SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
Bachelor of Technology
Department of Computer Science & Engineering

I B. Tech. – I Semester (CSE)

S.No.	Course Code	Subject	L	T	P/Drg	C
1	18HS0830	Mathematics-1	3	0	0	3
2	18HS0801	Chemistry	3	1	0	4
3	18ME0302	Engineering Graphics & Design	1	0	4	3
4	18HS0810	English	3	0	0	3
5	18HS0802	Chemistry Lab	0	0	3	1.5
6	18HS0811	English Lab	0	0	3	1.5
7	18ME0301	Workshop Practices Lab	0	0	4	2
		Induction Program (3 weeks)	0	0	0	0
Contact Periods / Week			**10**	**01**	**14**	**18**
			Total/Week 25			

I B. Tech. – II Semester (CSE)

S.No.	Course Code	Subject	L	T	P	C
1.	18HS0831	Mathematics-II	3	1	0	4
2.	18HS0851	Semi-Conductor Physics	3	1	0	4
3.	18CS0501	Programming for Problem Solving	3	0	0	3
4.	18CS0502	Digital Logic Design	3	0	0	3
5.	18EE0239	Basic Electrical Engineering	3	0	0	3
6.	18CS0503	Programming for Problem Solving Lab	0	0	3	1.5
7.	18HS0852	Physics Lab	0	0	3	1.5
Non- Credit Course						
8.	18HS0817	Essence of Indian Traditional Knowledge	3	0	0	0
Contact Periods / Week			**18**	**02**	**6**	**20**
			Total/Week 26			

II B. Tech. – I Semester (CSE)

S.No.	Course Code	Subject	L	T	P	C
1.	18EC0443	Analog Electronics Circuits	3	0	0	3
2.	18CS0504	Data Structures & Algorithms	3	1	0	4
3.	18CS0505	Computer Organization & Architecture	3	0	0	3
4.	18HS0835	Probability & Statistics	3	0	0	3
5.	18CS0506	Database Management Systems	3	0	0	3
6.	18CS0507	Data Structures & Algorithms Lab	0	0	3	1.5
7.	18CS0508	Database Management Systems Lab	0	0	3	1.5
8.	18EE0241	Basic Electrical & Electronics Engineering Lab	0	0	2	1
Non- Credit Course						
9.	18HS0816	Indian Constitution	3	0	0	0
Contact Periods / Week			**18**	**1**	**8**	**20**
			Total/Week 27			

II B. Tech. – II Semester (CSE)

S. No.	Course Code	Subject	L	T	P	C
1.	18HS0836	Discrete Mathematics	3	0	0	3
2.	18CS0509	Formal Languages and Automata Theory	3	1	0	4
3.	18CS0510	Operating Systems	3	0	0	3
4.	18HS0803	Biology for Engineers	3	0	0	3
5.	18CS0511	Object Oriented Programming	3	0	0	3
6.	18CS0512	Operating Systems Lab	0	0	3	1.5
7.	18CS0513	Object Oriented Programming Lab	0	0	3	1.5
Credit Course						
8.	COE-1	Comprehensive Online Examination – I	0	0	0	1
Non- Credit Course						
9.	18HS0804	Environmental Sciences	3	0	0	0
Contact Periods / Week			**18**	**01**	**06**	**20**
			Total/Week 25			

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

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I B. Tech I – Semester

L	T	C
3	0	3

(18HS0830) Mathematics-I
(Common to all branches)

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 : ***(Differentiation)*** 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 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
3. A Text book of B.Sc. mathematics volume-II, V.Venkateswara Rao S.Chand Publications

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.

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I B. Tech - I Semester	**L**	**T**	**C**
	3	**1**	**4**

(18HS0801) Chemistry
(Common to all Branches)

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:

- Analyze 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

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).

UNIT-II

Organic Reactions and Organic Polymers: Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, Synthesis of a commonly used drug molecule. 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-III

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-IV

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-V

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 Treatment.Water softening methods (Lime-Soda, Zeolite, Ion-Exchange resins). Demineralization of Brackish Water: Reverse Osmosis and Electro Dialysis.

Text Books:

1. University chemistry, by B. H. Mahan
2. Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane
3. Fundamentals of Molecular Spectroscopy, by C. N. Banwell
4. Engineering Chemistry (NPTEL Web-book),by B. L. Tembe, Kamaluddin and M. S. Krishnan
5. Physical Chemistry, by P. W. Atkins 1.
6. Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5th Edition http://bcs.whfreeman.com/vollhardtschore5e/default.asp

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I B. Tech. – I Semester

L	P	C
1	4	3

(18ME0302) Engineering Graphics & Design

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

3. *Engineering Graphics with using AutoCAD,2007*. Jeyapoovan.T, Vikas Publishing House

References:

1. *Fundamentals of Engineering Drawing*, Warren J.Luzadder and Jon. M.Duff, Prentice Hall of India Pvt., Ltd., Eleventh Edition, 2001.

2. *Engineering Graphics,* Bhattacharyya, S.C.Bera, I.K .International Pvt Ltd. 2009.

3. *A text Book of Engineering Drawing and Graphic*, K.Venugopal New Age PublishinNew Delhi, 2008.

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I B. Tech - I Semester

L	T	P	C
3	0	0	3

(18HS0810) English
(Common to all branches)

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 communicate effectively.
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-I

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-II

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-III
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-IV
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-V
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.

Reference Books:

1. *Practical English Usage.* Michael Swan. OUP. 1995.
2. *Remedial English Grammar.* F.T. Wood. Macmillan. 2007.
3. *On Writing Well.* William Zinsser. Harper Resource Book, 200.
4. *Study Writing.* Liz Hamp-Lyons and Ben Heasly. Cambridge University Press, 2006.
5. *Communication Skills*. Sanjay Kumar and PushpLata. Oxford University Press, 2011.
6. *Exercises in Spoken English.* Parts. I-III. CIEFL, Hyd. Oxford University Press, 2005.
7. Oscar Wilde, Create Independence Publisher, Kindle Edition, 2017.
8. The Complete Works of William Shakespeare, Kindle Edition, 2017.
9. G. P. Editors, The Complete Works of William Shakespeare, Global Classic, 2018.
10. Robert Frost, Robert Frost Collection, Wider Publication, 2011.

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I B. Tech - I Semester	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

(18HS0802) Chemistry Laboratory
(Common to all Branches)

Course 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.

List of Experiments

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

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I B. Tech – I Semester

L	T	P	C
0	0	3	1.5

(18HS0811) English Lab
(Common to all branches)

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:

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

UNIT -I

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

UNIT-II

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-III

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-IV

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

UNIT-V

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.

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.

References 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.
3. *Speaking English Effectively*, second Edition Krishna Mohan & NP Singh 2011 (Mcmillian).
4. *A Hand Book of English Laboratories*,E.Sureshkumar ,P.Sreehari, Foundation books, 2011.

Spring Board Success, SharadaKoshik, BinduBajwa, Orient Black Swan, Hyderabad, 2010.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

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I B. Tech. – I Sem. **L P C**

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(18ME0301) Workshop Practices Lab

PART-A –Engineering Workshop

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.

PART-B – IT Workshop

Course Objectives:
To provide students with hands-on experience in basic hardware, productivity tools and basic operating system installations.

Course Outcomes:
After Completion of this Course the Student would be able to

- Identify the basic computer peripherals.
- Gain sufficient knowledge on assembling and disassembling a PC.
- Learn the installation procedure of Windows and Linux OS.
- Acquire knowledge on basic networking infrastructure.
- Learn productivity tools like Word, Excel and Power point.
- Acquire knowledge on basics of internet and worldwide web.

Task 1:

Identification of the peripherals of a computer: To prepare a report containing the block diagram of the CPU along with the configuration of each peripheral and its functions. Description of various I/O Devices

Task 2:

A practice on disassembling the components of a PC and assembling them.

Task 3:

1. Basic DOS commands, Installation of MS windows.
2. Basic Linux Commands,Installation ofLinux.

Task 4:

Hardware Troubleshooting (Demonstration): Identification of a problem and fixing the solution (improper assembly or defective peripherals). Software Troubleshooting (Demonstration): Identification of a problem and fixing the PC for any software issues

Productivity tools

Task 5:

1. **MS Word Orientation:** Accessing, overview of toolbars, saving files, Using help and resources, rulers, formatting ,Drop Cap , Applying Text effects, Using Character Spacing, using templates, Borders and Colors, Inserting Header and Footer, Using Date and Time option, security features in word, converting documents while saving
2. **Presentations:** Creating, opening, saving and running the presentations, selecting the style for slides, formatting the slides with different fonts, colors, creating charts and tables, inserting and deleting text, graphics and animations, bulleting and numbering, hyperlinking, running the slide show, setting the timing for slide show. Students should submit a user manual of the Presentation tool considered.
3. **Spreadsheet :**Students should be able to create, open, save the application documents and format them as per the requirement. Some of the tasks that may be practiced are Managing the worksheet environment, creating cell data, inserting and deleting cell data, format cells, adjust the cell size, applying formulas and functions, preparing charts, sorting cells. Students should submit a user manual of the Spreadsheet application considered.

Task 6:

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

REFERENCES:

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
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I B. Tech. II –Semester

L	T	C
3	1	4

(18HS0831) Mathematics-II
(Common to all branches)

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* by T.K.V. Iyengar, S.Chand publication

Reference Books:

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: PUTTUR
(AUTONOMOUS)

I B. TECH, II – Semester

L	T	C
3	1	4

(18HS0851) Semi-Conductor Physics
(Common to ECE, CSE and CS&IT)

Course Objectives:

- Basic concepts of free electron theory and energy bands in solids.
- Key points, formation and importance of semiconductors.
- Will Understanding working principles and applications of optoelectronic devices.
- Will recognize the basic concepts related properties of Lasers and Optical Fibers..
- To understand the fundamentals Nano materials.

Course outcomes:

- Would understand the basic concepts of free electron theory and energy bands in solids.
- Able to deliver importance of semiconductors.
- Would understand working principles and applications of optoelectronic devices.
- Able to explain concepts related toLasers and Optical fibers. .
- Understand the importance of Nanotechnology.

UNIT – I

ELECTRONIC MATERIALS: Free electron theory, density of states and energy band diagrams – Energy bands in solids – E – K band diagram, direct and indirect band gaps, types of electronic materials : metals , semiconductors and insulators – occupation probability – Fermi level – effective mass .

UNIT – II

SEMICONDUCTORS: Intrinsic and Extrinsic semiconductors – Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics) - Carrier generation and recombination - Carrier transport: diffusion and drift -Hall Effect- p -n junction – Metal semiconductors junction-Ohmic and Schottky Junctions.

UNIT –III

LIGHTEMITING DIODE (LED) & PHOTODETECTORS: Rate equations for carrier density – radiative and non - radiative recombination mechanisms in semiconductors – LED: structure, materials, characteristics and figure of merits.

Photo detectors – PIN and Avalanche diode and their structure, materials working principle and characteristics – Solar cell.- Principle and characteristics

UNIT – IV

LASERS AND FIBER OPTICS: Characteristics of laser beams,Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion, different types of lasers: Semiconductor laser, applications of lasers in science, engineering and medicine.

Principle of fiber optics – acceptance angle and numerical aperture – types of fibre cables- loses in fiber optics – optical fiber communication system - applications of fiber optics.

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. J. Singh, Semiconductor optoelectronics, Physics and Technology, McGraw-Hill Inc. (1995).
2. S.M. Sze, Semiconductor devices: Physics and Technology, Wiley (2008).
3. P. Bhattacharya, Semiconductor optoelectronic devices, Prentice Hall of India (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: PUTTUR
(AUTONOMOUS)

I B. Tech. – II Sem.(CSE)

L	T	C
3	0	3

(18CS0501) Programming for Problem Solving

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. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
3. Programming in C, Second Edition – Pradip Dey, Manas Ghosh, Oxford University Press.
4. "C from Theory to Practice"- George S. Tselikis- Nikolaos D. Tselikas- CRC Press.
5. "Programming with C"- R S Bichkar- University Press.
6. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A.Ananda Rao, Pearson Education. (UNIT-I)

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

I B. Tech. – II Sem.(CSE)

L	T	C
3	0	3

(18CS0502) Digital Logic Design

Course Objectives:

- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
- To prepare students to perform the analysis and design of various digital electronic circuits.

Course Outcomes:

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

- Understand working of logic families and logic gates.
- Design and implement Combinational and Sequential logic circuits.
- Understand the process of Analog to Digital conversion and Digital to Analog conversion.
- Be able to use PLDs to implement the given logical problem.

UNIT- I

Binary systems and Boolean algebra: Digital Systems, Binary Numbers, Number Base Conversions, Octa land Hexa decimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Axiomatic Definition of Boolean Algebra, Basic Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates.

UNIT- II

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

UNIT- III

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

UNIT- IV

Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure, Registers, Shift Registers, Ripple counters, Synchronous counters, Ring Counter and Johnson Counter.

UNIT- V

Memory And Programmable Logic: Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices, Integrated circuits.

TEXT BOOKS:

1. Digital Design, M.Morris Mano, Micheal D.Ciletti, 5th Edition, 2013, Pearson.

REFERENCE BOOKS:

1. Digital Logic & State Machine Design, David J. Comer, Oxford University Press, 3rd Reprinted Indian Edition, 2012.
2. Digital Logic Design, R.D.Sudhakar Samuel, Elsevier Fundamentals of Logic Design, 5/e, Roth, Cengage

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

I B.Tech –II Semester (CSE)

L	T	C
3	0	3

(18EE0239) Basic Electrical Engineering

Course Objectives:
To make the student learn about:

- To understand the nature of different circuit elements, fundamental laws and network Theorems.
- Understand the operation of dc machines and single phase transformers.

Course Outcomes:
Upon completion of the course, students will:

- Determine the equivalent impedance of given network by using network reduction techniques.
- Determine the current through any element and voltage across any element
- Apply the network theorems suitably.
- Analyze the operating principles of electrical machines and transformer.

UNIT-I

DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.

UNIT-II

AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three phase balanced circuits, voltage and current relations in star and delta connections.

UNIT-III

Transformers: Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.

UNIT-IV

Electrical Machines: Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators.

UNIT-V

Electrical Installations

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.

TEXT BOOKS:

1. D. P. Kothari and I. J. Nagrath, "*Basic Electrical Engineering*", Tata McGraw Hill,2010.
2. D. C. Kulshreshtha, "*Basic Electrical Engineering*", McGraw Hill, 2009.

REFERENCES:

1. L. S. Bobrow, "*Fundamentals of Electrical Engineering*", Oxford University Press,2011.
2. E. Hughes, "*Electrical and Electronics Technology*", Pearson, 2010.
3. V. D. Toro, "*Electrical Engineering Fundamentals*", Prentice Hall India, 1989.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

I B. Tech. – II Sem.(CSE) **P** **C**
3 **1.5**

(18CS0503) Programming for Problem Solving Lab

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: PUTTUR

I B. Tech - II – Semester	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

(18HS0852) Physics Lab
(Common to CIVIL, EEE, ME, ECE, CSE, CSIT and AG).

Course Objectives:

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.

Course Outcomes:

- 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.

Reference books:

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

I B. Tech – II Semester. (C.S.E)

L	T	C
3	0	0

(18HS0817) Essence of Indian Traditional Knowledge

Course objectives:

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.

Course Outcome:

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

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
3. Swami Jitatmanand, *Holistic Science and Vedant*, Bharatiya Vidya Bhavan
4. Fritzof Capra, *Tao of Physics*
5. Fritzof Capra, *The Wave of life*

References:

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

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

II B. Tech – I Semester. **L T C**
3 0 3

(18EC0443) Analog Electronics Circuits
(Common to CSE, CSIT & EEE)

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/REFERENCE 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.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

II B. Tech. – I Sem.(CSE) **L T C**
3 1 4

(18CS0504) Data Structures & Algorithms

Course Objective:

- Understand different data structures
- Understand searching and sorting techniques

Course Outcome:

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

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

UNIT-I

Arrays and Linked lists: One Dimensional array : insert, delete, merging operations, Multi Dimensional array, Single linked list, Circular linked list, Double linked list, Circular Double linked list, Applications of linked lists.

UNIT-II

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

UNIT-III

Trees: Basic Terminologies- Definition and Concepts- Representations of Binary Tree- Operation on a Binary Tree- Types of Binary Trees-Binary Search Tree, Heap Trees, AVL Trees, Red black trees

UNIT-IV

Graphs: Introduction- Graph terminologies- Representation of graphs, Graph traversal techniques, Applications of Graph Structures: map colouring, Dijkstra's technique, topological sorting.

Searching:

Linear Search, Binary Search, Hash based searching: Hashing Techniques, Collision Resolution Techniques: Closed Hashing, Open Hashing.

UNIT-V

Sorting: Sorting Techniques: Sorting by Insertion: Straight Insertion sort- List insertion sort- Sorting by selection: Straight selection sort- Heap Sort- Sorting by Exchange: bubble sort, Shell Sort- Quick Sort, merge sort technique

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Fundamentals of Data Structures in C – Horowitz, Sahni, Anderson-Freed, Universities Press, Second Edition.
2. Schaum' Outlines – Data Structures – Seymour Lipschutz – McGrawHill- Revised First Edition.

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

(18CS0505) Computer Organization and Architecture

Course Objectives:

To expose the students to the following:

- How Computer Systems work & the basic principles
- Instruction Level Architecture and Instruction Execution
- The current state of art in memory system design
- How I/O devices are accessed and its principles.
- To provide the knowledge on Instruction Level Parallelism
- To impart the knowledge on micro programming
- Concepts of advanced pipelining techniques.

Course outcomes:

- Draw the functional block diagram of a single bus architecture of a computer and describe the function of the instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set.
- Write assembly language program for specified microprocessor for computing 16 bit multiplication, division and I/O device interface (ADC, Control circuit, serial port communication).
- Write a flowchart for Concurrent access to memory and cache coherency in Parallel Processors and describe the process.
- Given a CPU organization and instruction, design a memory module and analyze its operation by interfacing with the CPU.
- Given a CPU organization, assess its performance, and apply design techniques to enhance performance using pipelining, parallelism and RISC methodology

UNIT - I

Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Basic operational concepts - Bus Structures - Instruction set architecture of a CPU – registers, instruction execution cycle, addressing modes, instruction set, Data Transfer, Data Manipulation and Program Control.

UNIT – II

Data Representation: signed number representation, fixed and floating point representations, character representation. Computer arithmetic – integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-and add, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic.

UNIT - III

Basic Processing Unit: RTL interpretation of instructions - Register Transfer -Bus and Memory Transfers -Arithmetic Micro operations-Logic Micro operations -Shift Micro operations

CPU control unit design: hardwired and micro-programmed design approaches. Address Sequencing

UNIT – IV

Memory organization: Concept of hierarchical memory organization, semiconductor memory technologies – Secondary memories.Virtual Memory, Cache memory, mapping functions, replacement algorithms, write policies.

Peripheral devices and their characteristics: Input-output subsystems, I/O deviceinterface, I/O transfers –interrupt driven and DMA,

UNIT - V

Pipelining: Basic concepts of pipelining, throughput and speedup, instruction hazards

Parallel Processors: Introduction to parallel processors, Multiprocessor –Inter Connection Structures- Concurrent access to memoryand cache coherency.

Text books:

1. "Computer Organization and Design: The Hardware/Software Interface", 5th Edition by David A. Patterson and John L. Hennessy, Elsevier.
2. "Computer Organization and Embedded Systems", 6th Edition by Carl Hamacher, McGraw Hill Higher Education.

Reference books:

1. "Computer Architecture and Organization", 3rd Edition by John P. Hayes, WCB/McGraw-Hill
2. "Computer Organization and Architecture: Designing for Performance", 10th Edition by William Stallings, Pearson Education.
3. "Computer System Design and Architecture", 2nd Edition by Vincent P. Heuring and Harry F. Jordan, Pearson Education.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

II B. Tech-I Semester	**L**	**T**	**C**
	3	**0**	**3**

(18HS0835) Probability & Statistics
(Common to ME, CSE and CSIT branches)

Course Objectives:

- To train the students thoroughly in Mathematical concepts fundamentals of probability, test of hypothesis, Test of significance.
- To prepare students for lifelong learning and successful careers using mathematical concepts of probability, test of hypothesis, Test of significance.
- To develop the skill pertinent to the practice of the mathematical concepts including the Student abilities to formulate and modeling the problems, to think creatively and to Synthesize information

Course Outcomes:

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

- Have acquired ability to participate effectively in group discussions
- Have developed ability in writing in various contexts

Have acquired a proper level of competence for employability

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

Applied Statistics:

Curve fitting: Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves (Exponential & Power curve).

Test of Hypothesis: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations.

UNIT V

Test of significance:

Test for single mean, difference of means and correlation coefficients, test for ratio of variances - Chi-square test for goodness of fit and independence of attributes.

Text Books:

1. B.S. Grewal, "*Higher Engineering Mathematics*", Khanna Publishers, 2000
2. *Statistical methods* by S.P. Gupta, S.Chand publications.
3. *Probability & Statistics* by T.K.V. Iyengar, S.Chand publications.

Reference Books:

1. *Probability & Statistics* by E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher.
2. *Probability & Statistics for engineers* by Dr. J. Ravichandran WILEY-INDIA publishers.
3. *Probability & Statistics for Science and Engineering* by G.Shanker Rao, Universities Press.
4. *Probability and Statistics for Engineering and Sciences* by Jay L.Devore, CENGAGE.
5. *Probability and Statistics* by R.A. Jhonson and Gupta C.B.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
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II B. Tech. – I Sem.(CSE) **L T C**
3 0 3

(18CS0506) Database Management Systems

Course Objectives:

- To understand the different issues involved in the design and implementation of a database system.
- To study the physical and logical database designs, database modeling, relational, hierarchical, and network models
- To understand and use data manipulation language to query, update, and manage a database
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Course Outcomes:

- For a given query write relational algebra expressions for that query and optimize the developed expressions
- For a given specification of the requirement design the databases using E_R method and normalization.
- For a given transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability.
- Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling.

UNIT- I

Introduction: Database System Applications, Purpose of Database Systems, View of Data - Data Abstraction, Data Independence , Data Models, Database Languages - DDL, DML, Database Architecture, Database Users and Administrators.

Introduction to Data base design: ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Conceptual Design with the ER Model.

Relational Model: Integrity Constraints over Relations, Logical data base Design, Introduction to Views Destroying/ altering Tables and Views.

UNIT- II

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

Form of Basic SQL Query- Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set - Comparison Operators, Aggregate Operators, NULL values - Comparison using Null values - Logical connectives - AND, OR and NOT - Outer Joins, Triggers.

UNIT -III

Introduction to Schema Refinement- Problems Caused by redundancy, Functional Dependencies, Armstrong's axioms, Normal Forms - FIRST, SECOND, THIRD Normal forms - BCNF - Properties of Decompositions- Loss less join Decomposition, Dependency preserving Decomposition - FOURTH Normal Form, FIFTH Normal form.

UNIT- IV

Transaction Management: Transaction Concept, Transaction State, ACID Property, Serializability, Recoverability.

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

Recovery System: Log - Based Recovery, Buffer Management, Remote Backup systems.

UNIT- V

Storage strategies and Indexing: RAID Levels, Indices.

Tree Structured Indexing: Indexed Sequential Access Methods (ISAM) B+ Trees: Search, Insert, Delete.

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

Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models

TEXT BOOKS:

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

REFERENCE BOOKS:

1.Database Systems, 6th edition, RamezElmasri, Shamkat B. Navathe, Pearson Education, 2013.
2. "Principles of Database and Knowledge – Base Systems", Vol 1 by J. D. Ullman, Computer Science Press.
3.Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
4.Introduction to Database Systems, C.J. Date, Pearson Education.
5.Database Management Systems, G.K. Gupta, McGrawHillEducation.
6."Foundations of Databases", Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
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II B. Tech. – I Sem.(CSE) **P C**
3 1.5

(18CS0507) Data Structures & Algorithms Lab

1. Write a program to perform the operations insertion, deletion, and traversing an array
2. Write a program to perform the operations creation, insertion, deletion, and traversing a Singly linked list.
3. Write a program to perform the operations creation, insertion, deletion, and traversing a Doubly linked list.
4. Write a program to implement stack using arrays and linked lists.
5. Write a program to convert infix expression to postfix expression
6. Write a program to implement queue using arrays and linked lists.
7. Write a program to implement circular queue using arrays
8. Write a program to implement Binary Tree
9. Write a program to perform different operations on Binary Search Trees
10. Write a program to implement depth first search and breadth first search on graphs.
11. A)Write a program to perform Linear Search on the elements of a given array

    B) Write a program to perform Binary Search on the elements of a given array
12. Write a program to perform Hash Based Searching.
13. Write a program to sort the elements of an array using Selection Sort.
14. Write a program to sort numbers using insertion sort.
15. Write a program to implement quick sort using non-recursive function

REFERENCE BOOKS:

1. Fundamentals of Data Structures in C – Horowitz, Sahni, Anderson-Freed, Universities Press, Second Edition.
2. Schaum' Outlines – Data Structures – Seymour Lipschutz – McGrawHill- Revised First Edition.

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II B. Tech. – I Sem.(CSE) **P C**
3 1.5

(18CS0508) Database Management Systems Lab

Course Objective:

- To know the components of DBMS.
- To understand design of ER Diagrams and represent using Relational model.
- To understand the concept of normal forms in the design of databases.
- To Understand representation of retrieval of data using relational algebra and calculus.

Course Outcome:

Apply ER concepts to design databases.

- Design simple database using a tool and implement it using SQL.
- Access normalization relations of relational model using normal forms
- Apply all constrains to develop a business application using cursors, triggers and stored

LIST OF EXPERIMENTS:

1. Practice session: Students should be allowed to choose appropriate DBMS software, install it, configure it and start working on it. Create sample tables, execute some queries, use SQLPLUS features, use PL/SQL features like cursors on sample database. Students should be permitted to practice appropriate User interface creation tool and Report generation tool.

2. A college consists of number of employees working in different departments. In this context, create two tables employee and department. Employee consists of columns empno, empname, basic, hra, da, deductions, gross, net, date-of-birth. The calculation of hra, da are as per the rules of the college. Initially only empno, empname, basic have valid values. Other values are to be computed and updated later. Department contains deptno, deptname, and description columns. Deptno is the primarykey in department table and referential integrity constraint exists between employee and department tables.

Perform the following operations on the database:

- Create tables department and employee with required constraints.
- Initially only the few columns(essential) are to be added. Add the remaining columns separately by using appropriate SQL command
- Basic column should not be null
- Add constraint that basic should not be less than 5000.
- Calculate hra, da, gross and net by using PL/SQL program.
- Whenever salary is updated and its value becomes less than5000 a trigger has to be raised preventing the operation.

- The assertions are: hra should not be less than 10% of basic and da should not be less than 50% of basic.
- The percentage of hra and da are to be stored separately.
- When the da becomes more than 100%, a message has to be generated and with user permission da has to be merged with basic.
- Empno should be unique and has to be generated automatically.
- If the employee is going to retire in a particular month, automatically a message has to be generated.
- The default value for date-of-birth is1jan, 1970.
- When the employees called daily-wagers are to be added the constraint that salary should be greater than or equal to5000 should be dropped. • Display the information of the employees and departments with description of the fields.
- Display the average salary of all the departments.
- Display the average salary department wise.
- Display the maximum salary of each department and also all departments put together.
- Commit the changes whenever required and rollback if necessary.
- Use substitution variables to insert values repeatedly.
- Assume some of the employees have given wrong information about date-of- birth. Update the corresponding tables to change the value.
- Find the employees whose salary is between 5000 and 10000 but not exactly 7500. • Find the employees whose name contains 'en'.
- Try to delete a particular deptno. What happens if there are employees in it and if there are no employees.
- Create alias for columns and use them in queries.
- List the employees according to ascending order of salary.
- List the employees according to ascending order of salary in each department.
- Use'&&'wherever necessary
- Amount 6000 has to be deducted as CM relief fund in a particular month which has to be accepted as input from the user. Whenever the salary becomes negative it has to be maintained as1000 and the deduction amount for those employees is reduced appropriately.
- The retirement age is 60 years. Display the retirement day of all the employees.
- If salary of all the employees is increased by 10% every year, what is the salary of all the employees at retirement time.
- Find the employees who are born in leap year.
- Find the employees who are born on feb 29.
- Find the departments where the salary of at least one employee is more than 20000.
- Find the departments where the salary of all the employees is less than 20000.
- On first January of every year a bonus of 10% has to be given to all the employees. The amount has to be deducted equally in the next 5 months. Write procedures for it.
- As a designer identify the views that may have to be supported and create views.
- As a designer identify the PL/SQL procedures necessary and create the musing cursors.
- Use appropriate Visual programming tools like oracle forms and reports, visual basic etc. to create user interface screens and generate reports.

Note: As a designer identify other operations that may be required and add to the above list.

The above operations are not in order. Order them appropriately. Use SQL or PL/SQL depending on the requirement.

3. Students may be divided in to batches and the following experiments may be given to them to better understand the DBMS concepts. Students should gather the required information, draw ER diagrams, map them to tables, normalize, create tables, triggers, procedures, execute queries, create user interfaces, and generate reports.

- Student information system
- APSRTC reservation system
- Hostel management
- Library management
- Indian Railways reservation
- Supermarket management
- Postal system
- Banking system
- Courier system
- Publishing house system

REFERENCES:

1. "Learning Oracle SQL and PL/SQL", Rajeeb C. Chatterjee,PHI.
2. "Oracle Database11g PL/SQL Programming",M.McLaughlin,TMH.
3. "Introduction to SQL",RickF.VanderLans, Pearson education.

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II B.Tech. I - Semester

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(18EE0241) Basic Electrical and Electronics Engineering Lab

Course Objectives:

- To enhance the student with knowledge on electrical and electronic equipment's.

Course Outcomes:

- Students will understand all the fundamental concepts involving electrical engineering.
- Students will understand all the fundamental concepts involving electronics engineering.

PART – A
BASIC ELECTRICAL ENGINEERING LAB

1. Verification of Superposition Theorem.
2. Verification of Thevenin's Theorem.
3. Determination of Open circuit and Short circuit parameters
4. Swinburne's Test on DC Shunt Machine (Predetermination of Efficiency of a Given DC Shunt Machine Working as Motor and Generator).
5. Brake Test on DC Shunt Motor. Determination of Performance Characteristics.
6. OC & SC Tests on Single-Phase Transformer (Predetermination of Efficiency and Regulation at Given Power Factors).

PART – B
ELECTRONICS LABORATORY

(Any Six Experiments)

1. P-N Junction Diode and Zener Diode Volt-Ampere Characteristics.
2. Bipolar Junction Transistor in CB Configuration-Input and Output Characteristics, Computation of α.
3. Half-Wave Rectifier- a) Without Filter b) With Capacitor Filter.
4. Full-Wave Rectifier- a) Without Filter b) With Capacitor Filter.
5. Bipolar Junction Transistor in CE Configuration-Input and Output Characteristics, Computation of β.
6. Junction field effect Transistor in Common Source Configuration Output and Transfer Characteristics.
7. Verification of Logic Gates- AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.

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II B. Tech – I Semester	**L**	**T**	**P**	**C**
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(18HS0816) Indian Constitution

Course Objectives:

Students will be able to:

- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- 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.
- 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.

Course Outcomes:

Students will be able to:

- Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
- Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
- Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
- Discuss the passage of the Hindu Code Bill of 1956.

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 framing of Indian Constitution, 1st Edition, 2015,

Reference Books:

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: PUTTUR
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II B. Tech. II –Semester

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(18HS0836) Discrete Mathematics
(Common to CSE and CSIT)

Course Objectives:

- To train the students thoroughly in Mathematical concepts of Mathematical logic, Relations, Algebraic structures, Recurrence Relation, Graph Theory.
- To prepare students for lifelong learning and successful careers using Mathematical concepts of Mathematical logic, Relations, Algebraic structures, Recurrence Relation, Graph Theory.
- To develop the skill pertinent to the practice of the Mathematical concepts including the students abilities to formulate and modelling the problems, to think creatively and to synthesize information.

Course Outcomes:

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

- Have acquired ability to participate effectively in group discussions
- Have developed ability in writing in various contexts
- Have acquired a proper level of competence for employability

UNIT-I

Mathematical Logic: Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of Contradiction, Automatic Theorem Proving.

UNIT-II

Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Functions: Inverse Function, Composition of functions, recursive Functions

Algebraic structures: Algebraic systems examples and general properties, Semi groups and monads, groups, sub groups homomorphism, Isomorphism.

UNIT-III

Elementary Combinatories: Basis of counting, Enumerating Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application

UNIT-IV

Recurrence Relation: Generating Functions & Sequences , Calculating Coefficient of generating function, Recurrence relations, Solving Recurrence relation by substitution and Generating functions. Characteristic roots, solution of Inhomogeneous Recurrence Relation.

UNIT-V

Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs, Graph Theory Applications: Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

Text Books:

1 *Discrete Mathematics with Applications*, Thomas Koshy, Elsevier.
2 *Discrete Mathematics and its applications*, 6th edition, K.H.Rosen, TMH.

References:

1. *Elements of Discrete Mathematics*- A Computer Oriented Approach, C.L.Liu, D.P. Mohapatra, 3/e,TMH.
2. *Discrete Mathematics for Computer Scientists & Mathematicians*, 2/e, J.L.Mott, A. Kandel, T.P. Baker, PHI
3. *Discrete Mathematical Structures with Application to Computer Science*, Tremblay, Manohar McGraw Hill Publication
4. *Discrete and Combinatorial Mathematics*- An Applied Introduction, Ralph. P.Grimaldi, 5/e, Pearson Education
5. *Discrete Mathematical Structures*, Mallik and Sen, Cengage Learning.
6. *Discrete Mathematical Structures*, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education
7. *Discrete Mathematics*, Lovasz, Springer.

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II B. Tech. – II Sem.(CSE) **L T C**
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(18CS0509) Formal Languages and Automata Theory

Course Objectives:

- Develop a formal notation for strings, languages and machines.
- Design finite automata to accept a set of strings of a language.
- Prove that a given language is regular and apply the closure properties of languages.
- Design context free grammars to generate strings from a context free language and convert them into normal forms.
- Prove equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
- Identify the hierarchy of formal languages, grammars and machines.
- Distinguish between computability and non-computability and Decidability and un decidability.

Course Outcomes:

1. Write a formal notation for strings, languages and machines.
2. Design finite automata to accept a set of strings of a language.
3. For a given language determine whether the given language is regular or not.
4. Design context free grammars to generate strings of context free language .
5. Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars
6. Write the hierarchy of formal languages, grammars and machines.
7. Distinguish between computability and non-computability and Decidability and un decidability

UNIT-I

Introduction: Alphabet, languages and grammars, productions and derivation, Chomsky hierarchy of languages.

Regular languages and finite automata: Regular expressions and languages, deterministic finite automata (DFA) and equivalence with regular expressions, nondeterministic finite automata (NFA) and equivalence with DFA, regular grammars and equivalence with finite automata, properties of regular languages, pumping lemma for regular languages, minimization of finite automata.

UNIT-II

Context-free languages and pushdown automata: Context-free grammars (CFG) and languages (CFL), Chomsky and Greibach normal forms, nondeterministic pushdown automata (PDA) and equivalence with CFG, parse trees, ambiguity in CFG, pumping lemma for context-free languages, deterministic pushdown automata, closure properties of CFLs.

UNIT-III

Context-sensitive languages: Context-sensitive grammars (CSG) and languages, linear bounded automata and equivalence with CSG.

UNIT-IV

Turing machines: The basic model for Turing machines (TM), Turing recognizable (recursively enumerable) and Turing-decidable (recursive) languages and their closure properties, variants of Turing machines, nondeterministic TMs and equivalence with deterministic TMs, unrestricted grammars and equivalence with Turing machines, TMs as enumerators.

UNIT-V

Undecidability: Church-Turing thesis, universal Turing machine, the universal and diagonalization languages, reduction between languages and Rice s theorem, undecidable problems about languages.

Text books:

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages, and Computation, Pearson Education Asia.

Reference books:

1. Harry R. Lewis and Christos H. Papadimitriou, Elements of the Theory of Computation, Pearson Education Asia.

2. Dexter C. Kozen, Automata and Computability, Undergraduate Texts in Computer Science, Springer.

3. Michael Sipser, Introduction to the Theory of Computation, PWS Publishing.

4. John Martin, Introduction to Languages and The Theory of Computation, Tata McGraw Hill.

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

(18CS0510) Operating Systems

Course Objectives:

- To make the students understand the basic operating system concepts such as processes, threads, scheduling, synchronization, deadlocks, memory management, file and protection.
- To get acquaintance with the class of abstractions afford by general purpose operating systems that aid the development of user applications.

Course Outcomes:

- Able to use operating systems effectively.
- Create processes and threads.
- Develop algorithms for process scheduling for a given specification of CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time.
- For a given specification of memory organization develop the techniques for optimally allocating memory to processes by increasing memory utilization and for improving the access time.
- Design and implement file management system.

UNIT I

Operating Systems Overview: What is an operating system, history of operating systems, Operating system functions, Operating systems Operations, Types of Operating Systems, Computing Environments.

System Structures: Operating System Services, User and Operating-System Interface, systems calls, Types of System Calls, system programs, Structure of an OS - Layered, Monolithic, Microkernel Operating Systems, Concept of Virtual Machine. Case study on UNIX and WINDOWS Operating System.

UNIT II

Processes: Definition, Process Relationship, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching.

Processes Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR; Multiprocessor scheduling.

Threads: Definition, Various states, Benefits of threads, Types of threads, Concept of multithreads.

UNIT III

Process Synchronization: Inter process Communication, Critical Section, Race Conditions, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer-Consumer Problem, Semaphores, Monitors, Message Passing, Classical IPC Problems: Reader's & Writer Problem, Dinning Philosopher Problem

Deadlocks: Definition, Necessary and sufficient conditions for Deadlock, Deadlock Prevention, Deadlock Avoidance: Banker's algorithm, Deadlock detection and Recovery.

UNIT IV

Memory Management: Basic concept, Logical and Physical address map, Memory allocation: Contiguous Memory allocation – Fixed and variable partition– Internal and External fragmentation and Compaction, Paging, Segmentation.

Virtual memory: Basics of Virtual Memory ,Demand paging, page-replacement, Page Replacement algorithms, Thrashing.

Disk Management: Disk structure, Disk scheduling - FCFS, SSTF, SCAN, C-SCAN.

UNIT V

File Management: Concept of File, Access methods, File types, File operation, Directory structure, File System structure, Allocation methods (contiguous, linked, indexed), Free-space management (bit vector, linked list, grouping), directory implementation (linear list, hash table).

Protection & Security: Protection Mechanisms, Protection matrix, Authentication Techniques, Threats, intruders, Basics of Cryptography-Secret key, public key, One-Way Function, Digital Signature.

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Wiley , Eight Edition,
2. Modern Operating Systems, Andrew S Tanenbaum, 3rd edition, Pearson Education International

Reference Books:

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley
3. Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India
4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates

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II B. Tech - II Semester

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(18HS0803) Biology for Engineers

(Common to all Branches)

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 codeand 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

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

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

5) Microbiology, Prescott, L.M J.P. Harley and C.A. Klein 1995. 2nd edition Wm, C. Brown

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

(18CS0511) Object Oriented Programming

Course Objectives:

The course will introduce standard tools and techniques for software development, using object oriented approach, use of a version control system, an automated build process, an appropriate framework for automated unit and integration tests

Course Outcomes: After taking the course, students will be able to:

- Specify simple abstract data types and design implementations, using abstraction functions to document them.
- Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.
- Name and apply some common object-oriented design patterns and give examples of their use.
- Design applications with an event-driven graphical user interface.

UNIT- I

The Java Language -The History and Evolution of Java -Security - Portability -Byte Code- The Java Buzzwords - An Overview of Java -Data Types Variables, and Arrays -Operators - Control Statements - Java's Selection Statements - Iteration Statements - Jump Statements.

UNIT- II

Introducing Classes -Class Fundamentals -Declaring Objects - Introducing Methods Constructors - Garbage Collection -Understanding static - Introducing final - Command line arguments -Varargs - Inheritance -Using Super - Method Overriding - Dynamic Method Dispatch- abstract classes - Packages and Interfaces.

UNIT- III

Exception Handling - Exception Fundamentals - Exception Types -Uncaught Exceptions - Using try and catch - Nested try Statements -throw -throws -finally - Java's Built-in Exceptions -Creating Your Own Exception Subclasses - Chained Exceptions

Multithreaded Programming - The Java Thread Model -Thread Priorities - The Thread Class and the Runnable Interface - Creating Multiple Threads -Using isAlive( ) and join( ) – Thread Priorities, Synchronization-String Handling.

UNIT- IV

Generics-A simple Generic Example-General form of Generic class-Generic Interfaces Collection Framework-Collections overview, Collection class, Collection interfaces.

The Applet Class - Event Handling -Two Event Handling Mechanism - The Delegation Event Model - Event Classes -Source of Events -Event Listener Interfaces.

UNIT- V

Introducing the AWT - Using AWT Controls-Layout Managers and Menus
Introducing Swing -Exploring Swing.

Java.net package, basics of network programming, address ports, sockets, simple client server program. Introduction to JDBC, java.sql package, JDBC architecture, Drivers, Connections, Statement, Prepared Statement, Example Programs.

TEXT BOOKS:

1. The Complete Reference Java Eight Edition – Herbert Schildt – McGrawHill.
2. Introduction to Java programming – Y Daniel Liang – Que E & T.

REFERENCE BOOKS:

1. Java for Programmers, P.J. Deitel and H.M. Deitel, Pearson education (OR) Java: How to Program P.J. Deitel and H.M. Deitel, PHI.
2. Thinking in Java, Bruce Eckel, Pearson Education

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II B. Tech. – II Sem.(CSE) **P C**
3 1.5

(18CS0512) Operating Systems lab

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate producer and consumer problem
3. Simulate dining philosopher‘s problem
4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate MVT and MFT
6. Simulate Paging Technique of memory management
7. Simulate all page replacement algorithms
   a) FIFO b) LRU c)Optimal
8. Simulate Disk Scheduling Algorithms
   a)FCFS b)SSTF c)SCAN
9. Simulate all File allocation strategies
   a) Sequential b) Indexed c) Linked
10. Simulate all File Organization Techniques
    a) Single level directory b) Two level c) Hierarchical

Reference Books:

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley

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3 1.5

(18CS0513) Object Oriented Programming Lab

1. a) Acquainting students to java programming environment
   b) write a program in java to display your details

2. a) How to read and write different types of data through keyboard and display them on console using java program
   b) Write a java program to find prime numbers between 1 to n.

3 a) Write a java program to print N Fibonacci series.
   b) Write a java program to find the maximum and minimum of N array elements.

4. Create a class with the name "Dog" with properties(attributes) name,age,colour,gender and create 3 objects to access those properties
5. Write java program to create a super class called Figure that receives the dimensions of two dimensional objects. It also defines a method called area that computes the area of an object. The program derives two subclasses from Figure. The first is Rectangle and second is Triangle. Each of the sub class overridden area() so that it returns the area of a rectangle and a triangle respectively.

6. a) create a user(your) defined package and import it into a java program.
   b) How to implement an interface in java program using your own example.
7. Write a Java program that prints all real and imaginary solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula.
8. A simple Java program to illustrate Constructor Overloading.
9. Use inheritance to create an exception super class called Exception A and exception sub class Exception B and Exception C, where Exception B inherits from Exception A and Exception C inherits from Exception B. Write a java program to demonstrate that the catch block for type Exception A catches exception of type Exception B and Exception C .

10. Write a Java program that creates three threads. First thread displays ―Good Morning, every one second, the second thread displays Hello, every two seconds and the third thread displays Welcome every three seconds.

11. Write a java program to accept a string from user and display number of vowels, consonants, digits and special characters present in each of the words of the given text.
12. How to create your own exception subclass and how to handle it.
13. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication
14. Write a Java Program for waving a Flag using Applets and Threads
15. A Simple Java program to show multiple type parameters in Java Generics.

16. Write a Java program for handling mouse events.
17. How to use swings to create frame and buttons in java program.
18. Write java programs establish a JDBC connection, create a table student with properties name, register number, mark1, mark2, mark3. Insert the values into the table by using the java and display the information of the students at front end.

TEXT BOOKS:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI

2. Java The Complete Reference" by Herbert Schildt, TMH, 8th Edition

REFERENCE BOOKS:

1. Introduction to Java programming, Sixth edition, Y.Daniel Liang, Pearson Education

2. Programming in Java, Sachine

3. Big Java, 2nd edition, Cay Horstmann, Wiley Student Edition, Wiley India Private Limited.

4. Introduction to Programming with Java, J.Dean&R.Dean, McGraw Hill

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Comprehensive Online Examination – 1
(COE – 1)

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II B. Tech. – II Sem.(CSE)

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(18HS0804) Environmental Sciences

(Common to all Branches) (AUDIT COURSE)

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 by 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 by 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/