Linear Applications: DC and AC amplifiers, Peaking Amplifier, Summing, Scaling and Averaging Amplifiers, Analog Multipliers, Instrumentation Amplifier, Voltage to Current Converter, Current to Voltage Converter, Integrator, Differentiator.

Active Filters: First, Second and Third order Butterworth filter and its frequency responses, Tow-Thomas biquad filter.

UNIT-IV

Non-Linear Applications: Oscillators, Phase shift and Wein-bridge oscillators, Square, triangular and sawtooth wave generators, Comparators, zero crossing detector, Schmitt trigger, characteristics and limitations.

Specialized applications: 555 timer IC: Monostable& Astable operation & its applications, PLL, operating principles, Monolithic PLL, applications, analog multiplier and phase detection, Wide bandwidth precision analog multiplier MPY634 and its applications.

UNIT V

Converters: Analog and Digital Data Conversions, D/A converter – specifications – weighted resistor type, R-2R Ladder type, Voltage Mode and Current-Mode R - 2R Ladder types - switches for D/A converters, high speed sample-and-hold circuits, A/D Converters – specifications – Flash type – Successive Approximation type – Single Slope type – Dual Slope type, Over-sampling A/D Converters.

TEXT BOOKS:

1. D. Roy Chowdhury, "Linear Integrated Circuits", New Age International (p) Ltd,2nd Edition, 2003.
2..Ramakanth A. Gayakwad, "Op-Amps & Linear ICs", PHI,3rd& 4th edition, 1987.

REFERENCES:

1.K.LalKishore,"Operational Amplifiers and Linear Integrated Circuits", Pearson Education,2007.
2.R.F.Coughlin& Fredrick Driscoll, "Operational Amplifiers & Linear Integrated Circuits", 6th Edition, PHI.
3.David A. Bell, "Operational Amplifiers & Linear ICs", Oxford University Press, 2nd edition, 2010.
4.Kamal PrakashPandey& Chandra Bhan, "Integrated Circuits", Educational & Technical Publications, 2013.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC418) Antennas & Wave Propagation

III B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- Fundamentals of electromagnetic radiation: Maxwell's equations, potential functions, wave equation, retarded potential, short current element, near and far fields, Poynting's theorem.
- Design of antenna arrays: principle of pattern multiplication, broadside and end fire arrays, array synthesis, coupling effects and mutual impedance, parasitic elements, Yagi-Uda antenna.

Course Outcomes*:*

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

- Approximate parametric equations for the calculation in the far field region.
- Write parametric integral expressions for a given current source.
- Calculate electromagnetic fields for a given vector potential.
- Discover pattern multiplication principle for array antennas.

UNIT - I

Antenna Basics & Dipole antennas: Introduction, Basic antenna parameters- patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity-Gain-Resolution, Antenna Apertures, Effective height, Fields from oscillating dipole, Field Zones, Shape- Impedance considerations, Polarization – Linear, Elliptical, & Circular polarizations, Antenna temperature, Antenna impedance, Front–to-back ratio, Antenna theorems, Radiation – Basic Maxwell's equations, Retarded potential-Helmholtz Theorem, Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Field Components, Radiated power, Radiation Resistance, Beam width, Natural current distributions, far fields and patterns of Thin Linear Center-fed Antennas of different lengths, Illustrative problems.

UNIT- II

VHF, UHF and Microwave Antennas -I: Loop Antennas - Introduction, Small Loop, Comparison of far fields of small loop and short dipole, Radiation Resistances and Directives of small and large loops (Qualitative Treatment), 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: Micro strip Antennas- Introduction, features, advantages and limitations, Rectangular patch antennas- Geometry and parameters, characteristics of Micro strip antennas, Impact of different parameters on characteristics, reflector antennas - Introduction, Flat sheet and corner reflectors, parabola reflectors-geometry, pattern characteristics, Feed Methods, Reflector Types - Related Features, Lens

Antennas - Geometry of Non-metallic Dielectric Lenses, Zoning , Tolerances, -Applications, Illustrative Problems.

UNIT- IV

Antenna Arrays: Point sources - Definition, Patterns, arrays of 2 Isotropic sources- Different cases, Principle of Pattern Multiplication, Uniform Linear Arrays – Broadside Arrays, End-fire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison, BSA with Non-uniform Amplitude Distributions – General considerations and Binomial Arrays, Illustrative problems.

Antenna Measurements: Introduction, Concepts- Reciprocity, Near and Far Fields, Coordination system, sources of errors, Patterns to be Measured, Pattern Measurement Arrangement, Directivity Measurement , Gain Measurements (by comparison, Absolute and 3-Antenna Methods).

UNIT – V

Wave Propagation: Introduction, Definitions, Characterizations and general classifications, different modes of wave propagation, Ray/Mode concepts, Ground wave propagation (Qualitative treatment) - Introduction, Plane earth reflections, Space and surface waves, wave tilt, curved earth reflections, Space wave propagation - Introduction, field strength variation with distance and height, effect of earth's curvature, absorption, Super refraction, scattering phenomena, tropospheric propagation, fading and path loss calculations, Sky wave propagation - Introduction, structure of Ionosphere, refraction and reflection of sky waves by Ionosphere, Ray path, Critical frequency, MUF, LUF, OF, Virtual height and Skip distance, Relation between MUF and Skip distance, Multi-HOP propagation, Energy loss in Ionosphere, Summary of Wave Characteristics in different frequency ranges, Illustrative problems.

TEXT BOOKS:

1. John D. Kraus and Ronald J. Marhefka and Ahmad S.Khan, "Antennas and wave propagation," TMH, New Delhi, 4th Ed., (special Indian Edition), 2010.
2. C.A. Balanis, "Antenna Theory- Analysis and Design," John Wiley & Sons, 2ndEdn. 2001.

REFERENCES:

1. K.D. Prasad, SatyaPrakashan, "Antennas and Wave Propagation," Tech. India Publications, New Delhi, 2001.
2. E.C. Jordan and K.G. Balmain, "Electromagnetic Waves and Radiating Systems," PHI, 2ndEdn, 2000.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EE216) Linear Control Systems

	L	T	C
III B. Tech. - I Sem. (ECE)	**3**	**1**	**3**

COURSE OBJECTIVES:

To make the students learn about: Merits and demerits of open loop and closed loop systems; the effect of feedback. The use of block diagram algebra and Mason's gain formula to find the effective transfer function. Transient and steady state response, time domain specifications. The concept of Root loci. Frequency domain specifications, Bode diagrams and Nyquist plots. The fundamental aspects of modern control.

COURSE OUTCOMES:

After completing the course, the student should be able to do the following:

.• Evaluate the effective transfer function of a system from input to output using (i) block diagram reduction techniques (ii) Mason's gain formula.

• Compute the steady state errors and transient response characteristics for a given system and excitation.

• Determine the absolute stability and relative stability of a system.

• Draw root loci.

• Design a compensator to accomplish desired performance.

• Derive state space model of a given physical system and solve the state equation.

UNIT - I

CONTROL SYSTEMS CONCEPTS

Introduction to linear Control Systems, Classification of control systems - Open Loop and closed loop control systems, merits and demerits, effects of feedback control systems.

Mathematical models – Definition and properties of transfer function, mechanical, electrical systems and electro mechanical systems, electrical analogous systems. Block diagram reduction methods, signal flow graph, Mason's gain formula- DC servo motor, AC servo motor, synchro pair and its applications.

UNIT- II

TIME RESPONSE ANALYSIS

Introduction- Standard test input signals – Time response of first and second order systems - Time domain specifications, Characteristic Equation of Feedback control systems, Transient and steady state response of second order systems- Error constants, Steady state error and genialized error constants– Introduction to controllers - proportional, integral and derivative Controllers.

UNIT-III

STABILITY ANALYSIS IN CONTROL SYSTEMS

The concept of stability – Routh's and Hurwiz stability criterion – difficulties in the formation of Routh table and problems. The Root Locus concept, Rules of Root Locus, construction of root loci-effects of adding poles and zeros of G(s)H(s) on the root loci.

UNIT-IV

FREQUENCY RESPONSE ANALYSIS

Introduction, Frequency domain specifications, Determination of Frequency domain specifications-Frequency response plots- Polar plots, Nyquist Plots, Bode Plots, Gain margin and Phase margin – Stability Analysis.

Compensation Networks –Introduction to Compensation networks, Types of compensators-Lead, Lag and Lead-Lag Compensators.

UNIT-V

STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS

Concepts of state, state variables and state model, derivation of state models from physical systems, diagonalization, solution of state equations - state transition matrix and it's properties. Concept of controllability and observability and problems.

TEXT BOOKS:

1.Control Systems Engineering byI. J. Nagrath and M. Gopal.New Age International Limited, Publishers, 2nd edition. 2008

2.*Control Systems* by A. Anand Kumar, Eastern Economy Edition -PHI learning Private Ltd. 2011.

REFERENCE BOOKS:

1. *Control Systems Engineering* by Norman S. Nise John wiley & sons, inc. 6th Edition. 2011.

2.*Control Systems* by A. NagoorKani, RBA Publications, Second Edition, 2009.

3. *Automatic Control Systems* by B. C. Kuo, John wiley and son's. 8th edition 2003

4. *Modern Control Engineering* by Katsuhiko Ogata ,Prentice Hall of India Pvt. Ltd., 5th edition, 2010.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16MB750) Managerial Economics & Financial Analysis

III B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objective:

The objective of this course is to equip the student with the basic inputs of Managerial Economics and Economic Environment of business and to enrich analytical skills in helping them take sound financial decisions for achieving higher productivity.

Course Outcome*:*

The thorough understanding of Managerial Economics and Analysis of Financial Statements facilitates the Technocrats – cum – Entrepreneurs to take-up decisions effectively and efficiently in the challenging Business Environment.

UNIT I

Introduction To Managerial Economics: Managerial Economics - Definition, nature and scope – contemporary importance of Managerial Economics - Demand Analysis: Determinants- Law of Demand - Elasticity of Demand. Significance – types – measurement of elasticity of demand - Demand forecasting- factors governing demand forecasting- methods of demand forecasting –Relationship of Managerial Economics with Financial Accounting and Management.

UNIT II

Theory of Production And Cost Analysis: Production Function – Short-run and long- run production - Isoquants and Isocosts, MRTS, least cost combination of inputs - Cobb-Douglas production function - laws of returns - Internal and External economies of scale - **Cost Analysis**: Cost concepts - Break-Even Analysis (BEA) - Managerial significance and limitations of BEA - Determination of Break Even Point (Simple Problems)

UNIT III

Introduction To Markets And New Economic Environment: Market structures: Types of Markets - Perfect and Imperfect Competition - Features, Oligopoly - Monopolistic competition. Price-Output determination - Pricing Methods and Strategies. Forms of Business Organization – Sole Proprietorship- Partnership – Joint Stock Companies – Public Sector Enterprises – New Economic Environment- Economic systems – Economic Liberalization – Privatization and Globalization

UNIT IV

Capital And Capital Budgeting: Concept of Capital - Over and Under capitalization – Remedial measures - Sources of Short term and Long term capital - Estimating Working Capital requirement – Capital budgeting – Features of Capital budgeting proposals – Methods and Evaluation of Capital budgeting – Pay Back Method – Accounting Rate of Return (ARR) – Net Present Value (NPV) – Internal Rate Return (IRR) Method (simple problems)

UNIT V

Introduction To Financial Accounting And Analysis: Financial Accounting – Concept - emerging need and importance - Double-Entry Book Keeping-Journal - Ledger – Trial Balance - Financial Statements - - Trading Account – Profit & Loss Account – Balance Sheet (with simple adjustments). Financial Analysis – Ratios – Techniques – Liquidity, Leverage, Profitability, and Activity Ratios (simple problems).

Text Books:

1. Aryasri: "Managerial Economics and Financial Analysis", 4/e, TMH, 2009.
2. Varshney&Maheswari: "Managerial Economics", Sultan Chand, 2009.

Reference Books:

1. Premchand Babu, MadanMohan": Financial Accounting and Analysis",Himalaya, 2009
2. S.A. Siddiqui and A.S. Siddiqui: "Managerial Economics and Financial Analysis", New Age International,. 2009.
3. Joseph G. Nellis and David Parker: "Principles of Business Economics", Pearson, 2/e, New Delhi.
4. Domnick Salvatore: "Managerial Economics in a Global Economy", Cengage, 2009.
5. H.L.Ahuja: "Managerial Economics", S.Chand, 3/e, 2009

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC419) Analog Communications Lab

III B. Tech –I Sem. (E.C.E.) **P** **C**
4 **2**

***Course Outcomes*:**
After completion of the course the students will be able

- To experience real time behavior of different analog modulation schemes
- Technically visualize spectra of different analog modulation schemes
- Analyze practical behavior of different elements available in analog communication system such as filters, amplifiers etc.
- Measure characteristics of radio receiver measurements.

List of Experiments: (All Experiments are to be conducted)

1. Amplitude modulation and demodulation.
2. Frequency modulation and demodulation.
3. Phase modulation and demodulation.
4. Characteristics of Mixer.
5. Pre-emphasis & de-emphasis
6. Pulse amplitude modulation & demodulation.
7. Pulse width modulation & demodulation
8. Pulse position modulation & demodulation.
9. Radio receiver measurements – sensitivity selectivity and fidelity.
10. Time division multiplexing

Equipment required for the Laboratory:

1. Regulated Power Supply equipment's 0 – 30 V
2. CROs 0 – 20 M Hz.
3. Function Generators 0 – 3 M Hz
4. Multimeters
5. Required electronic components (active and passive) for the design of experiments.
6. Radio Receiver Demo kits or Trainers.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC420) Linear IC Applications Lab

III B. Tech –I Sem. (E.C.E.)	**P**	**C**
	4	**2**

Minimum Twelve Experiments to be conducted:

1. Study the characteristics of Negative feedback amplifier
2. Op-Amp Applications – Adder, Subtractor Circuits.
3. Instrumentation Amplifier.
4. Active Filter Applications – LPF, HPF (first order).
5. Integrator and Differentiator
6. Comparator –Applications
7. Schmitt Trigger
8. Notch filter.
9. Automatic Gain Control (AGC).
10. Low Drop out (LDO) Regulator.
11. Function Generator using Op-Amp.
12. IC 555 Timer – Monostable and Astable Operation Circuit.
13. IC 566 – VCO Applications.
14. Wein bridge oscillator
15. 4 Bit DAC using Op-Amp.

Equipment required for Laboratories:

1. RPS
2. ASLK Pro Kit
3. CRO
4. Function Generator
5. Multi Meters
6. IC Trainer Kits (Optional)
7. Bread Boards
8. Components: - ICTL082, IC555, IC566, IC 565 and other essential components.
9. Analog IC Tester

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS616) Aptitude Practice-I

III B. Tech –I Sem. (E.C.E.) **L 3**

***Course Objectives*:**
After thorough learning of Quantitative Aptitude and Reasoning, a student:

- Will be able to critically evaluate various real life situations by resorting to Analysis of key issues and factors.
- Will be able to read between the lines and understand various language structures.
- Will be able to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

***Course Outcomes*:**
At the end of the course, students would be expected to:

- Have developed the subtle way of approaching in the candidate.
- Have acquired the decision making with in no time.
- Have acquired logical thinking during professional tenure.
- Have obtained quick decision making skills.

UNITI
Numbers: Classification of numbers, Divisibility rules, finding the units digit, decimal fractions, simplifications, LCM and HCF Models. Square roots and Cube roots.
Averages: Averages, Mixtures and Allegations
Ages: Problems on Ages

UNITII
Time and Distance: Relation between speed, distance and time, Converting kmph into m/s and vice versa, Problems on average speed, Relative speed, Trains, Boats and Streams, circular tracks and Races.
Time and Work: Problems on unitary method, Relation between Men, Days, Hours and Work. Problems on Man-Day-Hours method, Problems on alternate days, Problems on Pipes and Cisterns.

UNITIII
Percentages: Converting percentage into decimals and vice versa. Equivalent percentage of fractions.
Partnership: Introduction, Relation between capitals, Period of investments and shares
Ratio and proportion: Ratio and its properties, Comparison of ratios, Problems on ratios, Compound Ratio, Problems on proportion, Mean proportional and continued proportion.

UNITIV
Profit and Loss: Problems on Profit and Loss, Relation between Cost Price and Selling price, Discount and Marked Price, Two different articles sold at same Cost Price, Two different articles sold at same Selling Price, Gain% and Loss%. .
Simple Interest: Definitions, Problems on interest and amount, Problems on rate of interest and time period.

Compound Interest: Definition and formula for amount in compound interest, Difference between simple interest and compound interest for 2 years on the same, Principle and time period.

UNITV

Clocks: Finding the angle when the time is given, Finding the time when the angle is known, Relation between Angle, Minutes and Hours, Exceptional cases in clocks

Calendars: Definition of a Leap Year, Finding the number of Odd days, framing the year code for centuries, Finding the day of any random calendar date

Blood relations: Defining the various relations among the members of a family, Solving Blood Relation puzzles, solving the problems on Blood Relations using symbols and notations.

Text Books:

1. *Thorpe's verbal reasoning*, GL Barrons, McGraw Hills, LSAT Materials
2. *A modern approach to Logical reasoning*, R S Agarwal, S.Chand

Reference Books:

1. *Quantitative Aptitude*, R S Agarwal, S Chand,
2. *Quantitative Aptitude*, G. L BARRONS
3. *Quantitative Aptitude*, AbhijitGuhaMcGraw Hills
4. *Magical Book on Quicker Maths*, Tyra, BSC publishing company.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC421) Digital Communications

III B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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***Course Objectives*:**

- The students to be able to understand, analyze, and design fundamental digital communication systems.
- The course focuses on developing digital communication systems by using a series of specific examples and problems.

***Course Outcomes*:**

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

- Understand the elements of DC & the fundamental concepts of sampling theorem along with different coding and modulation techniques
- Understand the basic principles of baseband and pass band digital modulation schemes
- Analyze probability of error performance of digital systems and are able to design digital communications

UNIT I

Source Coding Systems: Introduction-Elements of digital communication systems, sampling process, quantization, quantization noise, encoding, Pulse-Code Modulation (PCM), Line codes, Differential encoding, Regeneration, Decoding & Filtering, Noise considerations in PCM systems, Delta modulation (DM), Differential PCM (DPCM), Comparison of the above systems, Illustrative Problems.

UNITII

Baseband Pulse Transmission: Introduction, Matched filter, Properties of Matched filter, Matched filter for rectangular pulse, Inter-symbol Interference (ISI), Nyquist's criterion for distortion less baseband binary transmission, ideal Nyquist channel, Raised cosine filter & its spectrum, Correlative coding – Duo binary & Modified duo binary signaling schemes, Partial response signaling, Baseband M-array PAM transmission, Eye diagrams, Illustrative Problems

UNITIII

Signal Space Analysis: Introduction, Geometric representation of signals, Gram-Schmidt Orthogonalization procedure, Conversion of the Continuous AWGN channel into a vector channel, Coherent detection of signals in noise, Correlation receiver, Equivalence of correlation and Matched filter receivers, Probability of error, Signal constellation diagram.

UNITIV

Pass band Data Transmission: Introduction, Pass band transmission model, Coherent phase-shift keying – binary phase shift keying (BPSK), Quadrature Phase shift keying (QPSK), Binary Frequency shift keying (BFSK), Error probabilities of BPSK, QPSK, BFSK, Generation and detection of Coherent BPSK, QPSK, & BFSK, Power spectra of above mentioned modulated signals,M-array PSK, M-array Quadrature amplitude modulation (M-

array QAM), Non-coherent orthogonal modulation schemes -Differential PSK, Binary FSK, Generation and detection of non-coherent BFSK, DPSK, Comparison of power bandwidth requirements for all the above schemes.

UNIT V

Channel Coding: Introduction-Error Detection & Correction, Parity Check Codes, Code Vectors and Hamming Distance, Forward Error Correction (FEC) Systems, Automatic Retransmission Query (ARQ) Systems.

Linear Block Codes–Matrix Representation of Block Codes(encoding), Syndrome decoding.

Convolutional Codes – Convolutional Encoding, Decoding Methods, Illustrative Problems

TEXT BOOKS:

1. Simon Haykin, "Communication Systems," Wiley India Edition, 4th Edition, 2011.
2.B.P. Lathi, &Zhi Ding, "Modern Digital & Analog Communication Systems", Oxford University Press, International 4th edition, 2010.

REFERENCES:

1. Sam Shanmugam, "Digital and Analog Communication Systems", John Wiley, 2005.
2. Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010
3. Bernard Sklar, "Digital Communications", Prentice-Hall PTR, 2nd edition, 2001.
4. Herbert Taub& Donald L Schilling, "Principles of Communication Systems", Tata McGraw-Hill, 3rd Edition, 2009.
5. J.G.Proakis, M Salehi, Gerhard Bauch, "Modern Communication Systems Using MATLAB," CENGAGE, 3rd Edition, 2013.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16EC422) Digital Signal Processing

III B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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***Course Objectives*:**

- This course will introduce the basic concepts and techniques for processing signals on a computer. By the end of the course, students will be familiar with the most important methods in DSP, including digital filter design, transform-domain processing and importance of Signal Processors.
- The course emphasizes intuitive understanding and practical implementations of the theoretical concepts.
- To produce graduates who understand how to analyze and manipulate digital signals and have the fundamental MATLAB programming knowledge to do so.

***Course Outcomes**:*

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

- Able to obtain different Continuous and Discrete time signals.
- Ability to develop Fast Fourier Transform (FFT) algorithms for faster realization of signals and systems.
- Able to design Digital IIR filters from Analog filters using various techniques (Butterworth and Chebyshev).
- Able to design Digital FIR filters using window techniques, Fourier methods and frequency sampling techniques.
- Ability to design different kinds of interpolator and decimator.

UNIT-I

Review of discrete-time signals and systems: Time domain analysis of discrete-time signals & systems, Frequency domain analysis of discrete-time signals and systems.

Discrete Fourier Transform: Frequency-domain sampling and reconstruction of discrete-time signals, Discrete Fourier Transform (DFT), The DFT as a linear transformation, Relationship of the DFT to other transforms, Properties of DFT, Linear filtering methods based on DFT, Frequency analysis of signals using the DFT.

UNIT-II

Efficient computation of the DFT – Direct computation of DFT, Divide and conquer approach to computation of DFT, Radix-2, Radix-4, and Split radix FFT algorithms, Implementation of FFT algorithms, Applications of FFT algorithms – Efficient computation of the DFT of two real sequences, 2N point real sequences, Use of the FFT algorithm in linear filtering and correlation, A linear filtering approach to computation of the DFT- the Goertzel, and the Chirp-z transform algorithms, Quantization errors in the computation of DFT.

UNIT-III

Structures for the realization of discrete-time systems, Structures for FIR systems - Direct form, Cascade form, Frequency sampling, and Lattice structures, Structures for IIR systems – Direct form, Signal flow graphs & Transposed, Cascade form, Parallel form and Lattice structures, Conversion from Lattice structure to direct form, lattice – Ladder structure.

UNIT-IV

IIR filter Design-Design of Infinite Impulse Response (IIR) filters from analog filters – IIR filter design by approximation of derivatives, by Impulse invariance, and by bilinear transformation methods, Characteristics of commonly used analog filters, Design examples of both FIR and IIR filters, Frequency transformation in the analog and digital domains, Illustrative problems.

UNIT-V

FIR filter Design-Characteristics of practical Frequency Selective Filters, Design of Finite Impulse Response (FIR) filters –Symmetric and asymmetric FIR filters, Design of linear phase FIR filters using windows, Design of linear phase FIR filters by the frequency sampling method, Design of optimum equi-ripple linear phase FIR filters, Comparison of design methods for linear phase FIR filters,

TEXT BOOKS:

1. John G. Proakis, Dimitris G. Manolakis, "Digital signal processing, principles, Algorithms and applications," Pearson Education/PHI, 4th ed., 2007.
2. Sanjit K Mitra, "Digital signal processing, A computer base approach," TataMcGraw Hill, 3rd edition, 2009.

REFERENCES:

1. A.V. Oppenheim and R.W. Schaffer, & J R Buck, "Discrete Time Signal Processing," 2nded., Pearson Education, 2012.
2. B. P. Lathi, "Principles of Signal Processing and Linear Systems," Oxford Univ. Press, 2011.
3. Li Tan, Jean Jiang, "Digital Signal Processing, Fundamentals and Applications," Academic Press, Second Edition, 2013.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
(16EC423) Microprocessors & Microcontrollers

III B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

To understand the architecture of 8085 microprocessor.

To learn 8086 architecture Instruction set

To learn and understand 8051 Architecture assembly Language programming

Course Outcomes:

After completion of this subject the students will be able to:
Do programming with 8086 microprocessors

Understand concepts of Intel x86 series of advanced processors

Able to understand the basic concepts of 8051 architecture

Design and implement some specific real time applications Using 8051 Microcontroller

UNIT - I

8085 architecture introduction-8085 Architecture-Block Diagram, Flag Register, Pin Diagram, Timing and Control Signals, System Timing Diagram, Instruction Set of 8085- Instruction & Data Formats- Addressing Modes- Instructions.

UNIT - II

8086 architecture 8086 Overview-Internal Architecture- Register Organization, Memory Segmentation, Flag Register, Pin Configuration, Physical Memory Organization, Features of some advanced Processors – 80286, 80386, Pentium

UNIT - III

Introduction to micro controllers 8051 Introduction, Architecture, Registers, Pin Description, Connections, I/O Ports, Memory Organization, Addressing Modes, Counters & Timers, Serial data Communication.

UNIT-IV

Programming the 8051- Assembly language Programming, Assembler directives, Instruction set - Moving Data, Logical operations – Byte level and bit level operations, Rotate and swap operations, Arithmetic operations, Jump and call Instructions, Interrupts & Returns

UNIT-V

Interfacing of 8051 – keyboard, Displays, ADC converters, Multiple interrupts, – 8051 Data Communication modes

TEXT BOOKS:

1. *Microprocessor architecture programming & applications with the 8085*, S.Ramesh Gaonkar, PRI Publishers. 6th Edition
2. *Advanced Microprocessors & Peripheral interfacing*, Ray Bhurchandi, 3rd edition, MC graw hill Publications
3. *The INTEL Microprocessors*, Brey, 6th edition, PHI Publishers
4. *The 8051 Microcontroller and architecture,* Kenneth J. Ayala, PRI Publishers 2nd edition

REFERENCES:

1. *Microprocessor and Microcontrollers*, N.Senthil Kumar, M.Saravanan, S.Jeevanathan, Oxford Publishers. 1st Edition, 2010

2. *The X86 Microprocessors, Architecture, Programming and* Inerfacing, Lyla B. Das, Pearson Publications, 2010

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC424) Digital IC Applications

III B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

***Course Objectives*:**

- To be able to use computer-aided design tools for development of complex digital logic circuits
- To be able to model, simulate, verify, analyze, and synthesize with hardware description languages
- To be able to design and prototype with standard cell technology and programmable logic
- To be able to design tests for digital logic circuits, and design for testability

Course Outcomes:

- Capable of using Computer-aided design tools to model, simulate, verify, analyze, and synthesize complex digital logic circuits.
- Efficient designing of any Digital System using basic structure ICs .
- Able to design and prototype with standard cell technology and programmable logic.
- Apply design test for digital logic circuits, and design for testability.

UNIT-I

CMOS Logic: Introduction to logic families, CMOS logic, CMOS logic families; BIPOLAR LOGIC AND INTERFACING**:** Bipolar logic, Transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families, Familiarity with standard 74-series and CMOS 40- series-ICs – Specifications.

UNIT-II

Hardware Description Languages: HDL Based Digital Design, The VHDL Hardware Description Language–Program Structure, Types, Constants and Arrays, Functions and procedures, Libraries and Packages, Structural design elements, Dataflow design elements, Behavioral design elements, The Time Dimension, Simulation, Test Benches, VHDL Features for Sequential Logic Design, Synthesis

UNIT-III

Combinational Logic Design Practices: Description of basic structures like Decoders, Encoders, Comparators, Multiplexers (74 –series MSI); Design of complex Combinational circuits using the basic structures; Designing Using combinational PLDs like PLAs, PALs, PROMs CMOS PLDs; Adders & sub tractors, ALUs, Combinational multipliers; VHDL models for the above standard building block ICs.

UNIT-IV

Sequential Machine Design Practices: Review of design of State machines**;** Standard building block ICs for Shift registers, parallel / serial conversion, shift register counters, Ring counters; Johnson counters, LFSR counter; VHDL models for the above standard building block ICs.Synchronous Design example using standard
ICs

UNIT –V

Design Examples (using VHDL): Barrel shifter, comparators, floating-point encoder, and dual parity encoder.

Sequential logic Design: Latches & flip flops, PLDs, counters, shift register and their VHDL models.

Text Books:

1. John F.Wakerly ,"Digital Design Principles and Practices" 4th edition, Pearson Education., 2009
2. Charles H.Roth,Jr., "Fundament/als of Logic Design" 5th edition , CENGAGE Learning 2012.

References:

1. M.Morris Mano and Michael D. Cilleti., "Digital Logic Design" 4th edition Pearson Education., 2013
2. Stephen Brown and ZvonkoVranesic, "Fundamentals of digital logic with VHDL design" 2nd edition McGraw Hill Higher Education.
3. J. Bhasker, "A VHDL PRIMER" 3rd edition Eastern Economy Edition, PHI Learning,2010.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC425) Microwave Engineering

III B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

***Course objectives*:**

- TO develop the knowledge on transmission lines for microwaves, cavity resonators and wave guide components and applications.
- To understand the scattering matrix parameters and its use
- To introduce the student the microwave test bench for measure different parameters like attenuation, VSWR, etc.,

***Course Outcomes*:**

- Ability to analyze micro-wave circuits incorporating hollow, dielectric and planar waveguides, transmission lines, filters and other passive components, active devices.
- Ability to Use S-parameter terminology to describe circuits and to explain how microwave devices and circuits are characterized in terms of their "S"- Parameters.
- Ability to understanding of microwave transmission lines and how to Use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.

UNIT-I

Microwave Transmission Lines: Introduction, Microwave spectrum and bands, applications of Microwaves. Waveguides-Solution of Wave Equation in Rectangular Coordinates, TE/TM mode analysis, Expressions for fields, Characteristic equation and cutoff frequencies, filter characteristics, dominant and degenerate modes, sketches of TE and TM mode fields in the cross-section. Mode characteristics- Phase and Group velocities, wavelengths and impedance relations,IllustrativeProblems.

Rectangular Waveguides– Power Transmission and Power Losses, Impossibility of TEM Modes, Micro strip lines-introduction, Z0 relations, effective dielectric constant, losses, Q-factor, Cavity resonators-introduction, Rectangular and cylindrical cavities, dominant modes and resonant frequencies, Q-factor and coupling coefficients,IllustrativeProblems.

UNIT-II

Waveguide Components And Applications: Coupling mechanisms- probe, loop, aperture types. Wave guide discontinuities-waveguide Windows, tuning screws and posts, matched loads. Waveguide attenuators-resistive card, rotary vane Attenuators; waveguide phase shifters-dielectric, rotary vane phase shifters. Wave guide multiport junctions-E plane and H plane Tees, Magic Tee, Directional couplers-2 hole, Bothe hole types, Illustrative Problems. Ferrites-composition and characteristics, Faraday rotation; Ferrite components-Gyrator, Isolator, Circulator.

UNIT-III

Microwave Tubes: Limitations and losses of conventional tubes at microwave frequencies. Microwave tubes-O type and M type classifications. O type tubes: 2 cavity klystrons-structure, Reentrant cavities, velocity modulation process and Applegate diagram, bunching process and small signal theory-Expressions for O/P power and efficiency. Reflex Klystrons-structure, Velocity Modulation, Applegate diagram, mathematical theory of bunching, power output, efficiency, oscillating modes and O/P characteristics, Effect of Repeller Voltage on

Power O/P, Illustrative Problems. HELIX TWTS: Significance, types and characteristics of slow wave structures; structure of TWT and amplification process (qualitative treatment), suppression of oscillations, gain considerations.

UNIT-IV

M-Type Tubes: Introduction, cross field effects, Magnetrons-different types, cylindrical travelling wave magnetron-Hull cutoff and Hartree conditions, modes of resonance and PI-mode operation, separation of PI-mode, O/P characteristics, Illustrative Problems. MICROWAVE SOLID STATE DEVICES: Introduction, classification, applications, Transfer Electronic Devices, Gunn diode-principles, RWH theory, characteristics, basic modes of operation - Gunn oscillation modes. LSA Mode, Varactor Diode, Parametric Amplifier, Introduction to Avalanche Transit time devices (brief treatment only).

UNIT-V

Microwave Measurements: Scattering Matrix-Significance, Formulation and properties. S Matrix calculations for 2port junction, E plane and H plane Tees, Magic Tee, Directional coupler, circulator and Isolator, Illustrative Problems Description of Microwave bench-different blocks and their features, errors and precautions; Microwave power measurement-Bolometers, Measurement of attenuation, frequency standing wave measurements – measurement of low and high VSWR, cavityQ, impedance measurements.

TEXT BOOKS:

1. Samuel Y. Liao, Pearson "Microwave devices and circuits"-, 3rd Edition, 2003.
2. Herbert J.Reich,J.G.Skalnik, P.F.Ordung and H.L.Krauss"Microwave principles", CBS publishers and distributors, New Delhi,2004.

REFERENCES:

1. R.E.Collin"Foundations for microwave engineering"-, IEEE press, John Wiley, 2nd edition, 2002.
2. M.L.Sisodia and G.S.Raghuvanshi"Microwave circuits and passive devices"-,WileyEasternLtd.,New age International publishers Ltd., 1995.
3. Peter A.Rizzi"Microwave engineering passive circuits"-, PHI, 1999.
4. E.Terman"Electronic and Radio Engineering"-, McGraw-Hill, 4th Edition, 1995.
5. A. Das "Microwave Engineering" –, TMH, 2nd ed., 2009

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS615) Advanced English Language and Communication Skills Lab

III B. Tech –II Sem. (E.C.E.) **P** **C**
4 **2**

***Course Description*:**
The introduction of the Advanced Professional Communication Skills Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalized context.

***Course Objectives*:**
This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary
- To enable them listening spoken English at normal conversational speed by educated English speakers
- To respond appropriately in different social-cultural and professional contexts
- To develop drafting skills among the students.

***Course Outcomes*:**

- Flair in Writing and felicity in written expression
- To enhance job prospects
- Improving Effective Speaking Abilities
- To prepare effective Interview techniques

UNIT I
COMMUNICATIVE COMPETENCY:

1. Reading Comprehension
2. Listening Comprehension
3. Vocabulary for competitive purpose
4. Spotting Errors

UNIT II
TECHNICAL WRITING

1. Report writing
2. Curriculum vitae
3. Cover Letter
4. E-mail writing

UNIT III
PRESENTATIONAL SKILLS

1. Oral presentation
2. Power point presentation
3. Poster presentation
4. Stage Dynamics

UNIT IV
CORPORATE SKILLS

1. Dress code
2. Telephonic skills

3. Net-etiquettes
4. Video conferencing and Chairing Session

UNIT V

GETTING READY FOR JOB

1. Group Discussion
2. Debate
3. Interview skills
4. Psychometric test.

Minimum Requirements for Advanced Professional Communication Skills Lab:

The English Language Lab shall have two parts:

1. Computer Assisted Language Learning (CALL) Lab: The Computer Aided Language Lab for 60 Students with 60 systems one Master Console, LAN facility and English Language Software for self-study by learners.
2. The Communication Skills Lab with movable chairs and audio visual aids with a P. A. system, Projector, a Digital stereo audio & video system and Camcorder etc.

System Requirement (Hardware component):

Computer network with: LAN with minimum 60 multimedia systems with the following.

Specifications:

i) P- IV Processor
   a) Speed 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB
ii) Headphones of High quality

Suggested Software:

iii) Clarity Pronunciation Power – Part I (Sky Pronunciation)
iv) Clarity Pronunciation Power – Part II
v) K – Van Advanced Communication Skills
vi) Walden Info Tech Software.

References:

1. *Effective Tech Communication*, Rizvi, Tata McGraw – Hill Education, 2007.
2. *Communication skills*, Sanjay Kumar & Pushpalatha, Oxford University Press, 2012.
3. *Writing Tutor*. *Advanced English Learners' Dictionary*, 9th Edition, Oxford University Press, 2015.
4. *Powerful Vocabulary Builder*, AnjanaAgarwal, New Age International Publishers, 2011.
5. *Listening Extra*, Miles Craven, Cambridge University Press, 2008.
6. *Reading Extra*, Liz Driscoll, Cambridge University Press, 2004.
7. *Writing Extra*, Graham Palmer, Cam Cambridge University Press, 2004.
8. *Speak Well*, Jayashree Mohanraj et al, Orient Blackswan, 2013.

Mode of Evaluation: Written Examination, Day-to-day Assessment

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC426) Digital Communications Lab

III B. Tech –II Sem. (E.C.E.)	**P**	**C**
	4	**2**

Course Outcomes:
After completion of the course the students will be able to experience real time behavior of different digital modulation schemes and technically visualize spectra of different digital modulation schemes.

Minimum of Ten experiments to be conducted
LIST OF EXPERIMENTS:
1. Pulse Code Modulation.
2. Differential Pulse Code Modulation.
3. Delta Modulation.
4. Amplitude Shift Keying
5. Frequency Shift Keying.
6. Phase Shift Keying.
7. Differential Phase Shift Keying.
8. Quadrature Amplitude Modulation
9. QPSK Modulation and Demodulation.
10. Eye Diagrams
11. Linear Block Codes- Encoder and Decoder
12. Convolutional Codes- Encoder and Decoder

Equipment required for Laboratories:
1. RPS - 0 – 30 V
2. CROs - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Multimeters
5. Experimental kits
6. Required Electronic components (Active and Passive) which include IC’s

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC427) Digital IC Applications Lab

III B. Tech –II Sem. (E.C.E.) **P** **C**
4 **2**

Course Outcome:

After completion of the course the students will be able to

a. Design and draw the internal structure of the various digital integrated circuits
b. Develop VHDL/Verilog HDL source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer.
c. Verify the logical operations of the digital IC‟s (Hardware) in the laboratory

List of Experiments

1.Logic Gates- 74XX.
2.Half Adder, Half Subtractor, Full Adder, Full Subtractor & Ripple Carry Adder.
3.3-8 Decoder -74138 & 8-3 En3333oder- 74X148.
4.8 x 1 Multiplexer -74X151 and 2x4 Demultiplexer-74X155.
5.4 bit Comparator-74X85.
6.D Flip-Flop 74X74.
7.JK Flip-Flop 74X109.
8.Decade counter-74X90.
9.Universal shift register -74X194.

For Software Simulation

1. Computer Systems
2. LAN Connections (Optional)
3. Operating Systems
4. VHDL/ VERILOG
5. FPGAS/CPLDS (Download Tools)

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16HS617) Aptitude Practice-II

III B. Tech –II Sem. (E.C.E.) **L 3**

Course Objectives:
After thorough learning of Quantitative Aptitude and Reasoning, a student:

- Will be able to critically evaluate various real life situations by resorting to analysis of key issues and factors.
- Will be able to read between the lines and understand various language structures.
- Will be able to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

Course Outcomes:
At the end of the course, students would be expected to:

- Have developed the subtle way of approaching in the candidate.
- Have acquired the decision making with in no time.
- Have acquired logical thinking during professional tenure.
- Have obtained quick decision-making skills.

UNITI
Permutations and Combinations: Definition of permutation, Problems on Permutations, Definition of Combinations, Problems on Combinations.
Probability: Definition of Probability, Problems on coins, Dice, Deck of Cards.

UNITII
Menstruation: Areas, Volumes of different solids, Problems on Areas, Volumes and Surface Areas.

UNITIII
Cubes: Basics of a cube, Formulae for finding volume and surface area of a cube, finding the minimum number of cuts when the number of identical pieces are given, Finding the maximum number of pieces when cuts are given, Problems on painted cubes of same and different colors, Problems on cuboids, Problems on painted cuboids, Problems on diagonal cuts.

UNITIV
Number and letter series: Difference series, Product series, Squares series, Cubes series, Alternate series, Combination series, miscellaneous series, Place values of letters
Number and Letter Analogies: Definition of Analogy, Problems on number analogy,
Odd man out: Problems on number Odd man out, Problems on letter Odd man out, Problems on verbal Odd man out

UNITV
Coding and decoding: Coding using same set of letters, Coding using different set of letters, Coding into a number, Problems on R-model.

Directions: Solving problems by drawing the paths, finding the net distance travelled, finding the direction, Problems on clocks, Problems on shadows, Problems on damaged compass, Problems on direction sense using symbols and notations.

Critical Reasoning: Problems on assumption, Problems on conclusions, Problems on inferences, Problems on strengthening and weakening of arguments, Problems on principle, Problems on paradox.

Text Books:

1. Thorpe's verbal reasoning, GL Barrons, McGraw Hills, LSAT Materials
2. A modern approach to Logical reasoning, R S Agarwal, S.Chand ,

Reference Books:

1. Quantitative Aptitude,R S Agarwal, S Chand,
2. Quantitative Aptitude - G. L BARRONS
3. Quantitative Aptitude - AbhijitGuhaMcGraw Hills
4. Magical Book on Quicker Maths, Tyra, BSC publishing company

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16MB751) Entrepreneurship Development

IV B. Tech –I Sem. (E.C.E.)	L	T	C
	3	0	3

Course objective: The objective of the course is to make the students aware of the importance of entrepreneurship opportunities available in the society for the entrepreneur.

Course outcome: Creates thorough understanding of the entrepreneurship concepts among the young engineering students to venture into creating jobs rather than seeking jobs.

UNIT-I

Introduction to Entrepreneurship: Concept of Entrepreneur‘s, Enterprise and Entrepreneurship; Characteristics, Qualities, Functions of entrepreneur and Advantages of Entrepreneurship; Role of entrepreneurship in Economic development, Challenges faced by entrepreneurs, Entrepreneurial scenario in India and Abroad; Elements of Social Entrepreneurship, Women Entrepreneurship, Corporate Entrepreneurship and Intrapreneurship, Rural and Urban Entrepreneurship.

UNIT-II

Small Business and its importance: Introduction, Need, Classification of Micro, Small and Medium Enterprises (MSMEs), Role of MSMEs, Problems of MSMEs, Steps for Starting MSMEs, The role of government in supporting MSMEs in India.

Forms of Business Organization: Evaluation of Form of Business organization: Sole Proprietorship, Partnership, Joint Hindu Family, Joint Stock Company and Co-operative Society. Special forms of business ownership: Licensing, Franchising and Leasing.

UNIT-III

Innovation and Idea Generation in Entrepreneurship: Concept of Invention and Innovation, types of innovation, Sources of Innovation, Importance of Innovation in Entrepreneurship. Sources of new ideas, Methods of generating ideas and Opportunity recognition and idea generation in entrepreneurship. Intellectual Property Rights (IPRs): Patents, trademarks, copyrights, and trade secrets. E-commerce and Business Start-ups, Sources of information for Start-up Entrepreneurs in India. Problems of Start-ups without IPRs

UNIT-IV

Entrepreneurial Motivation: Concept of Motivation and Factors influencing the entrepreneurs; Motivational Theories-Maslow‘s Need Hierarchy Theory, McClelland‘s Acquired Need Theory. Entrepreneurship Development Programs (EDPs) - Need and Role of EDPs. Opportunities for entrepreneurship in present scenario. Successful entrepreneurs.

Financing of Enterprises: Source of financing - Debt capital, seed capital, venture capital, Loans available for starting ventures in India, Role of government agencies in small business financing. Role of consultancy organizations.

UNIT-V

Project Planning and Feasibility Study: Meaning of Project, Project Life Cycle, Stages of Planning Process. Project Planning and Feasibility, Project proposal and report preparation.

TEXT BOOKS:

1. Entrepreneurship, 8/e, Robert D Hisrich, Mathew J.Manimala, Michael P Peters, Dean A Shepherd, McGraw Hill Education.

2. The Dynamics of Entrepreneurial Development and Management, Vasanth Desai, Himalaya Publishing House, Mumbai.

REFERENCES:

1. Entrepreneurial Development, S.S. Khanka, S. Chand and Company Limited.,

2. Fundamentals of Entrepreneurship, H. Nandan, PHI.

3. Entrepreneurship Management – text and cases, Bholanath Dutta, Excel Books.

4. Entrepreneurship – New venture Creation, Holt, PHI.

5. Entrepreneurial Development, Ramachandran, Tata McGraw Hill, New Delhi.

6. Entrepreneurial Development,Gupta and Srinivasan, S Chand & Sons, New Delhi

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC429) Embedded Systems

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

Course Outcomes:

- Able to understand the fundamental concepts of embedded systems.
- Able to learn the architecture of Advanced AVR microcontrollers.
- Able to learn to program the Advanced AVR microcontrollers.
- Able to understand the basic concepts of Internet of Things (IoT).

UNIT I

Introduction to embedded systems - classification, purpose, applications, features and architecture considerations of embedded system – Memory (RAM & ROM), timers, clocks, address bus, data bus, Embedded Processor and their types, overview of design process of embedded systems, programming languages and tools for embedded design.

UNITII

RISC vs CISC design philosophy, Harvard and Von-Neuman architectures, I/O – sensors and actuators, Communication Interfaces – Onboard (I2C, SPI, UART, 1-wire interface, parallel interface), External (RS-232 & RS-485, USB, IEEE 1394, IrDA, Bluetooth, Wi-Fi, ZigBee, GPRS. Application specific circuitry – reset, brownout protection, oscillator, RTC, Watchdog timer. Embedded firmware.

UNITIII

Introduction to Arduino platform, overview of Arduino UNO board, ATMega328/P Block diagram, Pin functions, overview of main features such as I/O Ports, Timers, interrupts, serial port, PWM, ADC, etc.

UNITIV

Introduction to Arduino programming, Structures – sketch, control structure, further syntax, Arithmetic operators, Comparison operators, Boolean operators, pointer access operators, bitwise operators, compound operators. Variables – constants, data types, variable scope & qualifiers, utilities, conversion, Functions – digital I/O, analog I/O, advanced I/O, time, math, trigonometry, characters, random numbers, bits & bytes, external interrupts, interrupts, communication, USB.

UNITV

Introduction to Internet of Things, reference architecture of IoT, Internet principles – IP addresses, MAC addresses, TCP and UDP ports, Application layer protocols. Data protocols – MQTT, XMPP, CoAP, challenges of IoT, Building IoT applications using connecting sensors.

Text Books:

1. Shibu K V "Introduction to Embedded systems" 1st Edition by, Tata McGraw-Hill Education, 2009 ISBN-13: 978-0070145894.
2. Adrian McEwen & Hakim Cassimally, John Wiley and sons "Designing of Internet of Things" by, LTD. 2014,ISBN 978-1118430620.

References:

1. Raj Kamal "Embedded Systems" 2E, Tata McGraw-Hill Education, 2011
2. https://store.arduino.cc/arduino-uno-rev3
3. https://www.arduino.cc/reference/en/
4. https://wso2.com/whitepapers/a-reference-architecture-for-the-internet-of-things/

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC430) Optical Fiber Communication

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To understand Optical Fiber Communications
- To understand the Ray Theory, single& amplitude; multimode fibers, fiber materials, losses, dispersion in OFC
- To understand the connectors, splices, couplers, LASER, LED sources

Course Outcomes:

- To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures.
- To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
- To learn the various optical source materials and optical receivers such as LED structures, quantum efficiency, Laser diodes, PIN, APD diodes, noise performance in photo detector, receiver operation and configuration.
- Analyze the use of analog and digital links such as the various criteria like power loss wavelength to be considered for point to point link in digital link system.
- To learn the fiber optical network components, variety of networking aspects, and operational principles WDM

UNIT I

Introduction to Optical Fibers: Evolution of fiber optic system, Element of an Optical Fiber Transmission link, Ray Optics, Optical Fiber Modes and Configurations, Mode theory of Circular Wave guides, Overview of Modes, Single Mode fibers, Graded Index fiber structure.

UNIT II

Signal Degradation Optical fibers: Attenuation, Absorption losses, scattering losses, Bending Losses, Core and Cladding losses, Signal Distortion in Optical Wave Guides-Information Capacity determination, Group Delay, Signal distortion in SMfibers-Polarization Mode dispersion, Intermodal dispersion, Design Optimization of SM fibers-RI profile and cut-off wavelength.

UNIT III

Fiber Optical Sources and Coupling: Direct and indirect Band gap materials, LED structures, Light source materials, Quantum efficiency and LED power, Modulation of a LED, lasers Diodes-Modes and Threshold condition, Rate equations, External Quantum efficiency, Resonant frequencies, Temperature effects, Introduction to Quantum laser, source-to-fiber Power Launching, Lensing schemes, Fiber –to- Fiber joints, Fiber splicing.

UNIT IV

Fiber Optical Receivers: PIN and APD diodes, Photo detector noise, SNR, Detector Response time, Avalanche Multiplication Noise, Comparison of Photo detectors.

Fundamental Receiver Operation, pre-amplifiers, Error Sources, Receiver Configuration, Probability of Error, Quantum Limit.

UNIT V

Design of Analog &Digital Systems: System specification, Rise Time Budget, Bandwidth Budget Power Budget, Receiver Sensitivity.

WDM Concepts: Passive components, Operational Principles of WDM, Tunable sources, Solitons, Optical CDMA.

Text Books:

1. Gerd Keiser, "Optical Fiber Communication" McGraw –Hill International, Singapore, 3rd ed.,2000.
2. J.Senior, "Optical Communication, Principles and Practice", Prentice Hall of India, 1994.

References:

1. Max Ming-Kang Liu, "Principles and Applications of Optical Communications", TMH, 2010.
2. S.C. Gupta, "Text book on optical fiber communication and its applications", PHI, 2005.
3. Satish Kumar, "Fundamentals of Optical Fiber communications", PHI, 2009.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC431) VLSI Design

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
	3	**1**	**3**

Course Objectives:

- To understand VLSI circuit design processes.
- To understand basic circuit concepts and designing Arithmetic Building Blocks.
- To have an overview of Low power VLSI.

Course Outcomes:

- Complete Knowledge about Fabrication process of ICs
- Able to design VLSI circuits as per specifications given.
- Capable of optimizing the design of Arithmetic / logic building Blocks at all levels of Design/Fabrication.

UNIT-I

Introduction: The Future of Microelectronics**,** Metal Oxide semiconductor VLSI Technology, Basic MOS transistors, Basic steps of IC fabrication: nMOS, CMOS & BiCMOS.

Basic Electrical Properties of MOS and BiCMOS Circuits: Drain to Source Current I_{ds} Versus Voltage V_{ds} Relationships, Threshold Voltage V_t, Transconductance g_m and Output conductance g_{ds}, Figure of merit $\omega_{0,}$ various pull ups loads, Bi-CMOS Inverters.

UNIT-II

VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2μm CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates.

UNIT-III

Gate level Design: Logic gates and other complex gates, Switch logic, Alternate gate circuits.

Physical Design: Floor-Planning, Placement, routing, Power delay estimation, Clock and Power routing.

UNIT-IV

Subsystem Design: Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, zero/one detectors, Counters, High Density Memory Elements.

UNIT-V

Semiconductor Integrated Circuit Design: Gate-arrays: PLDs, FPGAs, CPLDs and Standard Cells.

CMOS Testing: Need for testing, Testing during the VLSI Life cycle, test principles, design strategies for test.

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, "Essentials of VLSI circuits and systems", PHI, 2013 Edition.
2. Lal Kishore and V.S.V. Prabhakar, "VLSI Design", IK Publishers.
3. Weste and Eshraghian, "Principles of CMOS VLSI Design", Pearson Education, 1999.

REFERENCES:

1. Wayne Wolf, "Modern VLSI Design", Pearson Education, 3rd Edition, 1997.
2. John P. Uyemura, "Chip Design for Submicron VLSI: CMOS layout and Simulation", Thomson Learning.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC432) Digital Image Processing

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- To understand the fundamental stages in digital image processing
- To acquire the knowledge regarding Transformation of Images
- Able to understand how to improve the quality of picture details through Enhancement techniques
- Able to know Restoration techniques used in Image processing Compression and segmentation techniques

Course Outcomes:

- Review the fundamental concepts of a digital image processing system.
- Analyze images in the frequency domain using various transforms.
- Evaluate the techniques for image enhancement and image restoration.
- Categorize various compression techniques.
- Interpret Image compression standards.
- Interpret image segmentation and representation techniques.

UNITI

Introduction To Digital Image Processing: Origins of DIP, Fundamental steps, Example fields of its usage.

Image Sensing And Acquisition: Image sensing and Acquisition – image Modeling - Sampling, Quantization and Digital Image representation – Basic relationships between pixels, - Mathematical tools/ operations applied on images - imaging geometry.

UNITII

Image Transforms: 2D Orthogonal and Unitary Transforms and their properties - Fast Algorithms - Discrete Fourier Transform - Discrete Cosine Transforms- Walsh- Hadamard Transforms- Hoteling Transforms, Comparison of properties of Fast Algorithms.

UNITIII

Image Enhancement: Background enhancement by point processing Histogram processing, Spatial filtering, Enhancement infrequency Domain, Image smoothing, Image sharpening,

Color Image Processing: Color Models, Color image Enhancement

UNITIV

Image Degradation/Restoration: Degradation model, Noise Models, Algebraic approach to restoration – Inverse filtering, Least Mean Square filters, Constrained Least square restoration.

Image Segmentation: Edge detection, Edge-linking, Threshold based segmentation methods, Region based Approaches - Template matching, Use of motion in segmentation

UNITV

Image Compression: Redundancies in Images- Compression models, Information theoretic perspective-Fundamental coding theorem. Variable Length Codes-Huffman Coding, Arithmetic coding, Bit plane coding, Run length coding, Transform coding, Image Formats and compression standards.

Text Books:

1. R.C. Gonzalez& R.E. Woods, "Digital Image Processing", Addison Wesley/Pearson education,3rd Edition, 2010.
2. A.K. Jain, "Fundamentals of Digital Image processing", PHI.

References:

1.Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, "Digital Image processing usingMATLAB", Tata McGraw Hill, 2010.
2.S jayaraman, S Esakkirajan, T Veerakumar, "Digital Image processing", Tata McGraw Hill

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC433) Medical Electronics

IV B. Tech –I Sem. (E.C.E.)

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Course Objectives:

- To gain knowledge about the various physiological parameters both electrical and non electrical and the methods of recording also the method of transmitting these parameters.
- To study about the various assist devices used in the hospitals.
- To gain knowledge about equipment used for physical medicine and the various recently developed diagnostic and therapeutic techniques.

UNIT I

Electro-Physiology and Bio-Potential Recording

The origin of Bio-potentials; biopotential electrodes, biological amplifiers, ECG, EEG, EMG, PCG, lead systems and recording methods, typical waveforms and signal characteristics.

UNIT II

Bio-Chemical And Non Electrical Parameter Measurement

pH, PO2, PCO2, colorimeter, Auto analyzer, Blood flow meter, cardiac output, respiratory measurement, Blood pressure, temperature, pulse, Blood cell counters.

UNIT III

Assist Devices

Cardiac pacemakers, DC Defibrillator, Dialyser, Heart lung machine107

UNIT IV

Physical Medicine and Biotelemetry

Diathermies- Shortwave, ultrasonic and microwave type and their applications, Surgical Diathermy Telemetry principles, frequency selection, biotelemetry, radiopill, electrical safety

UNIT V

Recent Trends in Medical Instrumentation Thermograph, endoscopy unit, Laser in medicine, cryogenic application, Introduction to telemedicine

TEXTBOOKS:

1. Leslie Cromwell "Biomedical instrumentation and measurement" Prentice Hall of India, New Delhi, 2007**.**
2. John G.Webster" Medical Instrumentation Application and Design", 3rd Edition, Wiley India Edition, 2007

REFERENCES:

1.Khandpur, R.S., "Handbook of Biomedical Instrumentation", TATA McGraw-Hill, New Delhi, 2003.
2. Joseph J.Carr and John M.Brown, "Introduction to Biomedical equipment Technology", John Wiley and Sons, New York, 2004.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC434) Pattern Recognition & Applications

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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UNIT – I
Introduction: Feature extraction and Pattern Representation Concept of Supervised and Unsupervised classification Introduction to Application Areas.

UNIT – II
Statistical Pattern Recognition Bayes Decision Theory, Minimum Error and Minimum Risk Classifiers, Discriminant Function and Decision Boundary Normal Density, Discriminant Function for Discrete Features, Parameter estimation

UNIT – III
Dimensionality Problem Dimension and accuracy, Computational Complexity, Dimensionality Reduction, Fisher Linear Discriminant, Multiple Discriminant Analysis Nonparametric Pattern Classification Density Estimation, Nearest Neighbour Rule, Fuzzy Classification

UNIT – IV
Linear Discriminant Functions Separability, Two Category and Multi Category Classification, Linear Discriminators, Perceptron Criterion, Relaxation Procedure, Minimum Square Error Criterion, Widrow-Hoff Procedure, Ho-Kashyap Procedure, Kesler‟s Construction. Neural Network Classifier Single and Multilayer Perceptron, Back Propagation Learning, Hopfield Network, Fuzzy Neural Network

UNIT – V
Time Varying Pattern Recognition First Order Hidden Markov Model, Evaluation, Decoding, Learning Unsupervised Classification Clustering, Hierarchical Clustering, Graph Based Method, Sum of Squared Error Technique Iterative Optimization

Textbooks:
1. Richard O. Duda, Peter E. Hart and David G. Stork, "Pattern Classification", JohnWiley& Sons, 2001.
2. Earl Gose, Richard Johsonbaugh and Steve Jost, "Pattern Recognition and Image Analysis", Prentice Hall, 1999.

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY
(AUTONOMOUS)

(16CE145) Elements of Road Traffic Safety
(OPEN ELECTIVE)

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

The main objective of this course is to make student aware about the accident statistics globally and in India specifically, its causes and measure to overcome the situation. The traffic regulation, parking problems, understanding of road signs, signals and marking are also taught; so that the student is well informed about all safety measures that a traffic engineer need to understand.

Course Outcomes:

After completion of this course the student:

1. Can clearly understand the accident scenario, causes and measure to be taken
2. Can know the traffic regulations
3. Can understand the parking problems and can give solutions
4. Can get an awareness of traffic signs, signals and road markings
5. Can understand the need of street light and their proper disposition on road

UNIT – I

Road Accidents – Causes & Prevention: Road Accidents & Traffic Engineering – Accident Situation in India – International Comparison of Road Accidents – Road & its Effects on Accidents – The Vehicle – The Driven – Skidding – Speed in Relation of Safety – Weather & its Effects on Accidents – Pedestrian Safety -Cyclists – Motor Cycle & Scooter Rider – Parking & Its Influence on Accident – Legislation, Enforcement, Education & Propaganda – Cost of Road Accidents

UNIT – II

Regulations Of Traffic: Basic Principals of Regulation – Regulation of Speed – Regulation of Vehicles – Regulations Concerning the Driver – Regulations Concerning Traffic – Parking Regulations – Enforcement of Regulations

Parking: Traffic & Parking Problems – Ill-Effects of Parking – Zoning & Parking Space Requirement Standards – Design Standards for On-Street Parking Facilities – Traffic Regulatory Measures for On-Street Parking – Off-Street Parking Facilities – Peripheral Parking Schemes – Loading & Unloading Facilities – Truck Terminals – Long Distance Bus Terminals

UNIT – III

Traffic Signs: Importance of Traffic Signs – Need for International Standardization – The Situation in India – General Principals of Traffic Signing – Types of Traffic Signs – Danger Signs (Warning Signs or Cautionary Signs) – Prohibitory Signs – Mandatory Signs – Informatory Sings – Indication Signs – Direction Signs, Advance Direction Signs & Place Identification Signs – Overhead Sings – Route Marker Sings – Location, Height & Maintenance of Traffic Sings

UNIT – IV

Traffic Signals: Advantages & Disadvantages of Traffic Signals – Signal Indications – Signal Face – Illustration of the Signals – Number & Location of Signals Faces – Amber Period, Red/Amber Period & Inter Green Period – Fixed Time Signals & Vehicle Actuated Signals – Determination of Optimum Cycle Length & Signal Settings for an Intersection with Fixed Time Signals – Warrants for Signals – Co-ordinated Control of Signals – Signal Approach Dimensions – Area Traffic Control – Delay at Signalized Intersection

UNIT – V

Road Markings: Function – Types of Road Marking – General Principals of Longitudinal Pavement Markings – Material & Color – Centre Lines – Traffic Lane Lines – No Overtaking Zone Markings – Pavement Edge Lines – Carriageway Width Reduction Transition Marking – Obstruction Approach Markings – Stop Lines – Pedestrian Crossings – Cyclist Crossings – Route Direction Arrows – Word Messages – Markings at Approaches to Intersections – Parking Space Limits – Object Markings

Street Lighting: Need for Street Lighting – Definition of Common Terms – Some Laws of Illumination – Mounting Height – Spacing – Lantern Arrangements – Type of Lamps – Lamp Installation of 'T' Junctions & Cross Roads – Illumination of Traffic Rotaries – Lighting of Bends – Lighting of Dual Carriageways – Lighting of Roads Carrying Only Local Traffic – Lighting Bridges – Tunnel Lighting – Maintenance of Lighting Installation

Text Books

1. Traffic Engineering & Transport Planning by K. R. Kadiyali 8th Edition, Khanna Publishers

Reference Books

1. Highway Engineering by Dr S.K. Khanna& Dr. C.E.G. Justo, 8thEdition, New Chand & Bros, Roorkee

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EE239) Neural Networks & Fuzzy Logic

(OPEN ELECTIVE)

IV B. Tech –I Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- This course introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks.
- It deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components.
- The Neural Network and Fuzzy Network system application is presented. This subject is very important and useful for doing Project Work.
- The main objective of this course is to provide the student with the basic understanding of neural networks and fuzzy logic fundamentals.

Course Outcomes:

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

- Understand the basic concept of biological neural networks
- Understand the basic concept of artificial neural networks
- Create Neural Network models.
- Understand the basic concepts of fuzzy logic.
- Create Fuzzy models.

UNIT - I

Fundamentals Of Artificial Neural Networks

Neural networks - introduction, artificial neural network, advantages, biological neural network, architectures of artificial neural networks -activation functions, important terminologies of ANN, McCulloch - Pitts neuron model, learning strategies - supervised, unsupervised, reinforced.

UNIT - II

Supervised, Unsupervised Networks

Learning rules - Hebbian learning rule, perceptron learning rule, delta learning rule, widow - huff learning rule, Back propagation neural network-architecture, training algorithm, learning factors - initial weights, leaning constant, Perceptron Neural Network- architecture, training algorithm. Applications of Neural Networks (any one problem).

UNIT - III

Associative memories: concepts, Bidirectional Associative Memory (BAM) - architecture, discrete BAM - testing algorithm, analysis of hamming distance, energy function and storage capacity. Discrete Hopfield network architecture and training algorithm.

UNIT - IV

Classical and Fuzzy Sets

Introduction to classical sets-properties–Fuzzy vs crsip-Fuzzy sets , Membership functions, basic fuzzy set operation ,properties of fuzzy sets- Fuzzy relations –Fuzzy Cartesian product, operations on fuzzy relations.

UNIT -V

Fuzzy Logic Systems

Fuzzification – Fuzzy quantifiers, fuzzy inference, fuzzy rule-based system - development of rule base and decision-making system - Defuzzification to crisp sets - Fuzzification and Defuzzification methods. Applications of Fuzzy logic systems (any one problem)

TEXTBOOKS:

1.S.N. Sivanandam, S.N. Deepa, Principles of Soft computing, Wiley India private Ltd., 2nd edition, 2013.
2.Timothy J Ross, Fuzzy Logic with Engineering Application, McGraw Hill Inc.1997.

REFERENCES BOOKS:

1.Jacek M. Zurada, Introduction to Artificial Neural Networks, Jaico Publishing House.
2.Simon Haykin, Neural Networks - A Comprehensive Foundation, Prentice- Hall Inc, 1999

SIDDHARTH INSTITUTE OF ENGINEERING &TECHNOLOGY: PUTTUR

(AUTONOMOUS)

(16ME313) Non- Conventional Energy Source
(Open Elective)

IV B. Tech –I Sem. (E.C.E.)

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Course Educational Objectives:

To Understand and analyze the pattern of renewable energy resources Suggest methodologies / technologies for its utilization Economics of the utilization and environmental aspects.

Course Outcomes:

Upon completion of this course, the students can able to identify the new methodologies / technologies for effective utilization of renewable energy sources.

UNIT I

Introduction -World Energy Use – Classification of Energy's-Reserves of Energy Resources – Environmental Aspects of Energy Utilization– Need of Renewable Energy– Renewable Energy Scenario in Andrapradesh, India and around the World.

UNIT II

Solar Energy -Solar Radiation – Measurements of Solar Radiation - Flat Plate and Concentrating Collectors – Solar direct Thermal Applications – Solar thermal Power Generation - Fundamentals of Solar Photo Voltaic Conversion – Solar Cells – Solar PV Power Generation – Solar PV Applications.

UNIT III

Wind Energy - Wind Data and Energy Estimation – Types of Wind Energy Systems – Performance – Site Selection – Details of Wind Turbine Generator – Safety and Environmental Aspects.

UNIT IV

Bio – Energy- Biomass direct combustion – Biomass gasifiers – Biogas plants – Digesters – Ethanol production – Bio diesel – Cogeneration - Biomass Applications

UNIT V

Other Sources of Energy - Tidal energy – Wave Energy – Open and Closed OTEC Cycles – Small Hydro-Geothermal Energy – Hydrogen and Storage - Fuel Cell Systems – Hybrid Systems.

TEXT BOOKS:

1. Rai. G.D., "Non-Conventional Energy Sources", Khanna Publishers, New Delhi, 2011.
2. Twidell, J.W. & Weir, A., "Renewable Energy Sources", EFN Spon Ltd., UK, 2006.

REFERENCES:

1. Sukhatme. S.P., "Solar Energy", Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
2. Godfrey Boyle, "Renewable Energy, Power for a Sustainable Future", Oxford University Press, U.K., 1996.
3. Tiwari. G.N., Solar Energy – "Fundamentals Design, Modelling & Applications", Narosa Publishing House, New Delhi, 2002.
4. Freris. L.L., "Wind Energy Conversion Systems", Prentice Hall, UK, 1990.
5. Johnson Gary, L. "Wind Energy Systems", Prentice Hall, New York, 1985
6. David M. Mousdale – "Introduction to Biofuels", CRC Press, Taylor & Francis Group, USA 2010
7. Chetan Singh Solanki, Solar Photovoltaics, "Fundamentals, Technologies and Applications", PHI Learning Private Limited, New Delhi, 2009.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16CS511) DATABASE MANAGEMENT SYSTEMS

IV B. Tech - I Sem

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Course Objective:

- To provide the student with clear conceptual understandings related to databases.
- After this course, the student should gain knowledge in the relational model, SQL, database design storage & indexing, failure recovery and concurrency control.

Course Outcome:

- Students can design the simple database, and can use the SQL instructions in Developing the database applications.
- Can apply the ER concepts to design the databases.
- Advanced concepts like triggers, assertions and constraints can be applied effectively in designing the business applications

UNIT-I

Introduction-Database System Applications, Purpose of Database Systems, View of Data - Data Abstraction, Instances and Schemas, Data Models, Database Languages - DDL, DML Database Architecture, Database Users and Administrators, History of Data base Systems.

Introduction to Data base design: ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. **Relational Model:** Introduction to the Relational Model - Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views Destroying/ altering Tables and Views.

UNIT-II

Relational Algebra and Calculus: Relational Algebra - Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus - Tuple relational Calculus - Domain relational calculus - Expressive Power of Algebra and calculus.

Form of Basic SQL Query - Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set - Comparison Operators, Aggregate Operators, NULL values - Comparison using Null values - Logical connectives - AND, OR and NOT - Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT-III

Introduction to Schema Refinement - Problems Caused by redundancy, Decompositions - Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms - FIRST, SECOND, THIRD Normal forms - BCNF - Properties of Decompositions - Loss less join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design - Multi valued Dependencies - FOURTH Normal Form, Join Dependencies, FIFTH Normal form, Inclusion Dependencies.

UNIT-IV

Transaction Management - Transaction Concept - Transaction State - Implementation of Atomicity and Durability - Concurrent - Executions - Serializability - Recoverability - Implementation of Isolation - Testing for serializability.

Concurrency Control - Lock - Based Protocols - Timestamp Based Protocols - Validation - Based Protocols - Multiple Granularity.

Recovery System-Failure Classification-Storage Structure-Recovery and Atomicity - Log - Based Recovery - Recovery with Concurrent Transactions - Buffer Management – Failure with loss of nonvolatile storage - Advance Recovery systems - Remote Backup systems.

UNIT-V

Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing - Clustered Indexes, Primary and Secondary Indexes, Index data Structures – Hash Based Indexing, Tree based Indexing, Comparison of File Organizations.

Tree Structured Indexing: Intuitions for tree indexes, Indexed Sequential Access Methods (ISAM) B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, McGrawHill Education, 3rd Edition, 2003.
2. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw Hill, VI edition, 2006.

REFERENCES:

1. Database Systems, 6th edition, Ramez Elmasri, Shamkat B. Navathe, Pearson Education, 2013.
2. Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
3. Introduction to Database Systems, C.J. Date, Pearson Education.
4. Database Management Systems, G.K. Gupta, McGrawHill Education
5. Introduction to Programming with Java, J.Dean & R.Dean, McGraw Hill education.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC435) Microwave & Optical Communications Lab

IV B. Tech –I Sem. (E.C.E.) **P** **C**
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Course Outcomes:

- Capable of Applying Microwave Concepts/ Microwave components and test them.
- Able to design and analyze an optical fiber communications link

Microwave Lab (PART – A) --- Any Seven (7) Experiments

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation Measurement.
4. Directional Coupler Characteristics.
5. VSWR Measurement.
6. Impedance Measurement.
7. Frequency and Wavelength measurements using slotted section.
8. Scattering parameters of Circulator.
9. Scattering parameters of Magic Tee.
10. Radiation Pattern Measurement of horn Antennas (at least two antennas).

Optical Communication Lab (PART – B) --- Any five (5) Experiments

1. Characterization of LED.
2. Characterization of Laser Diode.
3. Intensity modulation of Laser output through an optical fiber.
4. Measurement of Data rate for Digital Optical link.
5. Measurement of Numerical Aperture of the given fiber.
6. Measurement of losses for Analog Optical link.

Equipment required for Laboratories:

1. Regulated Klystron Power Supply 6 nos.
2. VSWR Meter 6 nos.
3. Milli/Micro Ammeters 10 nos.
4. Multi meters 10 nos.
5. CROs 8 nos.
6. GUNN Power Supply, Pin Moderator 4 nos.
7. Relevant Microwave components
8. Fiber Optic Analog Trainer based LED 3 nos.
9. Fiber Optic Analog Trainer based LASER 2nos.
10. Fiber Optic Digital Trainer 1 no.
11. Fiber cables - (Plastic, Glass)

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC436) Embedded System Lab

IV B. Tech –I Sem. (E.C.E.) **P 4** **C 2**

Course Objective:

- To develop an algorithm, the flow diagram, source code and perform the compilation
- To generate the required binary file which can be dumped into the controller and obtain the respective output control on the connected peripheral.
- To verify the logic with the necessary hardware
- To develop an embedded system by designing and writing code to the microcontroller.

EMBEDDED SYSTEMS Lab

Embedded C Experiments using MSP430 Microcontroller

1. Interfacing and programming GPIO ports in C using MSP430 (blinking LEDs , push buttons)
2. Usage of Low Power Modes: (Use MSPEXP430FR5969 as hardware platform and demonstrate the low power modes and measure the active mode and standby mode current)
3. Interrupt programming examples through GPIOs
4. PWM generation using Timer on MSP430 GPIO
5. Interfacing potentiometer with MSP430
6. PWM based Speed Control of Motor controlled by potentiometer connected to MSP430 GPIO
7. Using ULP advisor in Code Composer Studio on MSP430 8. Low Power modes and Energy trace++:

a. Enable Energy Trace and Energy Trace ++ modes in CCS
b. Compute Total Energy, and Estimated lifetime of an AA battery.

Arduino Programming:

1. a) Blinking an LED with a delay of 2 seconds.
   b) Blinking two LED's alternatively with a delay of 1 second.
   c) Blinking two LED's together with a delay of 1 second.
   d) Traffic light program Turn ON Red LED for 4 seconds, Green LED for 5 seconds, Yellow for 2 seconds.
   Use Case: 8-bit binary LED counter.

2. a) Turn ON an LED when a button is pressed, OFF when button is released.
   b) Turn ON an LED for 1 second when a button is pressed.
   c)Turn ON an LED when button is pressed for odd number of times, OFF when button is pressed for even number of times.
   Use Case: Three floor elevator using Push button & LED.

3. a) Read the analogue sensor value and display it in serial monitor
   b) Turn on Buzzer if analogue sensor value exceeds its threshold value.
   c) Read the digital sensor value and display it in serial monitor.
   d) Turn on Buzzer if digital sensor value is HIGH.
   Use Case: clap switch by using sound sensor

4. a) Interfacing DC motor.
   b) Interfacing Relay.
   c) Interfacing Servo
   d) Interfacing Stepper motor.
   Use Case: Automatic Tollgate system.

5. a) LCD interfacing and displaying “Hello, Your Name”.
   b) Interfacing GPS
   c) Interfacing GSM
   Use Case: Sending GPS location to your mobile number through GSM.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC437) Real Time Operating Systems

IV B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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***Course Outcomes**:*

- After completion of the course students able to
- Know about the basic concepts of embedded systems
- Understand the different architectural features of embedded systems
- Understand the goal embedded systems in real time design applications

UNIT-I

Introduction to Real Time System Introduction to Real time Embedded System, need for a real-time system, different kinds (reactive, time driven, deadline driven, etc.,) Embedded system Design cycle, Types of Real Time systems, Real Time Applications and features, Issues in real time computing, aspects of real-time systems (timeliness, responsiveness, concurrency, predictability, correctness, robustness, fault tolerance and safety, resource limitations, RTOS necessity), real-time requirement specifications, modelling/verifying design tools (UML, state charts, etc.,).

UNIT-II

Embedded Hardware for Real Time System Selection criteria for Real time system - Hardware and Software perspective, need for partitioning, criteria for partitioning (performance, criticality, development ease, robustness, fault tolerance and safety, resource limitations, etc.,), System Considerations, Basic development environment-host vs target concept, CPU features, Architecture, I/O Ports, on-chip peripherals, Memory, Real time implementation considerations, bus architecture, Introduction to Interrupts, Interrupt vector table, interrupt programming, Pipeline and Parallelism concepts. Case study of C2000 architecture, Real time applications by interfacing C2000 with sensors and actuators (example: Motor Control, Digital Power, and Power Line Communication)

UNIT III

Embedded Hardware – On chip Peripherals and Communication protocols – Role of peripherals for Real time systems, On-Chip peripherals & hardware accelerators, Peripherals [Direct Memory Access, Timers, Analog to Digital Conversion (ADC), DAC, Comparator, Pulse Width Modulation (PWM)],Need of real time Communication, Communication Requirements, Timeliness, Dependability, Design Issues, Overview of Real time communication, Real time Communication Peripherals – I2C, SPI & UART

Case study - Illustration of configuring and interfacing the peripherals (timers, ADC, DAC, and PWM) and Real time communication protocols (I2C, SPI & UART) using C2000 platforms

UNIT IV

Embedded Software and RTOS Software Architecture of real time System, Introduction to RTOS, role of RTOS, foreground Back ground system, pros and cons, Real time kernel, qualities of good RTOS, Functionalities of RTOS – Task Management, I/O management,

Memory management, Inter Task Communication, Tasks, Task states, Task control block, attributes of TCB, Context switching, Interrupts handling, Multiprocessing and multitasking
Case study examples for demonstrating task management functionalities (ex: Task switching, task deleting, task suspending and resuming, managing priority and etc.,) using TI RTOS on C2000 platforms.

UNIT-V

Scheduling, Synchronization and Inter task communication in Real Time Systems Basic Concepts for Real-Time Task Scheduling, Scheduling criteria, Overview of Scheduling policies, Task Synchronization – Need of synchronization, shared data problems and its ways of handling, Role of Semaphore, types of semaphores, semaphore functions, Inter task communication – Need of communication, Message Mailbox and Message Queues, RTOS problems - Priority inversion phenomenon, Deadlock phenomenon and steps to handle them. Case study examples to demonstrate concepts of task synchronization (Semaphore) and Inter task communication (Mailbox and Message queues), using TI RTOS for C2000 platforms

TEXT BOOKS:

1. Jane W. S. Liu "Real-Time Systems" Prentice Hall; 1 edition ISBN: 9780130996510
2. Krishna .C.M "Real Time Systems" Mc-Graw Hill Publication.
3.Hamid A. Toliyat and Steven G. Campbell, "DSP based Electromechanical Motion Control" CRC Press, 2003, ISBN 9780849319181.
4. Jean J Labrosse, "Embedded System Design blocks", CMP books, Second Edition, ISBN 0-87930-604-1
5. John H Davies, "MSP430 Microcontroller Basics" Newnes, 2nd edition, ISBN13: 978-0750682763

REFERENCES:

1. TMS320C28x CPU and Instruction Set Reference Guide, TI Literature Number: SPRU 430E, Revised January 2009
2. TMS320x28xx, 28xxx DSP Peripheral Reference Guide, TI Literature Number: SPRU566J, Revised April 2011
3. C2000 Teaching CD ROM from Texas Instruments
4. Intro to the TI-RTOS Kernel Workshop Lab Manual, by Texas Instruments, Rev 2.3 – December 2014
5. http://processors.wiki.ti.com/index.php/C2000_32-bit_Real-Time_MCU_Training

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC438) Radar Engineering and Navigational Aids

IV B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objectives:

- This course describes the understanding of the components of a radar system and their relationship to overall system performance
- To become familiar with design, operation, and applications of various types of radar systems
- To understand clutter and its effects of radar system performance and learn the principle of target track and various types of radar antennas.

Course Outcomes:

- To become familiar with fundamentals of radar.
- To gain in knowledge about the different types of radar and their operation.

UNIT I

Nature of Radar and Radar equation – Simple form of Radar equation – Radar block diagram and operation, Radar frequencies, Applications of Radar. Minimum Detectable signal – Receiver noise, Probability – Density functions, signal – to – noise ratio, Radar cross section of targets, cross-section fluctuations system losses**.**

UNIT II

Radar components : RF amplifier, TWT, CFA, Modulators, mixers – Conversion loss, Noise figure, Balanced mixer, Image recovery mixer, Duplexers – Branch type, Balanced type and solid state duplexers, limiters, Displays – CRT displays, A,B,C,D – scopes PPI and RHI.

UNIT III

Radar systems: CW radar, frequency-modulates CW radar, multiple - Frequency CW radar. MTI radar – Delay line cancellers, Pulse repetition frequencies, Range-gated Doppler filters tracking radar – Range and angle tracking sequential lobing and conical scanning.

UNIT IV

Radio direction finding and radio ranges, the loop antenna, the goniometer, errors in direction finding the LF/MF four-course radio range, VHF-VOR, VOR receiving equipment.

UNIT V

Hyperbolic systems of navigation & DME: TACAN: Loran-A, Loran-C, The decca navigation system, decca receivers. DMA-operation, TACAN STACAN equipment.

Text Books:

1**.** M.I.Skolnik, “Introduction to radar systems”, 2nd edition, TMH 1980.
2. N.S.Nagaraja, “Elements on electronic navigation”, 2nd edition, TMH 1996.

Reference Books:

1. G.M.Miller, “Modern electronic communication”, Prentice Hall, 6th Edition, 1999.
2. Kennedy & Davis, “Electronic communication systems”, McGraw Hill, 4th Edition, 1993..

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

(16EC439) Satellite and TV Engineering

IV B. Tech –II Sem. (E.C.E.)	L	T	C
	3	1	3

Course Objectives:

1. To make the students familiar with the principles of orbital mechanism and satellite subsystems.
2. To understand the satellite link design and VSAT System.
3. To analyze concepts of DBS TV and GPS system.
4. To gain knowledge about Digital Television Transmission and Reception.

UNITI

Orbital Mechanics, Launchers And Satellites: History of Satellite Communication, satellite communication in 2000, Orbital Mechanics, Look angle determination, Orbital perturbations, Orbit determination, Launchers and Launch Vehicles, Orbital effects in communication system performance.

Satellite Subsystems, Attitude and control systems (AOCS), Telemetry, Tracking, Command and Monitoring, Power systems, Communication subsystems, Satellite antennas, Equipment reliability and space qualification.

UNITII

Satellite Link Design: Introduction, Basic transmission Theory, System Noise Temperature and G/T Ratio, Design of Downlinks, Satellite Systems using Small Earth Stations, Uplink Design, Design of Specified C/N: Combining C/N and C/I values in Satellite Links, System Design Examples.

UNITIII

Vsat System, Low Earth Orbit and Non-Geo-Stationary Satellite Systems: Overview of VSAT Systems, Network Architecture, VSAT Earth Station Engineering, Orbit considerations, Coverage and frequency Consideration, Delay and Throughput considerations, System considerations, Operational NGSO constellation designs.

UNITIV

Dbs Tv And Radio And Satellite Navigation And The Global Positioning System: C-Band and Ku- Band Home Satellite TV, Digital DBS TV, DBS-TV System Design, DBS-TV Link Budget, Error Control in Digital DBS-TV, Master control upstation and Uplink, Installation of DBS-TV antennas, Satellite Radio Broadcasting. Radio and satellite navigation, GPS position location principles, GPS receivers and codes, satellite signal acquisition, GPS navigation message, GPS signal levels, Timing Accuracy, GPS receiver operation, GPS C/A code accuracy, differential GPS.

UNITV

Digital Television – Transmission And Reception: Introduction, Digital System Hardware, Signal Quantization and Encoding, Digital Satellite Television, Direct-to-Home Satellite Television, Digital TV Receiver, Merits of Digital TV Receivers, Digital Terrestrial Television(DTT)

Text Books:

1. Timothi Pratt, Charles Bostian and Jeremy Allnutt, WSE "Satellite communications"-, Wiley publications, 2nd Edition, 2003.
2. R.R.Gulati "Modern Television Practice, Transmission, Reception and Applications",New Age International Publishers, Fourth Revised Edition, 2012.

References:

1. Wilbur L.Prichard, Robert A. Nelson &HenryG.Suyderhoud"Satellite communications Engineering", 2nd Edition, Pearson Publications, 2003.
2. D.C.Agarwal"Satellite communications"-, Khanna publications, 5th Edition.
3. Dennis Roddy"Satellite communications", McGraw Hill, 2nd Edition, 1996.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
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(16EC440) Spread Spectrum Communications

IV B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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Course Outcomes*:*
At the end of the course the students should be able to:

- Understand the general concepts of spread spectrum techniques.
- Generate spread spectrum signals through hardware and computer simulations.
- Know various applications of spread spectrum techniques and working operation of CDMA systems of 2G and 3G standards.

UNIT I
Fundamentals of Spread Spectrum: General concepts, Direct sequence (DS), Bi-phase and , Pseudo noise (PN) signal characteristics, Direct Sequence receiver, Frequency Hopping – transmitter, receiver, Time Hopping, Comparison of modulation methods.

UNIT II
Analysis of Direct-Sequence & Avoidance type Spread Spectrum Systems: Properties of PN sequences, Properties of m-sequences, Partial Correlation, PN signals from PN sequences, Partial correlation of PN signals, Generation of PN signal, Dispreading the PN signal, Interference rejection, Output Signal – to – Noise ratio, Antijam characteristics, Interception, Energy and Bandwidth efficiency. The frequency hopped signal, Interference rejection in a Frequency – Hopping receiver, The Time-Hopped Signal.

UNIT III
Generation and Detection of Spread Spectrum Signals: Shift register sequence generators, Discrete-Frequency Synthesis, Saw device PN generators, Charge coupled devices, Coherent Direct – sequence receivers, Other methods of carrier tracking, Delay lock loop analysis, Tau-Dither loop, Coherent carrier tracking, Non-coherent frequency hop receiver, Acquisition of Spread Spectrum Signals, Acquisition by cell-by-cell searching, Reduction of Acquisition time, Acquisition with matched filter, Matched filters for PN sequences, Matched filters for Frequency Hopped signals, Matched filters with acquisition aiding waveforms.

UNIT IV
Application of Spread Spectrum to Communications: General characteristics of Spread spectrum, Multiple access considerations – number of active users (equal powers), number of active users(unequal powers), bandwidth limited channels, power limited channels, Energy and bandwidth efficiency in multiple access, Selective calling and identification, Antijam considerations, Jamming direct-sequence systems, Jamming Frequency – Hopping Systems, Intercept considerations.

UNIT V
CDMA Digital Cellular Systems: Introduction, Cellular radio concept, CDMA Digital cellular systems, Specific examples of CDMA digital cellular systems based on 2G, and 3G standards and their technical specifications.

TEXT BOOKS:

1. George. R. Cooper and Clare D. McGillem, "Modern Communications and Spread Spectrum",
McGraw – Hill Book Company, 1986.
2. Roger L. Peterson, Rodger E. Ziemer& David E. Borth, "Introduction to Spread Spectrum Communications", McGraw Hill, 2011.

REFERENCES:

1. Dr. KamiloFeher, "Wireless Digital Communications – Modulation & Spread Spectrum Applications", PHI, 1999.
2. T. S. Rappaport, "Wireless Communications – Principles and Practice," PHI, 2001.
3. Simon Haykin, "Communication Systems" 4th edition
4. Andrea Goldsmith "Wireles Communications", Cambridge University Press, 2005

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(16EC441) Wireless Communication & Networks

IV B. Tech -II Sem (E.C.E)

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Course Objectives:

- To understand basics of Wireless Communication and Networks and its evolution process.
- To learn about the mechanism of radio mobile propagation and its effects.
- To understand various types of diversity and equalization techniques to counter balance the effects of Wireless Channel.
- To Study about importance of Wireless Networking and multiple access techniques in the present day mobile communications
- To design and analyze mobile systems using OFDM technology for mitigating the ISI effect at higher data rates.

Course Outcomes:

After completion of this course the student will be able to

- Understand basics of Wireless Communications and its evolution process.
- Know about the mechanism of radio mobile propagation and its effects.
- Apply various types of diversity and equalization techniques to counter balance the effects of Wireless Channel.
- Recognize the importance of Wireless Networking and multiple access techniques in the present day mobile communications
- Analyze and design mobile systems using OFDM technology for mitigating the ISI effects at higher data rates.

UNIT I

Introduction to Wireless Communication Systems: Evolution of Mobile Radio Communication Systems, Examples of Wireless Communication Systems-Paging Systems, Cordless Telephone, Cellular Telephone systems.

Multiple Access Techniques for Wireless Communications: Introduction to Multiple Access, FDMA, TDMA, CDMA, SDMA, Packet Radio-Packet Radio protocols, Slotted ALOHA, CSMA protocols, Reservation Protocols.

UNIT II

Mobile Radio Propagation: Large Scale Path Loss: Introduction to Radio wave Propagation, Free Space Propagation Model, Propagation Mechanisms – Reflection, Diffraction, and Scattering, Practical Link Budget Design using Path loss Models.

Small Scale Fading and Multipath: Small Scale Multipath Propagation, Impulse Response Model of a Multipath Channel, Small Scale Multipath Measurements, Parameters of Mobile Multipath Channels, Types of Small Scale Fading (all variations), Rayleigh and Ricean Distributions. Problem Solving.

UNIT III

Equalization Techniques: Introduction, Fundamentals of Equalization, Training a Generic Adaptive Equalizer, Equalizers in a communication receiver, Survey of Equalization Techniques, Linear Equalizers, Non-linear Equalizers – Decision Feedback Equalizer (DFE), MLSE Equalizer, Algorithms for Adaptive Equalization – Zero Forcing, LMS, RLS, Summary of Algorithms, and Fractionally Spaced Equalizers.

Diversity Techniques: Introduction, Derivation of Selection Diversity Improvement, Derivation of Maximal Ratio combining Improvement, Practical Space Diversity Considerations, Polarization Diversity, Frequency Diversity, Time Diversity, Rake receiver.

UNIT IV

Multicarrier Modulation: Introduction, Data Transmission using Multiple Carriers, Multicarrier Modulation with Overlapping Sub channels, Discrete Implementation of Multicarrier Modulation- The Cyclic Prefix, Orthogonal Frequency Division Multiplexing (OFDM), Matrix Representation of OFDM, Vector Coding, Challenges in Multicarrier Systems- Peak to Average power ratio, Frequency and Timing Offset, Problem Solving.

UNIT V

Wireless Networking: Introduction to Wireless Networks, Differences between Wireless and Fixed Telephone Networks- the PSTN, Limitations in Wireless networking, merging Wireless networks and PSTN, Development of Wireless Networks- 1G, 2G and 3G wireless networks. Traffic Routing in Wireless Networks- Circuit Switching, Packet Switching, X.25Protocol.

Wireless Data Services: CDPD, ARDIS, RMD, Common Channel Signaling- Distributed Central Switching Office for CCS.

Text Books:

1. T. S. Rappaport, “Wireless Communications, Principles and Practice,” Prentice Hall, 2nd Edition, 2002.
2. Andrea Goldsmith, “Wireless Communications,” Cambridge University Press, 2005.

Reference Books:

1. Wireless Communications and Networks – William Stallings, 2nd Edition, PHI, 2003

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
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(16CS527) Computer Networks

IV B. Tech –II Sem. (E.C.E.)	**L**	**T**	**C**
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Course Objective

- Study the evolution of computer networks and future direction
- Study the concepts of computer networks from layered perspective
- Study the issues open for research in computer networks.

Course Outcome:

- Use appropriate transmission media to connect to a computer network and Internet
- Work on the open issues for their project
- Start using the Internet effectively
- Able to design new protocols for computer network

UNIT I

Introduction: Networks, Network Types, Internet History, Standards and Administration, Network Models: Protocol Layering, TCP/IP Protocol Suite, The ISO Model.

Introduction to physical layer: Data and Signals, Transmission impairment, Data rate limits, Performance, Transmission media: Introduction, Guided Media, Unguided Media, switching: Introduction, Circuit Switched Networks, Packet switching.

UNIT II

Data link layer: Design issues, Framing: fixed size framing, variable size framing, flow control, error control, error detection and correction, CRC, Checksum: idea, one's complement internet checksum, services provided to Network Layer**,** Data link control: DLC Services, Data link layer protocols, HDLC, Point to Point Protocol, Media Access control: Random Access, Controlled Access, Channelization, connecting devices and virtual LANs: Connecting Devices.

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. Internetworking, The network layer in the Internet: IPV4 Addresses, IPV6, Internet Control protocol, OSPF, BGP, IP, ICMPv4, IGMP.

UNIT IV

The Transport Layer: The Transport Service, Elements of Transport Protocols, Congestion Control, The internet transport protocols: UDP, TCP, Performance problems in computer networks, Network performance measurement.

UNIT V

Introduction to Application Layer: Introduction, Client Server Programming, WWW and HTTP, FTP, e-mail, TELNET, Secure Shell, Domain Name System, SNMP.

Text Books:

1. "Data communications and networking" 5th edition, 2012, Behrouz A. Forouzan, TMH.
2. "Computer Networks", 4th edition, 2010, Andrew S. Tanenbaum, Wetherall, Pearson.

Reference Books:

1. "Internetworking with TCP/IP – Principles, protocols, and architecture- Volume 1, Douglas E. Comer, 5th edition, PHI
2. "Computer Networks", 5E, Peterson, Davie, Elsevier.
3. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
4. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson

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(16EC442) Cellular & Mobile Communications

IV B. Tech -II Sem. (E.C.E)	**L**	**T**	**C**
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Course Objectives:

1. To make students familiar with fundamentals of mobile communication systems
2. To identify the requirements of mobile communication as compared to static communication

Course Outcomes:

1. To understand the concept of cellular communication
2. To understand the basics of wireless communication
3. Knowledge of GSM mobile communication standard, its architecture, logical channels, advantages and limitations.

UNITI

Cellular Mobile Radio Systems: Introduction to Cellular Mobile system, performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems.

Elements Of Cellular Radio System Design: General description of the problem, concept of frequency channels, Cochannel Interference Reduction Factor, desired C/I from a normal case in a Omni directional Antenna system, Cell splitting, consideration of the components of cellular system.

UNITII

Interference: Introduction to Co-channel interference, real time co-channel interference, Co-channel measurement, design of Antenna system, design of omni directional antenna, design of directional antenna, Antenna parameters and their effects, non-cochannel interference-different types.

UNITIII

Cell Coverage For Signal And Traffic: Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, general formula for mobile propagation over water and flat open area, near and long-distance propagation antenna height gain, form of a point to point model.

UNITIV

Cell Site And Mobile Antennas: Sum and difference patterns and their synthesis, Omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas.

Frequency Management and Channel Assignment: Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells.

UNITV

Handoff: Handoff, dropped calls and cell splitting, types of handoff, handoff invitation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff, cell splitting, dropped call rates and their evaluation.

Digital Cellular Networks: GSM architecture, GSM channels, GSM modes.

Text Books:

1. Mobile cellular telecommunications-W.C. Y. Lee, Tata Mc-GrawHill, 2nd Edition, 2006.
2. Wireless communications-Theodore. S. Rapport, Pearson Education, 2nd Edn., 2002.

References:

1. Principles of Mobile communications-Gordon L. Stuber, Springer International 2nd Edition, 2007.
2. Wireless and Mobile Communications-Lee McGraw Hills, 3rd Edition, 2006.