

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

Department of Computer Science & Information Technology

I B. Tech. – I Semester (CSIT)

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

I B. Tech. – II Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16HS610	Professional English	3	-	-	3
2.	16HS611	Engineering Mathematics-II	3	1	-	3
3.	16HS603	Engineering Physics	3	1	-	3
4.	16HS606	Human Values & Professional Ethics	3	-	-	3
5.	16CS503	Data Structures through C	3	1	-	3
6.	16HS608	Engineering Physics Lab	-	-	4	2
7.	16CS504	Data Structures through C Lab	-	-	4	2
8.	16ME301	Engineering & IT Workshop Lab	-	-	4	2
Contact Periods / Week			15	03	12	21
			Total/Week 30			

II B. Tech. – I Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16HS612	Engineering Mathematics-III	3	1	-	3
2.	16HS605	Environmental Studies	3	-	-	3
3.	16CS505	Advanced Data Structures through C++	3	1	-	3
4.	16CS506	Digital Logic Design	3	1	-	3
5.	16CS507	Mathematical Foundations of Computer Science	3	1	-	3
6.	16EE207	Basic Electrical and Electronics Engineering	3	1	-	3
7.	16CS508	Advanced Data Structures through C++ Lab	-	-	4	2
8.	16EE208	Basic Electrical and Electronics Engineering Lab	-	-	4	2
Credit Course						
9.	COE-I	Comprehensive Online Examination-I	-	-	-	1
Audit Course						
10.	16CS538	Ethical Hacking	3	-	-	-
Contact Periods / Week			21	05	08	23
			Total/Week 34			

II B. Tech. – II Semester (CSIT)

S. No.	Course Code	Subject	L	T	P	C
1.	16HS613	Probability & Statistics	3	1	-	3
2.	16CS509	Object Oriented Programming	3	1	-	3
3.	16CS510	Computer Organization	3	1	-	3
4.	16CS511	Database Management Systems	3	1	-	3
5.	16IT601	Fundamentals of Operating Systems	3	1	-	3
6.	16CS513	Object Oriented Programming Lab	-	-	4	2
7.	16CS514	Database Management Systems Lab	-	-	4	2
8.	16IT602	Fundamentals of Operating Systems Lab	-	-	4	2
Credit Course						
9.	COE-II	Comprehensive Online Examination-II	-	-	-	1
Audit Course						
10.	16HS614	Comprehensive Soft Skills-I	3	-	-	-
Contact Periods / Week			18	5	12	22
			Total/Week 35			

III B. Tech– I Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16CS527	Computer Networks	3	1	-	3
2.	16CS517	Formal Languages and Automata Theory	3	1	-	3
3.	16IT603	Python & R Programming	3	1	-	3
4.	16CS531	Data Warehousing and Data Mining	3	1	-	3
5.	16MB750	Managerial Economics and Financial Analysis	3	1	-	3
6.	16CS521	Design and Analysis of Algorithms	3	1	-	3
7.	16IT604	Computer Networks Lab	-	-	4	2
8.	16IT605	Data Mining, Python & R programming Lab	-	-	4	2
Credit Course						
9.	COE-III	Comprehensive Online Examination-III	-	-	-	1
Audit Course						
10.	16HS616	Aptitude Practice-I	3	-	-	-
Contact Periods / Week			21	6	08	23
			Total/Week 35			

III B. Tech – II Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16IT606	Computer Graphics & Animation	3	1	-	3
2.	16CS524	Compiler Design	3	1	-	3
3.	16IT607	Software Engineering & Testing	3	1	-	3
4.	16CS526	Object Oriented Analysis and Design	3	1	-	3
5.	16IT608	Linux programming	3	1	-	3
6.	16CS528	Software Testing and CASE tools Lab	-	-	4	2
7.	16IT609	Linux programming Lab	-	-	4	2
8.	16HS615	Advanced English Language and Communication Skills Lab	-	-	4	2
Credit Course						
9.	COE-IV	Comprehensive Online Examination-IV	-	-	-	1
Audit Course						
10.	16HS617	Aptitude Practice-II	3	-	-	-
Contact Periods / Week			18	5	12	22
			Total/Week 35			

IV B. Tech – I Semester (CSIT)

S.No	Course Code	Subject	L	T	P	C
1.	16IT610	Statistical Machine Learning	3	1	-	3
2.	16IT611	Information Security	3	1	-	3
3.	16CS519	Web Technologies	3	1	-	3
4.	16CS532	Mobile Application Development	3	1	-	3
Department Elective – I						
5.	16IT614	Internetworking with TCP/IP	3	1	-	3
	16CS534	Software Project Management				
	16IT615	Essentials of Big Data Analytics				
Open Elective						
6.	16CE145	Elements of Road Traffic Safety	3	-	-	3
	16EE239	Neural Networks & Fuzzy Logic				
	16ME313	Non-Conventional Energy Resources				
	16EC443	MATLAB Programming				
	16MB752	Intellectual Property Rights				
7.	16CS523	Web Technologies Lab	-	-	4	2
8.	16CS540	Mobile Application development Lab	-	-	4	2
Contact Periods / Week			18	5	8	22
			Total/Week 31			

IV B. Tech – II Semester (CSIT)

S.No.	Course Code	Subject	L	T	P	C
1.	16MB751	Entrepreneurship Development	3	-	-	3
Department Elective – II						
2.	16IT616	Enabling Technology for Data Science & Analytics : IoT	3	1	-	3
	16IT617	Image Processing				
	16IT618	Distributed Computing				
Department Elective – III						
3.	16CS541	Mobile Computing	3	1	-	3
	16IT619	Computer Vision & Deep Learning				
	16IT620	Crypto currency & Block chain Technology				
Department Elective – IV						
4.	MOOCS	MOOC courses-offered by SWAYAM/ NPTEL/ NISTE-suggested by the department(online courses)	-	-	-	3
5.	16IT612	Seminar	-	-	4	2
6.	16IT613	Project	-	-	20	10
Contact Periods / Week			09	02	24	24
			Total/Week 35			

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

Total credits:178

Year	1 st year		2 nd year		3 rd year		4 th year		Total
	I sem	II sem							
Credits	21	21	23	22	23	22	22	24	178

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

I B. Tech. – I Sem. (CSIT)

L	T	C
3	0	3

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

Course Objectives:

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

Course Outcomes:

Students will be able to

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

UNIT I

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

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

Grammar: Parts of speech-Kinds of sentences-Tenses

Vocabulary: Synonyms & Antonyms-Affixes – Phrasal verbs

Listening & Reading Activities

Writing: Paragraph writing-Note taking & Note making

Phonetics- Syllabification

UNIT II

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

1. Learning English Language through Literature (Stopping by Woods on a Snowy Evening-

Robert Frost)

2. Set in the Past

3. Inter-personal skills Grammar – Articles – Past Events – Voice & Impersonal passive voice – Gerund & -ing forms

to-infinitives

Vocabulary: Phrases – Idioms – word roots

Listening & Reading Activities

Writing: Letter writing- Informal- Formal

Phonetics – Accent

UNIT III

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

1. Learning English Language through Literature (What is my Name?-P.Satyavathi)

2. Describing a person, place and object

3. Possibilities

Grammar: Modals – Conditionals – Framing Questions – Compound nouns

Verbs

Vocabulary: One word substitute– Fixed expressions– Clauses

Listening & Reading Activities

Writing: Information transfer

Intonation: Falling & Rising

UNIT IV

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

1. Learning English Language through Literature (Man in Black-Oliver Goldsmith)

2. Analytical thinking

3. Co-operative learning

Grammar: Concord–Reported speech-compare & contrast

Vocabulary: Numerical expressions-definitions-collocations

Listening & Reading

Writing: Summary-Essay writing-Making instructions

JAM

UNIT V

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

1. Learning English Language through Literature (The Power of Prayer-Abdul Kalam)

2. Exploring creative ideas

3. Synthesis of sentences

Grammar: Simple, compound and complex-Spotting errors

Vocabulary: Discourse markers-Homonyms-Homophones-Homographs

Listening & Reading Activities

Writing: Writing recommendations-scrambled sentences

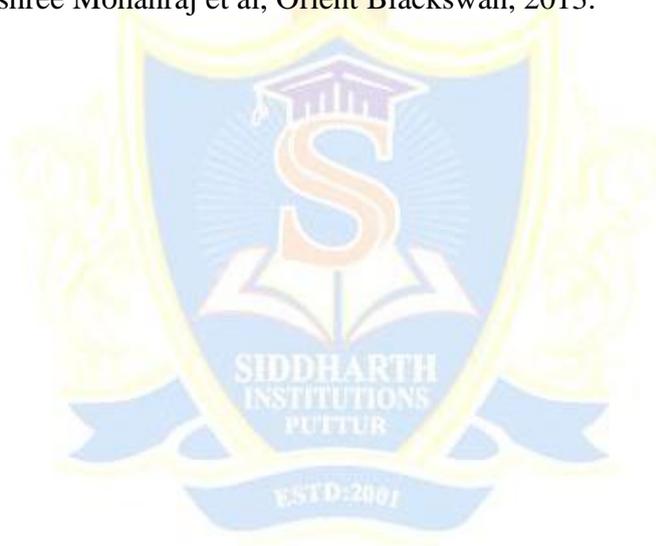
Convincing others

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

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

Course Objectives:

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

Course Outcomes:

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

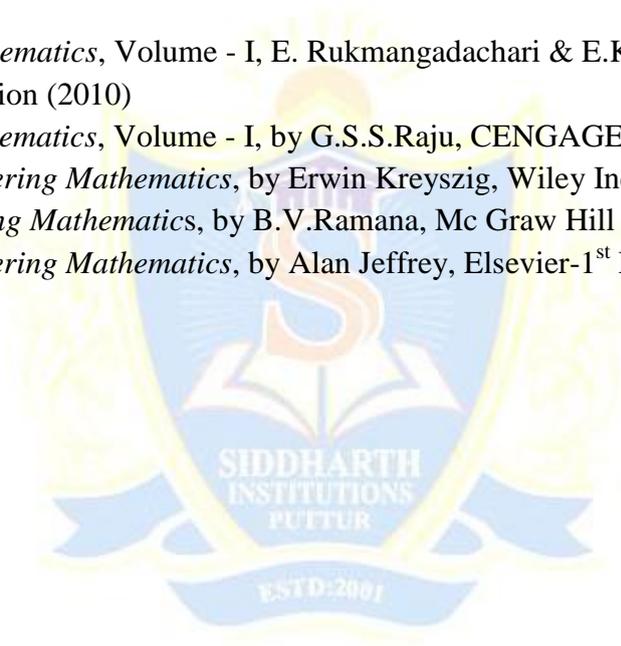
LAPLACE TRANSFORM II: Inverse Laplace Transforms, Convolution theorem, Application of Laplace transforms to ordinary differential equations of first and second order.

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

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

Course Objectives:

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

Course Outcomes:

The student is expected to:

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

UNIT I

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

UNIT II

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

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

Treatment of Boiler Feed water:

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

External Treatment: Ion-Exchange and Permutit processes.

UNIT III

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

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

UNIT IV

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

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

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

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

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

Inorganic polymers: Basic introduction, silicones, polyphosphazines applications.

UNIT V

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

Refractories- introduction, classification, properties and applications.

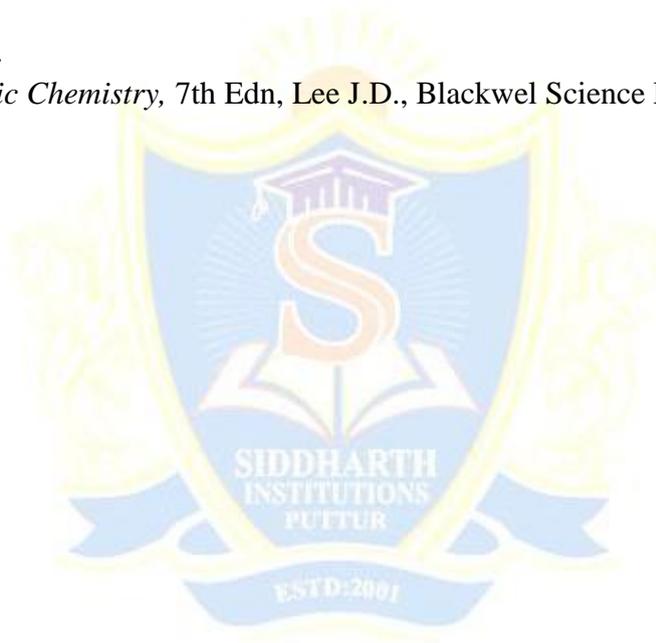
Nanomaterials- Introduction-Carbon Nano Tubes, Fullerenes. Semi conductors, superconductors and quantum dots.

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

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

Course Objectives:

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

Course Outcomes:

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

UNIT I

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

UNIT II

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

UNIT III

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

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

UNIT IV

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

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

UNIT V

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

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

TEXT BOOKS:

1. Programming in C and Data Structures – Jeri R. Hanly, Elliot B Koffman, Ashok Kamthane, A Anand Rao – Pearson.(UNITS I, II and III)
2. The C Programming Language – Brain W. Kernighan and Dennis M. Ritchie, PHI Publishers.
3. Programming in C and Data Structures – E Balagurusamy – McGrawHill

REFERENCES:

1. Computer Fundamentals and C Programming - Dr. P. Chenna Reddy, ISBN: 9789351045885, Publisher: Pothi.com
2. The art of Computer Programming - Donald E. Knuth
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)

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

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

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

Course Objectives:

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

Course Outcomes:

Students undergoing this course are able to

- Frame ideas based on the conceptual modeling and design
- Provide good understanding of the methods involved in preparing various views in engineering drawings
- Can prepare 2D and 3D diagrams of various objects

INTRODUCTION (Not to be included for examination)

Drawing instruments and their use – Lettering - Dimensioning – Simple Geometrical constructions.

UNIT I

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

UNIT II

POINTS: Projections of points

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

UNIT III

PLANES: Projections of planes – Surface inclined to both reference planes

SOLIDS: Projections of simple solids (Prisms, pyramids, cylinder and cone) - Axis inclined to both the planes.

UNIT IV

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

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

UNIT V

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

INTERPENETRATION/INTERSECTIONS OF SOLIDS: Simple solids.

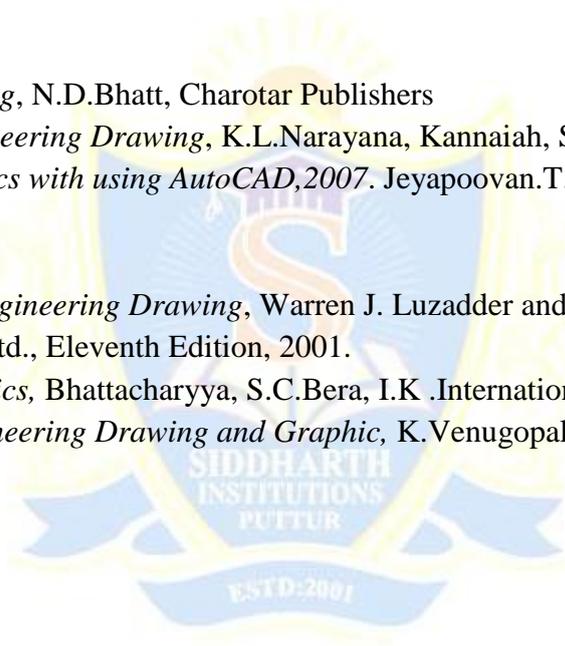
COMPUTER AIDED DRAFTING: Introduction to drafting packages - orthographic views and projections and Isometric projections (demonstration only)

TEXT BOOKS:

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

REFERENCES:

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



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

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

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

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

Course objectives:

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

Course outcomes:

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

UNIT I

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

UNIT II

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

UNIT - III

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

UNIT IV

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

UNIT V

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

Minimum Requirements for ELCS Lab:

The English Language Lab shall have two parts:

1. Computer Assisted Language Learning (CALL) Lab: The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
2. The Communication Skills Lab with movable chairs and audio-visual aids with a P.A. system,

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

System Requirement (Hardware component):

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

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

Suggested Software:

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

REFERENCES:

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

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

I B. Tech. – I Sem. (CSIT)

P	C
4	2

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

Course Objectives:

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

Course Outcomes:

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

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

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

List of Experiments:

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

REFERENCES:

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



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

I B. Tech. – I Sem. (CSIT)

**P C
4 2**

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

Course Objectives:

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

Course Outcomes:

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

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

LIST OF EXPERIMENTS/TASKS:

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

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$
14. Write a program to generate Pascal Triangle.

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

REFERENCES:

1. How to Solve it by Computer, R.G. Dromey, Pearson.
2. The C Programming Language, Brian W. Kernighan, Dennis M. Ritchie, Pearson.
3. Let us C Yeswant Kanetkar, BPB publications
4. Pointers in C, Yeswant Kanetkar, BPB publications.

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

I B. Tech. – II Sem. (CSIT)

L	T	C
3	0	3

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

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

Course Objectives:

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

Course Outcomes:

Students will be able to

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

UNIT I

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

1. Learning English Language through Literature (*Playing the English Gentleman*

M.K.Gandhi)

2. Oral presentation

3. Effective writing

Grammar: Relative clauses-Adjectives

Vocabulary: Sequencing words

Listening & Reading Activities

Writing: Analytical paragraph writing-Minutes of meeting

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

1. Learning English Language through Literature. (*The Portrait of a Lady* -Kushwant Singh)
2. Preparing and presenting slides, Telephone etiquette
3. Making drafts
 - Grammar: Adverbs - prepositions -cause and effect expressions
 - Vocabulary: phrasal verbs - Technical vocabulary-Extended definitions
 - Listening & Reading Activities
 - Writing: Report writing

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

1. Learning English Language through Literature (*La Belle Dame Sans Mercy*-John Keats)
2. Poster presentation, Debate
3. Technical drafting
 - Grammar: Using connectives-Gap filling exercise using appropriate tense form
 - Vocabulary: Acronyms & Abbreviations
 - Listening & Reading Activities
 - Writing: Writing projects

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

1. Learning English Language through Literature (*A Marriage Proposal*-Anton Chekov)
2. Group Discussion
3. Reading comprehension
 - Grammar: Structure indicating purpose-Subject-verb agreement
 - Vocabulary: emoticons-cloze test
 - Listening & Reading
 - Writing: Intensive and extensive

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

1. Learning from Literature (*Bird Sanctuary* -Sarojini Naidu)
2. Interview etiquette
3. Job application
 - Grammar: Spotting errors, Gap filling exercises using “gerunds” & present participle forms
 - Vocabulary: verbal ability
 - Listening & Reading Activities
 - Writing: Covering letter, Resume, Curriculum vitae
 - Convincing others

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

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

Course Objectives:

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

Course Outcomes:

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

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

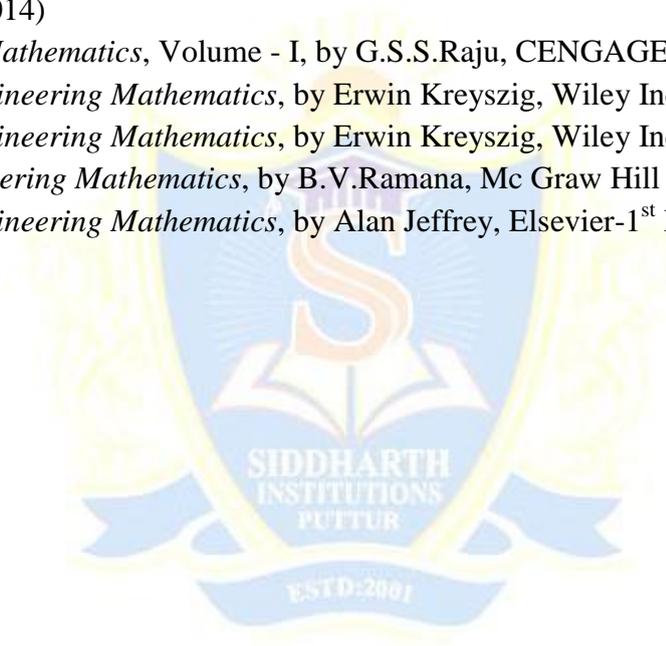
Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, Method of separation of variables, Solution of one dimensional wave equation, Heat equation and two dimensional Laplace equation under initial and boundary conditions.

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

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

Course Objectives:

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

Course Outcomes:

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

- The importance of superconducting materials and nanomaterials along with their engineering applications are well elucidated.

UNIT I

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

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

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

UNIT II

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

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

UNIT III

QUANTUM MECHANICS AND FREE ELECTRON THEORY: Quantum Mechanics: Introduction to matter waves – de’Broglie hypothesis - Heisenberg’s uncertainty principle and its applications - Schrödinger’s time independent and time dependent wave equation – Significance of wave function - Particle in a one dimensional infinite potential well . Free Electron theory: Classical free electron theory - Equation for electrical conductivity - Quantum free electron theory - Origin of bands in solids – Classification of solids into conductors, semiconductors and insulators.

UNIT IV

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

UNIT V

SUPERCONDUCTIVITY AND PHYSICS OF NANOMATERIALS: Superconductivity: Introduction – Meissner effect - Properties of superconductors- Type I and Type II

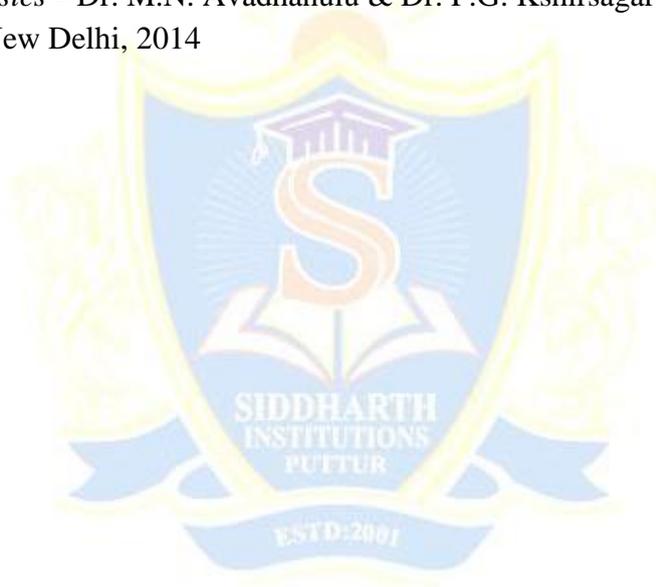
superconductors- ac and dc Josephson effects BCS theory (qualitative) –Applications of superconductors. Physics of Nanomaterials: Introduction - Significance of nanoscale - Surface area and quantum confinement –Synthesis of nanomaterials: ball mill, chemical vapour deposition, sol-gel, plasma arcing –applications of nano materials

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

L	T	C
3	0	3

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

Course Objectives:

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

Course Outcomes:

Students undergoing this course are able to

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

.UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

Safety, Responsibilities And Rights- Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk
Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

UNIT V

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

TEXTBOOKS:

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

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

L	T	C
3	0	3

**(16CS503) DATA STRUCTURES THROUGH C
(Common to CSE & CSIT)**

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

Introduction and overview: One Dimensional array- Multi Dimensional array- pointer arrays. **Linked lists:** Definition- Single linked list- Circular linked list- Double linked list- Circular Double linked list- Application of linked lists.

UNIT-II

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

UNIT-III

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

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

UNIT-IV

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

UNIT-V

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

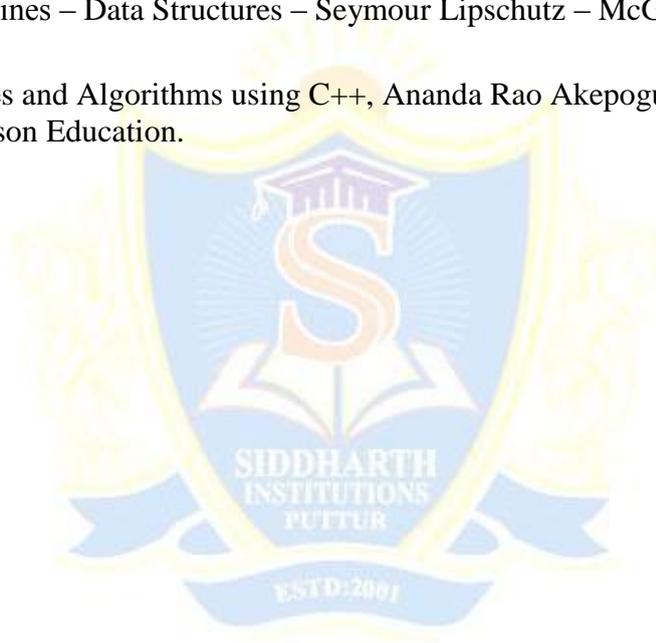
Tables: Hash Tables: Hashing Techniques- Collision Resolution Techniques- Closed Hashing- Open Hashing.

TEXT BOOKS:

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

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

P	C
4	2

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

Course Objectives:

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

Course Outcomes:

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

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

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

10. Determination of thickness of the thin wire using wedge Method.
11. Laser: Diffraction due to single slit.
12. Laser: Diffraction due to double slit.
13. Laser: Determination of wavelength using diffraction grating.
14. Magnetic field along the axis of a current carrying coil – Stewart and Gee’s method.
15. Synthesis of nano material by any suitable method.

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

P	C
4	2

**(16CS504) DATA STRUCTURES THROUGH C LAB
(Common to CSE & CSIT)**

Course Objectives:

- To develop skills to analyze and program linear and nonlinear data structures.
- Develop different data structures with effective usage of arrays and linked lists.
- Develop recursive algorithms as they apply to trees and graphs

Course Outcomes:

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

- Implement data structures like array, list, stack, queue, various trees, and graphs.
- Design an appropriate data structure to solve a real world problem.
- Develop various types of Programs in sorting.
- Implement the binary search tree operations.

Apply searching and tree traversal techniques.

List of Experiments/Tasks

1. Write a program to sort the elements of an array using sorting by exchange.
2. Write a program to sort the elements of an array using Selection Sort.
3. Write a program to implement heap sort.
4. Write a program to perform Linear Search on the elements of a given array.
5. Write a program to perform Binary Search on the elements of a given array.
6. Write a program to convert infix expression to postfix expression and evaluate postfix expression.
7. Write a program to implement stack, queue, circular queue using arrays and linked lists.
8. Write a program to perform the operations creation, insertion, deletion, and traversing a Singly linked list.
9. Write a program to perform the operations creation, insertion, deletion, and traversing a Doubly linked list.
10. Write a program to remove duplicates from ordered and unordered arrays.
11. Write a program to sort numbers using insertion sort.
12. Write a program to implement quick sort using non-recursive
13. Write a program to search a word in a given file and display all its positions.
14. Write a program to perform Hash Based Searching.
15. Write a program to perform Warshall's Algorithm for Shortest Path.
16. Write a program to implement depth first search and breadth first search on graphs.
17. Write a program to perform different operations on Binary Search Trees.

18. Write a program to implement Binary Tree.

REFERENCES:

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



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

I B. Tech. – II Sem. (CSIT)

P	C
4	2

**(16ME301) ENGINEERING & IT WORK SHOP LAB
(Common to all Branches)**

Course Educational Objectives:

ENGINEERING WORKSHOP

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

IT WORKSHOP

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

Course Outcomes:

ENGINEERING WORKSHOP

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

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

IT WORKSHOP

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

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

LIST OF EXPERIMENTS

1. TRADES FOR EXERCISES

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

- b. Fitting shop:** Two joints (exercises) from: Square joint, V joint, Half round joint or Dove tail joint out of 100 x 50 x 5 mm M.S. stock.
- c. Sheet metal shop:** Two jobs (exercises) from: Tray, Cylinder, Hopper or Funnel from out of 22 or 20 gauge G.I. sheet.
- d. House-wiring:** Two jobs (exercises) from: Wiring for ceiling rose and two lamps (bulbs) with independent switch, two way switch, controls with or without looping, wiring for stair case lamp, wiring for water pump with single phase starter.
- e. Foundry:** Preparation of two moulds (exercises): for a single pattern and a double pattern.
- f. Welding:** Preparation of two welds (exercises): Single V butt joint, Lap joint, Double V butt joint or T fillet joint.

2. TRADES FOR DEMONSTRATION:

- a. Plumbing**
- b. Machine Shop**
- c. Metal Cutting**

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

REFERENCES:

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

IT WORKSHOP

LIST OF EXPERIMENTS

1. Preparing your Computer Knowledge (5 weeks)
2. **Learn about Computer:** Identify the internal parts of a computer, and its peripherals. Represent the same in the form of diagrams including Block diagram of a computer. Write specifications for each part of a computer including peripherals and specification of Desktop computer. Submit it in the form of a report.
3. **Assembling a Computer:** Disassemble and assemble the PC back to working condition. Students should be able to trouble shoot the computer and identify working and non-working

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

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

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

6 Networking and Internet (4 weeks)

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

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

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

8. Productivity tools (6 weeks)

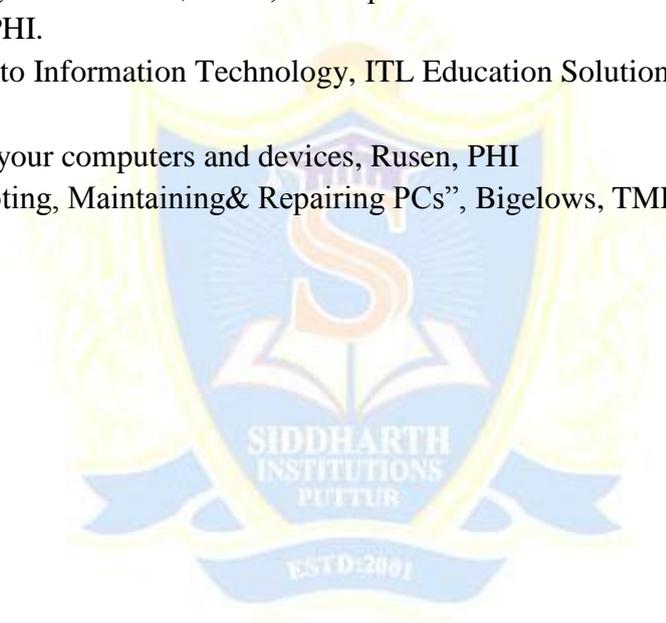
8.1 Word Processor: Students should be able to create documents using the word processor tool. Some of the tasks that are to be performed are inserting and deleting the characters, words and lines, Alignment of the lines, Inserting header and Footer, changing the font, changing the color, including images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

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

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

REFERENCES:

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



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

II B.Tech. - I Sem. (CSIT)

L	T	C
3	1	3

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

Course Objectives:

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

Course Outcomes:

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

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

UNIT I

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

UNIT II

COMPLEX ANALYSIS-II: Singularities, poles, Residues, Residues theorem, Evaluation of

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

UNIT III

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

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

UNIT IV

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

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

UNIT V

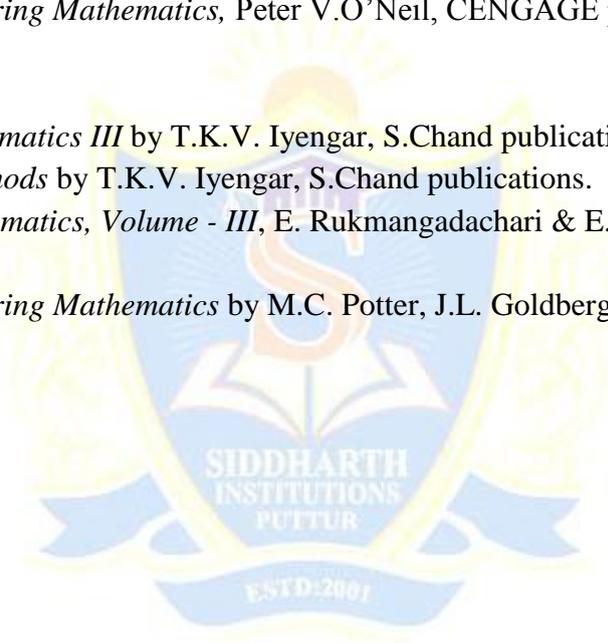
NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Solution by Taylor's series, Picard's Method of successive Approximations, Euler's Method, Runge-Kutta second and fourth order methods.

TEXT BOOKS:

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

REFERENCES:

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



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

II B. Tech -I Sem. (CSIT)

L	T	C
3	0	3

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

Course Objectives:

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

Course Outcomes:

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

UNIT- I

INTRODUCTION:

Definition, Scope and Importance-Need for Public Awareness

NATURAL RESOURCES:

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

UNIT-II**ECOSYSTEMS:**

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

UNIT-III**BIODIVERSITY AND ITS CONSERVATION:**

Introduction, Definition, genetic, species and ecosystem diversity, Bio-geographical classification of India, India as a Mega-diversity Nation, Hot spots of biodiversity, Value of biodiversity, threats to biodiversity, endemic, endangered and extinct species of India, In-Situ and Ex-situ conservation of biodiversity.

UNIT-IV**ENVIRONMENTAL POLLUTION AND GLOBAL ENVIRONMENTAL ISSUES:**

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

Global Environmental Issues: Population Growth, Urbanizations, Land Management, Water and Waste Water Management. Climate change and impacts on human environment
Solid Waste Management: causes, effects and control measures of Municipal solid wastes – E-waste and management, Role of an individual in prevention of pollution – pollution case studies.

UNIT-V**ENVIRONMENTAL LEGISLATION, LAWS, POLICIES FOR SUSTAINABLE DEVELOPMENT:**

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

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

TEXT BOOKS:

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



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

II B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS505) ADVANCED DATA STRUCTURES THROUGH C++
(Common to CSE & CSIT)**

Course Objectives:

- This course is aimed to provide basic understanding of different data structures and algorithms.
- This Course covers C++, C++ features, various types of trees, graphs and their implementation and hashing.

Course Outcomes:

- To develop skills to design and analyze linear and nonlinear data structures.
- Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
- Develop recursive algorithms as they apply to trees and graphs.

UNIT- I

C++ Class Overview: Class definition, Objects, class members, Access control, Class scope, Constructors and Destructors, Parameter passing methods, Inline functions, Static class members, This pointer, Friend functions, Dynamic memory allocation and De-allocation (new and delete), Exception handling.

UNIT- II

Function Over Loading, Operator Overloading, Generic Programming-Function and class templates, Inheritance basics, Base and derived classes, Inheritance types, Base class access control, Runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT- III

Trees: Introduction, Representation of Trees, Binary Trees, Binary Tree Traversal, Threaded Binary Trees, Binary Search Trees, Selection Trees. **Graphs:** Introduction- Graph terminologies-Representation of graphs, Operations on Graphs, graph traversals, Applications of graph.

UNIT- IV

Dictionaries: Definition, Hash Table Representation, Static and Dynamic Hashing, Skip List Representation.

Priority Queues: Definition and Applications, Leftist Trees, Binomial Heaps, Fibonacci Heaps, Pairing Heaps.

UNIT- V

Efficient Binary Search Trees: Optimal Binary Search Trees, AVL Trees, Red – Black Trees, Splay Trees.

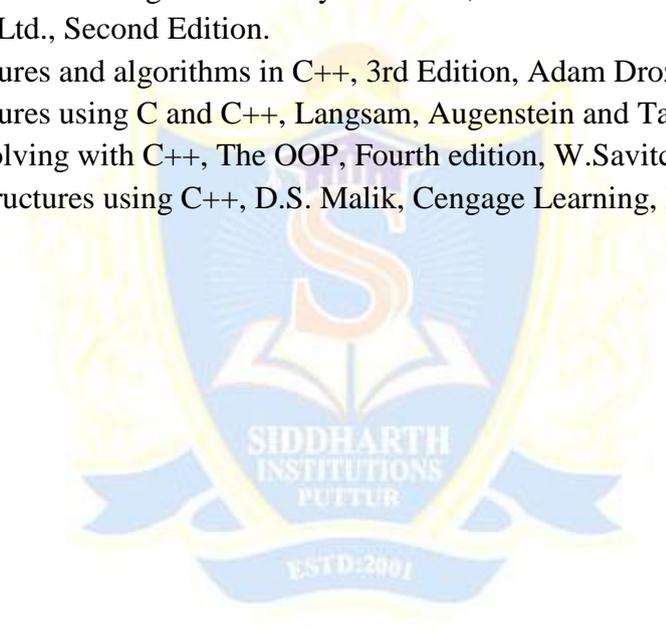
Multiway Search Trees: M – way Search Trees, B – Trees, B+ Trees

Text Books:

1. Fundamentals of Data Structures in C++ by Ellis Horowitz, Sartaj Sahni, Dinesh Mehta, Universities Press, Second Edition.
2. Data structures and Algorithms using C++, Ananda Rao Akepogu and Radhika Raju Palagiri, Pearson Education.

Reference Books:

1. Data structures and Algorithms in C++, Michael T.Goodrich,R.Tamassia and .Mount, Wiley student edition, John Wileyand Sons.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education.Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
4. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
5. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
Data Structures using C++, D.S. Malik, Cengage Learning, India Edition



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

II B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS506) DIGITAL LOGIC DESIGN
(Common to CSE & CSIT)**

UNIT- I

Binary systems and Boolean algebra:

Digital Systems, Binary Numbers, Number Base Conversions, Octal and 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.

REFERENCES:

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

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

II B. Tech –I Sem. (CSIT)

L	T	C
3	1	3

**(16CS507) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common to CSE & 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 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

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, Lattices, Hasse diagram.

Functions: Inverse Function, Composition of functions, recursive Functions, Lattice and its Properties.

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

UNIT-III**Elementary Combinatorics:**

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. 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

REFERENCES:

1. Discrete Mathematical Structures with Application to Computer Science, Tremblay, Manohar McGraw Hill Publication
2. Discrete and Combinatorial Mathematics- An Applied Introduction, Ralph.P. Grimaldi, 5/e, Pearson Education.
3. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.

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

II B. Tech –I Sem. (CSIT)

L	T	C
3	1	3

**(16EE207) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CSE & CSIT)**

Course Objectives:

Basic Electrical Engineering contains basic Electrical Laws, Network theorems, AC & DC generators and motors which are widely used in industry are covered and their performance aspects will be studied.

UNIT – I INTRODUCTION TO ELECTRICAL ENGINEERING

Ohm's Law, Basic Circuit Components, Kirchhoff's Laws, Types of Sources, Resistive Networks, Inductive Networks, Capacitive Networks, Series Parallel Circuits, Star Delta and Delta Star Transformation. Principle of AC Voltages, Root Mean Square and Average Values of Alternating Currents and Voltage, Form Factor and Peak Factor, Phasor Representation of Alternating Quantities.

UNIT- II NETWORK THEOREMS & TWO PORT NETWORKS

Network Theorems: Thevenin's, Norton's, Maximum Power Transfer, Reciprocity and Superposition Theorems for DC Excitations.

Two Port Networks: Two Port Network Parameters – Impedance, Admittance, Transmission and Hybrid Parameters and Their Relations.

UNIT-III DC MOTORS and TRANSFORMERS

DC Motors: Principle of Operation of DC Motors, Types of DC Motors, Torque Equation, Losses and Efficiency Calculation in DC Motor- Swinburne's Test and Applications.

Transformers: Principles of Operation, EMF equation, Losses and Efficiency, Regulation of Transformer, Testing: OC & SC Tests.

Outcomes:

After going through this course the student gets a thorough knowledge on basics of Network theorems, Two port networks, DC Motors and Transformers with which he/she can able to apply the above conceptual things to real-world problems and applications.

TEXT BOOKS:

1. Basic Electrical Engineering - By M.S.Naidu and S. Kamakshiah – TMH.
2. Basic Electrical Engineering –By T.K.Nagasarkar and M.S. Sukhija Oxford University Press.

REFERENCES:

1. Theory and Problems of Basic Electrical Engineering by D.P.Kothari & I.J. Nagrath PHI.
2. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications.
3. Fundamentals of Electrical Electronics Engineering by T.Thyagarajan, SCITECH Publications 5th Edition-2007
4. Electrical and Electronic Technology-By Hughes – Pearson Education.

PART-B

UNIT I

Semiconductor Devices: Intrinsic semiconductors-Electron-Hole Pair Generation, Conduction in Intrinsic Semiconductors, Extrinsic Semiconductors-N-Type and P-Type Semiconductors, Comparison of N-Type and P-Type Semiconductors. The p-n Junction – Drift and Diffusion Currents, The p-n Junction Diode-Forward Bias, Reverse Bias, Volt-Ampere Characteristics- Diode Specifications, Applications of Diode, Diode as a Switch. Diode as a Rectifier-Half-wave Rectifier, Full-Wave Rectifier, Full-Wave Bridge Rectifier, Rectifiers with Filters, Zener Diode- Volt-Ampere Characteristics, Zener Diode as Voltage Regulator.

UNIT II

BJT and FETs: Bipolar Junction Transistor (BJT) – Types of Transistors, Operation of NPN and PNP Transistors, Input-Output Characteristics of BJT-CB, CE and CC Configurations, Relation between I_C , I_B and I_E . Transistor Biasing- Fixed Bias, Voltage Divider Bias, Transistor Applications- Transistor as an Amplifier, Transistor as a Switch,. Junction Field Effect Transistor (JFET)- Theory and Operation of JFET, Output Characteristics, Transfer Characteristics, Configurations of JFET-CD, CS and CG Configurations, JFET Applications- JFET as an Amplifier, JFET as a Switch, Comparison of BJT and JFET, MOSFET-The Enhancement and Depletion MOSFET, Static Characteristics of MOSFET, Applications of MOSFET.

UNIT III

Oscillators and Op-Amps: Sinusoidal Oscillators, Barkhausen Criteria for Oscillator Operation, Components of an Oscillator-Transistor Amplifier Circuits, Feedback Circuits and Oscillator Circuits, Classification of Oscillators, LC Tuned, RC Phase Shift Oscillator circuits.

Operational Amplifiers(Op-Amps)-Symbol of an Op-Amp, single Input and Dual Input Op-Amps(Differential Amplifier), Characteristics of an Ideal Op-Amp, Basic Forms of Op-Amps-Inverting & Non-Inverting Amplifiers, Applications of Op-Amps, summing, Differential, Integrator, differentiator Amplifier.

TEXT BOOKS:

1. Basic Electrical and Electronics Engineering, M.S.Sukhija, T.K.Nagsarkar, Oxford University Press, 1st Edition, 2012.
2. Basic Electrical and Electronics Engineering, S.K Bhattacharya, Pearson Education, 2012

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

II B. Tech -I Sem. (CSIT)

P	C
4	2

**(16CS508) ADVANCED DATA STRUCTURES THROUGH C++ LAB
(Common to CSE & CSIT)**

Course Objectives:

- This course is aimed to provide basic understanding of different data structures and algorithms.
- This Course covers C++, C++ features, various types of trees, graphs and their implementation and hashing.

Course Outcomes:

- To develop skills to design and analyze linear and nonlinear data structures.
- Develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.
- Develop recursive algorithms as they apply to trees and graphs.

Week 1 :

- a) Write a C++ program implement area of circle using constructor.
- b) Write a C++ program to implement inline functions.

Week 2:

- a) Write a C++ program to implement friend function and this pointer.
- b) Write a C++ program to perform student marks record using dynamic memory allocation (new and delete).

Week 3:

- a) Write a C++ program to implement user-defined Exceptions.
- b) Write a C++ program to implement Operator Overloading.

Week 4 :

- a) Write a C++ program to implement the Inheritance using class templates.
- b) Write a C++ program to implement static and abstract classes.

Week 5:

Write a C++ program to perform the following operations:

- a) Insert an element into a binary search tree.
- b) Delete an element from a binary search tree.

c) Search for a key element in a binary search tree.

Week 6:

Write C++ programs that use recursive functions to traverse the given binary tree in

a) Preorder b) inorder and c) postorder.

Week7 :

Write a C++ program to implement complete binary tree using arrays.

Week8 :

Write C++ programs for the implementation of BFS and DFS for a given graph.

Week9 :

Write a C++ program to implement hash based search.

Week10 :

Write a C++ program to perform the following operations

a) Insertion into a B-tree b) Deletion from a B-tree

Week11 :

Write a C++ program to perform the following operation

a) Insertion into an AVL-tree

Week12 :

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

(Note: Use Class Templates in the above Programs)

Reference Books:

1. Data structures and Algorithms using C++, Ananda Rao Akepogu and RadhikaRajuPalagiri, Pearson Education.
2. Data Structures A Pseudocode Approach with C++, India Edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning.
3. Programming Principles and Practice using C++, B.Stroustrup, Addison-Wesley(Pearson education).
4. Data Structures and STL, W.J.Collins, McGrawHill, International edition.
5. Data structures and Algorithms with OODesign patterns in C++, B.R.Priess, John Wiley & sons.
The Art, Philosophy, and Science of OOP with C++, Rick Miller, SPD

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

II B. Tech -I Sem. (CSIT)

P	C
4	2

**(16EE208) BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB
(Common to CSE & CSIT)**

PART – A

BASIC ELECTRICAL ENGINEERING LAB

PART- A : ELECTRICAL 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.

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

II B. Tech -I Sem. (CSIT)

L	T	C
0	0	1

(COE-1) COMPREHENSIVE ONLINE EXAMINATION -I



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

II B. Tech -I Sem. (CSIT)

L	T	C
3	0	0

**(16CS538) ETHICAL HACKING
(Common to CSE & CSIT)**

Course Objectives:

- This course will function as an introduction to ethical hacking mechanisms.
- Students will understand about social engineering and types of attacks.
- Students will begin by understanding how perimeter defenses work and then be lead into scanning and attacking their own networks, no real network is harmed.
- Students then learn how intruders escalate privileges and what steps can be taken to secure a system.

Course Outcomes:

1. To understand how intruders escalate privileges.
2. To understand Intrusion Detection, Policy Creation, Social Engineering, Buffer Overflows and different types of Attacks and their protection mechanisms.
3. To learn about ethical laws and tests.

UNIT- I

ETHICAL HACKING: Types of Data Stolen From the Organizations, Elements of Information Security, Authenticity and Non-Repudiation, Security Challenges, Effects of Hacking, Hacker – Types of Hacker, Ethical Hacker, Hacktivism - Role of Security and Penetration Tester, Penetration Testing Methodology, Networking & Computer Attacks – Malicious Software (Malware), Protection Against Malware, Intruder Attacks on Networks and Computers, Addressing Physical Security – Key Loggers and Back Doors.

UNIT- II

FOOT PRINTING AND SOCIAL ENGINEERING: Web Tools for Foot Printing, Conducting Competitive Intelligence, Google Hacking, Scanning, Enumeration, Trojans & Backdoors, Virus & Worms, Proxy & Packet Filtering, Denial of Service, Sniffer, Social Engineering – shoulder surfing, Dumpster Diving, Piggybacking.

UNIT-III

DATA SECURITY: Physical Security – Attacks and Protection, Steganography – Methods, Attacks and Measures, Cryptography – Methods and Types of Attacks, Wireless Hacking, Windows Hacking, Linux Hacking.

UNIT- IV

NETWORK PROTECTION SYSTEM & HACKING WEB SERVERS: Routers, Firewall & Honeypots, IDS & IPS, Web Filtering, Vulnerability, Penetration Testing, Session Hijacking, Web Server, SQL Injection, Cross Site Scripting, Exploit Writing, Buffer

Overflow, Reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobiles Phone Hacking.

UNIT- V

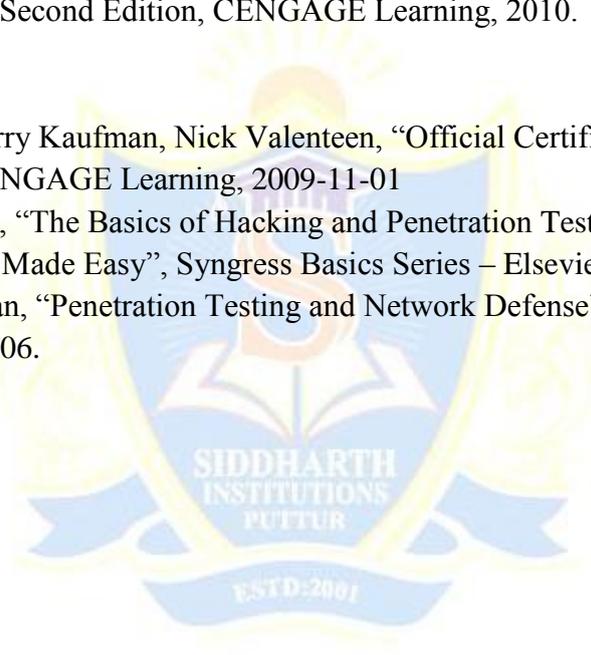
ETHICAL HACKING LAWS AND TESTS :An introduction to the particular legal, professional and ethical issues likely to face the domain of ethical hacking, ethical responsibilities, professional integrity and making appropriate use of the tools and techniques associated with ethical hacking – Social Engineering, Host Reconnaissance, Session Hijacking, Hacking - Web Server, Database, Password Cracking, Network and Wireless, Trojan, Backdoor, UNIX, LINUX, Microsoft, NOVEL Server, Buffer Overflow, Denial of Service Attack, Methodical Penetration Testing.

TEXT BOOK:

1. Michael T. Simpson, Kent Backman, James E. “Corley, Hands-On Ethical Hacking and Network Defense”, Second Edition, CENGAGE Learning, 2010.

REFERENCES:

1. Steven DeFino, Barry Kaufman, Nick Valenteen, “Official Certified Ethical Hacker Review Guide”, CENGAGE Learning, 2009-11-01
2. Patrick Engebretson, “The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy”, Syngress Basics Series – Elsevier, August 4, 2011.
3. Whitaker & Newman, “Penetration Testing and Network Defense”, Cisco Press, Indianapolis, IN, 2006.



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

II B. Tech -II Sem. (CSIT)

L	T	C
3	1	3

**(16HS613) PROBABILITY & STATISTICS
(Common to CSE & CSIT)**

Course Objectives:

- To train the students thoroughly in Mathematical concepts fundamentals of probability, test of hypothesis, Test of significance and ANOVA
- To prepare students for lifelong learning and successful careers using mathematical concepts of probability, test of hypothesis, Test of significance and ANOVA
- 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

Probability: Introduction, Conditional probability – Baye’s theorem, Random variables – Discrete and continuous Distributions, Expectation, Variance, Moments, Moment generating functions

UNIT- II

Distributions-Binomial, Poisson, Normal, Uniform, Exponential and Gamma distributions – Related properties and applications

UNIT- III

Test of Hypothesis: Population and Sample, Confidence interval of mean from Normal distribution, Null and Alternative hypothesis, Level of significance

Test of significance: Test based on normal distribution, Z test for means and proportions, Small samples t- test for one sample and two sample problem and paired t-test, F-test and Chi-square test (testing of goodness of fit and independence).

UNIT- IV

Analysis of variance one way classification and two way classification (Latin square Design and RBD)

UNIT- V

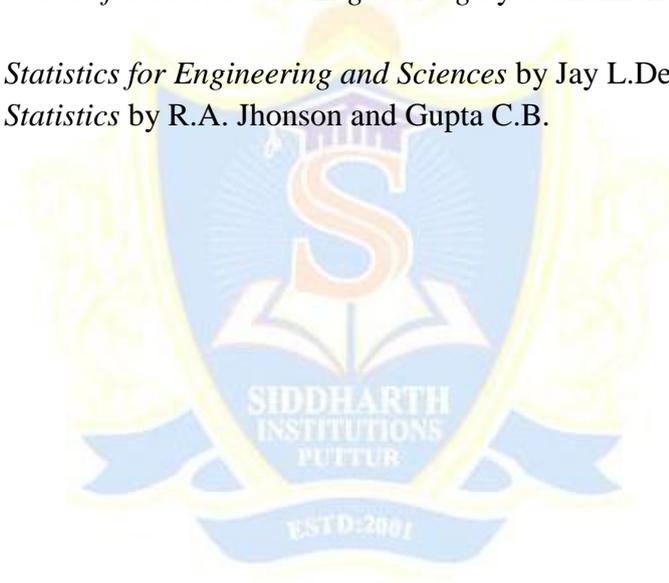
Statistical Quality Control: Concept of quality of a manufactured product -Defects and Defectives - Causes of variations - Random and assignable - The principle of Shewhart Control Chart-Charts for attribute and variable quality characteristics- Constructions and operation of X- bar Chart, R-Chart, P-Chart and C-Chart.

TEXT BOOKS:

1. *Statistical methods* by S.P. Gupta, S.Chand publications.
2. *Probability & Statistics* by T.K.V. Iyengar, S.Chand publications.
3. *Probability and statistics* by Murray R Spiegel, John J Schiller, R Alu Srinivasan Schaum's Outlines.

REFERENCES:

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.ShankerRao, 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.



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

II B. Tech -II Sem. (CSIT)

L	T	C
3	1	3

**(16CS509) OBJECT ORIENTED PROGRAMMING
(Common to CSE & CSIT)**

Course Objectives:

- Study the syntax, semantics and features of Java Programming Language
- Learn the method of creating Multi-threaded programs and handle exceptions
- Learn Java features to create GUI applications & perform event handling
- Learn basics of Java Data Base Connectivity

Course Outcomes:

- Solve problems using object oriented approach and implement them using Java
- Write efficient programs with multitasking.
- Create own Exceptions and handle Exceptions.
- Develop GUI Components.
- Develop application projects and design Java Application to connect Database

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

The Applet Class – Event Handling – Two Event Handling Mechanism – The Delegation Event Model – Event Classes –Source of Events –Event Listener Interfaces - Event–Introducing the AWT - Using AWT Controls, Layout Managers, and Menus – Introducing Swing – Exploring Swing.

UNIT- V

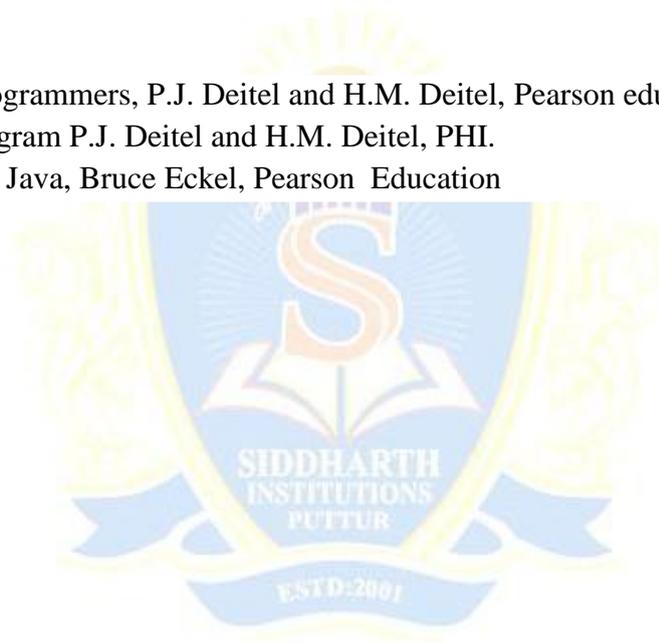
Java.net package, basics of network programming, address ports, sockets, simple client-server program. Introduction to JDBC, java.sql package, JDBC architecture, Drivers, Connections, Statement, Prepared Statement, Example Programs.

TEXT BOOKS:

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

REFERENCES:

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



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

II B. Tech -II Sem. (CSIT)

L	T	C
3	1	3

**(16CS510) COMPUTER ORGANIZATION
(Common to CSE & CSIT)**

Course Objectives:

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

Course Outcomes:

- Use memory and I/O devices effectively
- Understand the CPU design and computer arithmetic
- Understand the design of control unit
- Explain hardware requirements for cache memory and virtual memory
- Design algorithms to exploit pipelining and multiprocessors

UNIT-I

Basic Structure of Computers : Functional Units -Basic Operational Concepts - Assembly Language - Basic I/O Operations -Bus Structures - Instruction Cycle - Memory Reference Instructions - Data Transfer, Data Manipulation and Program Control- Addressing Modes.

UNIT-II

Arithmetic Unit: Addition and Subtraction of Signed Numbers - Multiplication Algorithms- Signed Operand Multiplication and Fast Multiplication -Integer Division-Floating Point Numbers and Operations-Decimal Arithmetic unit.

UNIT-III

Basic Processing Unit: Register Transfer Language - Register Transfer - Bus and Memory Transfers -Arithmetic Micro operations-Logic Micro operations - Shift Micro operations- Hardwired Control - Micro Programmed Control - Address Sequencing.

UNIT-IV

Memory System: Basic Concepts -Memory Hierarchy - Main Memory - Auxiliary Memory - Cache Memories-Virtual Memory- Memory Management Requirements - Secondary Storage.

UNIT-V

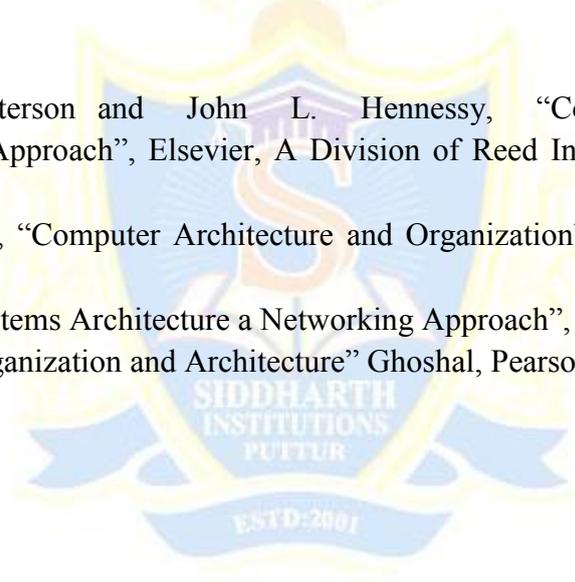
I/O Organization: Parallel Processing - Pipelining - Multiprocessor - Interconnection Structures – Inter Processor Arbitration – Inter Processor Communication and Synchronization -Direct Memory Access (DMA)-Standard I/O Interfaces (PCI, SCSI and USB).

TEXT BOOKS

1. “Computer Organization”, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Mcgraw-Hill, Fifth Edition, Reprint 2012.
2. William Stallings, “Computer Organization and Architecture”, Pearson Education, 7/e, 2006.
3. “Computer Systems Organization and Architecture”, John D. Carpinelli, PEA, 2009.
4. “Computer Systems Architecture”, 3/e, M. Moris Mano, PEA, 2007.

REFERENCES

1. David A. Patterson and John L. Hennessy, “Computer Architecture-A Quantitative Approach”, Elsevier, A Division of Reed India Private Limited, Fifth Edition, 2012.
2. John P. Hayes, “Computer Architecture and Organization”, Tata Mcgraw Hill, 3/e, 1998.
3. “Computer Systems Architecture a Networking Approach”, 2/e, Rob Williams.
4. “Computer Organization and Architecture” Ghoshal, Pearson Education, 2011.



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

II B. Tech -II Sem. (CSIT)

L	T	C
3	1	3

**(16CS511) DATABASE MANAGEMENT SYSTEMS
(Common to CSE & CSIT)**

Course Objective:

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

Course Outcome:

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

UNIT-I

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

Introduction to Data base design , ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises.

Relational Model: Introduction to the Relational Model - Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views Destroying/ altering Tables and Views.

UNIT-II

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

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

UNIT-III

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

UNIT-IV

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

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

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

UNIT-V

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

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

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

TEXT BOOKS:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, McGrawHill Education, 3rd Edition, 2003.
2. Data base System Concepts, A. Silberschatz, H.F. Korth, S. Sudarshan, McGraw Hill, VI edition, 2006.
3. Database Systems : The Complete book , Hector Garcia – Molina, Jeffrey Ullman, and Jennifer Widom.

REFERENCES:

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

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

II B. Tech -II Sem. (CSIT)

L	T	C
3	1	3

(16IT601) FUNDAMENTALS OF OPERATING SYSTEMS

Course Objective:

- To make the students understand the basic operating system concepts such as processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection.

Course Outcome:

- Student Able to use operating systems effectively.
- Able to write system and application programs to exploit operating system functionality.
- Add functionality to the existing operating systems
- Design new operating systems

UNIT I

Operating Systems Overview: Operating system structure, operating systems Operations, protection and security, Computing Environments, Open- Source Operating Systems

System Structures: Operating System Services, User and Operating-System Interface, systems calls, Types of System Calls, system programs, operating system structure, operating system debugging, System Boot.

Processes: Process concept, process Scheduling, Operations on processes, Inter process Communication, Examples of IPC systems.

UNIT II

Threads: overview, Multicore Programming, Multithreading Models, Thread Libraries, Implicit

Threading, Threading Issues.

Process Synchronization: The critical-section problem, Peterson's Solution, Synchronization Hardware, Mutex Locks, Semaphores, Classic problems of synchronization, Monitors, Synchronization examples, Alternative approaches.

CPU Scheduling: Scheduling-Criteria, Scheduling Algorithms, Thread Scheduling, Multiple-Processor Scheduling, Real-Time CPU Scheduling, Algorithm Evaluation.

UNIT III

Memory Management: Swapping, contiguous memory allocation, segmentation, paging, structure of the page table.

Virtual memory: demand paging, page-replacement, Allocation of frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory

Deadlocks: System Model, deadlock characterization, Methods of handling Deadlocks, Deadlock prevention, Detection and Avoidance, Recovery from deadlock.

UNIT IV

Mass-storage structure: Overview of Mass-storage structure, Disk structure, Disk attachment, Disk scheduling, Swap-space management, RAID structure, Stable-storage implementation.

File system Interface: The concept of a file, Access Methods, Directory and Disk structure, File system mounting, File sharing, Protection.

File system Implementation: File-system structure, File-system Implementation, Directory Implementation, Allocation Methods, Free-Space management.

UNIT V

I/O systems: I/O Hardware, Application I/O interface, Kernel I/O subsystem, Transforming I/O requests to Hardware operations.

Protection: Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection

Security: The Security problem, Program threats, System and Network threats, Cryptography as a security tool, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer–security classifications.

Text Books:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Ninth Edition, 2012, Wiley.
2. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition, 2009, Pearson Education.

Reference Books:

1. Operating systems by A K Sharma, Universities Press,
2. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Operating Systems, A.S.Godbole, Second Edition, TMH.
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
7. Operating Systems, R.Elmasri, A,G.Carrick and D.Levine, Mc Graw Hill.
8. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
9. Operating System Desgin, Douglas Comer, CRC Press, 2nd Edition.

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

II B. Tech -II Sem. (CSIT)

P	C
4	2

**(16CS513) OBJECT ORIENTED PROGRAMMING LAB
(Common to CSE & CSIT)**

Course Objective:

- Study the syntax, semantics and features of Java Programming Language
- Learn the method of creating Multi-threaded programs and handle exceptions
- Learn Java features to create GUI applications & perform event handling
- Learn basics of Java Data Base Connectivity

Course Outcome:

- Solve problems using object oriented concepts.
- Write efficient programs for string handling and file handling.
- Write efficient programs to perform multitasking and exception handling.
- Develop GUI Components.
- Develop Java applications to connect database.

Week-1:

1. Use Eclipse or Netbean platform and acquaint with the various menus. Create a test project, add a test Class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with java program to find prime numbers between 1 to n.

Week-2:

1. 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.
2. Write a Java program for sorting a given list of names in ascending order
3. 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.

Week -3:

1. Write a java program to make rolling a pair of dice 10,000 times and counts the number of times doubles of are rolled for each different pair of doubles. *Hint: Math.random()*
2. Write java program that inputs 5 numbers, each between 10 and 100 inclusive. As each number is read display it only if it's not a duplicate of any number already read display the complete set of unique values input after the user enters each new value.
3. Write a java program to read the time intervals (HH:MM) and to compare system time if the system time between your time intervals print correct time and exit else try again to repute the same thing. By using String Tokenizer class.

Week-4:

1. Write a java program to split a given text file into n parts. Name each part as the name of the original file followed by .part<n> where n is the sequence number of the part file.
2. 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.
3. 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

Week-5:

1. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication
2. Write a java program to find and replace pattern in given file,
3. 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

Week-6:

1. Write a java program to convert an ArrayList to an Array.
2. Write a Java Program for waving a Flag using Applets and Threads
3. Write a Java Program for Bouncing Ball (The ball while moving down has to increase the size and decrease the size while moving up)

Week-7:

1. Write a Java Program for stack operation using Buttons and JOption Pane input and Message dialog box.
2. Write a Java Program to Addition, Division, Multiplication and subtraction using JOption Pane dialog Box and Text fields

Week-8:

1. Write a Java Program for the blinking eyes and mouth should open while blinking.
2. Implement a Java Program to add a new ball each time the user clicks the mouse. Provided a maximum of 20 balls randomly choose a color for each ball.

Week-9:

1. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Jtable component
2. Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Week-10:

1. Write a Java Program to implement the opening of a door while opening man should present before hut and closing man should disappear.
2. Write a Java code by using JTextField to read decimal value and converting a decimal number into binary number then print the binary value in another JTextField

Week-11:

1. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.
2. Write a Java program for handling mouse events.

Week-12:

1. Write a java program 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

REFERENCES:

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 education.

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

II B. Tech -II Sem. (CSIT)

P	C
4	2

**(16CS514) DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE & CSIT)**

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 is 1jan, 1970.
- When the employees called daily-wagers are to be added the constraint that salary should be greater than or equal to 5000 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 as 1000 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”, Rick F. VanderLans, Pearson education.

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

II B. Tech -II Sem. (CSIT)

P C
4 2

(16IT602) FUNDAMENTALS OF OPERATING SYSTEMS LAB

Course Objectives:

- To understand the design aspects of operating system
- To solve various synchronization problems

Course out comes:

- Ensure the development of applied skills in operating systems related areas.
- Able to write software routines modules or implementing various concepts of operating system.

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU Etc. ...
8. Simulate Paging Technique of memory management
9. Control the number of ports opened by the operating system with
a) Semaphore b) monitors
10. Simulate how parent and child processes use shared memory and address space
11. Simulate sleeping barber problem
12. Simulate dining philosopher's problem
13. Simulate producer and consumer problem using threads (use java)
14. Simulate little's formula to predict next burst time of a process for SJF scheduling algorithm.
15. Develop a code to detect a cycle in wait-for graph

Reference Books :

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.
2. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition -2009, Pearson Education
3. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
4. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
5. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
6. Operating Systems, A.S.Godbole, Second Edition, TMH.
7. *An Introduction to Operating Systems*, P.C.P. Bhatt, PHI.

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

II B. Tech -II Sem. (CSIT)

L	T	C
0	0	1

(COE-II) COMPREHENSIVE ONLINE EXAMINATION -II



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

II B. Tech -II Sem. (CSIT)

L	T	C
0	0	1

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

Course Description:

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

Course Objectives:

The main objectives of this course are:

- To help the students understand interpersonal skills.
- To support them in building interpersonal skills.
- To enhance the ability to work with others.

Course Outcomes:

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

UNIT I:

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

UNIT II:

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

UNIT III:

Vision and Goal setting – Personal goal – Career goal – Types of Organization – Deep dive of company profiles – Win-win situation – Proactive skills – Entrepreneurial skills and model start-ups- Developing Mind skills – quizzes – General knowledge – Puzzles – Reading Comprehension - Spell Bee - Seminar – Who is who? – Biographies

UNIT IV:

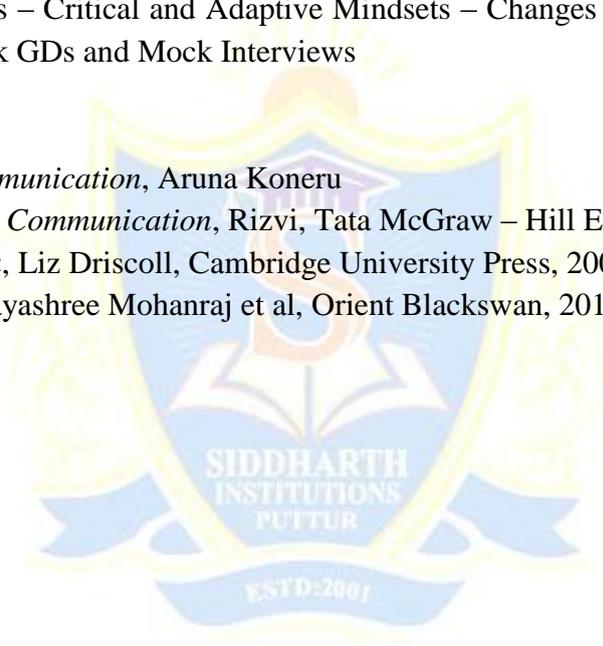
Flight Leadership: Assessing Leadership qualities – Experiential learning of leadership skills exercise in team work Time and Stress Management: Importance of Time Management – The art of prioritizing and scheduling – Stress and Source of Stress Types of Stress – Managing stress

UNIT V:

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

References:

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



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

III B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS527) COMPUTER NETWORKS
(Common to CSE & CSIT)**

Course Objective

Study the evolution of computer networks and future direction
Study the concepts of computer networks from layered perspective
Study the issues open for research in computer networks

Course Outcome:

After completion of this subject the students will be able to:

Use appropriate transmission media to connect to a computer network and Internet
Work on the open issues for their project
Start using the Internet effectively
Able to design new protocols for computer network

UNIT- I:

Introduction: Uses of computer networks, Network Hardware, Network Software, Reference Models: The OSI Reference Model, The TCP/IP Reference Model, A Comparison of the OSI and TCP/IP Reference Models, Example Networks.

The Physical Layer: The Theoretical bass for data communication, Guided Transmission Media, Wireless Transmission, The Public Switched Telephone Network.

UNIT- II:

The Data Link Layer: Data Link Layer design issues, Error Detection and Correction, Elementary Data Link Protocols, Sliding Window Protocols, Example Data Link Protocols **The Medium Access Control Sub Layer:** The Channel Allocation Problem, Multiple Access Protocols, Ethernet, Data Link Layer switching.

UNIT- III:

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, The Network Layer in the Internet.

UNIT- IV:

The Transport Layer: The Transport Service, Elements of Transport Protocols, Congestion Control, The Internet Transport Protocols, Performance Issues.

UNIT-V:

Application Layer: Introduction, DNS, WWW and HTTP, FTP, E-mail, TELNET.

TEXT BOOKS:

1. “Computer Networks”, 5th edition, 2010, Andrew S. Tanenbaum, Wetherall, Pearson.
2. “Data communications and networking” 5th edition, 2012, Behrouz A. Forouzan, TMH. 2013- 2014

REFERENCES:

1. “Internetworking with TCP/IP – Principles, protocols, and architecture- Volume 1, Douglas E. Comer, 5th edition, PHI
2. “Computer Networks”, 5E, Peterson, Davie, Elsevier.
3. “Introduction to Computer Networks and Cyber Security”, Chawan- Hwa Wu, Irwin, CRC Publications.
4. “Computer Networks and Internets with Internet Applications”, Comer.



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

III B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS517) FORMAL LANGUAGES AND AUTOMATA THEORY
(Common to CSE & CSIT)**

Course Objectives:

- Understand formal definitions of machine models.
- Classify machines by their power to recognize languages.
- Understanding of formal grammars, analysis
- Understanding of hierarchical organization of problems depending on their complexity
- Understanding of the logical limits to computational capacity
- Understanding of decidable problems

Course Outcomes:

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

- Construct finite state diagrams while solving problems of computer science
- Find solutions to the problems using Turing machines
- Design of new grammar and language

UNIT - I

Introduction: Basics of set theory, Relations on sets, Alphabets, Strings, Languages, Grammar formalism, Chomsky Hierarchy

Finite Automata: History of the Automata theory, Use of Automata, Characteristics of Automata, Graphical and Tabular Representation FA, Transitional system, DFA and NFA, Conversion of an NFA to DFA, NFA with ϵ (null)Move, Equivalence of DFA and NFA, Dead state, Finite Automata with Output, Conversion of one machine to another, Minimization of Finite Automata, Myhill-Nerode Theorem, Applications of FA, Limitations of FA.

UNIT - II

Regular Languages: Regular Expressions (RE), Basics of Regular Expressions, Identities of Regular Expression, The Arden's Theorem, Using Arden's theorem to construct RE from FA, Equivalence of Two FAs, Equivalence of Two REs, Construction of Regular Grammar from RE, Constructing FA from Regular Grammar, Pumping Lemma for RLs, Applications of Pumping Lemma, Closure properties of Regular Set, Decision problems of Reapplications of REs.

UNIT - III

Context Free Grammars and Languages: Definition of Context Free Grammars (CFG), Derivation and Parse trees, Ambiguity in CFGs, Removing ambiguity, Left recursion and Left factoring, Simplification of CFGs, Linear grammars, Normal Forms, Closure properties for CFLs, Pumping Lemma for CFLs, Decision problems for CFLs.

UNIT - IV

Push Down Automata (PDA): Informal introduction, The Formal Definition, Graphical notation, Instantaneous description, The Languages of a PDA, Equivalence of PDAs and CFGs, Deterministic Push Down Automata.

UNIT - V

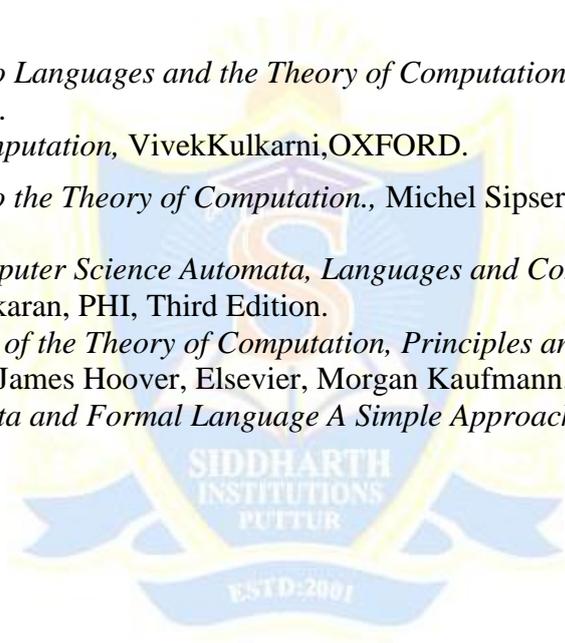
Turing Machines and Un decidability: Basics of Turing Machine (TM), Transitional Representation of TMs, Instantaneous description, Non Deterministic TM, Conversion of Regular Expression to TM, Variations of the TM, Universal TM, Linear Bounded Automata, Post's Correspondence Problem(PCP), Modified PCP.

TEXT BOOKS:

1. *Introduction to Automata Theory, Formal Languages and Computation*, Shyamal endukandar, Pearson.
2. *Introduction to Automata Theory, Languages, and Computation*, Third Edition, John E. Hopcroft, Rajeev Motwani, Jeffery D. Ullman, Pearson.

REFERENCES:

1. *Introduction to Languages and the Theory of Computation*, John C Martin, TMH, Third Edition.
2. *Theory of Computation*, Vivek Kulkarni, OXFORD.
3. *Introduction to the Theory of Computation.*, Michel Sipser, 2nd Edition, Cengage Learning
4. *Theory of computer Science Automata, Languages and Computation*, K.L.P.Mishra, N.Chandrasekaran, PHI, Third Edition.
5. *Fundamentals of the Theory of Computation, Principles and Practice*, Raymond Greenlaw, H. James Hoover, Elsevier, Morgan Kaufmann.
6. *Finite Automata and Formal Language A Simple Approach*, A.M. Padma Reddy, Pearson



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

III B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

(16IT603) PYTHON & R PROGRAMMING

Course Objectives:

- *Introduction of Scripting Language*
- *Exposure to various problem solving approaches of computer science*
- *Understand the fundamentals of 'R' programming*
- *Learn how to carry out a range of commonly used statistical methods including analysis of variance and linear regression.*
- *Explore data-sets to create testable hypotheses and identify appropriate statistical tests.*

Course Outcomes:

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

- *Making Software easily right out of the box.*
- *Experience with an interpreted Language.*
- *To build software for real needs.*
- *Prior Introduction to testing software*
- *Ability to Work on a real life Project, implementing R Analytics to create Business Insights.*
- *Ability to analyze the data and results using R, a flexible and completely cross- platform.*
- *Ability to use a wide range of analytical methods and produce presentation quality graphics.*

UNIT- I

Introduction: History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

Types, Operators and Expressions: Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass

UNIT- II

Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences. Comprehensions.

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and

Local

Variables.

Modules: Creating modules, import statement, from. Import statement, name spacing,
Python packages Introduction to PIP, Installing Packages via PIP, Using Python Packages

UNIT-III

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Data hiding,

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions

UNIT-IV

INTRODUCING R: Getting the Hand of R, Running the R Program, Finding Your Way with R, Command Packages. **BECOMING FAMILIAR WITH R:** Reading and Getting Data into R, Viewing Named Objects, Types of Data Items, The Structure of Data Items, Examining Data Structure Working with History Commands, Saving your Work in R. **WORKING WITH OBJECTS:** Manipulating Objects, Viewing Objects within Objects, Constructing Data Objects, Forms of Data Objects: Testing and Converting,

UNIT V

Data: Descriptive statistics and tabulation. **DISTRIBUTION:** Looking at the Distribution of Data **SIMPLE HYPOTHESIS TESTING:** Using the Student's t-test, The Wilcoxon U-Test (Mann-Whitney), Paired t- and U-Tests, Correlation and Covariance, Tests for Association.

INTRODUCTION TO GRAPHICAL ANALYSIS: Box-whisker Plots, Scatter Plots, Pairs Plots(Multiple Correlation Plots) Line Charts, Pie Charts, Cleveland Dot Charts, Bar Charts, Copy Graphics to Other Applications. Adding elements to existing plots, Matrix plots, multiple plots in one window, exporting graphs **WRITING YOUR OWN SCRIPTS:** **BEGINNING TO PROGRAM:** Copy and Paste Scripts, Creating Simple Functions, Making Source Code.

TEXT BOOKS:

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Learning Python, Mark Lutz, Orielly
3. "Beginning R the statistical programming language" Dr. Mark Gardener, Wiley Publications, 2015.

REFERENCES:

1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W.Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage
4. Hands-On Programming with R Paperback by Golemund (Author), Garrett (Author), SPD, 2014. 2. The R Book, Michael J. Crawley, WILEY, 2012.

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

III B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS531) DATA WAREHOUSING AND DATA MINING
(Common to CSE & CSIT)**

Course Objectives:

To learn the concepts of database technology evolutionary path which has led to the need for data mining and its applications

To learn Data mining algorithms to build analytical applications

Course Outcomes:

After completion of this subject the students will be able to:

Applying preprocessing methods for any given raw data.

Utilizing Data mining algorithms to build analytical applications.

Developing practical work of Data Mining techniques and design hypotheses based on the analysis to conceptualize a Data Mining Solution to practical problem

UNIT - I

Introduction

:

What Motivated Data Mining? Why is it important? What is Data Mining? Data Mining-On What Kind of Data? Data Mining Functionalities- What Kinds of Patterns can be Mined? Classification of Data mining Systems, Data Mining Task Primitives, Major Issues in Data Mining.

Data Preprocessing: Data Preprocessing: Why Preprocess the Data? Data Cleaning, Data Integration, Data Reduction , Data Transformation and Data Discretization.

UNIT - II

Data Warehouse and OLAP Technology: An Overview, What is a Data Warehouse? A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, From Data Warehouse to Data Mining, Attribute Oriented Induction.

Data Warehousing Case studies in Government: Data Mining Applications, customer data warehouse of the world's first and largest online bank in the united kingdom, A German super market EDEKA's Data warehouse, Data Warehouse for the Government of Andhra Pradesh, Data Warehousing in the Tamilnadu Government, A Highly available Data Warehouse-Atypical Business data Warehouse for a Trading company.

UNIT - III

Mining Frequent Patterns, Associations and Correlations:

Basic Concepts and a Road Map, Efficient and Scalable Frequent Item Set Mining Methods, Mining various kinds of Association rules, From Association Mining to Correlation Analysis, Constraint based Association Mining.

UNIT - IV

Classification and Prediction: What is Classification? What is Prediction? Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Back propagation.

Prediction: Prediction, Accuracy and Error Measures, Evaluating the Accuracy of a Classifier or Predictor.

UNIT - V

Cluster Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods, Outlier Analysis, Applications of Data mining.

TEXT BOOKS:

1. *Data Mining: Concepts and Techniques*, Jiawei Han and Micheline Kamber, Elsevier, Second Edition,
2. *Data Ware housing: Concepts, Techniques, Products and Applications*, Prabhu C.S.R., Prentice Hall of India, 2011

REFERENCES:

1. *Introduction to Data Mining* – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson Education.
2. *Data Mining Techniques*, Arun K Pujari, University Press,2001.



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

III B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

(16MB750) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

Course Objectives:

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

Course Outcomes:

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

UNIT - I - INTRODUCTION TO MANAGERIAL ECONOMICS

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

UNIT - II - THEORY OF PRODUCTION AND COST ANALYSIS

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

UNIT -III - INTRODUCTION TO MARKETS AND NEW ECONOMIC ENVIRONMENT

Market structures: Types of Markets - Perfect and Imperfect Competition - Features, Oligopoly -Monopolistic competition. Price-Output determination - Pricing Methods and Strategies. New Economic Environment- Economic systems – Economic Liberalization – Privatization and Globalization

UNIT - IV - CAPITAL AND CAPITAL BUDGETING

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

UNIT - V - INTRODUCTION TO FINANCIAL ACCOUNTING AND ANALYSIS

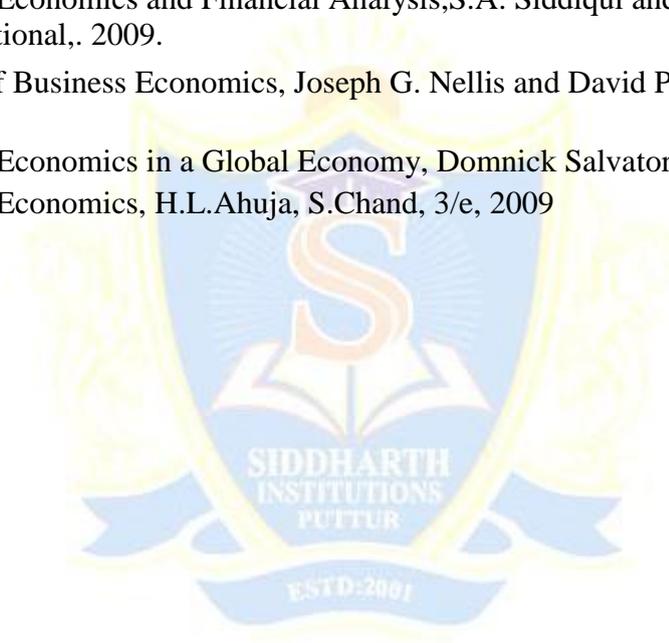
Financial Accounting – Concept - emerging need and importance - Double-Entry Book Keeping- Journal - Ledger – Trial Balance - Financial Statements - - Trading Account – Profit & Loss Account – Balance Sheet (with simple adjustments). Financial Analysis – Ratios – Techniques – Liquidity, Leverage, Profitability,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

TEXT BOOKS:

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

REFERENCES:

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



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

III B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS521) DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & CSIT)**

Course Objectives:

- *To know the importance of the complexity of a given algorithm.*
- *To study various algorithmic design techniques.*
- *To utilize data structures and/or algorithmic design techniques in solving new problems.*
- *To know and understand basic computability concepts and the complexity classes P, NP, and NP-Complete.*

Course Outcomes:

At the end of the course, students can able to

- *Able to explain good principles of algorithm design.*
- *Be able to analyze the Time & Space complexity of the algorithms and estimate their worst-case, average-case, Best case running times of algorithms using asymptotic notations.*
- *Use techniques divide and conquer, greedy, dynamic programming, backtracking, branch and bound to solve the problems.*
- *Identify and analyze criteria and specifications appropriate to new problems and choose the appropriate algorithmic design technique for their solution.*
- *Able to prove that a certain problem is NP-Complete.*

UNIT-I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space Complexity, Time Complexity, Asymptotic Notation - Big (O) Notation, Omega notation, Theta notation, Recurrences.

Basic Traversal and Search Techniques: Techniques for Binary Trees, Techniques for Graphs, DISJOINT SETS - Disjoint set Operations, Union and Find Operations, Connected Components and Spanning Trees.

UNIT-II

Divide and Conquer: General Method, Applications-Binary Search, Merge sort, Quick Sort, Finding Max and Min, Strassen's Matrix Multiplication.

Greedy Method: General Method, Applications-Knapsack Problem, Job Sequencing with Deadlines, Minimum Cost Spanning Trees-Prims and Kruskals, Optimal storage on Tapes, Single-Source Shortest Paths.

UNIT-III

Dynamic Programming: General Method, Applications-Multistage Graphs, All-Pairs Shortest Paths, Optimal Binary Search Trees, 0/1 Knapsack, The Traveling Sales Person Problem.

Backtracking: General Method, Applications-8-Queens problem, Sum of Subsets, Graph

Coloring and Hamiltonian Cycles, Knapsack Problem.

UNIT-IV

Branch and Bound: The Method, Applications-Travelling Sales Person Problem, 0/ 1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT-V

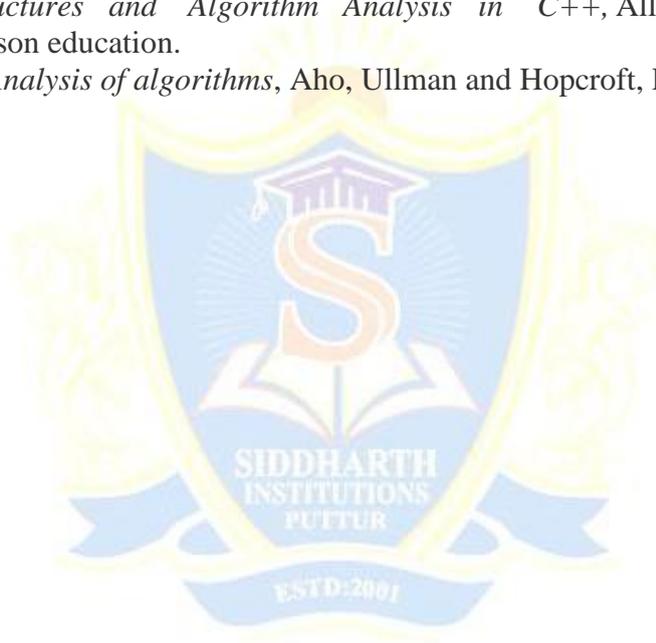
NP-Hard and NP-Complete Problems: NP-hard and NP-complete problems- Basic concepts, Nondeterministic Algorithms, NP-Hard and NP-Complete Classes, Cook's Theorem, Reduction Source Problems.

TEXT BOOKS:

1. *Fundamentals of Computer Algorithms*, Ellis Horowitz, Satraj Sahani and Sanguthevar Rajasekhran, 2nd Edition, 2012, Universities Press.

REFERENCES:

1. *Data structures and Algorithm Analysis in C++*, Allen Weiss, Second edition, Pearson education.
2. *Design and Analysis of algorithms*, Aho, Ullman and Hopcroft, Pearson education.



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

III B. Tech. – I Sem. (CSIT)

**P C
4 2**

(16IT605) COMPUTER NETWORKS LAB

Course Objectives:

- To understand the functionalities of various OSI Layers.
- To understand the routing algorithms and concepts.

Course Outcomes:

- Able to design routing protocols in networks.
- Able to write coding for networking applications.

1. Study of different types of Network cables and Practically implement the cross-wired cables and straight through cable using clamping tool.
2. Study of Network devices in detail.
3. Study of Network IP.
4. Connect the computers in Local Area Network.
5. Study of basic network command and Network configuration commands.
6. Configure Network topology using packet tracer software.
7. Write a C program to implement the data link layer framing methods such as bit stuffing.
8. Write a C program to implement the data link layer framing method such as character stuffing.
9. Write a C program to implement data link layer framing method character count.
10. Write a C program to implement on a data set characters the three CRC polynomials – CRC 12, CRC 16, and CRC CCIP.
11. Write a C program to Implement Dijkstra's Algorithm to compute the shortest path through a given path.
12. Write a C program to take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
13. Write a C program Implement Broadcast Tree for a given subnet hosts.
14. Write a program for Hamming Code generation for error detection and correction.
15. Write a program for congestion control using Leaky bucket algorithm.
16. Implementation of Stop and Wait Protocol and Sliding Window Protocol.
17. Write a C/C++ program for distance vector algorithm to find suitable path for transmission

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

III B. Tech. – I Sem. (CSIT)

**P C
4 2**

(16IT605) DATA MINING, PYTHON & R PROGRAMMING LAB

Course objectives:

To design experiments and working with WEKA tool.

The course is designed to provide Basic knowledge of Python & R. Python & R programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python & R programming language.

Course Outcomes:

Students able to

Design experiments using WEKA tool for Data mining applications

Solve problems using Python and R Programs.

Data mining Lab

Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to makes many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient. To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:

Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data (Down load from web). In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

- DM stands for Deutsche Mark, the unit of currency, worth about 90cents Canadian (but looks and acts like a quarter).
- Owns telephone. German phone rates are much higher than in Canada so fewer people own telephones.
- Foreign worker. There are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents.
- There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Sub tasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately.
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes.
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly ? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy ?
5. Is testing on the training set as you did above a good idea ? Why or Why not ?
6. One approach for solving the problem encountered in the previous question is using cross validation ? Describe what is cross validation briefly. Train a Decision Tree again using cross validation and report your results. Does your accuracy increase/decrease ? Why ?
7. Check to see if the data shows a bias against "foreign workers"(attribute 20), or "personal-status" (attribute 9). One way to do this(perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the raff data file to get all the attributes initially before you start selecting the ones you want.)

9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting them as classifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?
11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?
12. (Extra Credit): How can you convert a Decision Tree into "if-then else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules. PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one! Can you predict what attribute that might be in this dataset? One R classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and one R.

Task Resources:

Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
 1. Introduction to Weka (html version) (download ppt version)
 2. Download Weka
 3. Weka Tutorial
 4. ARFF format
 5. Using Weka from command line

Python Programming Lab

Exercise 1 - Basics

- a) Running instructions in Interactive interpreter and a Python Script
- b) Write a program to purposefully raise Indentation Error and Correct it

Exercise 2 - Operations

- a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)
- b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

Exercise - 3 Control Flow

- a) Write a Program for checking whether the given number is a even number or not.
- b) Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

Exercise - 4 - DS

- a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure
- b) Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

Exercise - 5 Files

- a) Write a program to print each line of a file in reverse order.
- b) Write a program to compute the number of characters, words and lines in a file.

Exercise - 6 Functions

- a) Write a function nearly equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.
- b) Write a function dups to find all duplicates in the list.
- c) Write a function unique to find all the unique elements of a list.
- d) Write a function reverse to reverse a list. Without using the reverse function.
- e) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

R Programming Lab

1. Write a R program to take input from the user (name and age) and display the values. Also print the version of R installation.
2. Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.
3. Write a R program to create a vector which contains 10 random integer values between -50 and +50.
4. Write a R program to get the first 10 Fibonacci numbers.
5. Write a R program to get all prime numbers up to a given number (based on the sieve of Eratosthenes).

6. Write a R program to extract first 10 english letter in lower case and last 10 letters in upper case and extract letters between 22nd to 24th letters in upper case.
7. Write a R program to find the factors of a given number
8. Write a R program to find the maximum and the minimum value of a given vector
9. Write a R program to get the unique elements of a given string and unique numbers of vector.
10. Write a R program to draw an empty plot and an empty plot specify the axes limits of the graphic.
11. Write a R program to create a simple bar plot of five subjects marks.
12. Write a R program to create a Data frames which contain details of 5 employees and display the details.



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

III B. Tech.- II Sem. (CSIT)

**L T C
3 1 3**

(16IT606) COMPUTER GRAPHICS & ANIMATION

Course Objectives:

- To understand the basic concepts of Computer Graphics
- To understand the computer animation techniques
- To understand the fundamentals of animation languages

Course Outcomes:

- Ability to animate different objects and scenarios
- Ability to design algorithms for animations
- Ability to use Basic interpolation techniques
- Able to understand the modeling and animating human figures
- Able to understand behavioral animation

UNIT- I

Introduction: Motion perception, the heritage of animation, animation production, a brief history of computer animation

Technical Background - Spaces and transformations: The display pipeline, homogeneous coordinates and the transformation matrix, Concatenating transformations: Multiplying transformation matrices, Basic transformations, Representing an arbitrary orientation, Extracting transformations from a matrix, Description of transformations in the display pipeline, Error considerations.

UNIT - II

Interpolation and basic Techniques:

Interpolation - The appropriate function, Controlling the motion along a curve, Interpolation of Orientations, Path following, Key frame systems, Animation languages, Deforming objects

UNIT - III

Interpolation and basic Techniques: Three - dimensional shape interpolation, Morphing (two-dimensional).

Motion Capture: Motion capture technologies, Processing the images, Camera calibration, Three-dimensional position reconstruction, Fitting to the skeleton, Output from motion capture systems, Manipulating motion capture data.

UNIT - IV

Modeling and Animating Human Figures: Overview of virtual human representation, Reaching and grasping, Walking, Coverings.

Facial Animation: The human face, Facial models, Animating the face, Lip-sync animation

UNIT – V

Behavioral Animation : Primitive behaviors, Flocking behavior, Prey-predator behavior -Knowledge of the environment, Vision, Memory - Modeling intelligent behaviour, Autonomous bahavior, Expressions and gestures, Modeling individuality, personality and emotions – Crowds, Crowd behaviors, Internal structure, Crowd control, Managing n-squared complexity, Appearance.

TEXT BOOK:

1. “Computer Animation Algorithms and Techniques” by Rick Parent, 3rd Edition, 2012 ,Morgan Kaufmann Publishers.

REFERENCES:

1. Principles of Three-Dimensional Computer Animation, 3rd ed, Michael O'Rourke
2. The Art of 3-D : Computer Animation and Imaging, 3rd ed., Isaac Victor Kerlow, Wiley, 2000.
3. The Computer Animator's Technical Handbook, Lynn Pocock and Judson Rosenbush, Morgan Kaufmann, 2002.
4. Real-Time Rendering, by Tomas Akenine-Möller and Eric Haines

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

III B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

**(16CS524) COMPILER DESIGN
(Common to CSE & CSIT)**

Course Objectives:

This course is a de facto capstone course in Computer Science, as it combines skills in software design, programming, data structures and algorithms, theory of computing, documentation, and machine architecture to produce a functional compiler.

- *Realize that computing science theory can be used as the basis for real applications*
- *Introduce the major concept areas of language translation and compiler design.*
- *Learn how a compiler works*
- *Know about the powerful compiler generation tools and techniques, which are useful to the other non-compiler applications*
- *Know the importance of optimization and learn how to write programs that execute faster*

Course Outcomes:

- *Able to design a compiler for a simple programming language*
- *Able to use the tools related to compiler design effectively and efficiently*
- *Ability to write optimized code*

UNIT - I

Introduction: Language processors, The Structure of a Compiler, the science of building a compiler

Lexical Analysis: The Role of the lexical analyzer, Input buffering, Specification of tokens, Recognition of tokens, The lexical analyzer generator Lex, Design of a Lexical Analyzer generator.

UNIT - II

Syntax Analysis: Introduction, Context Free Grammars, Writing a grammar, TOP Down Parsing, Bottom Up Parsing, Introduction to LR Parsing: Simple LR, More Powerful LR Parsers, The Parser Generator Yacc.

UNIT - III

Syntax Directed Translation: Syntax Directed Definitions, Evaluation orders for SDD's, Application of SDT, SDT schemes, Implementing L-attribute SDD's.

Intermediate Code Generation: Variants of syntax trees, three address code, Types and declarations, Translations of expressions, Type checking, control flow statements.

UNIT - IV

Run Time Environment: Storage organization, Stack allocation of space - Activation trees, Activation Records, Calling Sequence, Access tonon-local data on stack - Data Access Without Procedures, Issues with Nested procedures , Heap management - The Memory Manager, The Memory Hierarchy of a Computer

Symbol Table: Introduction, symbol table entries, operations on the symbol table, symbol table organizations, non block structured language, block structured language.

UNIT - V

Code Generation: Issues in the design of a code generator, The Target language, Basic blocks and flow graphs, optimization of basic blocks, a simple code generator, register allocation and assignment, optimal code generation for expressions.

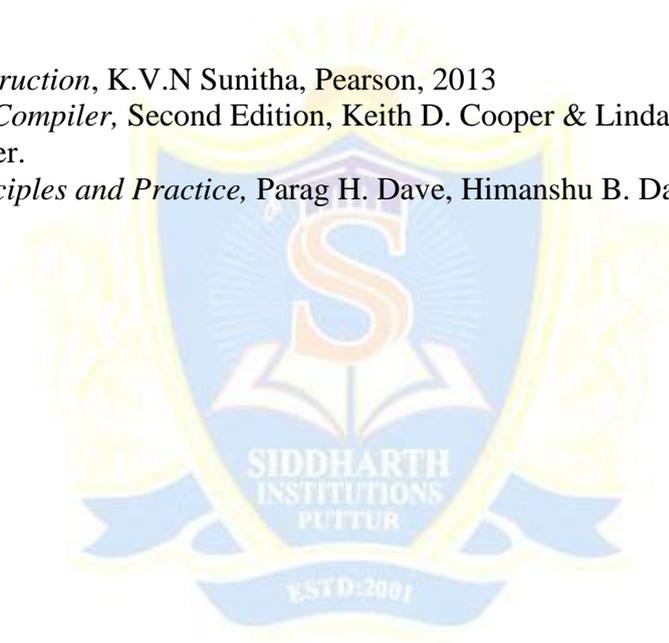
Code Optimization: Introduction, where and how to optimize, principle source of optimization, function preserving transformations, loop optimizations, global flow analysis, machine dependent optimization

TEXT BOOKS:

1. *Compilers Principles, Techniques and Tools*, Second Edition, Alfred V. Aho, Monica S. Lam, RaviSethi, Jeffrey D. Ullman., Pearson.
2. *Compiler Design*, K. Muneeswaran., Oxford University Press, 2012

REFERENCES:

1. *Compiler Construction*, K.V.N Sunitha, Pearson, 2013
2. *Engineering a Compiler*, Second Edition, Keith D. Cooper & Linda Torczon., Morgan Kaufmann, Elsevier.
3. *Compilers Principles and Practice*, Parag H. Dave, Himanshu B. Dave., Pearson.



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

III B. Tech.- II Sem. (CSIT)

L	T	C
3	1	3

(16IT607) SOFTWARE ENGINEERING & TESTING

Course Objectives:

- *To understand the software life cycle model*
- *To understand the software requirements and SRS document*
- *Basic software debugging methods*
- *Knowing various testing methodologies*
- *Testing of domains and paths*

Course Outcomes:

At the end of the course, students can able to

- *Define and develop a software project from requirement gathering to implementation*
- *Ability to code and test the software*
- *Understand the basic testing procedures*
- *Generating test cases and test suites*
- *Facilitate the dichotomies and taxonomy of bugs*

UNIT - I

SOFTWARE PROCESS MODELS

The Evolving role of Software – Software – The changing Nature of Software – Legacy software – A generic view of process– A layered Technology – A Process Framework – The Capability Maturity Model Integration (CMMI) – Process Assessment – Personal and Team Process Models – Product and Process – Process Models – The Waterfall Model – Incremental Process Models – Incremental Model – The RAD Model – Evolutionary Process Models – Prototyping – The Spiral Model – The Concurrent Development Model – Specialized Process Models – the Unified Process.

UNIT - II

REQUIREMENT ENGINEERING

Software Engineering Practice – communication Practice – Planning practice - Modeling practice– Construction Practice –Deployment - Requirements Engineering - Requirements Engineering tasks – Initiating the requirements Engineering Process- Eliciting Requirements – Developing Use cases – Building the Analysis Models – Elements of the Analysis Model – Analysis pattern – Negotiating Requirements – Validating Requirements.

UNIT - III

ANALYSIS MODELLING

Requirements Analysis – Analysis Modeling approaches – Data Modeling

Concepts – Object Oriented Analysis – Scenario based Modeling – Flow Oriented Modeling – Class based Modeling

DESIGN & IMPLEMENTATION

Architectural Design – Detailed Design - Design process -Design Quality- Design model - User interface Design – Implementation

UNIT IV

Introduction:

Purpose of testing, Dichotomies, model for testing, Taxonomy of Bugs - consequences of bugs, taxonomy for Bugs.

Flow graphs and Path testing:

Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT V

Transaction Flow Testing:

Transaction flows, transaction flow testing techniques.

Dataflow testing:

Basics of data flow testing, strategies in dataflow testing, application of data flow testing.

Domain Testing:

Domains and Paths, Nice & Ugly Domains, Domain testing, Domains and Interface testing, Domains and Testability.

TEXT BOOKS:

1. *Software Engineering A practitioner's Approach*, Roger S. Pressman, Seventh Edition, 2009
McGrawHill International Edition.
2. *Software Testing techniques* - Boris Beizer, Dreamtech Publishers, second edition.

REFERENCES:

1. *Software Engineering*, Ian Sommerville, 8th Edition, Pearson Education, 2008.
2. *Software Engineering Concepts*, Richard Fairley, McGraw Hill, 2004.
3. *Software Engineering*, Stephan Schach, Tata McGraw Hill, 2007.
4. *Software Engineering : Theory and Practice*, Pfleeger and Lawrence, Pearson Education, 2nd, 2001
5. *The craft of software testing* – Brian Marick, Pearson Education.
6. *Software Testing Techniques*–SPD(Oreille)
7. *Software Testing in the Real World* – Edward Kit, Pearson.
8. *Effective methods of Software Testing*, Perry, John Wiley.

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

III B. Tech. – II Sem (CSIT)

L	T	C
3	1	3

**(16CS526) OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE & CSIT)**

Course Objectives:

- *Introducing students to the fundamental concepts and terms used in the object-oriented approach to systems analysis and design.*
- *To study on the importance of object-oriented analysis and design, principles of modelling and its limitations.*
- *Showing how we apply the process of object-oriented analysis and design to development of software with the different applications.*
- *Pointing out the importance and function of each UML model throughout the process of object-oriented analysis and design and explaining the notation of various elements in these models.*

Course Outcomes:

After completion of this subject the students will be able to:

- *Show the importance of systems analysis and design in solving complex problems.*
- *Explain the importance of modelling and how the Unified modelling Language (UML) represents an object-oriented system using a number of modelling views.*
- *Construct various UML models using the appropriate notation.*
- *Compare the difference between various object relationships.*

UNIT-I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, and Software Development Life Cycle.

UNIT-II

Basic Structural Modeling: Classes, Relationships, Common Mechanisms, and diagrams.
Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT-III

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

Basic Behavioral Modeling-I: Interactions, Interaction diagrams. Use cases, Use case Diagrams, Activity Diagrams

UNIT-IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

Case Study: The Unified Library application.

TEXT BOOKS:

1. *The Unified Modeling Language User Guide*, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education.
2. *UML 2 Toolkit*, Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, WILEY-Dreamtech India Pvt. Ltd.

REFERENCES:

1. *Fundamentals of Object Oriented Design in UML*, Meilir Page-Jones, Pearson Education.
2. *Modeling Software Systems Using UML2*, Pascal Roques, WILEY Dreamtech India Pvt. Ltd.
3. *Object Oriented Analysis and Design*, AtulKahate, The McGraw-Hill Companies.
4. *Object-Oriented Analysis and Design with the Unified Process*, John W. Satzinger, Robert B Jackson and Stephen D Burd, Cengage Learning.
5. *Learning UML 2.0*, Russ Miles and Kim Hamilton, O'Reilly, SPD.
6. *Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process*, Craig Larman, Pearson Education.
7. *UML and C++*, R.C.Lee and W.M.Tepfenhart, PHI.



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

III B. Tech. –II Sem. (CSIT)

L	T	C
3	1	3

(16IT608) LINUX PROGRAMMING

Course Objectives:

- *To understand and make effective use of Linux utilities and shell scripting language (bash) to solve problem.*
- *To implement in C some standard Linux utilities such as ls, mv, cp etc. using system calls.*
- *To develop the skills necessary for system programming including file system programming, process and signal management, and inter process communication.*
- *To develop the basic skills required to write network programs using sockets.*

Course Outcomes:

Upon completion of the course, students shall be able to

- *Understand LINUX architecture and get familiar with UNIX environment.*
- *Work with LINUX utilities and to develop shell scripts.*
- *The fundamental skills required to write simple and complex Shellscripts to automate jobs and processes in the Unix environment.*

UNIT I

INTRODUCTION:

The LINUX Environment, LINUX structure, Accessing LINUX, common and useful commands. The Vi Editor –Concepts, Modes and Commands.

FILES AND PERMISSIONS:

File Systems –File names and types, regular files and Directories and their implementation. Operations on directories, files and on both. Security levels, user masks, Changing permissions, Ownership and group

UNIT II

INTRODUCTION TO SHELLS:

LINUX Session, standard streams, redirection, pipes, tee Command, Command Execution and Substitution, Quotes, job control, Aliases, Variable Types and options, Shell Customization.

FILTERS:

Filters and pipes, concatenating files, displaying beginning and end of files, cut and paste, sorting, Commands for Translating Characters, Files with duplicate Lines, Counting characters, words and Lines and Comparing files

UNIT III**REGULAR EXPRESSIONS:**

Atoms and Operators, **grep:** Operation, grep family, Examples, searching for file content

INTERACTIVE KORN/BASH SHELL: Variables, output, input, Exit status of a command, eval command, Basic Script concepts, Expressions, Decision Making, Repetition, special parameters and variables, changing positional parameters, Argument validation, Debugging scripts, Script Examples

UNIT IV**KORN SHELL ADVANCED PROGRAMMING:**

Variable evaluation and substitution, string manipulation, here documents, functions, arrays, functions, arrays, Built in commands, script examples

AWK: Execution, Fields and Records, scripts, Operation, Patterns, Actions, Associative arrays, String functions: length, index, substring, split, substitution, Match, Toupper and Tolower,

UNIT V

AWK AND GREP: Applications: phone List, Count lines and words, print line before a blank line.

Find the line that matches a regular expression, Find the line that doesn't match a regular expression.

USER COMMUNICATION:

Talk , write commands, Electronic mail, Remote access: The telnet concept, connecting to the remote host, File Transfer: The ftp command, Establishing ftp connection, closing an ftp connection, Transferring files.

TEXT BOOKS:

1. UNIX and Shell Programming, Behrouz A. Forouzan and Richard F. Gilberg, cengage learning publications, Indian Reprint 2012
2. UNIX Concepts and Applications, 4th Edition, Sumitabha Das, TMH.

REFERENCE BOOKS:

1. Beginning Linux Programming, 4th Edition, N. Mathew, R. Stones, Wrox, Wiley India Edition.
2. LINUX for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson.
3. System Programming with C and LINUX, A. Hoover, Pearson.
4. LINUX System Programming, Communication, Concurrency and Threads, K. A. Robbins, Pearson Education.
5. LINUX shell Programming, S. G. Kochan and P. Wood, 3rd edition, Pearson Education.
6. Shell Scripting, S. Parker, Wiley India Pvt. Ltd.

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

III B. Tech.- II Sem. (CSIT)

**P C
4 2**

**(16CS528) SOFTWARE TESTING AND CASE TOOLS LAB
(Common to CSE & CSIT)**

1. Write programs in C Language to demonstrate the working of the following constructs:
 - i) do...while ii) while....do iii) if...else iv) switch v) for
2. A program written in C language for Matrix Multiplication fails. Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents* and final test report document.

*Note: To create the various testing related documents refer to the text
—Effective Software Testing Methodologies by William E. Perry

CASE Tools

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.

2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.
9. Test Design.

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

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

III B. Tech. – II Sem. (CSIT)

**P C
4 2**

(16IT609) LINUX PROGRAMMING LAB

1. Installing any Linux flavoured Operating System(eg:ubuntu) on computer
2. Practice session: Study the features of Linux environment and submit a report on it.
3. Write a shell script that accepts a name from the user and displays whether it is a file, directory or something else.
4. Write a shell script that creates users
5. Write a shell script that searches for a given string in a file
6. Write a shell script that compiles all C files in your home directory and creates executable files
7. Write a shell script that given a filename as argument, deletes all even lines in a file
8. Implement the grep command in C language
9. Write a shell script that removes duplicate lines from a file
10. Write a shell script that enhances find command by adding error messages that explain why the command failed.
11. Write a shell script to backup files in a specified directory
12. Write a shell script that finds all links to a file
13. Write an awk script to count the number of lines in a file that do not contain vowels.
14. Write an awk script to find the number of characters, words and lines in a file.
15. Write C programs that illustrate communication between two unrelated processes using named pipe(FIFO File).
16. Write a C program in which a parent writes a message to a pipe and the child reads the message.
17. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
18. Write a C program (receiver.c) that receives the messages (from the above message queue and displays them.

TEXT BOOKS:

1. Beginning Linux Programming 4th Edition, N.Matthew,R.Stones, Wrox, Wiley India Edition.
2. Advanced Unix Programming N.B.Venkateswarlu, BS Publications.
3. Unix & Shell Programming, M.G.Venkatesh Murthy, Pearson Education
4. Unix shells by example,4th Edition Ellie Quigley, Pearson Education.
5. Sed andawk, O.Dougherty & A.R.Robbins , 2nd Edition, SPD

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

	P	C
III B. Tech.- II Sem. (CSIT)		
(16HS615) ADVANCED ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB	4	2

Course Description:

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

Course Objectives:

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

- *To improve the students' fluency in English, through a well-developed vocabulary*
- *To enable them listening spoken English at normal conversational speed by educated English speakers*
- *To respond appropriately in different socio-cultural and professional contexts.*
- *To communicate effectively and appropriately in real life situation.*
- *To develop drafting skills among the students.*
- *To develop and integrate use of the four language skills.*
- *To enhance employability skills*

UNIT I

COMMUNICATIVE COMPETENCY:

1. Functional English(Introducing yourself & others, Making Requests, Agreeing, Disagreeing)
2. Reading Comprehension
3. Listening Comprehension
4. Vocabulary for competitive purpose

UNIT II

TECHNICAL WRITING

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

UNIT III

PRESENTATIONAL SKILLS

1. Oral presentation
2. Power point presentation
3. Extempore – Public Speaking
4. Stage Dynamics

UNIT IV

CORPORATE SKILLS

1. Dress code
2. Telephonic skills
3. Net-etiquette
4. Personality Development

UNIT V

GETTING READY FOR JOB

1. Group Discussion
2. Interview skills
3. JAM

Outcomes

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

Minimum Requirements for Advanced Professional Communication Skills Lab:

The English Language Lab shall have two parts:

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

System Requirement (Hardware component):

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

Specifications:

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

Suggested Software:

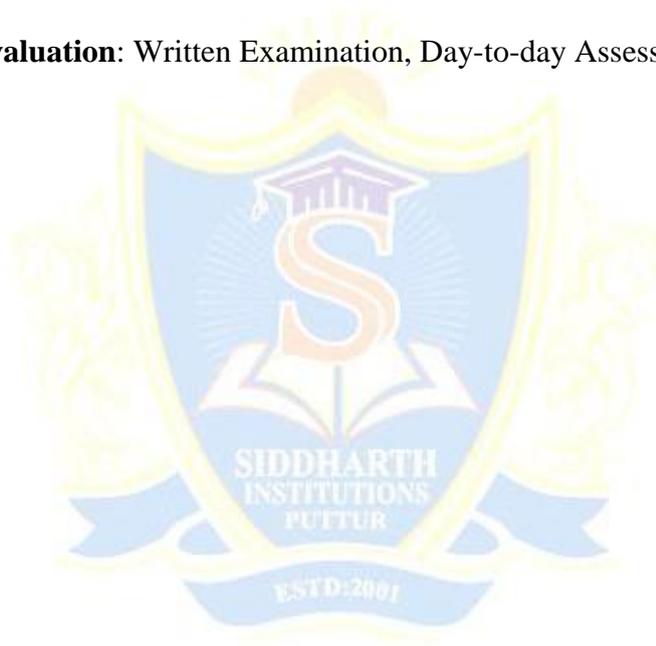
1. Clarity Pronunciation Power – Part I (Sky Pronunciation)
2. Clarity Pronunciation Power – Part II

3. K – Van Advanced Communication Skills
4. Walden Info Tech Software.

REFERENCES:

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

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



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

IV B. Tech. - I Sem. (CSIT)

**L T C
3 1 3**

(16IT610) STATISTICAL MACHINE LEARNING

Course Objectives:

- *To understand the basic theory underlying machine learning.*
- *To be able to formulate machine learning problems corresponding to different applications.*
- *To understand a range of machine learning algorithms along with their strengths and weaknesses.*
- *To be able to apply machine learning algorithms to solve problems of moderate complexity.*

Course Outcomes:

- *Ability to understand what is learning and why it is essential to the design of intelligent machines.*
- *Ability to design and implement various machine learning algorithms in a wide range of real-world applications.*
- *Acquire knowledge deep learning and be able to implement deep learning models for language, vision, speech, decision making, and more*

UNIT I

Introduction: Introduction to Machine Learning, Examples of Machine Learning Applications – **Supervised Learning:** Learning a Class from Examples, Probably Approximately Correct (PAC) Learning, Noise, Regression, Dimensions of a Supervised Machine Learning Algorithm.

UNIT II

Bayesian Decision Theory: Introduction, Classification, Discriminant Functions, Utility Theory, Association rules.

Parametric Methods: Introduction, Maximum Likelihood Estimation, The Baye’s Estimator, Regression.

UNIT III

Non Parametric Methods : Non Parametric Density Estimation, Histogram Estimator, Kernel Estimator, k-Nearest Neighbor Estimator.

Support Vector Machines: Maximal Margin Classifier, Support Vector Classifiers, Support Vector Machines.

UNIT IV

Unsupervised Learning: The Challenge of Unsupervised Learning, Principal Components Analysis,
Clustering Methods: K-Means Clustering, Hierarchical Clustering, Practical issues in Clustering.

UNIT V

Reinforcement Learning – Introduction, Elements of Reinforcement Learning, Model-Based Learning,

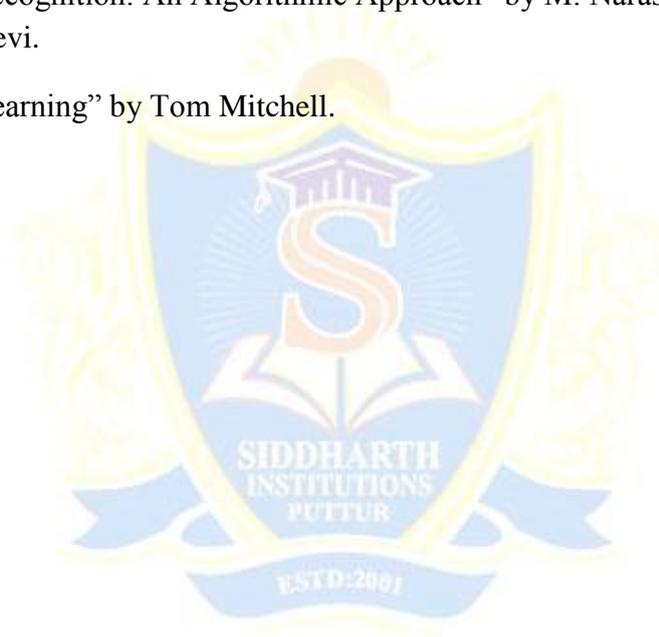
Temporal Difference Learning: Exploration Strategies, Deterministic Rewards and Actions, Non-Deterministic Rewards and Actions, Eligibility Traces - Generalization

TEXT BOOKS

1. “Introduction to Machine Learning”(2nd Edition) by Ethem Alpaydin, The MIT Press Cambridge, Massachusetts London, England.
2. “An Introduction to Statistical Learning with Applications in R” by Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, Springer.

REFERENCES:

1. “Pattern Classification” by R. O. Duda, P. E. Hart and D. G. Stork.
2. “Pattern Recognition and Machine Learning” by Christopher M. Bishop.
3. “Pattern Recognition: An Algorithmic Approach” by M. Narasimha Murty, V. Susheela Devi.
4. “Machine learning” by Tom Mitchell.



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

IV B. Tech.- I Sem. (CSIT)

L	T	C
3	1	3

(16IT611) INFORMATION SECURITY

Course Objectives:

- *Extensive, thorough and significant understanding of the concepts, issues, principles and theories of computer network security*
- *Identifying the suitable points for applying security features for network traffic*
- *Understanding the various cryptographic algorithms and implementation of the same at software level*
- *Understanding the various attacks, security mechanisms and services*

Course Outcomes:

- *Protect the network from both internal and external attacks*
- *Design of new security approaches*
- *Ability to choose the appropriate security algorithm based on the requirements.*

UNIT-I

Computer Security concepts, The OSI Security Architecture, Security attacks, Security services and Security mechanisms, A model for Network Security

Classical encryption techniques- symmetric cipher model, substitution ciphers, transposition ciphers, Steganography.

Modern Block Ciphers: Block ciphers principles, Data encryption standard (DES), Strength of DES, linear and differential cryptanalysis, block cipher modes of operations, AES, RC4.

UNIT-II

Introduction to Number theory – Integer Arithmetic, Modular Arithmetic, Matrices, Linear Congruence, Algebraic Structures, GF(2ⁿ) Fields, Primes, Primality Testing, Factorization, Chinese remainder Theorem, Quadratic Congruence, Exponentiation and Logarithm.

Public-key cryptography - Principles of public-key cryptography, RSA Algorithm, Diffie-Hellman Key Exchange, ELGamal cryptographic system, Elliptic Curve Arithmetic, Elliptic curve cryptography

UNIT-III

Cryptographic Hash functions: Applications of Cryptographic Hash functions, Requirements and security, Hash functions based on Cipher Block Chaining, Secure Hash Algorithm (SHA)

Message Authentication Codes: Message authentication Requirements, Message authentication functions, Requirements for Message authentication codes, security of MACs, HMAC, MACs based on Block Ciphers, Authenticated Encryption
Digital Signatures-RSA with SHA & DSS

UNIT-IV

Key Management and distribution: Symmetric key distribution using Symmetric Encryption, Symmetric key distribution using Asymmetric, Distribution of Public keys, X.509 Certificates, Public key Infrastructure.

User Authentication: Remote user Authentication Principles, Remote user Authentication using Symmetric Encryption, Kerberos, Remote user Authentication using Asymmetric Encryption, Federated Identity Management, Electronic mail security: Pretty Good Privacy (PGP), S/MIME.

UNIT-V

Security at the Transport Layer(SSL and TLS) : SSL Architecture, Four Protocols, SSL Message Formats, Transport Layer Security, HTTPS, SSH

Security at the Network layer (IPSec): Two modes, Two Security Protocols, Security Association, Security Policy, Internet Key Exchange.

System Security: Description of the system, users, Trust and Trusted Systems, Buffer Overflow and Malicious Software, Malicious Programs, worms, viruses, Intrusion Detection System(IDS), Firewalls

TEXT BOOKS:

1. “Cryptography and Network Security”, Behrouz A. Frouzan and Debdeep Mukhopadhyay, Mc Graw Hill Education, 2nd edition, 2013.
2. “Cryptography and Network Security: Principals and Practice”, William Stallings, Pearson Education , Fifth Edition, 2013.

REFERENCES:

1. “Network Security and Cryptography”, Bernard Menezes , Cengage Learning.
2. “Cryptography and Security”, C.K. Shymala, N. Harini and Dr. T.R. Padmanabhan, Wiley-India.
3. “Applied Cryptography, Bruce Schiener, 2nd edition, John Wiley & Sons.
4. “Cryptography and Network Security”, Atul Kahate, TMH.
5. ‘Introduction to Cryptography’, Buchmann, Springer.
6. ‘Number Theory in the Spirit of Ramanujan’, Bruce C.Berndt, University Press
7. “Introduction to Analytic Number Theory”, Tom M.Apostol, University Press

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

IV B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**(16CS519) WEB TECHNOLOGIES
(Common to CSE & CSIT)**

Course Objectives:

- *Learn to access data bases using java*
- *Learn to communicate over a network using java*
- *Learn do design server side programs and access them from client side*

Course Outcomes:

At the end of the course, students can able to

- *Familiarity with WWW technical concepts: IP addressing, routing, client-server interaction,*
- *Exposure to basic Web Technologies.*
- *Exposure to database Technologies using java*

UNIT-I

HTML-Introduction: Fundamentals of HTML, Working with Text, Organizing Text in HTML, Working with Links and URLs, Creating Tables, Working with Images, Canvas, Forms, Frames and Multimedia. HTML5: Introduction, HTML5 Document Structure, Creating Editable Content, Checking Spelling Mistakes, Exploring Custom Data Attributes, Client-Side Storage, Drag and Drop Feature, Offline Web Applications, Web Communications, Cross-Document Messaging and Desktop Notifications.

UNIT-II

CSS AND JAVASCRIPT:

CSS Introduction, CSS Selectors, Inserting CSS in an HTML document, Backgrounds, Fonts, and Text Styles, Creating Boxes, Displaying, Positioning and Floating Elements, Features of CSS3. JAVASCRIPT: Overview of JavaScript, JavaScript Functions, Events, Image Maps and Animations, JavaScript Objects, Working with Browser and Document Objects, JQuery - Introduction, JQuery Selectors, Events, Methods to access HTML elements and attributes.

UNIT-III

INTRODUCTION TO PHP: Introduction, Data Types, Variables, Constants, expressions, String Interpolation, Control Structures, Functions, Arrays, Embedding PHP Code in Web Pages, Object Oriented PHP, Sending Form Data to a Server, Working with Cookies and Session Handlers, PHP with MySQL - Interacting with the Database.

UNIT-IV

Python: Introduction, Setting up python, using python shell, writing Hello World, Adding Comments to the code, storing and processing of data, variables, different data types,

operators, statements and syntax, input function advanced print, receive input from files, controlling flow of statements: conditional, loop statements, Creating functions and importing modules.

UNIT-V

XML AND AJAX: XML-Introduction, Structure of XML Document, Document Type Definition, XML Namespaces, XML Schema, Working with DOM and SAX Parser, Working with XSLT.

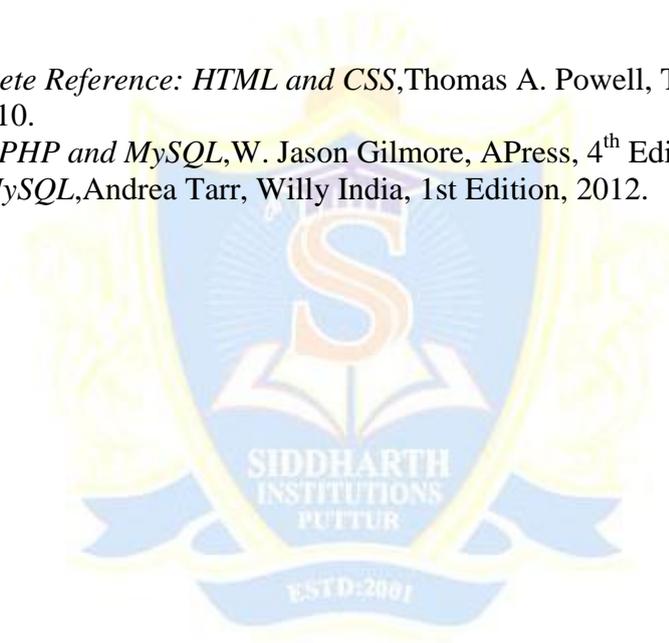
AJAX: Overview, Exploring AJAX, XMLHttpRequest object.

TEXT BOOKS:

1. *HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery*, Kogent Learning Solutions Inc, Dreamtech Press, 1st edition, 2011.
2. *Python Programming for Beginners: A Step-by-Step Guide to learning The basics of computer programming and python computer language*, Corey kidd, Kindle Edition.

REFERENCES:

1. *The Complete Reference: HTML and CSS*, Thomas A. Powell, Tata McGraw Hill, 5th edition, 2010.
2. *Beginning PHP and MySQL*, W. Jason Gilmore, APress, 4th Edition, 2011.
3. *PHP and MySQL*, Andrea Tarr, Willy India, 1st Edition, 2012.



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

IV B. Tech. - I Sem. (CSIT)

L	T	C
3	1	3

**(16CS532) MOBILE APPLICATION DEVELOPMENT
(Common to CSE & CSIT)**

Course Objectives:

- *To introduce the Android technology and its application.*
- *Design & program real working education based mobile application projects.*
- *Become familiar with common mobile application technologies and platforms; open files, save files, create and program original material, integrate separate files into a mobile application project, create and edit audio sound effects & music.*

Course Outcomes:

At the end of the course students will be assessed to determine whether they are able to

- *Describe the limitations and challenges of working in a mobile and wireless environment as well as the commercial and research opportunities presented by these technologies*
- *Describe and apply the different types of application models/architectures used to develop mobile software applications*
- *Describe the components and structure of a mobile development frameworks (Android SDK and*
- *Eclipse Android Development Tools (ADT)) and learn how and when to apply the different components to develop a working system*

UNIT - I

The Android Platform: Introduction to the Android platform, Required tools, Setting up environment, creating Hello world Application; Understanding activities, Linking activities using Intents, Fragments.

UNIT - II

Understanding the Components of a Screen, Adapting to Display Orientation, Managing Changes to Screen Orientation, Utilizing the Action Bar.

UNIT - III

Designing user interface with views: Basic views, Picker Views, List views; Pictures and menus with views.

UNIT - IV

Data Persistence: Saving and loading user preferences, Persisting data to files, creating and using databases.

Content providers: Sharing Data in Android, Using a Content Provider, Creating Own Content Providers.

UNIT - V

Messaging: Sending SMS Messages Programmatically, Getting Feedback after Sending a message, Sending SMS Messages Using Intent, Receiving SMS Messages, Caveats and Warnings.

Developing and Publishing Android Applications: Creating Your Own Services, Establishing Communication between a Service and an Activity, Binding Activities to Services, Understanding Threading; Preparing for Publishing, Deploying APK Files.

TEXTBOOKS:

1. *Beginning Android 4 Application Development*, Wei-Meng Lee, Wrox Publications.
2. *Android Programming with Android Studio*, J.F.Dimarzio, @p2p.wrox.com, 4th Edition

REFERENCES:

1. *Introduction to android application development*, 4th edition, Addison Wesley by Joseph Annuzzi Jr., Lauren Darcey, Shane Conder.
2. *Android: A programmer's guide*, Jerome Dimarzio, McGrawHill



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

IV B. Tech. - I Sem. (CSIT)

L	T	C
3	1	3

**Department Elective I
(16IT614) INTERNETWORKING WITH TCP/IP**

Course Objectives:

- *To understand the concepts and techniques that have been used to design and implement the TCP/IP Internet*
- *To understand the issues that are driving the development of new protocols to broaden and enhance the operation of the Internet*
- *To understand stream control protocol, network management.*
- *To study various network protocols.*

Course Outcomes:

- *Ability to configure a network.*
- *Ability to remotely access other computers.*
- *Ability to upload and download files.*

UNIT I

The OSI Model and the TCP/IP Protocol suite: TCP/IP Protocol Suite, Addressing, Internet Protocol Version 4 (IPv4): Datagrams, Fragmentation, Options, Checksum.

IPv4 Addresses: Introduction, Classful Addressing, Classless Addressing, Special Addresses, NAT.

UNIT II

Address Resolution Protocol (ARP): Address Mapping, The ARP Protocol, ATMARP, ARP PACKAGE. Internet Control Message Protocol Version 4: Introduction, Messages, Debugging Tools, ICMP Package.

UNIT III

Unicast Routing Protocols (RIP, OSPE, and BGP): Introduction, Intra and Inter-Domain Routing, Distance Vector Routing, RIP, Link State Routing, OSPF, Path Vector Routing, BGP.

UNIT IV

User Datagram Protocol (UDP): Introduction, User Datagram, UDP Services, UDP Applications, UDP Package.

Transmission Control Protocol (TCP): TCP Services, TCP Features, Segment, A TCP Connection

UNIT V

Windows in TCP, Flow Control, Error Control, Congestion Control, TCP Timers, Options, TCP Package
IPv6 Protocol: Introduction, Package format, Transition from IPv4 to IPv6

ICMPv6: Introduction, Error Messages, Informational Messages, Neighbor Discovery Messages, Group Membership Messages.

TEXT BOOKS:

1. Behrouz A. Forouzan, "TCP/IP Protocol Suite" Fourth Edition- TATA McGraw-Hill.

REFERENCES:

1. Douglas E. Comer, Stevens, "Internetworking with TCP/IP", Second Edition, PHI.
2. Craig Hunt, "TCP/IP Network Administration", Third Edition, O'Reilly
3. Kevin R. Fall, W. Richard Stevens "TCP/IP Illustrated Volume 1", Second edition, 2011.

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

IV B. Tech. - I Sem. (CSIT)

L	T	C
3	1	3

**Department Elective I
(16CS534) SOFTWARE PROJECT MANAGEMENT
(Common to CSE & CSIT)**

Course Objectives:

- To outline the need for Software Project Management*
- To highlight different techniques for software cost estimation and activity planning.*
- To identify main elements of software project*
- To explain the purpose of a project's planning documents*
- To construct the scope statement and the work breakdown structure*
- To approach the project planning in an organized step-by-step manner*
- To construct project network diagrams and use critical path analysis*
- To portray how the software can assist in project management*
- To describe main cost management process types*
- To articulate what is involved in quality assurance, planning and control on projects*
- To demonstrate RUP, Microsoft project 2007 & open source software project management tools*

Course Outcomes:

- At the end of course student should be able to:*
- Actively participate or successfully manage a software development project by applying project management concepts*
- Demonstrate knowledge of project management terms and techniques*
- Work on Microsoft project, IBM RUP & open source software project management tools*

UNIT - I: PROJECT EVALUATION AND PROJECT PLANNING

Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning.

UNIT - II : PROJECT LIFE CYCLE AND EFFORT ESTIMATION

Software process and Process Models – Choice of Process models – mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points – Staffing Pattern.

UNIT - III : ACTIVITY PLANNING AND RISK MANAGEMENT

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Monitoring – PERT technique – Resource Allocation – Creation of critical patterns – Cost schedules.

UNIT - IV : PROJECT MANAGEMENT AND CONTROL

Framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management –Contract Management.

UNIT - V : STAFFING IN SOFTWARE PROJECTS

Managing people – Organizational behavior – Best methods of staff selection – Motivation - Hackman job characteristic model – Ethical and Programmed concerns – Working in teams – Decision making – Team structures – Virtual teams – Communications genres – Communication plans.

TEXT BOOKS:

1. *Software Project Management*, Bob Hughes, Mike Cotterell and Rajib Mall, Fifth Edition, Tata McGraw Hill, New Delhi, 2012.

REFERENCES:

1. *Managing Global Projects*, Ramesh, Gopaldaswamy, "", Tata McGraw Hill, 2001.
2. *Software Project Management*, Royce, Pearson Education, 1999.
3. *Software Project Management in Practice*, Jalote, Pearson Education, 2002.
4. *Software Project Management: A Unified Framework*, 2010 Edition, Walker Royce



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

IV B. Tech. – I Sem. (CSIT)

L	T	C
3	1	3

**Department Elective I
(16IT615) ESSENTIALS OF BIG DATA ANALYTICS**

Course Objectives:

- Understand the Big Data Platform and its Use cases
- Provide an overview of Apache Hadoop
- Provide HDFS Concepts and Interfacing with HDFS
- Understand Map Reduce Jobs
- Provide hands on Hadoop Eco System
- Apply analytics on Structured, Unstructured Data.
- Exposure to Data Analytics with R.

Course Outcomes:

The students will be able to:

- Identify Big Data and its Business Implications.
- List the components of Hadoop and Hadoop Eco-System
- Access and Process Data on Distributed File System
- Manage Job Execution in Hadoop Environment
- Develop Big Data Solutions using Hadoop Eco System
- Analyze Infosphere BigInsights Big Data Recommendations.
- Apply Machine Learning Techniques using R.

UNIT I

INTRODUCTION TO BIG DATA AND HADOOP

Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets.

UNIT II

HDFS (Hadoop Distributed File System)

The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

UNIT III

Map Reduce

Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features

UNIT IV

Hadoop Eco System

Pig : Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators.

Hive : Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions.

Hbase : HBasics, Concepts, Clients, Example, Hbase Versus RDBMS.

Big SQL : Introduction

UNIT V

Data Analytics with R

Machine Learning : Introduction, Supervised Learning, Unsupervised Learning, Collaborative Filtering.

Big Data Analytics with BigR.

TEXT BOOKS:

1. Tom White “ Hadoop: The Definitive Guide” Third Edit on, O’reily Media, 2012.
2. Seema Acharya, Subhasini Chellappan, "Big Data Analytics" Wiley 2015.

REFERENCES:

1. Michael Berthold, David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2. Jay Liebowitz, “Big Data and Business Analytics” Auerbach Publications, CRC press (2013)
3. Tom Plunkett, Mark Hornick, “Using R to Unlock the Value of Big Data: Big Data Analytics with Oracle R Enterprise and Oracle R Connector for Hadoop”, McGraw-Hill/Osborne Media (2013), Oracle press.
4. Anand Rajaraman and Jeffrey David Ulman, “Mining of Massive Datasets”, Cambridge University Press, 2012.
5. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.
6. Glen J. Myat, “Making Sense of Data”, John Wiley & Sons, 2007
7. Pete Warden, “Big Data Glossary”, O’Reily, 2011.
- 8 Michael Mineli, Michele Chambers, Ambiga Dhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley Publications, 2013.
9. ArvindSathi, “BigDataAnalytics: Disruptive Technologies for Changing the Game”, MC Press, 2012
10. Paul Zikopoulos ,Dirk DeRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles , David Corigan , "Harness the Power of Big Data The IBM Big Data Platform ", Tata McGraw Hill Publications, 2012.

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

IV B. Tech. - I Sem. (CSIT)

L	T	C
3	-	3

**(16CE145) ELEMENTS OF ROAD TRAFFIC SAFETY
(OPEN ELECTIVE)**

Course Objectives:

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

Course Outcomes:

After completion of this course the student:

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

UNIT – I

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

UNIT – II

REGULATIONS OF TRAFFIC: Basic Principals of Regulation – Regulation of Speed – Regulation of Vehicles – Regulations Concerning the Driver – Regulations Concerning Traffic – Parking Regulations – Enforcement of Regulations

PARKING: Traffic & Parking Problems – Ill-Effects of Parking – Zoning & Parking Space Requirement Standards – Design Standards for On-Street Parking Facilities – Traffic Regulatory Measures for On-Street Parking – Off-Street Parking Facilities – Peripheral

Parking Schemes – Loading & Unloading Facilities – Truck Terminals – Long Distance Bus Terminals

UNIT – III

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

UNIT – IV

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

UNIT – V

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

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

TEXT BOOK:

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

REFERENCE BOOK

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

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

IV B. Tech. - I Sem. (CSIT)

L	T	C
3	-	3

**(16EE239) NEURAL NETWORKS & FUZZY LOGIC
(OPEN ELECTIVE)**

Course Objectives:

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

Course Out Comes:

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

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

UNIT - I

FUNDAMENTALS OF ARTIFICIAL NEURAL NETWORKS

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

UNIT - II

SUPERVISED, UNSUPERVISED NETWORKS

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

UNIT - III

ASSOCIATIVE MEMORIES

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

UNIT - IV

CLASSICAL AND FUZZY SETS

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

UNIT -V

FUZZY LOGIC SYSTEMS

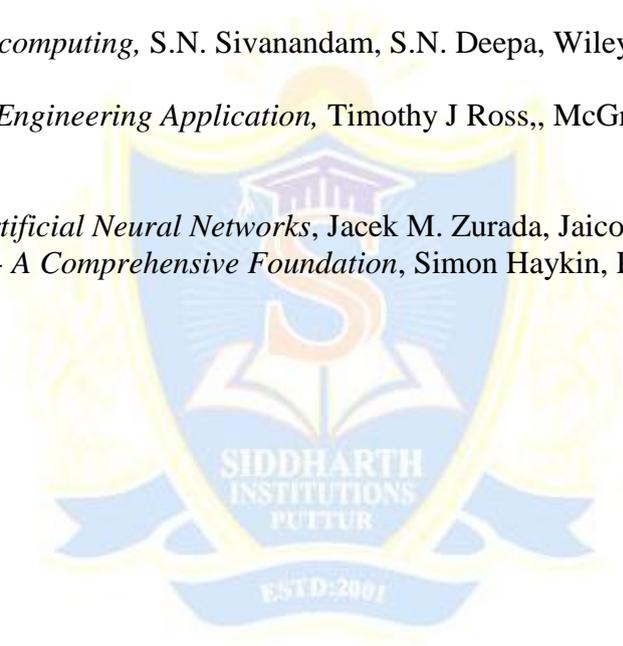
Fuzzification – Fuzzy quantifiers, fuzzy inference, fuzzy rule based system - development of rule base and decision making system - Defuzzification to crisp sets - Fuzzification and Defuzzification methods. Applications of Fuzzy logic systems (any one problem)

TEXT BOOKS:

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

REFERENCES:

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



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

IV B. Tech. - I Sem. (CSIT)

**L T C
3 - 3**

**(16ME313) NON- CONVENTIONAL ENERGY SOURCE
(OPEN ELECTIVE)**

Course Objectives:

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

Course Outcomes:

Upon completion of this course, the students can able to

- *Identify the new methodologies / technologies for effective utilization of renewable energy sources.*

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

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

UNIT V

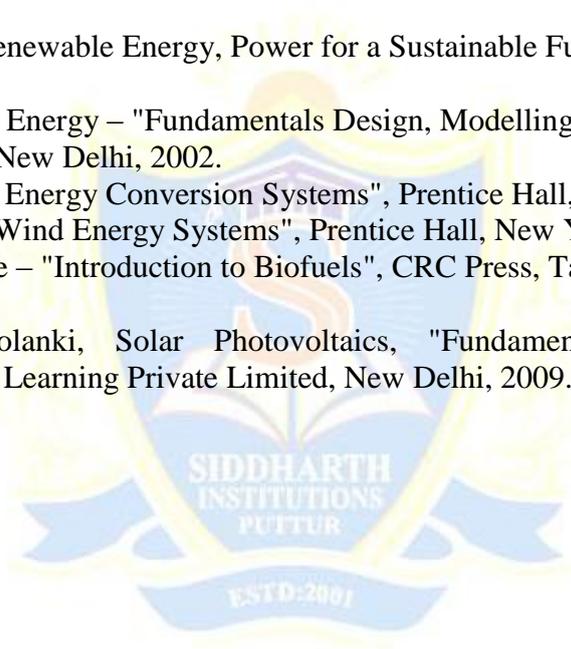
Other Sources of Energy - Tidal energy – Wave Energy – Open and Closed OTEC Cycles – Small Hydro-Geothermal Energy – Hydrogen and Storage - Fuel Cell Systems – Hybrid Systems.

TEXT BOOKS:

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

REFERENCES:

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



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

IV B. Tech. - I Sem. (CSIT)

**L T C
3 - 3**

**(16EC443) MATLAB PROGRAMMING
(OPEN ELECTIVE)**

Course Objectives:

*Understand the MATLAB Desktop, Command window and the Graph Window
Be able to do simple and complex calculation using MATLAB
Be able to carry out numerical computations and analyses
Understand the mathematical concepts upon which numerical methods
Ensure you can competently use the MATLAB programming environment
Understand the tools that are essential in solving engineering problems*

Course Outcomes:

At the end of the course student will have ability to. Assessment methods: Operation skill and familiarization of software.

UNIT-I

Introduction to MATLAB, MATLAB Interactive Sessions, Menus and the toolbar, computing with MATLAB, Script files and the Editor Debugger, MATLAB Help System, Programming in MATLAB.

UNIT-II

Arrays, Multidimensional Arrays, Element by Element Operations, Polynomial Operations Using Arrays, Cell Arrays, Structure Arrays.

UNIT-III

Functions & Files Elementary Mathematical Functions, User Defined Functions, Advanced Function Programming, Working with Data Files.

UNIT-IV

Programming with MATLAB Program Design and Development Relational Operators and Logical Variables Logical Operators and Functions Conditional Statements for Loops while Loops the switch Structure Debugging MATLAB Programs Applications to Simulation, Problems

UNIT-V

Plotting Functions Additional Commands and Plot Types Interactive Plotting in MATLAB Three-Dimensional Plots Summary, Problems

TEXT BOOKS:

1.G.H.Golub and C.F.Van Loan, “Matrix Computations”, 3rd Ed., Johns Hopkins University Press, 1996.

~~P.N.Datta~~ P.N.Datta, “Numerical Linear Algebra and Applications”, Brooks/Cole, 1994 (out of print)
L. Elden, “Matrix Methods in Data Mining and Pattern Recognition”, SIAM Press, 2007 Misc.

REFERENCES:

1. NA-digest, <http://www.netlib.org/na-digest-html>
2. Society for Industrial and Applied Mathematics (SIAM), see <http://www.siam.org>
3. Google “MATLAB Primer” or “MATLAB Tutorial” and you should be able to access lots of free MATLAB.



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

IV B. Tech. - I Sem. (CSIT)

**L T C
3 - 3**

**(16MB742) INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE)**

Course Objectives:

1. The main objective of the IPR is to make the students aware of their rights for the protection of their invention done in their project work.
2. To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act.
3. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR's.

Course Outcomes:

The students once they complete their academic projects, they get awareness of acquiring the patent and copyright for their innovative works. They also get the knowledge of plagiarism in their innovations which can be questioned legally.

UNIT - I

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT - II

Trade Marks: Purpose and function of trade marks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT - III

Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer

UNIT - IV

Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

Unfair competition: Misappropriation right of publicity, False advertising.

UNIT - V

New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits.

International overview on intellectual property, international - trade mark law, copy right law, international patent law, international development in trade secrets law.

TEXT BOOKS:

1. Intellectual property right, Deborah, E. Bouchoux, cengage learning.

REFERENCES:

1. Intellectual property right - Unleashing the knowledge economy, prabuddhaganguli, Tata McGraw Hill Publishing Company Ltd.



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

IV B. Tech. – I Sem. (CSIT)

**P C
4 2**

(16CS523) Web Technologies Lab

1. Install Dreamweaver software. Practice all the experiments using dreamweaver.
2. Write a Java program which stores the user login information in database in a server, creates user interface for inserting, deleting, retrieving information from the database, accepts user login information and verifies it.
3. Write a Java Servlet Program to display the Current time on the server.
4. To write html and servlet to demonstrate invoking a servlet from a html.
5. Write a Java servlet program to change the Background color of the page by the color selected by the user from the list box.
6. Write a Java servlet to get the personal details about the user(Like name, Address, City, Age, Email id) and check whether the user is Eligible to vote or not.
7. Write a Java servlet Program to create a Cookie and keep it alive on the client for 30 minutes.
8. Write a java servlet program to display the various client information like Connection, Host, Accept-Encoding, User Agent.
9. To write java servlet programs to conduct online examination and to display student mark list available in a database
10. Write a Java servlet Program to implement the Book Information using JDBC.
11. Write a Java Servlet Program to create a Session and display the various information like Last accessed time, Modified time, Expiration)
12. Write a JSP Program to Display the number of visitors visited the page.
13. Write a JSP Program to implement the Book Information using Database.
14. Write a JSP Program to implement the Telephone Directory.
15. Develop an Applet that draws Human Face.
16. Develop the applet that handles mouse and keyboard Events.
17. Develop the python program that implements Fibonacci series.
18. Develop the python program that implements prime numbers.
19. Develop the python program that implements class and objects concept.
20. Develop a java bean that can display a rectangle if its property is true. Otherwise draw the circle in BDK bean.

REFERENCES:

1. *Web Technologies*, Uttam K Roy, Oxford University Press
2. *The Complete Reference PHP* – Steven Holzner, Tata McGraw-Hill
3. *Web Programming*, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
4. *Java Server Pages*-Hans Bergsten, SPD O' Reilly
5. *Beginning Web Programming*-Jon Duckett WROX.
6. *Programming World Wide Web*, R.W.Sebesta, Fourth Edition, Pearson.

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

IV B. Tech. – I Sem. (CSIT)

P	C
4	2

(16CS540) Mobile Application Development Lab

OBJECTIVES:

The student should be made to:

- Know the components and structure of mobile application development frameworks for Android and windows OS based mobiles.
- Understand how to work with various mobile application development frameworks. Learn the basic and important design concepts and issues of development of mobile applications.
- Understand the capabilities and limitations of mobile devices.

OUTCOMES:

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

- Design and implement various mobile applications using emulators.
- Deploy applications to hand-held devices

LIST OF EXPERIMENTS:

1. Develop an application that uses GUI components, Font and Colors.
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multithreading.
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Write a mobile application that creates alarm clock.

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

IV B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

(16MB751) ENTREPRENEURSHIP DEVELOPMENT

Course objectives:

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

Course outcomes:

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

UNIT-I

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

UNIT-II

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

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

UNIT-III

Innovation and Idea Generation in Entrepreneurship: Concept of Invention and Innovation, types of innovation, Sources of Innovation, Importance of Innovation in Entrepreneurship. Sources of new ideas, Methods of generating ideas and Opportunity recognition and idea generation in entrepreneurship. Intellectual Property Rights (IPRs): Patents, trademarks, copyrights, and trade secrets. E-commerce and Business Start-ups,

Sources of information for Start-up Entrepreneurs in India. Problems of Start-ups without IPRs.

UNIT-IV

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

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

UNIT-V

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

TEXT BOOKS:

1. *Entrepreneurship*, 8/e, Robert D Hisrich, Mathew J. Manimala, Michael P Peters, Dean A Shepherd, McGraw Hill Education.
2. *The Dynamics of Entrepreneurial Development and Management*, Vasanth Desai, Himalaya Publishing House, Mumbai.

REFERENCES:

1. *Entrepreneurial Development*, S.S. Khanka, S. Chand and Company Limited.,
2. *Fundamentals of Entrepreneurship*, H. Nandan, PHI.
3. *Entrepreneurship Management – text and cases*, Bholanath Dutta, Excel Books.
4. *Entrepreneurship – New venture Creation*, Holt, PHI.
5. *Entrepreneurial Development*, Ramachandran, Tata McGraw Hill, New Delhi.
6. *Entrepreneurial Development*, Gupta and Srinivasan, S Chand & Sons, New Delhi

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

IV B. Tech. - II Sem. (CSIT)

L	T	C
3	1	3

**Department Elective II
(16IT616) ENABLING TECHNOLOGIES FOR DATA SCIENCE
& ANALYTICS: IOT**

Course objectives:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IoT Devices.

Course Outcomes:

Able to understand the application areas of IoT

Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks

Able to understand building blocks of Internet of Things and characteristics.

UNIT I:

Introduction to Internet of Things

Introduction, Physical Design of IoT, Logical Design of IoT, IoT Enabling Technologies.

Domain Specific IoTs

Introduction, Home Automation, cities, Environment, Retail, Agriculture, Industry, Health & Lifestyle.

UNIT II:

IoT and M2M

Introduction, M2M, Difference between IoT and M2M, SDN and NFV for IoT.

IoT System Management with NETCONF-YANG

Need for IoT Systems Management, Simple Network Management Protocol (SNMP), Network Operator requirements, NETCONF, YANG, IoT System Management with NETCONF-YANG.

UNIT III:

Developing Internet of Things

Introduction, IoT Design Methodology, Case Study on IoT System for Weather Monitoring.

Case Studies Illustrating IoT Design:

Introduction, Home Automation, Cities, Environment, Agriculture, Productivity Applications.

UNIT IV**Advanced Topics:**

Introduction, Apache Hadoop, Using Hadoop Map Reduce for Batch Data Analysis.

IEEE 802.15.4:

The IEEE 802 committee family of protocols, The physical layer, The Media Access control layer, Uses of 802.15.4, The Future of 802.15.4: 802.15.4e and 802.15.4g.

UNIT V:**ZigBee:**

Development of the standard, ZigBee Architecture, Association, The ZigBee network layer, The ZigBee APS Layer, The ZigBee Devices Object (ZDO) and the ZigBee Device Profile (ZDP), Zigbee Security, The ZigBee Cluster Library (ZCL), ZigBee Applications profiles, The ZigBee Gateway Specifications for network devices.

TEXT BOOKS:

1. Internet of Things a Hands-on Approach by Arshdeep Bahga and Vijay Madiseti. University Press.
2. The Internet of Things key applications and protocols by Oliver Hersent, David Boswarthick and Omar elloumi, Wiley Student Edition.

REFERENCE:

1. Internet of Things: Architecture, Design Principles and Applications by Raj Kamal MCGraw Hill Edition.



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

IV B. Tech. - II Sem. (CSIT)

L	T	C
3	1	3

**Department Elective II
(16IT617) IMAGE PROCESSING**

Course Objectives:

- *To comprehend the relation between human visual system and machine perception and processing of digital images.*
- *To provide a detailed approach towards image processing applications like enhancement, segmentation and compression.*

Course Outcomes:

- *Exploration of the limitations of the computational methods on digital images.*
- *Expected to implement the spatial and frequency domain image transforms on enhancement and restoration of images.*
- *Elaborate understanding on image enhancement techniques.*
- *Expected to define the need for compression and evaluate the basic compression algorithms.*

UNIT I

Digital Image Fundamentals & Image Transforms: Digital Image Fundamentals, Sampling and Quantization, Relationship between Pixels. Image Transforms: 2-D FFT, Properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar Transform, Slant Transform, Hotelling Transform.

UNIT II

Image Enhancement (Spatial Domain): Introduction, Image Enhancement in Spatial Domain, Enhancement Through Point Processing, Types of Point Processing, Histogram Manipulation, Linear and Non – Linear Gray Level Transformation, Local or Neighborhood criterion, Median Filter, Spatial Domain High-Pass Filtering. Image Enhancement (Frequency Domain): Filtering in Frequency Domain, Low Pass (Smoothing) and High Pass (Sharpening) Filters in Frequency Domain.

UNIT III

Image Restoration: Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT IV

Image Segmentation: Detection of Discontinuities, Edge Linking And Boundary Detection, thresholding, Region Oriented Segmentation. Morphological Image Processing: Dilation and Erosion: Dilation, Structuring Element Decomposition, Erosion, Combining Dilation and Erosion, Opening and Closing, Hit or Miss Transformation.

UNIT V

Image Compression: Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

TEXT BOOKS:

1. Digital Image Processing - Rafael C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008
2. Fundamentals of Digital Image Processing – A.K.Jain , PHI, 1989

REFERENCES:

1. Digital Image Processing- S Jayaraman, S Esakkirajan, T Veerakumar- TMH, 2010.
2. Digital Image Processing and Analysis-Human and Computer Vision Application with using CVIP Tools - Scotte Umbaugh, 2nd Ed, CRC Press, 2011
3. Digital Image Processing using MATLAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Eddings, 2nd Edition, TMH, 2010.
4. Digital Image Processing and Computer Vision – Somka, Hlavac, Boyle- Cengage Learning

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

IV B. Tech. - II Sem. (CSIT)

L	T	C
3	1	3

**Department Elective II
(16IT618) DISTRIBUTED COMPUTING**

Course Objectives:

To provide in-depth study in the area of distributed computing on models, architectures, algorithms and techniques and to allow the student to:

- To acquire fundamental knowledge in distributed computing;*
- To learn about advanced distributed computing concepts;*
- To understand limitations and appreciate innovative solutions;*
- To apply the knowledge in distributed application development and problem solving.*

Course Outcome:

After learning the course the students should be able to

- To Understand distributed systems*
- To Know various types of transparencies which Distributed OS should provide*
- To Understand and analyse Message passing models*
- To Understand RPC and implement it using manual or automatic stub generation*
- To Know various synchronization issues*
- To Know, analyse various election algorithms*
- To Implement threads Understand distributed systems*
- To Know various types of transparencies which Distributed OS should provide*
- To Understand and analyse Message passing models*
- To Understand RPC and implement it using manual or automatic stub generation*
- To Know various synchronization issues*
- To Know, analyse various election algorithms*
- To Implement threads*
- To Know File systems*
- To Compare various Distributed OS*

UNIT I

Concepts of Distributed Systems : Introduction, Distributed computing models, Software concepts, Design issues in distributed systems, Client-server model, WWW 1.0 and 2.0 Network Communication: LAN and WAN technologies, OSI Model and Internet protocols, ATM, Protocols for Distributed systems.

UNIT II

Interprocess Communication: Message Passing and its features, IPC message format, IPC synchronization, Buffering, multi datagram messaging, process addressing techniques, failure handling, Formal Models for message passing systems, Broadcast and converge cast on a spanning tree, Flooding and building a spanning tree, Constructing a DFS spanning tree with and without a specified root.

UNIT III

Remote Communication: Introduction, RPC basics, RPC implementation, RPC Communication and Other issues, Sun RPC, RMI basics, RMI Implementation, Java RMI. Synchronization: Clock synchronization, Logical clocks, Global state, Mutual exclusion, **Election algorithms:** Bully algorithm, Ring algorithm, Leader election in rings, anonymous rings, Asynchronous rings, synchronous rings, election in wireless networks, Deadlocks in Distributed systems, Deadlocks in Message communication.

UNIT IV

Distributed System Management: Resource management, Task management approach, Load balancing approach, Load sharing approach, Process Management, Process migration, threads, fault tolerance.

UNIT V

Distributed Shared Memory: Concepts, Hardware DSM, Design issues in DSM systems, Implementation issues, Heterogeneous and other DSM systems, Naming: Overview, Features, Basic concepts, System oriented names, Object locating mechanisms, Issues in designing human oriented names, Name caches, Naming and security, DNS.

TEXT BOOKS:

1. Distributed Computing, Sunita Mahajan and Seema Shah, Oxford University Press
2. Distributed Systems: Principles and Paradigms, Taunenbaum
3. Distributed Systems: Concepts and Design, G. Coulouris, J. Dollimore, and T. Kindberg, Pearson Education
4. Distributed Computing, Fundamentals, Simulations and Advanced topics, 2nd Edition, Hagit Attiya and Jennifer Welch, Wiley India

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

IV B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

**Department Elective –III
(16CS541) MOBILE COMPUTING
(Common to CSE & CSIT)**

Course Objectives:

- *Understand mobile ad hoc networks, design and implementation issues, and available solutions.*
- *Acquire knowledge of sensor networks and their characteristics.*

Course Outcomes:

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

- *Students able to use mobile computing more effectively.*
- *Students gain understanding of the current topics in MANETs and WSNs, both from an industry and research point of views.*
- *Acquire skills to design and implement a basic mobile ad hoc or wireless sensor network via simulations.*

UNIT - I

Wireless LANS and PANS: Introduction, Fundamentals of WLANS, IEEE 802.11 Standards, HIPERLAN Standard, Bluetooth, Home RF.

Wireless Internet: Wireless Internet, Mobile IP, TCP in Wireless Domain, WAP, Optimizing Web over Wireless.

UNIT- II

AD HOC Wireless Networks: Introduction, Issues in Ad Hoc Wireless Networks, AD Hoc Wireless Internet.

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

UNIT - III

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

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

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

UNIT – IV

Quality of Service: Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classification of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, QoS Frameworks for Ad Hoc Wireless Networks.

Energy Management: Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Ad Hoc Wireless Networks, Battery Management Schemes, Transmission Power Management Schemes, System Power Management Schemes.

UNIT – V

Wireless Sensor Networks: Introduction, Background of Sensor Network Technology, Basic Overview of the Technology, Basic Sensor Network Architectural Elements, Brief Historical Survey of Sensor Networks, Challenges and Hurdles.

Applications of Sensor Networks: Home Control, Building Automation, Industrial Automation, Medical Applications, Sensor and Robots, Highway Monitoring, Civil and Environmental Engineering Applications and Habitat Monitoring.

TEXT BOOKS:

1. *Ad Hoc Wireless Networks: Architectures and Protocols*, C. Siva Ram Murthy and B.S.Manoj, PHI, 2004.
2. *Wireless Sensor Networks Technology, Protocols and Applications* - KAZEM SOHRABY, DANIEL MINOLI, TAIEB ZNATI, Wiley Interscience, A John Wiley and Sons Inc. Publications, 2007
3. *Wireless Ad- hoc and Sensor Networks: Protocols, Performance and Control*, Jagannathan ,Sarangapani, CRC Press

REFERENCES:

1. *Ad hoc Mobile Wireless Networks*, Subir Kumar sarkar, T G Basvaraju, C Puttamadappa, Auerbach Publications, 2012.
2. *Wireless Sensor Networks*, C. S. Raghavendra, Krishna M. Sivalingam, 2004, Springer.
3. *Ad- Hoc Mobile Wireless Networks: Protocols & Systems*, C.K. Toh , Pearson Education.

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

IV B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

**Department Elective –III
(16IT619) COMPUTER VISION & DEEP LEARNING**

Course Objectives:

Develop an understanding of the technologies behind the deep learning.

Course Outcomes:

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

- understand how deep neural networks work and how to train them,
- analyze state-of-the-art applications of deep neural networks to problems in different domains,
- apply deep neural networks to solve problems in machine learning

UNIT I

Review of Visual Perception and Artificial Neural Networks:

Overview of Computer Vision, Preprocessing Images for Recognition, Feature Engineering for Conventional Image Classification, K-Nearest Neighbor, Linear Classification, Gradient Descent, Feed Forward Neural Network, Back propagation, Unstable Gradient Problem

UNIT II

Convolutional Neural Networks:

Introduction to Deep Supervised Learning, Convolution & Pooling, Dropout, LeNet, AlexNet, ZFNet, VGGNet, Google Net, ResNet and other State-of-the-art, CNNs.

UNIT III

Transfer Learning:

Transfer Learning Scenarios, Applications of Transfer Learning, Transfer Learning Methods, Fine Tuning and Data Augmentation, Related Research Areas

UNIT IV

Convolutional Neural Networks in Action for Computer Vision:

Semantic Segmentation, Object Detection, Instance Segmentation, Feature Visualization and Inversion, DeepDream and Style Transfer, Highway Networks, Image Recognition, Real Time CNN, Stereo Siamese Networks, Depth from Single Image, Image Generation, Domain Adaptation

UNIT V**Review of other Deep Neural Networks:**

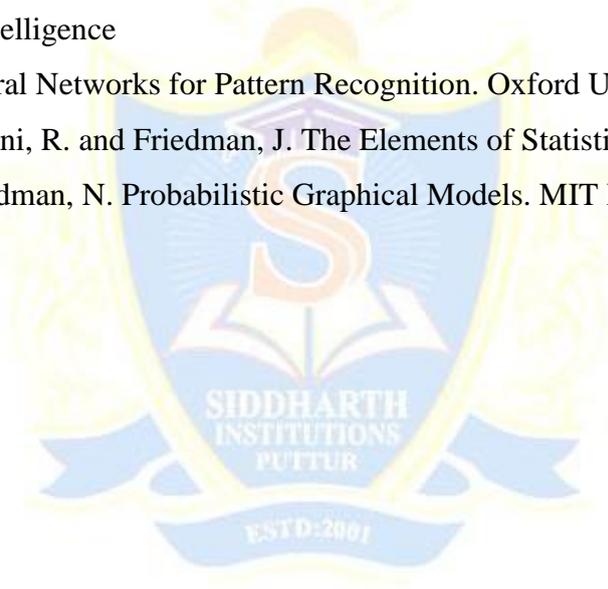
Auto Encoders, Recurrent and Recursive Neural Networks, Boltzmann and Restricted Boltzmann Machine

Practical Deep Learning and Case Studies:

Various Frameworks such as DIGITS, TensorFlow, Caffe and Theano, 2-3 Case Studies based on the Latest Developments in the Field

TEXT BOOKS/REFERENCES:

1. Ian Goodfellow, Yoshua Bengio, Aaron Courville, Deep Learning, MIT Press
2. Adam Gibson, Josh Patterson, Deep Learning, O'Reilly Media, Inc.
3. Duda, R.O., Hart, P.E., and Stork, D.G., Pattern Classification, Wiley.
4. Theodoridis, S. and Koutroumbas, K., Pattern Recognition. Academic Press
5. Russell, S. and Norvig, N. Artificial Intelligence: A Modern Approach. Prentice Hall Series in Artificial Intelligence
6. Bishop, C. M. Neural Networks for Pattern Recognition. Oxford University Press.
7. Hastie, T., Tibshirani, R. and Friedman, J. The Elements of Statistical Learning, Springer
8. Koller, D. and Friedman, N. Probabilistic Graphical Models. MIT Press



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

IV B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

Department Elective –III

(16IT620) CRYPTOCURRENCY AND BLOCKCHAIN TECHNOLOGY

Course Objectives:

After this Students able to

Develop an understanding of how blockchain technology works, the consensus and protocol in the blockchain

Develop a historical background of block chain and cryptocurrencies, and understanding the key differences of different cryptocurrencies.

Be able to share blockchain industry overview, from the world of cryptocurrencies and real world use cases of blockchains.

Understand an overview of key regulatory guidelines in Singapore for cryptocurrencies.

Understand the different risks and potential of cryptocurrencies.

Learn how cryptocurrencies are disrupting the financial market; Understanding their co-relations with other financial assets and common platforms available for market participants.

Course outcomes:

After this student able to

Share the fundamentals of block chain technology, its ecosystem and the use cases in different industry segments.

Understand an overview of key regulatory guidelines in Singapore for crypto currencies.

Understanding how crypto currencies are disrupting the financial market, their co-relations with other financial assets and common platforms available for market participants.

Students will be familiar with block chain

and crypto currency concepts. Also they can build their own application using the learned concepts.

UNIT I

Basics: Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete.

Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.

UNIT II

Blockchain: Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit,

Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

UNIT III

Distributed Consensus: Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate.

UNIT IV

Cryptocurrency: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin

UNIT V

Cryptocurrency Regulation: Stakeholders, Roots of Bitcoin, Legal Aspects - Cryptocurrency Exchange, Black Market and Global Economy.

Blockchain Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.

TEXT BOOK /REFERENCE BOOKS:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).
2. Wattenhofer, The Science of the Blockchain
3. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies
4. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System
5. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger," Yellow paper.2014.
6. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts

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

IV B. Tech. – II Sem. (CSIT)

L	T	C
3	1	3

**Department Elective – IV
MOOCS**

MOOC courses-offered by SWAYAM/ NPTEL/ NISTE-suggested by the department (online courses)

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

IV B. Tech. - II Sem. (CSIT)

L	T	C
-	-	2

(16IT612) SEMINAR

ESTD:2001

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

IV B. Tech. - II Sem. (CSIT)

L	T	C
-	-	10

(16IT613) PROJECT WORK
