Under Graduate (B.Tech):

Department of Electrical and Electronics Engineering (EEE)

I Year 1st Semester

S. No.	Subject Code	Name of the Course / Laboratory	No.of Periods per week			No. of Credits
			L	T	Lab/ Practice	
1	18HS0830	Mathematics – I	3	0	0	3
2	18HS0849	Physics	3	1	0	4
3	18CS0501	Programming for problem solving	3	0	0	3
4	18ME0348	Thermal and Fluid Engineering	3	0	0	3
5	18ME0301	Workshop practice Lab	0	0	4	2
6	18HS0852	Physics Lab	0	0	3	1.5
7	18CS0503	Programming for problem solving Lab	0	0	3	1.5
8		Induction Program (3 weeks)				
			12	1	10	
Total :			**Total/week 23**			**18**

I Year 2nd Semester

S. No.	Subject Code	Name of the Course / Laboratory	No.of Periods per week			No. of Credits
			L	T	Lab/ Practice	
1	18HS0810	English	3	0	0	3
2	18HS0831	Mathematics – II	3	1	0	4
3	18HS0801	Chemistry	3	1	0	4
4	18EE0201	Electrical circuits -I	3	0	0	3
5	18ME0302	Engineering Graphics & Design	1	0	4	3
6	18HS0811	English Lab	0	0	3	1.5
7	18HS0802	Chemistry Lab	0	0	3	1.5
Non credit course						
8	18HS0816	Indian Constitution	3	0	0	0
			16	2	10	
Total :			**Total/week 28**			**20**

II Year 1st Semester

S. No.	Subject Code	Name of the Course / Laboratory	No. of Periods per week			No. of Credits
			L	T	Lab/ Practice	
1	18HS0803	Biology for Engineers	2	1	0	3
2	18EE0202	Electrical circuits-II	3	0	0	3
3	18EC0443	Analog Electronic Circuits	3	0	0	3
4	18EE0203	Electromagnetic Fields	3	0	0	3
5	18EE0204	Electrical Machines -I	3	1	0	4
6	18EC0445	Analog Electronic Circuits lab	0	0	3	1.5
7	18ME0349	Thermal &Fluid Engineering Lab	0	0	3	1.5
8	18EE0205	Electrical circuits lab	0	0	2	1
Non credit course						
9	18HS0804	Environmental Sciences	3	0	0	0
			17	2	8	
Total :			**Total/week**		**27**	**20**

II Year 2nd Semester

S. No.	Subject Code	Name of the Course / Laboratory	No. of Periods per week			No. of Credits
			L	T	Lab/ Practice	
1	18EC0444	Digital Electronics	3	0	0	3
2	18HS0833	Probability &Statistics, Numerical Methods	3	1	0	4
3	18EE0206	Power Electronics	3	0	0	3
4	18EE0207	Electrical Machines – II	3	0	0	3
5	18EC0403	Signals & Systems	3	0	0	3
6	18EE0208	Electrical Circuits Simulation Lab	0	0	3	1.5
7	18EE0209	Electrical Machines-I Lab	0	0	3	1.5
Credit course						
8	COE-I	Comprehensive Online Exam-I	0	0	0	1
Non credit course						
9	18HS0817	Essence of Indian Traditional Knowledge	3	0	0	0
			18	1	6	
Total :			**Total/week**		**25**	**20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0830) MATHEMATICS-I

B.Tech, I Year 1st semester

L	T	P	C
3	0	0	3

Course Objectives:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines. More precisely, the objectives are:

- To introduce the idea of applying differential and integral calculus to notions of curvature and to improper integrals. Apart from some applications it gives a basic introduction on Beta and Gamma functions.
- To introduce the fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
- To develop the tool of power series and Fourier series for learning advanced Engineering Mathematics.
- To familiarize the student with functions of several variables that is essential in most branches of engineering.
- To develop the essential tool of matrices and linear algebra in a comprehensive manner.

Course Outcomes:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariate analysis and linear algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

UNIT – I

MATRICES

Inverse and rank of a matrix; System of linear equations; Symmetric,skew-symmetric and orthogonal matrices; Eigen values and eigen vectors; Diagonalization of matrices; Cayley-Hamilton Theorem, and Orthogonal transformation.

UNIT – II

CALCULUS

Evaluation of definite and improper integrals; Applications of definite integrals to evaluate surface areas and volumes of revolutions; Beta and Gamma functions and their properties.
Rolle'sTheorem, Mean value theorems (without proof) Taylor's and Maclaurin's theorems.

UNIT – III

MULTIVARIABLE CALCULUS

Limit, continuity and partial derivatives, total derivative; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, directional derivatives, curl and divergence.

UNIT – IV

SEQUENCES AND SERIES

Convergence of sequence and series, tests for convergence (Geometric test, P- test, limit comparison test, D' Alember ratio test, Cauchy' s nth root test); Power series, Taylor's series, series for exponential, trigonometric and logarithm functions.

UNIT-V

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,

TEXT BOOKS:

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

REFERENCES:

1. Ramana B.V. "*Higher Engineering Mathematics"*, Tata McGraw Hill New Delhi,11thReprint, 2010.
2." *Engineering mathematics"*, volume-I&II, E.Rukmangadachari & E.Keshava Reddy Pearson Publishers.
3. D. Poole, *"Linear Algebra: A Modern Introduction*", 2nd Edition, Brooks/Cole, 2005.
4. N.P. Bali and Manish Goyal,*" A text book of Engineering Mathematics*", LaxmiPublications, Reprint, 2008.
5.Bhavanari Satyanarayana, T.V.Pradeepkumar&D.Srinivasulu "*Linear Algebra & Vector Calculus"*, Studera Press, New Delhi.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0849) PHYSICS

B.Tech, I Year 1st semester

L	T	P	C
3	1	0	4

Objectives:

- Will recognize the various basic terms related to Oscillations.
- The basic concepts related properties of Lasers.
- Will understand the dual nature of Matter.
- Recognize importance of free electrons theory and semiconductors.
- To understand the fundamentals Nano materials.

Course outcomes:

Studies will be familiar with

- Various basic terms related to waves and Oscillations.
- Some of the basic concepts related properties of Lasers.
- Able to explain Dual nature of matter.
- Recognize importance of free electrons theory and semiconductors.
- Understand the importance of Nanotechnology.

UNIT – I

WAVES & OSCILLATIONS

Mechanical and electrical simple harmonic oscillators - damped harmonic oscillator - forced mechanical and electrical oscillators - impedance, steady state motion of forced damped harmonic oscillator.

UNIT – II

LASERS

Properties of laser beams: mono-chromaticity, coherence, directionality and brightness Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: gas lasers (He-Ne), solid-state lasers (Neodymium) , applications of lasers in science, engineering and medicine.

UNIT – III

INTRODUCTION TO QUANTUM MECHANICS & SOLUTION OF WAVE EQUATION

Wavenature ofParticles – de Broglie hypothesis,Heisenberg's Uncertainty principle.Time-dependent and time - independent Schrodinger equation for wave function – physical significance of wave function - Solution of stationary-state Schrodinger equation for one dimensional problems–particle in a box.

UNIT – IV

INTRODUCTION TO SOLIDS & SEMICONDUCTORS

Free electron theory of metals - and origin of energy bands. Types of electronic materials: metals, semiconductors, and insulators. Intrinsic and extrinsic semiconductors, Fermi

level – effect of temperature - diffusion and drift –Einstein Relation- Hall effect and it's application.

UNIT-V

PHYSICS OF NANOMATERIALS

Introduction, significance of nano scale – surface area and quantum confinement- Quantum dot, Quantum well ,Quantum wire -Synthesis of nanomaterials- Top Down Process- Ball Milling ; Bottom Up Process: Sol-Gel method– CNT-Properties of Graphene- Applications.

TEXT BOOKS:

1. H. J. Pain, "*The physics of vibrations and waves*", Wiley, 2006.
2. E. Hecht, "*Optics*", Pearson Education, 2008.

REFERENCES:

1. O. Svelto, "*Principles of Lasers*", Springer Science & Business Media, 2010.
2. D. J. Griffiths, "*Quantum mechanics*", Pearson Education, 2014.
3. D. A. Neamen, "*Semiconductor Physics and Devices*", Times Mirror High Education Group, Chicago, 1997.
4. B.E.A. Saleh and M.C, Tech, "*Fundamentals of photonics*", John Wiley & Sons.
5. *"Engineering Physics"* – K.Thyagarajan, MCGrawHill Education Private Ltd, New Delhi.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18CS0501) PROGRAMMING FOR PROBLEM SOLVING

B.Tech, I Year 1st semester

L	T	P	C
3	0	0	3

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

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

UNIT I

OVERVIEW OF COMPUTERS AND C-PROGRAMMING

Description of Computer Hardware &Software.

INTRODUCTION TO C

overview of C, executing a 'c' program, c-character set, constants, variables, data types, declaration of variables, assigning values to variables, managing input & output operations, operators and expressions, basics of algorithm and flow chart

UNIT II

DECISION&LOOPCONTROL STATEMENTS

Introduction, If Statement, If-else Statement, Nested- If-else Statement, Else if Ladder, Switch case – break – continue – go to Statement ,for loop, nested for loop, while loop, do-while, do-while statement with while loop

UNIT III

ARRAYS

Introduction, one-dimensional (1D)-Arrays, declaration and initialization of one-dimensional (1D)-Arrays, Two- dimensional (2D)-Arrays, initialization of Two-dimensional(2D)-Arrays, Multi-dimensional Arrays

FUNCTIONS

Introduction, need for user-defined functions, a multi function program, elements of user-defined functions, definition of functions, return values and types, category of functions, recursion, scope and life time of variables, preprocessor commands:#define, #include, multi file programs

UNIT IV

POINTERS

Introduction, understanding pointers, accessing address of a variable, declaring and initialization of pointer variables, accessing variable through pointers, chain of pointers, pointer expressions, pointer increment and scale factor, pointers and arrays, passing arrays to functions, array of pointers, pointers as function arguments, functions returning pointers.

STRINGS

Introduction, declaring and initializing string variables, reading and writing strings, arithmetic operations on characters, putting strings together, comparison of two strings, string handling functions, table of strings(array of strings)

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 within structures, structures within structures, structures and functions, unions, 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.

TEXT BOOKS:

1. "*C and Data Structures",* Ashok Kamthane Pearson education.
2. "*Programming in C and Data Structures",* E Balagurusamy – Mc GrawHill.

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.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18ME0348) THERMAL &FLUID ENGINEERING

B.Tech, I Year 1st semester

L	T	P	C
3	0	0	3

Course Objectives:

- To understand the applied thermodynamic concepts, the construction and the working principles of various engineering devices such as steam generators, steam nozzles, steam turbine.
- Fluid properties and their engineering significance. Students able to study the methods of fluid pressure measurement and basic idea about the fundamentals of fluid flow and its description. The student is exposed to the fundamental equations, used in the analysis of fluid flow problems.
- Know the different types of pipe flow and the conditions governing them. Equations related to different flows are derived and the student gets to understand the working of the different devices used for measurement of fluid flow under different conditions.

Course Outcomes:

- Understands the applied thermodynamic concepts, the construction and the working principles of various engineering devices such as steam generators, steam nozzles, steam turbine.
- Knows the different types of pipe flow and the conditions governing them. Equations related to different flows are derived and the student gets to understand the working of the different devices used for measurement of fluid flow under different conditions.

UNIT-I

THERMAL POWER PLANT

Layout of a Thermal Power Plant, Water cooling, Feed water treatment, Coal, handling, Coal storage, Chimney

HYDROELECTRIC POWER STATIONS

Elements of hydroelectric power station types- concept of pumped storage plants-storage requirements.

UNIT-II

BASIC CONCEPTS

Definitions of system, boundary, surrounding control volume. Types of thermodynamic systems, Properties of system, definitions for properties like pressure, volume, temperature, enthalpy, internal energy, density, with their units.State, Property, Process and Cycle, Quasi Static Process, Thermodynamic Equilibrium.

WORK & HEAT TRANSFER

Work transfer, Types of work transfers, Point and Path Functions, Heat transfer, Comparison of Work and Heat transfers. Law of Thermodynamics: Zeroth Law of Thermodynamics, First Law of Thermodynamics and Second Law of Thermodynamics

UNIT-III

PURE SUBSTANCES

P-V, P-T, T-S diagrams of Pure Substances, Mollier Diagram, Dryness Fraction, Enthalpy and Entropy of Steam using Steam Tables with Problems. Thermodynamic Cycles**:** Carnot Cycle & Rankine Cycle with simple problems.

STEAM BOILERS

Classifications of Boilers, Fire Tube boiler- Cochran boiler, Water Tube boiler- Babcock and Wilcox Boiler, Modern High Pressure Boilers - Lamont, Benson Boilers.

BOILER MOUNTINGS AND ACCESSORIES

Pressuregauge, water level indicator, fusible plug, blow down cock, stop valve, safety valve– feedpump, economiser, super heater and air pre-heater. Problems on Performance of Boilerand Heat balance sheet.

UNIT-IV

FLUID STATICS

Dimensions and units: physical properties of fluids – specific gravity, porosity surface tension – vapor pressure and their influence on fluid motion – atmospheric gauge and vacuum pressure – measurement of pressure – Piezometer, U-tube differential manometers.

FLUID KINEMATICS

Stream line, path line and streak lines and steam tube, classification of flows-steady & unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows-equation of continuity for one dimensional flow.

UNIT–V

FLUID DYNAMICS

Surface and body forces – Euler‟s and Bernoulli‟s equations for flowing stream line, momentum equation and its application on force on pipe bend.

CONDUIT FLOW

Reynold‟s experiment – Darcy Weisbach equation – Minor losses in pipes – pipes in series and pipes in parallel – total energy line-hydraulic gradient line.

Measurement of flow: Pitot tube, Venturimeter and orificemeter, Flow nozzle.

TEXT BOOKS:

1. *"Thermal Engineering"*, Rajput, R. K., Laxmi Publications, 6th Edition, New Delhi, 2010.
2. *"A Course in Thermal Engineering"*, Domkundwar,A., DhanpatRai& Co., New Delhi, 2003.

REFERENCES:

1. *"Fluid Mechanics, Hydraulic and Hydraulic Machines",* Modi & Seth, Standard book house.
2. *"A Text of Fluid Mechanics and Hydraulic Machines",* Dr.R.K.Bansal – Laxmi Publications (P) Ltd., New Delhi.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18ME0301) WORKSHOP PRACTICE LAB

B.Tech, I Year 1st semester

L	T	P	C
0	0	4	2

Course Objectives:

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

Course Outcomes:

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.

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 Dovetail 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.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
(18HS0852) PHYSICS LAB

B.Tech, I Year 1st semester

L	T	P	C
0	0	3	1.5

Course Description:

Physics practical course is meant for making the students to gain practical knowledge to correlate with the theoretical studies. It covers experiments on principle of Mechanics and Optics, measurement of magnetic field and studying resonance using LCR circuit.

Objectives:

- To explore the application of Interference and Diffraction by doing concerned experiments.
- Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge.
- To understand the concept of energy gap, B-H curve and resonance phenomena in LCR circuits.
- Develop an ability to apply the knowledge of physics experiments in the later studies.

Suggested list of experiments from the following: (Perform any EIGHT experiments from the following)

1. Determination of wavelengths of variouscolors of Mercury spectrum using Diffraction Grating – Normal Incidence method.
2. Determination of Dispersive power of prism.
3. Rigidity Modulus – Torsional Pendulum
4. Study of Resonance effect in Series and Parallel LCR circuit.
5. Determination of thickness of thin object by wedge method.
6. Determination of radius of curvature of Plano convex lens – Newton's Rings.
7. Determination of wavelength of a given laser source by using diffraction grating.
8. Determination of particle size using laser source.
9. Determinationof energy gap of a semi conductor using p – n junction diode.
10. B- H curve.
11. Magnetic field along the axis of current carrying coil – Stewart & Gee's Method.
12. Determination of frequency of tuning fork - Melde's Apparatus.
13. Determination of Spring constant – Coupled Oscillator.
14. Study of Characteristics of Solar Cell.
15. Determination of Numerical Aperture of an Optical fiber.

REFERENCES:

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18CS0503) PROGRAMMING FOR PROBLEM SOLVING LAB

B.Tech, I Year 1st semester

L	T	P	C
0	0	3	1.5

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.

Experiments List:

1. a) Acquainting students to "c" programming environment and DOS commands
   b) calculate sum of three numbers using c-program
2. a) swap(exchange) values of two integer variables using c-program
   b) read an integer, a character and a float values through keyboard and display
   c) check operators precedence and associativity using c-program
   d) write a c-program using all basic data types of c language
3. a) read 3 integer values through keyboard and display largest among them
   b) read marks of 5 subjects obtained by a student through keyboard and display "fail" or "pass" message on console
   c) using switch() statement implement arithmetic operations
4. a) check whether entered number is prime number
   b) display factorial of entered number
   c) display all multiples of an entered number upto given value(n)
5. a) Generate fibonacci series upto entered number(n)
   b) find out sum of the digits of a number
6. a) find the binary equivalent of entered decimal number
   b) generation multiplication table of entered number(n)
7. a) calculate sum of two integer matrices
   b) calculate product of two integer matrices
8. a) create your header file by including 2 user(your) defined functions and include them in a c-program student
   b) find out factorial of a number using recursive function
   c) find square of an entered number using "call by address(reference)" technique
   d) a program that tells us purpose of few predefined functions in "math.h" header file
9. a) check whether entered string is palindrome
   b) write a program to sort the entered set of strings using structure concept
10. a) count number of vowels, consonants, digits, white spaces and special characters in entered string(a line of text)
    b) swap(exchange) values of two integer variables using pointers
11. a) for 3 students with 3 subjects, calculate total marks and grade obtained by each

b) read data from a file(text) and display it on the monitor

12. a) copy contents of one file(text) to other created file
    b) merge contents of two files(text) and store it in another created file

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.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0810) ENGLISH

B.Tech, I Year 2nd semester

L	T	P	C
3	0	0	3

Course Objectives:

- To develop interest in reading English Literature for language learning.
- To improve knowledge and understanding of Grammar.
- To enhance the ability for making use of grammar in writing English.
- To enrich communication skills among the students.
- To develop their insight and positive attitude towards English language.
- To impart LSRW skills and inculcate the habit of learning.
- To build vocabulary.
- To enhance employability skills.

Course Outcomes

Students will be able:

1. To understand the rules of English grammar and their usage in writing English.
2. To use LSRW skills through the prescribed text and develop their ability to communicateeffectively.
3. To get the mastery of language to express ideas, views, feelings and experience.
4. To communicate well among themselves.
5. To inculcate values and ideal characteristic qualities in themselves.

UNIT: 1

Reading:

1. *All the World's a Stage* by William Shakespeare. (Act-II, Scene-VII).
2. *After Twenty Years* by O. Henry.

Writing: Nature and Style of Sensible Writing: Describing & Defining.

Speaking: Oral Communication (involves interactive practice sessions) Self -introduction and introducing a friend.

Listening: Listening activity (Present tense).

Vocabulary: The concept of word formation & root words from foreign languages.

Grammar: Subject – Verb Agreement. Sentence Structures & use of phrases and clauses in sentences. Identifyin common errors in noun, pronoun and adjectives.

UNIT: 2

Reading:

1. *I Have a Dream* Martin Luther King jr.
2. *Knowledge and Wisdom* by Bertrand Russell.

Writing: Importance of proper punctuation and creating coherence- Simple sentences.

Speaking: Expressing apology.

Listening: Listening activity. (Past tense)

Vocabulary: Prefixes and Suffixes.

Grammar: Identifying common errors in Articles, Modifiers and degrees of comparison.

UNIT: 3

Reading:

1) Nelson Mandela (Biography)
2) "The Happy Prince" by Oscar wilde.

Writing: Paragraph writing – letter writing.

Speaking: Situational dialogues.

Listening: Listening activity. (Future tense)
Vocabulary: Synonyms and Antonyms.
Grammar: Identifying common errors in Prepositions and Link words and complex sentences.

UNIT: 4
Reading:
1. *Where the Mind is without Fear* by RabindraNath Tagore.
2. Cause - Effect and Control Measures of Pollution (Air, Water, Noise) and Nuclear Hazards.

Writing: Essay writing - Organizing principles of essay writing - Introduction and Conclusion.
Speaking: Public speaking dynamics.
Listening: Listening activity. (Active voice and passive voice)
Vocabulary: Abbreviations and Acronyms.
Grammar: Identifying common errors in redundancies and compound sentences.
UNIT-5
Reading:
1. *The Road not Taken* by Robert Frost.
2. *An Astrologer's Day* by R K Narayan.

Writing: Techniques for writing precisely.
Speaking: Interviews and formal presentations.
Listening: speeches of A P J Abdul Kalam, Steve Jobs and so on.
Vocabulary: One word substitutes.
Grammar: Identifying common errors in clichés.

TEXT BOOKS:
1. *"Practical English Usage",* Michael Swan. OUP. 1995.
2. *"Remedial English Grammar",* F.T. Wood. Macmillan. 2007

REFERENCES:
1. *"On Writing Well",* William Zinsser. Harper Resource Book, 200.
2. *"Study Writing",* Liz Hamp-Lyons and Ben Heasly. Cambridge University Press, 2006.
3. *"Communication Skills",* Sanjay Kumar and PushpLata. Oxford University Press, 2011.
4. *"Exercises in Spoken English",* Parts. I-III. CIEFL, Hyd. Oxford University Press, 2005.
5. "*Oscar Wilde*", Create Independence Publisher, Kindle Edition, 2017.
6. *"The Complete Works",* William Shakespeare, Kindle Edition, 2017.
7. G. P. Editors, "*The Complete Works of William Shakespeare"*, Global Classic, 2018.
8. *"Robert Frost"*, Robert Frost Collection, Wider Publication, 2011.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0831) MATHEMATICS-II

B.Tech, I Year 2nd semester

L	T	P	C
3	1	0	4

Course Objectives:

The objective of this course is to familiarize the prospective engineers with techniques in Multivariate integration, ordinary and partial differential equations and complex variables. It aims to equip the students to deal with advanced level of mathematics and applications that would be essential for their disciplines. More precisely, the objectives are:

- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.
- To introduce effective mathematical tools for the solutions of differential equations that model physical processes.
- To introduce the tools of differentiation and integration of functions of complex variable that are used in various techniques dealing engineering problems.

Course Outcomes:

The objective of this course is to familiarize the prospective engineers with techniques in calculus, multivariable calculus and complex analysis. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of Mathematics and applications that they would find useful in their disciplines.

UNIT-I

FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS

Exact, linear and Bernoulli's equations, Euler's equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.

UNIT-II

ORDINARY DIFFERENTIAL EQUATIONS OF HIGHER ORDERS

Second order linear differential equations with variable coefficients, method of variation of parameters, Cauchy-Euler equation; Power series solutions; Legendre polynomials, Bessel functions of the first kind and their properties.

UNIT-III

MULTIVARIABLE CALCULUS (INTEGRATION)

Multiple Integration: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar), Applications: areas and volumes,
Triple integrals (Cartesian), orthogonal curvilinear coordinates.

UNIT-IV

COMPLEX VARIABLE – DIFFERENTIATION

Differentiation, Cauchy-Riemann equations, analytic functions, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties; Conformal mappings, Mobius transformations and their properties.

UNIT-V

COMPLEX VARIABLE – INTEGRATION

Contour integrals, Cauchy-Goursat theorem (without proof), Cauchy Integral formula (without proof), Taylor's series, zeros of analytic functions, singularities, Laurent's series; Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine.

TEXT BOOKS:

1. *"Higher Engineering Mathematics"*, B.S.Grewal, Khanna publishers
2. *"Engineering Mathematics Volume-I &III",* T.K.V. Iyengar, S.Chand publication

REFERENCES:

1. *"Engineering Mathematics volume-I&III"*, E. Rukmangadachari& E.Keshava Reddy Pearson Publishers
2. Ramana B.V., "*Higher Engineering Mathematics"*, Tata McGraw Hill New Delhi, 11thReprint, 2010.
3. *"Engineering Mathematics-I & III"*, T.K.V.Iyengar S.Chand Publications.
4. D. Poole, "*Linear Algebra: A Modern Introduction"*, 2nd Edition, Brooks/Cole, 2005.
5. N.P. Bali and Manish Goyal, "*A text book of Engineering Mathematics"*, Laxmi Publications, Reprint, 2008.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0801) CHEMISTRY

B.Tech, I Year 2nd semester

L	T	P	C
3	1	0	4

Course Objectives:

- Developed in this course will aid in quantification of several concepts in chemistry that have been introduced at the 10+2 levels in schools.
- Technology is being increasingly based on the electronic, atomic and molecular level modifications.
- Quantum theory is more than 100 years old and to understand phenomena at Nanometer levels, one has to base the description of all chemical processes at molecular levels.

Course Outcomes:

- Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
- 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 Rationalise bulk properties and processes using thermodynamic considerations.
- Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.

UNIT-I
ATOMIC, MOLECULAR STRUCTURE AND PERIODIC PROPERTIES

Schrodinger wave equation, Molecular orbital's of diatomic molecules. Energy level diagrams of diatomic. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Effective Nuclear charge, variations of s, p, d and f orbital energies of atoms in the periodic table, atomic and ionic sizes, oxidation states, hard soft acids and bases, molecular geometries.

UNIT-II
USES OF FREE ENERGY AND CHEMICAL EQUILIBRIA

Thermodynamic functions: Energy Entropy and free energy, Cell potentials, Nernest equations and Its Applications. Acid base Oxidation, reduction and Solubility Equilibria.

Corrosion: Types of Corrosion, Factors Influencing the rate of Corrosion, Prevention of Corrosion (Sacrificial anodic protection, Impressed Cathodic Protection), Anodic and Cathodic Inhibitors, Electro plating (Copper, Nickel, Chromium) and Electroless Plating.

UNIT-III

WATER TECHNOLOGY

Hardness of water and its units, Estimation of Hardness by EDTA method. Boiler Troubles: Scale & Sludge, Priming and Foaming and Boiler corrosion. Municipal Solid waste water Treatment. Break point chlorination, Water softening methods (Lime-Soda, Zeolite, Ion-Exchange resins). Demineralization of Brackish Water: Reverse Osmosis and Electro Dialysis.

UNIT-IV

ORGANIC REACTIONS AND ORGANIC POLYMERS

Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, Synthesis of a commonly used drug molecules (Paracetamol, Penicillin, Prodrugs - Asprin, Sulfa drugs)

Organic polymers types (Thermosetting and Thermoplastics), Preparation, Properties and Engineering Applications of PVC, Teflon, Nylon6,6, Bakelite), Moulding Process and its uses, Conducting polymers (polyacetylene, Polyaniline).

UNIT-V

SPECTROSCOPIC TECHNIQUES AND APPLICATIONS

Principles, selection rules and applications of absorption (UV/Visible, Atomic Absorption, Infrared) and Emission spectroscopy (Flame photometry and Fluorescence and its applications in medicine. Advanced Instrumental Techniques and their Significance: XRD, Scanning Electron microscope (SEM) and Transmission electron microscopy (TEM).

TEXT BOOKS:

1. "*University chemistry"*, by B. H. Mahan
2. "*Chemistry: Principles and Applications"*, by M. J. Sienko and R. A. Plane

REFERENCES:

1. "*Fundamentals of Molecular Spectroscopy*", by C. N. Banwell
2. "*Engineering Chemistry*" (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan
3. "*Physical Chemistry*", by P. W. Atkins

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0201) ELECTRICAL CIRCUITS-I

B.Tech, I Year 2nd semester

L	T	P	C
3	0	0	3

Course Objectives:

- To understand the nature of different circuit elements, fundamental laws and network Theorems.
- To understand about phasor concepts of single phase and Magnetic circuits.
- To understand the concepts of Locus diagrams and Resonance.

Course Outcomes:

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

- Determine the equivalent impedance of given network by using network reduction techniques.
- Determine the real power, reactive power, power factor etc,.for the given network.
- Determine the current through any element and voltage across any element.
- Apply the network theorems suitably.

UNIT-I

INTRODUCTION

Circuit concept R,L,C parameters, Voltage and Current sources, Independent and dependent sources, source transformation, Voltage-current relation.

Kirchhoff's laws, network reduction techniques, series, parallel, series parallel, star-delta or delta-star transformation, Nodal analysis, Mesh analysis, Super node and super mesh for DC excitations.

UNIT-II

AC CIRCUITS

R.M.S, Average values and form factor for different periodic waveforms, phase and phase difference of sinusoidal alternating quantities, steady state analysis of R, L and C (in series, parallel and series parallel combinations) with sinusoidal excitation, concept of reactance, impedance, susceptance and admittance, Power triangle, power factor.

UNIT-III

NETWORK THEOREMS

Thevenin's, Norton's, Maximum power transfer and Millman's theorem's for DC and sinusoidal excitations, Tellegen's, superposition, reciprocity and compensation theorem's for DC and Sinusoidal excitations.

UNIT-IV

LOCUS DIAGRAMS AND RESONANCE

Series R-L, R-C, R-L-C and parallel combination with variation of various
Parameters - Locus diagrams, Resonance, series, parallel circuits, concept of bandwidth and Q factor.

UNIT-V

MAGNETIC CIRCUITS

Magnetic circuits, Faraday's laws of electromagnetic induction, concept of self and mutual inductance, dot convention, coefficient of coupling, composite magnetic circuit, Analysis of series and parallel magnetic circuits, Ideal Transformer.

TEXT BOOKS:

1. "*Circuits and networks",* A. Sudhakar and Shyammohan SPalli, Tata McGraw, Hill.
2. Alexander and sadiku: "*Fundamentals of Electric circuits"*, Mc, graw Hill.

REFERENCES:

1. "*Network analysis",* M.E Van Valkenberg
2. "*Engineering circuit analysis",* William Hayt and Jack E.Kemmerly, McGraw Hill Company, 6th edition.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18ME0302)ENGINEERING GRAPHICS & DESIGN

B.Tech, I Year 2nd semester

L	T	P	C
1	0	4	3

Course Objectives:

- To familiarize the students in basic concept of conic sections, projections and Development 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.

UNIT-I

INTRODUCTION TO ENGINEERING DRAWING

Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections, Cycloids and Involutes.

UNIT-II

PROJECTIONS OF POINTS

Principles of Orthographic Projections-Conventions - Projections of Points, Traces

PROJECTIONS OF STRAIGHT LINES

Inclined to both the planes - simple problems only, Traces

UNIT-III

PROJECTIONS OF PLANES

Planes (Inclined to single plane only)

PROJECTIONS OF SOLIDS

Introduction– Projections of right regular solids-Prisms, Pyramids in different positions. (Single plane only)

UNIT-IV

SECTIONS OF SOLIDS

Sectional Views of Right regular Solids - Prisms, Pyramids.

DEVELOPMENT OF SURFACES

Development of surfaces of Right Regular Solids - Prisms, Pyramids.

UNIT-V

ORTHOGRAPHIC PROJECTIONS

Principles of Orthographic projection, Conversion of objects from 3D to 2D

ISOMETRIC PROJECTIONS

Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids, Conversion of 2D to 3D.

Auto CAD (for Practice only not for External Exam)

INTRODUCTION TO CAD

Applications, commands, Tool bar, modeling of Simple parts, isometric problems.

TEXT BOOKS:

1. "*Engineering Drawing"*, N.D.Bhatt, Charotar Publishers.
2. "*A text Book of Engineering Drawing"*, K.L.Narayana, Kannaiah, Scitech Publishers, 2010.

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 PublishinNew Delhi, 2008.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0811) ENGLISH LAB

B.Tech, I Year 2nd semester

L	T	P	C
0	0	3	1.5

Course Objectives:

To get the job students dream of today largely depends on the way they communicate. Due to globalization, civilization and fast growing technologies, communication has become a very important factor. Good communication skills increase the possibilities of getting good jobs. To meet the requirement of corporate word one has to be capable of expressing oneself.

- To provide Computer Assisted Language Learning facility for the students on self-instructional method for improving language.
- To improve the correct articulation as English is international language.
- To enhance the communication skills with a variety of activities and practice sessions.

Course Outcomes:

Students will be able:

- To recognize sounds of English language with different classifications.
- To know phonetic transcription and phonemic symbols of English language.
- To understand international accent and utilize the same in their daily conversation.
- To crease confidence for public speaking, for facing interviews, for making effective oral presentations, for having discussions, and for delivering impromptu speeches.

UNIT -1

a) Importance of Phonetics – Introduction, organs of speech, classification of sounds, and Phonetic transcriptions.

UNIT-2

a) Syllable, Syllabification, Word stress, Stress Rules and Intonation.
b) Intonation (Falling, Raising, and fall-raise) - Pitch and Rhythm.
c) Influence of mother tongue (MTI) - Common Indian Variants in pronunciation.
d) Difference between British and American Pronunciation

UNIT- 3

a) Vocabulary building.
b) Functional English; Telephone skills; Giving Directions; Situational dialogues; Role play.
c) JAM, Oral presentation-Prepared and extempore and PPT presentation.

UNIT- 4:

a) Describing people, places, things and situations- Body language–- listening some

UNIT- 5

a) Preparation of resume (C.V) & Cover Letter.
b) Interview Skills - mock interviews.
c) Group Discussion, Debate and Dress code.

Minimum requirement for ELCS LAB

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 1(sky pronunciation)
2. Clarity pronunciation power--- Part 2
3. K-Van Advanced Communication Skills.
4. Walden Info tech Software.

TEXT BOOKS:

1."A Textbook of English Phonetics for Indian Students", second edition T. Balasubramanian. (Mcmillian) 2012.
2."A Course in Phonetics and spoken English", DhamijaSethi, Prentice-hall of India Pvt. Ltd, 2000.

REFERENCES:

1."Speaking English Effectively", second Edition Krishna Mohan & NP Singh 2011 (Mcmillian).
2."A Hand Book of English Laboratories", E.Sureshkumar ,P.Sreehari, Foundation books, 2011.
3."Spring Board Success", SharadaKoshik, BinduBajwa, Orient Black Swan, Hyderabad, 2010.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0802) CHEMISTRY LABORATORY

B.Tech, I Year 2nd semester

L	T	P	C
0	0	3	1.5

Choice of 10-12 experiments from the following:

1. Estimation of copper by EDTA method
2. Determination of chloride content of water
3. Determination of acidity of water sample.
4. Determination of alkalinity of water sample
5. Potentiometric determination of Fe^{2+} by potassium permanganate.
6. Determination of Viscosity of an oil by Redwood Viscometer
7. Determination of dissolved oxygen in a water sample by Winkler's method
8. Conductometric titrations of strong acid against strong base.
9. Chemical analysis of a salt
10. Synthesis of a polymer/drug

Laboratory Outcomes

The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering. The students will learn to:

- Estimate rate constants of reactions from concentration of reactants/products as a function of time.
- Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
- Synthesize a small drug molecule and analyse a salt sample.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0816) INDIAN CONSTITUTION

B.Tech, I Year 2nd semester

L	T	P	C
3	0	0	0

Course Objectives:

Students will be able to:

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. To address the growth of Indian opinion regarding modern Indian intellectuals 'constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
3. To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.

UNIT-I

- Meaning of the Constitution Law

UNIT-II

- Historical Perspective of the Constitution of India
- Salient features and characteristics of the Constitution of India

UNIT-III

- Scheme of the fundamental rights
- The scheme of the Fundamental Duties and its legal status
- The Directive Principles of State Policy – Its importance and implementation
- Federal structure and distribution of legislative and financial powers between the Union and the States

UNIT-IV

- Parliamentary Form of Government in India – The constitution powers and status of the President of India.
- Amendment of the Constitutional Powers and Procedure.
- The historical perspectives of the constitutional amendments in India.
- Emergency Provisions : National Emergency, President Rule, Financial Emergency

UNIT-V

- Local Self Government – Constitutional Scheme in India.
- Scheme of the Fundamental Right to Equality.
- Scheme of the Fundamental Right to certain Freedom under Article 19

- Scope of the Right to Life and Personal Liberty under Article 21

TEXT BOOKS:

1. "*The Constitution of India*", 1950 (Bare Act), Government Publication.

2. Dr. S. N. Busi, Dr. B. R. Ambedkar "F*raming of Indian Constitution"*, 1st Edition, 2015

REFERENCES

1. M. P. Jain, "*Indian Constitution Law*", 7th Edn., Lexis Nexis, 2014.

2. D.D. Basu, "*Introduction to the Constitution of India*", Lexis Nexis, 2015.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0803) BIOLOGY FOR ENGINEERS

B.Tech, II Year 1st semester

L	T	P	C
2	1	0	3

Course Objectives

- Describe how biological observations of 18th Century that lead to major discoveries.
- Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological
- Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
- Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine

Course Outcomes

- Classify enzymes and distinguish between different mechanisms of enzyme action.
- Identify DNA as a genetic material in the molecular basis of information transfer.
- Analyse biological processes at the reductionistic level
- Apply thermodynamic principles to biological systems.
- Identify and classify microorganisms.

UNIT I

INTRODUCTION & CLASSIFICATIONS OF ORGANISMS

Introduction - classification based on (a) cellularity- Unicellular or multicellular (b) ultrastructure- prokaryotes or eucaryotes. (c) energy and Carbon utilisation -Autotrophs, heterotrophs, lithotropes (d) Ammonia excretion – aminotelic, uricoteliec, ureotelic (e) Habitata- acquatic or terrestrial (e) Molecular taxonomy- three major kingdoms of life. Model organisms - study of different groups - E.coli, S.cerevisiae, D. Melanogaster, C. elegance, A. Thaliana, M. musculus.

UNIT II

GENETICS PURPOSE

Concept of allele. Gene mapping, Gene interaction, Epistasis. Meiosis- Concepts of recessiveness and dominance - Concept of mapping of phenotype to genes - single gene disorders in humans - Complementation in human genetics.

UNIT III

BIOMOLECULES PURPOSE & ENZYMES PURPOSE

Building blocks of Molecules of life & it's types. Introduction & Concepts- Monomer units and polymeric structures, Sugars, starch, cellulose, Amino acids, proteins, Nucleotides, DNA/RNA, Two carbon units and lipids.

Role of catalysis life in existed on earth Enzymology: Enzyme classification. Mechanism of enzyme action. Enzyme kinetics and kinetic parameters related to Biology. RNA catalysis. Classifications and Procedure for Enzyme catalysed reactions with two examples.

UNIT IV

INFORMATION TRANSFER PURPOSE & MACROMOLECULAR ANALYSIS PURPOSE

Molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer. Genetic material of DNA, Hierarchy of DNA structure- from single stranded to double helix to nucleosomes. Introduction and Explanation of genetic code and degeneracy of genetic code. Gene - complementation and recombination.

Biological processes at the reductionist level Proteins - structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements.

UNIT V

METABOLISM PURPOSE

The principles of energy transactions - in physical and biological world. Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergoinc reactions. Concept of Keq and its relation to standard free energy. Spontaneity. ATP as an energy currency- including breakdown of glucose to CO2 + H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2 and H2O (Photosynthesis). Energy yielding and energy consuming reactions.

Microbiology -single celled organisms -species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics.

TEXT BOOKS:

1. "*Biology: A global approach",* Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd

2. "*Outlines of Biochemistry, Conn, E.E*", Stumpf, P.K; Bruening, G; Doi, R.H. John Wiley and Sons

REFERENCES:

1. "*Principles of Biochemistry (V Edition*)", By Nelson, D. L.; and Cox, M. M.W.H. Freeman and Company

2. "*Molecular Genetics* (Second edition)", Stent, G. S.; and Calender, R. W.H. Freeman and company, Distributed by Satish Kumar Jain for CBS Publisher

3. "*Microbiology, Prescott"*, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
(18EE0202) ELECTRICAL CIRCUITS-II

B.Tech, II Year 1st semester

L	T	P	C
3	0	0	3

Course Objectives:

- To understand Magnetic Circuits, Network Topology and Three phase circuits.
- To analyze transients in Electrical systems.
- To evaluate Network parameters of given Electrical network.

Course Outcomes:

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

- Analyze the transient behavior of electrical networks for various excitations.
- Analyze the Electrical Circuits with the concept of Network topology.
- Analyze the three phase circuits with Star & Delta connected balanced and unbalanced loads.
- Obtain the various network parameters for the given two port networks.
- Represent the transfer function for the given network.

UNIT-I

THREE PHASE CIRCUITS

Three phase circuits: phase sequence, star and delta connection, relation between line and phase Voltages and currents in balanced systems, analysis of balanced and unbalanced three phase circuits measurement of active and reactive power.

UNIT-II

TRANSIENT ANALYSIS

Transient response of R-L, R-C, and R-L-C Series circuits for d.c.excitation, initial conditions, solution method using differential equations and Laplace transforms response of R-L and R-C networks to pulse excitation.

Transient response of R-L, R-C, and R-L-C Series circuits for sinusoidal excitations, initial conditions, solution method using differential equations.

UNIT-III

NETWORK TOPOLOGY

Definitions, graph, tree, basic cut set and basic tie set matrices for planar networks, loop and nodal methods of analysis of networks with dependent and independent voltage and current sources, duality and dual networks.

UNIT-IV

TWO PORT NETWORKS

Two port network parameters Z, Y, ABCD and hybrid parameters and their relations, Concept of transformed network, two port network parameters using transformed variables, cascaded networks.

UNIT-V

ELECTRICAL CIRCUIT ANALYSIS USING LAPLACE TRANSFORMS

Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, Circuit elements in s-domain, Transfer function and convolution integral, inverse Laplace transform, Transfer function representation-Poles and Zeros.

TEXT BOOKS:

1. "*Circuits and networks",* A.Sudhakar and Shyamohan S.Palli, Tata McGraw, Hill
2. Alexander and sadiku: "*Fundamentals of Electric circuits"*, Mc, graw Hill.

REFERENCES:

1. "*Network analysis",* M.E.Van Valkenberg, prantice hall India, 3rd edition.
2. "*Electric circuit analysis",* C.L.Wadhwa, new age international.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EC0443) ANALOG ELECTRONIC CIRCUITS

B.Tech, II Year 1st semester

L	T	P	C
3	0	0	3

Course Objectives:

The objectives of this course is to

- Discuss the principle and operation of Diode Circuits, BJT and FET.
- Introduce the basic building blocks of linear integrated circuits.

Course Outcomes:

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

- Understand Diode Circuits, BJT and FET amplifiers.
- Become familiar with the basic building blocks of linear integrated circuits.

UNIT I

DIODE CIRCUITS

P-N junction diode, V-I characteristics of a diode; Half-wave and Full-wave Rectifiers, filters, Zener diode, clipping and clamping circuits.

UNIT II

BJT CIRCUITS

Construction, Operation NPN transistor, Transistor Configuration: CB, CE and CC, Transistor Characteristics, BJT as an Amplifier, Transistor Biasing Circuits, h-parameter model for low frequency

UNIT III

FET CIRCUITS

FET Classification, FET configurations : CG, CS and CD, JFET- Construction, Operation, Characteristics and Parameters, MOSFET- N-channel Enhancement and Depletion MOSFETs: Construction, Working and Characteristics; Comparison of BJT and FET, Biasing of FET, FET small signal model, FET amplifiers – CS amplifier, CD amplifier, CG amplifier, High frequency model of FET.

UNIT IV

OPERATIONAL AMPLIFIER

Basic Information of Op-Amp, Ideal Op-Amp, Inverting Amplifier, Non Inverting Amplifier, Voltage Follower, Differential Amplifier, Difference and Common Mode gains, Operational Amplifier Internal Circuit, CMRR, DC Characteristics – Input Bias Current, Input Offset Current, Input and Output Offset Voltage, Thermal Drift, AC Characteristics – Frequency Response, Frequency Compensation, Slew rate.

UNIT V

APPLICATIONS OF OP-AMP

Scale Changer, Summing Amplifier, Subtractor, Instrumentation Amplifier, Differentiator, Integrator, Fixed Voltage Series Regulator, IC 723 General purpose Regulator, Active filters: Low pass, High pass, Band pass and Band stop, DAC – Weighted Resistor DAC, R-2R ladder DAC, Inverted R-2R Ladder DAC, ADC– Flash Type ADC, Successive Approximation ADC, Dual Slope ADC, DAC/ADC Specifications.

TEXT BOOKS:

1. *"Electronic Devices and Circuits"*, Salivahanan, N.Suresh Kumar, McGraw Hill Education, Third Edition.
2. *"Linear Integrated Circuits"*, D.Roy Choudhury, Shail B.Jain, New Age International Publishers, Fourth Edition, 2010.

REFERENCES:

1. *"Micro Electronic Circuits",* Sedra A.S. and K.C. Smith, Oxford University Press, 4th Edition.
2. *"Electronic Devices and Circuits",* Jacob Millman, Christos C.Halkias, Tata McGraw Hill Edition, 1991.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0203) ELECTRO MAGNETIC FIELDS

B.Tech, II Year 1st semester

L	T	P	C
3	0	0	3

Course Objectives:

To make the student learn about:

- The laws concerning static electric fields: Coulomb's law, Gauss law; the laws concerning static magnetic fields: Biot, savart law, Ampere circuital law
- The equations concerned with static electric fields
- The equations concerned with static magnetic fields
- The difference between the behaviors of conductors and dielectrics in electric fields
- The energy stored and energy density in (i) static electric field (ii) magnetic field Electric dipole and dipole moment, magnetic dipole and dipole moment

Course Outcomes:

- After going through this course the student acquires:
- Knowledge on basic principles, concepts and fundamental laws of electromagnetic fields.
- The knowledge to understand 3, dimensional coordinate systems, electrostatics, magneto statics, time, varying fields and interaction between electricity and magnetism.

UNIT-I

INTRODUCTION TO VECTOR CALCULUS

Vectoralgebra-addition,subtraction, components of vectors,scalar and vectormultiplications, tripleproducts,Three orthogonal coordinatesystems (rectangular, cylindrical and spherical). Vectorcalculus-differentiation, partial differentiation, integration, vector operatordel,gradient,divergence a nd curl;integral theorems of vectors. Conversion of avector from onecoordinate system to another.

UNIT-II

STATIC ELECTRIC FIELD

Coulomb's law, Electric field intensity, Electrical field due to point charges. Line, Surface and Volume charge distributions. Gauss law and its applications. Absolute Electric potential, Potential difference, Calculation of potential differences for different configurations. Electric dipole, Electrostatic Energy and Energy density.

UNIT-III

CONDUCTORS, DIELECTRICS AND CAPACITANCE

Current and current density, Ohms Law in Point form, Continuity of current, Boundary conditions of perfect dielectric materials. Permittivity of dielectric materials, Capacitance, Capacitance of a two wire line, Poisson's equation, Laplace's equation, Solution of Laplace and Poisson's equation, Application of Laplace's and Poisson's equations.

UNIT-IV

STATIC MAGNETIC FIELDS

Biot-Savart Law, Ampere Law, Magnetic flux and magnetic flux density, Scalar

and Vector Magnetic potentials. Steady magnetic fields produced by current carrying conductors.

MAGNETIC FORCES, MATERIALS AND INDUCTANCE

Force on a moving charge, Force on a differential current element, Force between differential current elements, Nature of magnetic materials, Magnetization and permeability, Magnetic boundary conditions, Magnetic circuits, inductances and mutual inductances.

UNIT-V

TIME VARYING FIELDS AND MAXWELL'S EQUATIONS

Faraday's law for Electromagnetic induction, Displacement current, Point form of Maxwell's equation, Integral form of Maxwell's equations, Motional Electromotive forces. Boundary Conditions.

TEXT BOOKS:

1. M. N. O. Sadiku, "*Elements of Electromagnetics*", Oxford University Publication, 2014.
2. A. Pramanik, "*Electromagnetism - Theory and applications*", PHI Learning Pvt. Ltd, New Delhi, 2009.

REFERENCES:

1. A. Pramanik, "*Electromagnetism-Problems with solution*", Prentice Hall India, 2012.
2. G. W. Carter, "*The electromagnetic field in its engineering aspects*", Longmans, 1954.
3. W. J. Duffin, "*Electricity and Magnetism*", McGraw Hill Publication, 1980.
4. W. J. Duffin, "*Advanced Electricity and Magnetism*", McGraw Hill, 1968.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0204) ELECTRICAL MACHINES-I

B.Tech, II Year 1st semester

L	T	P	C
3	1	0	4

Course Objectives:

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

- Understand the operation of dc machines.
- Analyse the differences in operation of different dc machine configurations.
- Analyse single phase transformers circuits.

Course Outcomes:

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

- Calculate the e.m.f. generated on open circuit and find terminal voltage on load.
- Diagonise the failure of DC generator to build up voltage.
- Compute the load shared by each generator when several generators operate in parallel.
- Draw the equivalent circuit of transformer
- Conduct O.C, S.C tests and predetermine the regulation and efficiency of transformer

UNIT-I

DC GENERATORS

Constructional details of dc machine, armature windings and its types, Emf equation,armature reaction, demagnetizing and cross magnetizing ampere turns, compensating windings, commutation, emf induced in a coil undergoing commutation, methods of improving commutation, OCC and load characteristics of different types of generators.

UNIT-II

DC MOTORS

Force on conductor carrying current, Torque and power developed by armature, speed control of dc motors, starting of dc motors: constructional details of 3-point and 4-point starters, load characteristics of dc motors Losses in dc machine, condition for maximum efficiency

UNIT-III

PARALLEL OPERATION OF DC GENERATORS

Dc shunt and series generators in parallel, equalizing connections

TESTING OF DC MACHINES

Brake test, Swinburne’s test, Hopkinson's test, Fields test, Retardation test, Separation of iron and frictional losses

UNIT-IV

SINGLE PHASE TRANSFORMERS

Constructional details, Principle of transformer, emf equation, ideal transformer, leakage flux, and phasor diagram of transformer, equivalent circuit, determination of parameters of equivalent circuit, losses and efficiency, Auto transformer, principle, saving of copper as compared to two winding transformer.

UNIT-V

TESTING OF TRANSFORMERS

Predetermination of performance from OC and SC tests

SINGLE PHASE INDUCTION MOTORS

Principle of operation: double revolving field theory, cross field theory, equivalent circuit and determination of parameters, stepper motors.

STARTING METHODS

split phase starting, shaded pole starting, Repulsion starting, Universal motor .

TEXT BOOKS:

1. I.J.Nagrath ,D.P.Kothari, "*Electric Machines*", New Age International Ltd.
2. P.S.Bimbhra, "*Electrical machinery*", Khannna Publishers, 2011.

REFERENCES:

1. B.R.Gupta, Vandana Singhal, "*Fundamentals of Electrical Machines*", New Age International Ltd.
2. Puchstein , Lloyd, Conrad , "*Alternating current Machines*".

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EC0445) ANALOG ELECTRONIC CIRCUITS LAB

B.Tech, II Year 1st semester

L	T	P	C
0	0	3	1.5

Course Objectives:

- To understand the student about various semiconductor devices and to plot its characteristics.
- To obtain the frequency response characteristics of BJT and FET amplifiers.

Course Outcomes:

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

- Understand about various semiconductor devices and its characteristics.
- Find the Frequency response characteristics of BJT and FET amplifiers and to determine bandwidth.

Electronic workshop practice (for 3 Lab sessions)

Identification, Specifications and Testing of passive & active components
Study the working of the electronic equipment used in the lab

List of Experiments

(Minimum of **TEN** experiments to be completed)

CYCLE-I

1. Forward and Reverse bias characteristics of PN Junction diode
2. Zener diode Reverse characteristics
3. Diode Clipper Characteristics
4. Half Wave Rectifier With and without filter.
5. Full wave Rectifier With and without filter.
6. Input and Output characteristics of Transistor in CE Configuration.
7. Drain and Transfer Characteristics of n-channel JFET.

CYCLE –II

8. Frequency response of CE Amplifier.
9. Frequency response of Common Source FET Amplifier.
10. Differential Amplifier using BJT
11. Inverting and Non Inverting Amplifier using OpAmp
12. Integrator and Differentiator using OpAmp
13. Active Lowpass and Highpass filters using OpAmp
14. Schmitt Trigger using OpAmp.

(AUTONOMOUS)

(18ME0349) THERMAL & FLUID ENGINEERING LAB

B.Tech, II Year 1st semester

L	T	P	C
0	0	3	1.5

List of Experiments:

1. Study of Boilers.
2. Study of Water Tube Boilers.
3. Study of Fire Tube Boilers.
4. Verification of Bernoulli's Theorem
5. Venturimeter
6. Orifice meter
7. Turbine Flow Meter
8. Estimation of friction factor for a given pipe line.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0205) ELECTRICAL CIRCUITS LAB

B.Tech, II Year 1st semester

L	T	P	C
0	0	2	1

Course Objectives:

To make the student learn about:

- To introduce the students to the basic electrical equipments in the lab.
- Experimental verification of theorems.

Course Outcomes:

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

- Correctly measure and successfully troubleshoot circuits by taking accurate data and interpret results.
- Apply suitable theorems for circuit analysis and verify the results theoretically.

List of Experiments:

1. Verification of KCL & KVL for any network.
2. Verification of Superposition & Reciprocity theorems with analysis.
3. Verification of Thevenin's & Norton`s theorems with analysis.
4. Verification of Millmann's theorem with analysis.
5. Verification of Maximum power transfer theorem with analysis.
6. Verification of compensation theorem with analysis.
7. Determination of self, Mutual inductance & Coefficient of coupling of pair of coils.
8. Series & Parallel Resonance.
9. Locus diagrams of RL and RC series circuits.
10. Determination of Z & Y parameters of two port network.
11. Determination of Transmission and Hybrid parameters.
12. Measurement of Active Power and Reactive power for Star and Delta Connected Balanced Loads.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0804) ENVIRONMENTAL SCIENCES

B.Tech, II Year 1st semester

L	T	P	C
3	0	0	0

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

REFERENCES:

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

E-learning resources:

1. http://nptel.ac.in/courses.php
2. http://jntuk-coeerd.in/

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
(18EC0444) DIGITAL ELECTRONICS

B.Tech, II Year 2nd semester

L	T	P	C
3	0	0	3

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

Course Outcomes:
At the end of the Course, the students will demonstrate the ability to
- Define different Number system and perform Number base conversions.
- Design and analyze Combinational Logic Circuits
- Design and analyze modular Combinational Circuits with MUX / DEMUX, Decoder / Encoder
- Design and analyze synchronous sequential logic circuits

UNIT-I
BINARY SYSTEMS
Binary Numbers, Octaland Hexadecimal Numbers, Number Base Conversions, Complements, Signed Binary Numbers, Binary Codes.
LOGIC SIMPLIFICATION: Review of Boolean algebra and DeMorgan's Theorem, SOP & POS forms, Canonical forms

UNIT-II
GATE–LEVELMINIMIZATION AND COMBINATIONALLOGIC
Karnaugh maps up to 5 variables, Tabular Minimization method, Combinational Circuits, Analysis Procedure, Design Procedure, BinaryAdder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, D e coders,Encoders,Multiplexers,De-Multiplexers.

UNIT-III
SEQUENTIAL LOGIC DESIGN
Building blocks like S-R, JK and Master-Slave JK FF, Edge triggered FF, Ripple and Synchronous counters, Shift registers, Pseudorandom Binary Sequence generator.

UNIT-IV
LOGIC FAMILIES
TTL NAND gate, Specifications, Noise margin, Propagation delay, fan-in, fan-out, Tristate TTL, ECL, CMOS families and their interfacing.

UNIT-V
SEMICONDUCTOR MEMORIES AND PROGRAMMABLE LOGIC DEVICES
Memory organization and operation, expanding memory size, classificationandcharacteristicsof memories, sequential memory, read only memory (ROM), read andwrite memory(RAM), content addressable memory (CAM), charge de coupled devicememory (CCD), commonly used memory chips, ROM as a PLD, Programmable logicarray, Programmable array logic.

TEXT BOOKS:
1. *"Switching & Finite Automata theory"* – ZviKohavi, TMH, 2nd Edition.
2. *"Digital Design"* – Morris Mano, PHI, 3rd Edition, 2006.

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 Publication.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0833) PROBABILITY &STATISTICS, NUMERICAL METHODS

B.Tech, II Year 2nd semester

L	T	P	C
3	1	0	4

Course Objectives:

The objective of this course is to familiarize the prospective engineers with techniques in Probability& Statistics and Numerical Methods, It aims to equip the students to deal with advanced level of mathematics and applications that would be essential for their disciplines. More precisely, the objectives are:

- To introduce the tools of differentiation and integration of functions of numerical methods that is used in various techniques dealing engineering problems.
- To develop the essential tool of Probability & Statisticsin a comprehensivemanner.

Course Outcomes:

The objective of this course is to familiarize the prospective engineers with techniques in Probability& Statistics and Numerical Methods. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

UNIT I

BASIC PROBABILITY

Probability spaces, Addition theorem,conditional probability, independence, Baye's rule.

RANDOM VARIABLES:

Discrete and Continuous random variables- distribution functions, densities and their properties. Expectation of Discrete and Continuous Random Variables, Moments

UNIT II

Probability DISTRIBUTIONS

Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions.

UNIT III

BASIC STATISTICS

Measures of Central tendency: Moments, skewness and Kurtosis.Correlation and regression – Rank correlation.

UNIT IV

NUMERICAL METHOD-I

Solution of polynomial and transcendental equations: Bisection method, Newton-Raphson method and Regula-Falsi method. Finite differences, Interpolation using Newton's forward and backward difference formulae.

NUMERICAL INTEGRATION

Trapezoidal rule and Simpson's 1/3rd and 3/8rules.

UNIT- V

ORDINARY DIFFERENTIAL EQUATIONS

Taylor's series, Euler and Runge-Kutta method of fourth order for solving first and second order equations.

PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution two dimensional Laplace equation.

TEXT BOOKS:

1. B.S. Grewal, "*Higher Engineering Mathematics*", Khanna Publishers, 2000
2. "*Statistical methods",* S.P. Gupta, S.Chand publications.

REFERENCES:

1. E.Rukmangadachari&E.Keshava Reddy "*Engineering mathematics",* volume-III, Pearson Publishers
2. Ramana B.V., "*Higher Engineering Mathematics"*, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
3. "*Engineering Mathematics-III",* T.K.V.Iyengar S.Chand Publications.
4. N.P. Bali and Manish Goyal, "*A text book of Engineering Mathematics",* Laxmi Publications, Reprint, 2008.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0206) POWER ELECTRONICS

B.Tech, II Year 2nd semester

L	T	P	C
3	0	0	3

Course Objectives:

- To provide the students a deep insight in to the working of different switching devices with respect to their characteristics.
- To analyze different converters and control with their applications.
- To study advanced converters and switching techniques implemented in recent technology

Course Outcomes:

- Design of power electronic converters in power control applications.
- Ability to express characteristics of SCR, BJT, MOSFET and IGBT.
- Ability design AC voltage controller and Cyclo Converter.
- Ability to design Chopper circuits.

UNIT-I

POWER SWITCHING DEVICES

Diode, Thyristor, MOSFET, IGBT: I-V Characteristics; Firing circuit for thyristor; Voltage and current commutation of a thyristor; Gate drive circuits for MOSFET and IGBT.

UNIT-II

THYRISTOR RECTIFIERS

Single-phase half-wave and full-wave rectifiers, Single-phase full-bridge thyristor rectifier with R-load and highly inductive load; Three-phase full-bridge thyristor rectifier with R-load and highly inductive load; Input current wave shape and power factor.

UNIT-III

CHOPPERS

DC-DC Buck converter

Elementary chopper with an active switch and diode, concepts of duty ratio and average voltage, power circuit of a buck converter, analysis and waveforms at steady state, duty ratio control of output voltage.

DC-DC Boost converter

Power circuit of a boost converter, analysis and waveforms at steady state, relation between duty ratio and average output voltage.

UNIT-IV

SINGLE-PHASE VOLTAGE SOURCE INVERTER

Power circuit of single-phase voltage source inverter, switch states and instantaneous output voltage, square wave operation of the inverter, concept of average voltage over a switching cycle, bipolar sinusoidal modulation and unipolar sinusoidal modulation, modulation index and output voltage

UNIT –V

THREE-PHASE VOLTAGE SOURCE INVERTER

Power circuit of a three-phase voltage source inverter, switch states, instantaneous output voltages, average output voltages over a sub-cycle, three-phase sinusoidal modulation

TEXT BOOKS:

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

REFERENCES :

1. R. W. Erickson and D.Maksimovic, "*Fundamentals of Power Electronics*", s pringer Science & Business Media, 2007.
2. L. Umanand, "*Power Electronics: Essentials and Applications*", Wiley India,2009

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)
(18EE0207) ELECTRICAL MACHINES-II

B.Tech, II Year 2nd semester

L	T	P	C
3	0	0	3

Course Objectives:

To make the student learn about:

- Parallel operation of transformers.
- Constructional details, principle of operation and the importance of slip in Induction motor operation
- The slip, torque characteristics and torque calculations of Induction motor
- Methods of starting and speed control of Induction motor

Course Outcomes:

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

- Compute the load shared by each transformer when several transformers operate in parallel.
- Draw the circle diagram of a three phase Induction motor and predetermine the performance characteristics.
- Determine the starting torque, maximum torque, slip at maximum torque using given data.

UNIT-I

3-PHASE TRANSFORMERS

Sumpner's test, separation of hysterisis and eddy current losses. Parallel operation of transformer, load sharing.

Types of connections, Scott connection, open delta operation of 3-phase transformers.

UNIT-II

3-PHASE INDUCTION MOTORS

Constructional details , 3-phase armature/stator windings, types of 3-phase induction motors, production of rotating magnetic field, principle of operation, torque equation , starting torque, maximum torque, torque slip characteristics, Phasor diagram, parameters of equivalent circuit.

UNIT-III

TESTING OF 3-PHASE INDUCTION MOTORS

Brake test, predetermination of performance from no load and blocked rotor tests, circle diagram.Methods of starting: star-delta starter, auto transformer starter, Rotor resistance starter.

SPEED CONTROL OF 3-PHASE INDUCTION MOTORS

Pole changing, Cascade connection, injection of emf in to rotor circuit, introduction to V/f control of 3-phase induction motor

UNIT-IV

SYNCHRONOUS MACHINES-I

Constructional details of synchronous machines, emf equation, synchronous reactance, equivalent circuit ,Phasor diagram, voltage regulation, determination of regulation by synchronous impedance method, mmf method.

Theory of salient pole machines**,** phasor diagram, determination of X_d and X_q from Slip test.

UNIT-V

SYNCHRONOUS MACHINES-II

Parallel operation of Synchronous generators:

Conditions for parallel operation, Synchronizing , load sharing , operation of alternator with infinite busbars.

SYNCHRONOUS MOTORS

Principle of operation, methods of starting , Phasor diagram of synchronous motor, variation of current and power factor with excitation , Predetermination of V and inverted V curves, Hunting and use of damper bars, Synchronous condenser and power factor correction.

TEXT BOOKS:

1. I.J.Nagrath ,D.P.Kothari, "*Electric Machines*", New Age International Ltd.
2. P.S.Bimbhra, "*Electrical* machinery", Khannna Publishers, 2011.

REFERENCES :

1. B.R.Gupta, Vandana Singhal, "*Fundamentals of Electrical Machines*", New Age International Ltd.
2. M.G.Say, "*Performance and desigh of AC Machines*" , CBS Publishers , 2002.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EC0403) SIGNALS & SYSTEMS

B.Tech, II Year 2nd semester

L	T	P	C
3	0	0	3

Course Objectives:

The Objective of this course is to

- Study about signals and systems.
- Do the analysis of signals & systems (continuous and discrete) using time domain & frequency domain methods.
- Understand the stability of systems through the concept of ROC.
- Know various transform techniques in the analysis of signals and systems.

Course Outcomes:

At the end of this course students will demonstrate the ability to

- Analyze different types of signals.
- Represent continuous and discrete systems in time and frequency domain using different transforms.
- Investigate the system stability.
- Sampling and reconstruction of a signal.

UNIT-I

INTRODUCTION TO SIGNALS AND SYSTEMS

Classification of signals - Energy and Power signals, Continuous and Discrete time signals, Continuous and Discrete amplitude signals, Periodic and Aperiodic, Deterministic and Random, Complex exponential and Sinusoidal signals, Elementary Signals, Operations on signals,Systems: Definition and Classification, Illustrative examples.

UNIT-II

FOURIER SERIES

Representation of Fourier series, Properties of Fourier series, Dirichlet‘s conditions, Trignometric Fourier Series and Exponential Fourier series, Discrete Time Fourier Series-properties, Illustrative examples.

FOURIER TRANSFORM

Deriving Fourier Transform from Fourier Series, Fourier Transform of standard signals, Magnitude and Phase response, Properties of Fourier Transform,Fourier Transform of Periodic signals, Discrete Time Fourier Transform-properties, Illustrative examples.

UNIT-III

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS

Linear system, Impulse response, Step response, Response of a Linear system, Linear Time-Invariant (LTI) system, Linear Time Variant (LTV) system, Linear Shift-Invariant (LSI) systems, LTI System properties,Characterization of Causality and Stability of linear Shift-Invariant Systems, Transfer function of a LTI system, Filter characteristics of Linear systems,Relation between Continuous and Discrete time systems.

SAMPLING

The Sampling Theorem, Spectra of sampled signals, Impulse sampling, Reconstruction of signal from its samples-Ideal reconstruction filter, Aliasing effect.

UNIT-IV

CONVOLUTION AND CORRELATION OF SIGNALS

Concept of Convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transform, Cross correlation and Auto correlation of functions, Properties of correlation function, Energy Density Spectrum, Parseval's theorem, Power Density Spectrum, Detection of Periodic signals in the presence of noise by correlation, illustrative examples.

UNIT-V

LAPLACE TRANSFORM

The Laplace transform (LT), region of convergence (ROC), Constraints on ROC for various classes of signals, poles and zeros of system, Laplace domain analysis, solution to differential equations, Properties of LT, relation between LT and FT of a signal, illustrative examples.

Z–TRANSFORM

The z-Transform for discrete time systems, 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, illustrative examples.

TEXT BOOKS:

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

REFERENCES:

1. *"Signals and Systems",* A. Anand Kumar, Phi
2. *"Signals and Systems Analysis using Transform methods and MATLAB",* M. J.Roberts, TMH, 2003.
3. *"Linear Systems and Signals",* B. P. Lathi, Second Edition, Oxford University press, 2008.
4. *"Fundamentals of Signals and Systems",* Michel J. Robert, MGH International Edition, 2008.
5. *"Signals and Systems",* J. Nagrath, S. N. Sharan, R. Ranjan, S. Kumar, TMH.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0208) ELECTRICAL CIRCUITS SIMULATION LAB

B.Tech, II Year 2nd semester

L	T	P	C
0	0	3	1.5

Course Objectives:
- To develop the simulation skills.
- To analyze electrical circuit in simulation environment.

Course Outcomes:
- Analyze networks by various techniques.
- Analyze circuit responses.

List of Experiments
1. Simulation of DC Circuits
2. DC Transient Response
3. Mesh Analysis
4. Nodal Analysis
5. Frequency response of RLC Series Circuits
6. Analysis of RL and RC Series circuits for DC Excitation
7. Analysis of RL and RC Series circuits for AC Excitation
8. Analysis of Three Phase balanced systems
9. Analysis of Three Phase unbalanced systems
10. Verification of the maximum power dissipation (plot the power dissipated versus the load).

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18EE0209) ELECTRICAL MACHINES-I LAB

B.Tech, II Year 2nd semester

L	T	P	C
0	0	3	1.5

Course Objectives:

The student has to learn about:

- No load and load characteristics of DC generators.
- Various tests on DC motors.
- The speed control techniques of DC motors.

Course Outcomes:

The student should be able to do the following:

- Conduct experiments to obtain the no, load and load characteristics of D.C. Generators.
- Conduct tests on D.C. motors for predetermination of efficiency.
- Conduct tests on D.C. motors for determination of efficiency.
- Control the speed of D.C. motor in a given range using appropriate method .
- Identify the reason as to why D.C. Generator is not building up voltage.

List of Experiments

1. Study of DC machine parts (identification of armature, field windings, brushes, Commutator etc,.) And finding Armature resistance R_a.
2. Load Test on DC Shunt Generator. Determination of Characteristics.
3. Brake Test on DC Shunt Motor. Determination of Performance Curves.
4. Load Test on DC Compound Generator. Determination of Characteristics.
5. Magnetization Characteristics of DC Shunt Generator. Determination of Critical Field Resistance and Critical Speed.
6. Fields Test on DC Series Machines. Determination of Efficiency.
7. Swinburne's Test
8. Brake Test on DC Compound Motor. Determination of Performance Curves.
9. Load Test on DC Series Generator. Determination of Characteristics.
10. Retardation Test on DC Shunt Motor. Determination of Losses at Rated Speed.
11. Separation of Losses in DC Shunt Motor.
12. Speed Control of DC Shunt Motor
13. Hopkinson's Test on DC Shunt Machines. Predetermination of Efficiency.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY
(AUTONOMOUS)

(18HS0817 ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

B.Tech, II Year 2nd semester

L	T	P	C
3	0	0	0

Course objective

The course aims at imparting basic principles of thought process, reasoning and inference. Sustainability is at the core of Indian Traditional knowledge Systems connecting society and nature. Holistic life style of yogic science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technological advancements and societal disruptions. The course focuses on introduction to Indian Knowledge Systems, Indian perspective of modern scientific world-view, and basic principles of Yoga and holistic health care system.

UNIT-I

- Basic structure of Indian Knowledge System: Astadash Vidya- 4 ved
- 4 Upaved (Ayurved, Dhanurved, Gandharva Ved & Sthapthya Adi.,)

UNIT-II

- 6 Vedanga (Shisha, Kalppa, Nirukha, VYkaran, Jyothish & Chand)
- 4 Upanga (Dharma Shastra, Meemamsa, Purana & Tharka Shastra)

UNIT-III

- Modern Science and Indian Knowledge System
- Yoga and Holistic Health care
- Case studies

UNIT-IV

- Philosophical Tradition (Sarvadarshan) Nyaya, Vyshepec,Sankhya, Yog, Meemamsa, Vedantha, Chavanka, Jain & Boudh
- Indian Linguistic Tradition –(Phonology, morphology, syntax and semantics)

UNIT-V

- Indian Artistic Tradition - Chitra kala, Moorthi kala, Vasthu kala , Sthapthya, Sangeetha, Nruthya Yevam Sahithya
- Case studies

TEXT BOOKS:

1. V. Sivaramakrishnan (Ed.), *Cultural Heritage of India-course material*, Bharatiya Vidya Bhavan, Mumbai. 5th Edition, 2014
2. Swami Jitatmanand, *Modern Physics and Vedant*, Bharatiya Vidya Bhavan

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1. VN Jha (Eng. Trans.), *Tarkasangraha of Annam Bhatta*, International Chinmay Foundation, Velliarnad, Arnakulam

2. *Yoga Sutra of Patanjali*, Ramakrishna Mission, Kolkata GN Jha (Eng. Trans.), Ed. RN Jha, *Yoga-darshanam with Vyasa Bhashya*, Vidyanidhi Prakashan, Delhi 2016
3. RN Jha, *Science of Consciousness Psychotherapyand Yoga Practices*, Vidyanidhi Prakashan, Delhi 2016
4. P B Sharma (English translation), *Shodashang Hridayan*
5. V. Sivaramakrishnan (Ed.), *Cultural Heritage of India-course material*, Bharatiya Vidya Bhavan, Mumbai. 5th Edition, 2014
6. S.C. Chaterjee & D.M. Datta, *An Introduction to Indian Philosophy*, University of Calcutta, 1984
7. K.S. Subrahmanialyer, *Vakyapadiya of Bhartrihari, (Brahma Kanda)*, Deccan College Pune 1965
8. *Panini Shiksha*, MotilalBanarasidas
9. V.N. Jha, *Language, Thought and Reality*, Vasudevasharan AGRAWAL Kala yevam Samskruthi, Shithya Bhavan Elahabad, 1952
10. Pramod Chandra, *India Arts*, Howard Univ. Press, 1983
11. Krishna Chaitanya, *Arts of India*, Abhinav Publications, 1987
12. R. Nagaswamy, *Foundations of Indian Art*, Tamil Arts Academy, 2002

PEDAGOGY: Problem based learning, group discussions, collaborative mini projects.

OUTCOME: Ability to understand, connect up and explain basics of Indian traditional Knowledge in modern scientific perspective.