

**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			

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

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

I B. Tech. – I Sem. (E.C.E)

L	T	C
3	0	3

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

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)**

I B. Tech. – I Sem. (E.C.E)

L	T	C
3	1	3

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

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

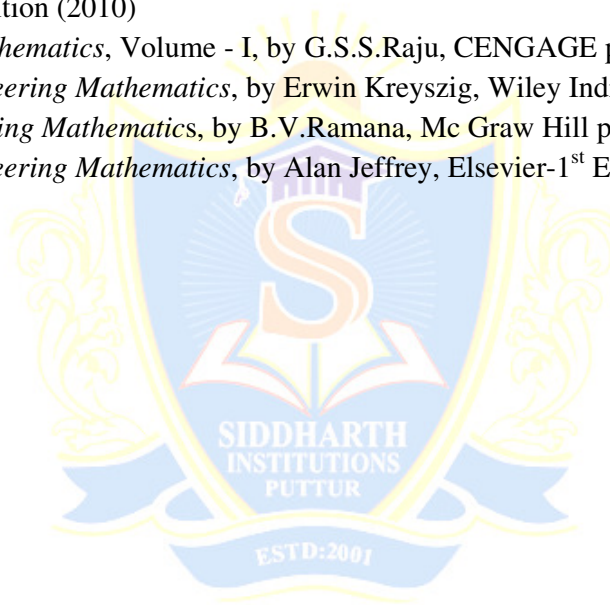
LAPLACE TRANSFORM II: Inverse Laplace Transforms, Convolution theorem, Application of Laplace transforms to ordinary differential equations of first and second order.

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-12th Edition.

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 Mathematics*, 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)**

I B. Tech. – I Sem. (E.C.E)

L	T	C
3	1	3

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

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 polyacetylene, polyaniline.

Inorganic polymers: Basic introduction, silicones, polyphosphazines 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 Engineering 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)**

I B. Tech. – I Sem. (E.C.E)

L	T	C
3	1	3

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

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)**

I B. Tech. – I Sem. (E.C.E)

L	T	D	C
0	0	6	3

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

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.

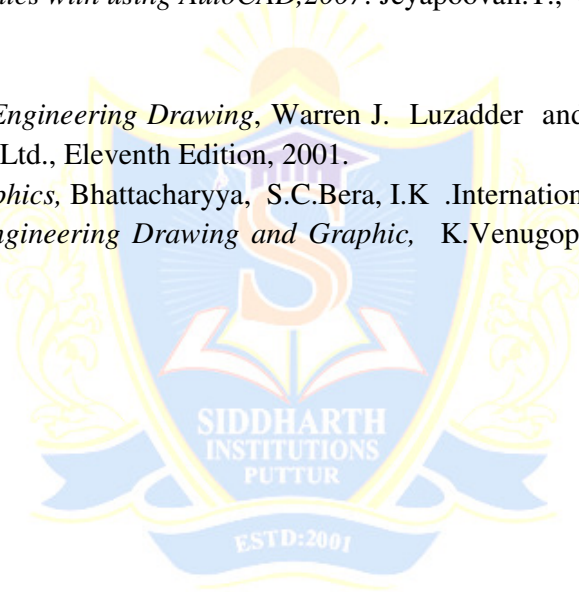
COMPUTER AIDED DRAFTING: Introduction to drafting packages - orthographic views and projections and Isometric projections (demonstration only)

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*. Jeyapooan.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)**

I B. Tech. – I Sem. (E.C.E)

P	C
4	2

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

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)**

I B. Tech. – I Sem. (E.C.E)

P	C
4	2

**(16HS609) ENGINEERING CHEMISTRY LAB
(Common to ECE & CSE)**

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:

Determination of total hardness of water by EDTA method.

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

I B. Tech. – I Sem. (E.C.E)

P	C
4	2

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

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

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$
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. Concatenate them, if they are not equal
 - iii. Compare Two Strings
 - 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)**

I B. Tech. – II Sem. (E.C.E)

L	T	C
3	0	3

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

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)**

I B. Tech. – II Sem. (E.C.E)

L	T	C
3	1	3

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

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, Diagonalization.

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

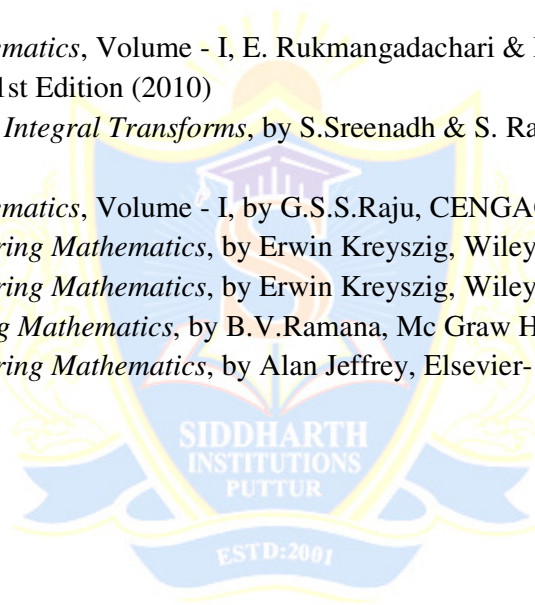
Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, Method of separation of variables, Solution of one dimensional wave equation, Heat equation and two dimensional Laplace equation under initial and boundary conditions.

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)**

I B. Tech. – II Sem. (E.C.E)

L	T	C
3	1	3

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

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 ULTRASONICS: Crystallography: Introduction – Space lattice –Unit cell – Lattice parameters –Bravais 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
(AUTONOMOUS)**

I B. Tech. – II Sem. (E.C.E)

L	T	C
3	0	3

**(16HS606) HUMAN VALUES AND PROFESSIONAL ETHICS
(Common to ECE & CSE)**

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. Fledermann, “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, “Fundamentals of Ethics for Scientists and Engineers”, Oxford University Press, Oxford, 2001



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

I B. Tech. – II Sem. (E.C.E)

L	T	C
3	1	3

(16EE205) NETWORK ANALYSIS

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)**

I B. Tech. – II Sem. (E.C.E)

**P C
4 2**

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

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 fibre, 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)**

I B. Tech. – II Sem. (E.C.E)

P C
4 2

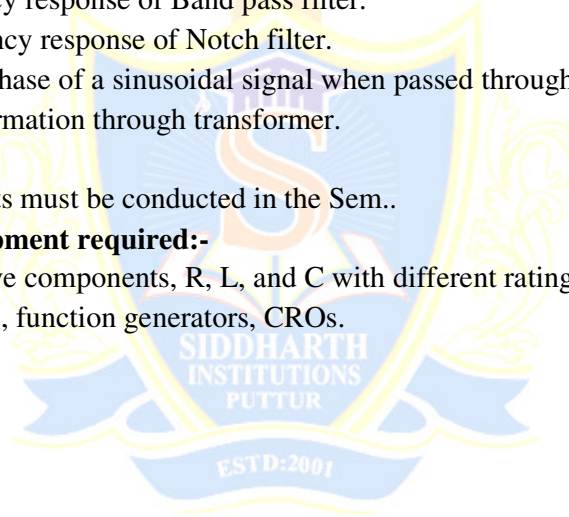
(16EE206) NETWORK ANALYSIS LAB

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)**

I B. Tech. – II Sem. (E.C.E)

P	C
4	2

**(16ME301) ENGINEERING & IT WORK SHOP LAB
(Common to ECE & CSE)**

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 trouble shooting 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. Crimping 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 it to 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)

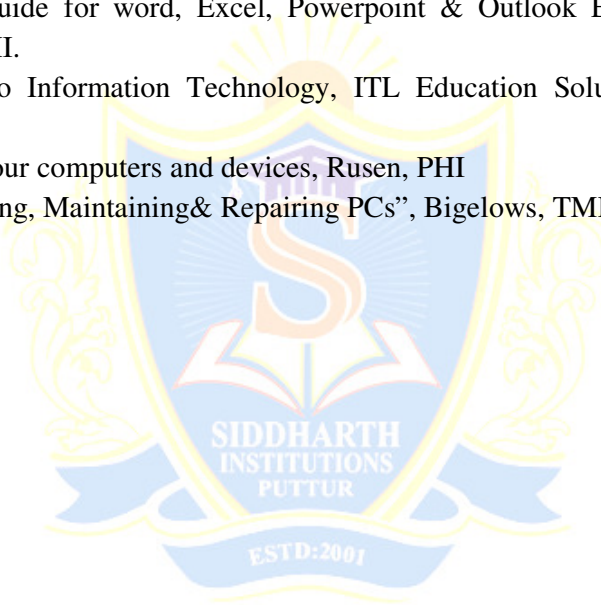
8.1 Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the color, including images 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)**

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

L	T	C
3	1	3

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

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

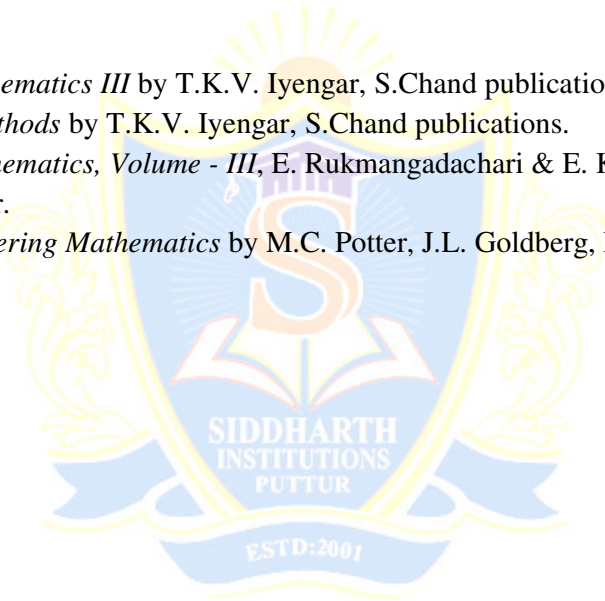
NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Solution by Taylor's series, Picard's Method of successive Approximations, Euler's Method, Runge-Kutta second and fourth order methods.

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)**

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

L	T	C
3	1	3

(16EC401) BASIC ELECTRONIC DEVICES

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} , I_c , 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.
2. *Electronic Devices and Circuits*, Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, Second Edition.
3. *Electronic Devices and Circuits*, BV Rao, KBR Murty, K Raja Rajeswari, PCR PantuluPearson, 2nd edition.

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

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

L	T	C
3	1	3

(16EC402) SWITCHING THEORY & LOGIC DESIGN

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, De coders, 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

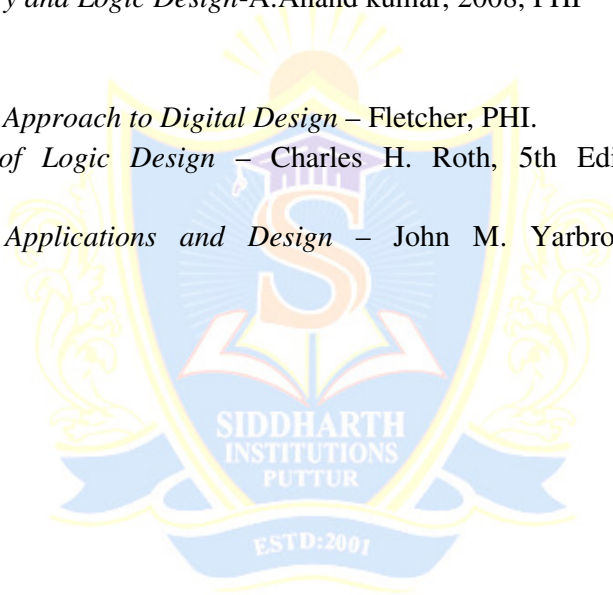
FINITE STATE MACHINES AND PROGRAMMABLE MEMORIES: Introduction to FSM, Mealy and Moore models, State Reduction and State Assignment, Design procedure, Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic

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)**

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

L	T	C
3	1	3

(16EC403) SIGNALS AND SYSTEMS

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)**

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

L	T	C
3	1	3

(16EC404) RANDOM SIGNAL AND STOCHASTIC PROCESSES

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, Clive 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)**

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

L	T	C
3	0	3

**(16HS605) ENVIRONMENTAL STUDIES
(Common to EEE, ECE & CSE)**

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)**

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

**P C
4 2**

(16EC405) BASIC ELECTRONIC DEVICES LAB

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 μ A, 0-50 μ A,0-100 μ A, 0-200 μ A.
8. Voltmeters (Analog or Digital) - 0-5V, 0-10V,0-25V.



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

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

P	C
4	2

(16EC406) BASIC SIMULATION LAB

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)**

II B. Tech - I Sem	L	T	C
	0	0	1
(COE-I) COMPREHENSIVE ONLINE EXAMINATION -I			

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

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

**(16CS503) DATA STRUCTURES THROUGH C
(AUDIT COURSE)
(Common to CE, EEE, ECE & CSE)**

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)**

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

L	T	C
3	1	3

(16EC407) ELECTRONIC CIRCUITS ANALYSIS

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, Bootstrap 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)**

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

L	T	C
3	1	3

(16EC408) COMPUTER ORGANIZATION AND ARCHITECTURE

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)**

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

L	T	C
3	1	3

(16EC409) ELECTRO MAGNETIC THEORY AND TRANSMISSION LINES

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 Z_{min} and Z_{max} , 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)**

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

L	T	C
3	1	3

(16EC410) PULSE AND DIGITAL CIRCUITS

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.

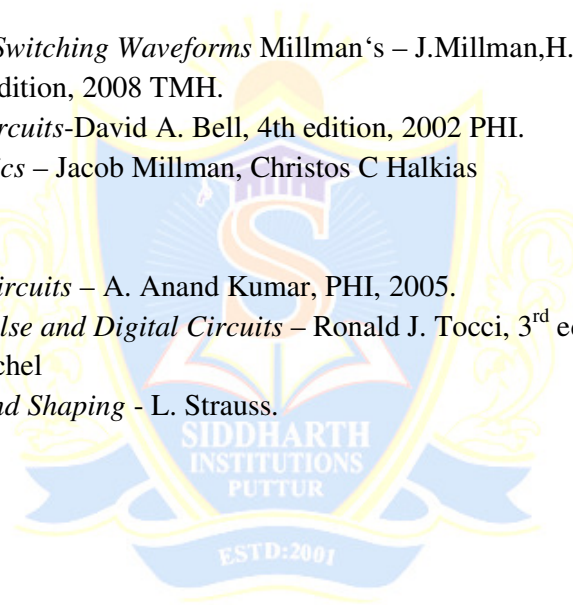
REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS: AND, OR, & NOT gates using Diodes, and Transistors, DCTL, RTL, DTL, TTL, and CMOS Logic Families, and Comparison between the logic families.

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)**

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

L	T	C
3	1	3

(16EE212) ELECTRICAL TECHNOLOGY

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)**

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

P	C
4	2

(16EC412) ELECTRONIC CIRCUIT ANALYSIS LAB

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.

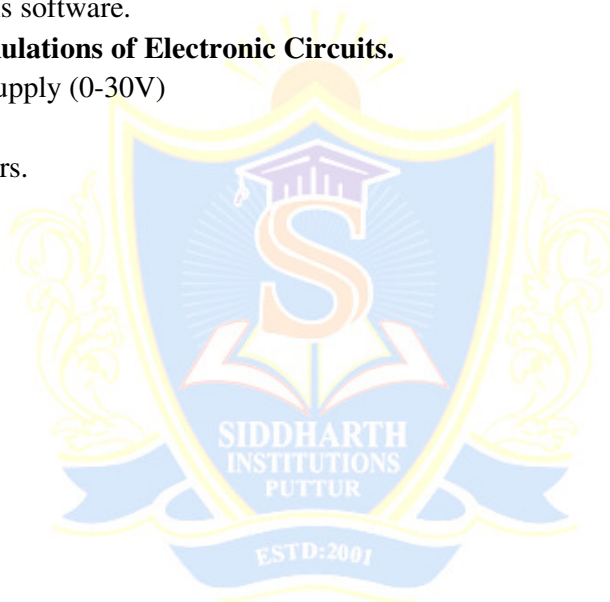
Regulated Power Supply (0-30V)

CRO's.

Functions Generators.

Multimeters.

Components.



**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

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

**P C
4 2**

(16EC413) PULSE & DIGITAL CIRCUITS LAB

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)**

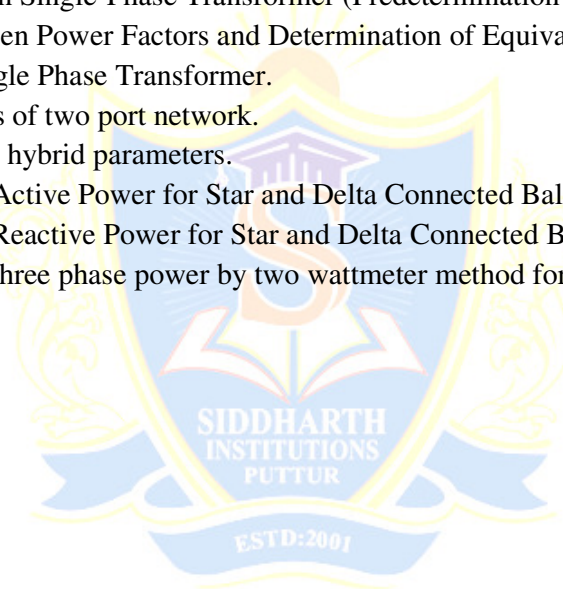
II B. Tech -II Sem. (E.C.E.)

P	C
4	2

(16EE213) ELECTRICAL TECHNOLOGY LAB

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)**

II B. Tech - II Sem

L	T	C
0	0	1

(COE-II) COMPREHENSIVE ONLINE EXAMINATION -II

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

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

**L
3**

**(16HS614) COMPREHENSIVE SOFT-SKILLS
(AUDIT COURSE)
(Common to All Branches)**

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.