SRI VENKATESWARA COLLEGE OF ENGINEERING

An Autonomous Institution,

Affiliated to Anna University, Chennai

SRIPERUMBUDUR TK - 602 117

REGULATION – 2018

B.E COMPUTER SCIENCE AND ENGINEERING

Choice Based Credit System

CURRICULUM and Syllabus for Semester I to IV

SEMESTER I

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Prerequisites	Fixed/Movable
THEORY										
1.	HS18151	Communicative English	HS	3	3	0	0	3	-	F
2.	MA18151	Engineering Mathematics I	BS	4	3	1	0	4	-	F
3.	PH18151	Engineering Physics	BS	3	3	0	0	3	-	F
4.	CY18151	Engineering Chemistry	BS	3	3	0	0	3	-	F
5.	EE18151	Basic Electrical and Electronics Engineering	ES	3	3	0	0	3	-	F
6.	IT18101	Programming for Problem Solving	ES	3	3	0	0	3	-	F
PRACTICAL										
7.	PC18161	Physics and Chemistry Laboratory	BS	2	0	0	2	1	-	F
8.	GE18161	Engineering Practices Laboratory	ES	3	0	0	3	1.5	-	F
9.	IT18111	Programming for Problem Solving Laboratory	ES	4	0	0	4	2	-	F
TOTAL				**28**	**18**	**1**	**9**	**23.5**	-	-

SEMESTER II

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Prerequisites	Fixed/Movable
THEORY										
1.	HS18251	Technical English	HS	3	3	0	0	3	-	F
2.	MA18251	Engineering Mathematics II	BS	4	3	1	0	4	-	F
3.	GE18151	Engineering Drawing	BS	5	3	0	0	4	-	F
4.	GE18251	Environmental Science and Engineering	BS	3	3	0	0	3	-	F
5.	CS18201	Digital Principles and System Design	ES	3	3	0	0	3	-	F
6.	CS18202	Object Oriented Programming	PC	3	3	0	0	3	-	F
PRACTICAL										
7.	CS18211	Digital Principles and System Design Laboratory	PC	3	0	0	3	1.5	-	F
8.	CS18212	Object Oriented Programming Laboratory	PC	3	0	0	3	1.5	-	F
TOTAL				**27**	**18**	**1**	**6**	**23**	-	-

SEMESTER III

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Prerequisites	Fixed/Movable
THEORY										
1.	MA18352	Discrete Mathematics (Common to CS & IT)	BS	**4**	3	1	0	**4**	-	F
2.	CS18301	Data Structures	PC	**3**	3	0	0	**3**	-	F
3.	CS18302	Database Management Systems	PC	**3**	3	0	0	**3**	-	F
4.	CS18303	Microprocessor and its Applications	PC	**3**	3	0	0	**3**	-	F
5.	CS18304	Advanced Object Oriented Programming	PC	**3**	3	0	0	**3**	-	F
PRACTICAL										
6,	CS18311	Data Structures Laboratory	PC	**3**	0	0	3	**1.5**	-	F
7.	CS18312	Database Management Systems Laboratory	PC	**3**	0	0	3	**1.5**	-	F
8.	CS18313	Microprocessor Laboratory	PC	**3**	0	0	3	**1.5**	-	F
TOTAL				**25**	**15**	**1**	**9**	**20.5**	-	-

SEMESTER IV

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	CONTACT PERIODS	L	T	P	C	Prerequisites	Fixed/Movable
THEORY										
1.	MA18453	Probability and Queuing Theory	BS	4	3	1	0	4	-	F
2.	CS18401	Computer Architecture (Common to CS & EE)	PC	3	3	0	0	3	-	F
3.	CS18402	Operating Systems (Common to CS & EC)	PC	3	3	0	0	3	-	F
4.	CS18403	Computer Networks (Common to CS & EE)	PC	3	3	0	0	3	-	F
5.	CS18404	Software Engineering	PC	3	3	0	0	3	-	F
6.	CS18405	Design and Analysis of Algorithms	PC	3	3	0	0	3	-	F
PRACTICAL										
7.	CS18411	Operating Systems Laboratory	PC	3	0	0	3	1.5	-	F
8.	CS18412	Computer Networks Laboratory	PC	3	0	0	3	1.5	-	F
9.	CS18413	Software Engineering Laboratory	PC	3	0	0	3	1.5		F
TOTAL				**28**	**18**	**1**	**9**	**23.5**	-	-

HS18151	COMMUNICATIVE ENGLISH (Common to all Branches except Marine Engineering)	L	T	P	C
		3	0	0	3

OBJECTIVES

- To enable learners to interact fluently on everyday social contexts.
- To enable learners engage in conversations in an academic/scholarly setting.
- To enable learners overcome public speaking barriers.
- To develop learners' ability to take notes and in the process, improve their listening skills
- To develop learners' reading skill through reading text passages for comprehension and contemplation.
- To enable learners write on topics of general interest and drafting correspondences for general purposes.

UNIT I **9**

Listening – short video clips – conversational scenes form movies, celebrities' speeches/interviews. Speaking – several ways of introducing oneself at several situations, introducing others at several situations, inviting people for several occasions, describing people and their places. Reading – short comprehension passages – making inferences, critical analysis. Writing – completing the incomplete sentences– developing hints from the given information. Grammar – Wh- Questions and Yes or No questions –Parts of speech. Vocabulary development– prefixes- suffixes- articles – countable / uncountable nouns.

UNIT II **9**

Listening – customer care voice files, short narratives – identifying problems and developing telephone etiquettes. Speaking – speaking over skype/whatsapp, making business calls, making self-recorded informative videos, inquiring about a concept/activity, describing a concept/activity. Reading – reading the headlines on news magazines – slogans and taglines from advertisements. Writing - free writing – writing - headlines , slogans and taglines individual inspirations. Grammar – conjunctions, idioms, phrases, quotes. Vocabulary development – guessing the meanings of words in various different contexts.

UNIT III **9**

Listening – courtroom scenes from movies, debates and talks from news channels, notes taking. Speaking – language and tone for arguments, discussion, deliberation, contemplation, expressing opinions, reacting to different situations in an alien country. Reading–language used in instruction manuals of household appliances, cookery and other basic instructions. Writing- understanding the structure of texts - use of reference words, discourse markers-coherence, rearranging the jumbled sentences. Grammar – adjectives - degrees of comparison,

framing direct and indirect questions. Vocabulary development – concise approach, single word substitution.

UNIT IV **9**

Listening – Sports commentaries, advertisements with users' criticisms; Speaking –for social causes, for promoting a concept, negotiating and bargaining; Reading – review of a product, movie, movement or a system; Writing – writing for advertisements, selling a product; Grammar – Tenses – Simple Past, Present and Future, Continuous - Past, Present and Future; Vocabulary Development – synonyms, antonyms and phrasal verbs.

UNIT V **9**

Listening – video lectures, video demonstration of a concept; Speaking – presenting papers/concepts, delivering short speeches, discourses on health, suggesting natural home remedies, cleanliness, civic sense and responsibilities; Reading – columns and articles on home science; Writing – correspondences of requests, basic enquiry/observation and basic complaints; Grammar - modal verbs, perfect tenses – Vocabulary development – collocations.

TOTAL (L:45): 45 PERIODS

OUTCOMES:

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

- Read articles and infer meanings from specific contexts from magazines and newspapers.
- Participate effectively in informal/casual conversations; introduce themselves and their friends and express opinions in English.
- Comprehend conversations and short talks delivered in English
- Write short write-ups and personal letters and emails in English.

REFERENCES:

1. Mindscapes : English for Technologists and Engineers. Orient Black swan, Chennai. 2017
2. Downes, Colm, Cambridge English for Job-hunting, Cambridge University Press, New Delhi. 2008
3. Murphy, Raymond, Intermediate English Grammar with Answers, Cambridge University Press 2000
4. Thomson, A.J. Practical English Grammar 1& 2 Oxford 1986.

WEBSITES

1. http://www.usingenglish.com

2. http://www.uefap.com3
3. https://owl.english.purdue.edu/owl/
4. www.learnenglishfeelgood.com/esl-printables-worksheets.html

SOFTWARE

1. Face 2 Face Advance – Cambridge University Press, 2014
2. English Advance Vocabulary- Cambridge University Press
3. IELTS test preparation – Cambridge University Press 2017
4. Official Guide to the TOEFL Test With CD-ROM, 4th Edition
5. CAMBRIDGE Preparation for the TOEFL TEST- Cambridge University Press, 2017

MA18151	MATHEMATICS – I (Common to all except Marine Engineering)	L	T	P	C
		3	1	0	4

OBJECTIVES

- To understand and apply matrix techniques for engineering applications.
- To make the student knowledgeable in statistical methods of analyzing and interpret the data for engineering problems.
- To familiarize the student with basic calculus including functions of several variables and how to apply the transformation of variables.
- To acquaint the student with Mathematical tools needed in evaluating multiple integrals and their usage

UNIT I MATRICES 9+3

Eigen values and Eigen vectors of a real matrix – Characteristic equation – Properties of Eigen values and Eigen vectors – Statement and Applications of Cayley-Hamilton Theorem – Diagonalization of matrices– Reduction of a quadratic form into canonical form by orthogonal transformation-Nature of quadratic forms

UNIT II STATISTICAL METHODS 9+3

Scatter diagram- Karl Pearson coefficient of correlation for raw data- Spermann rank correlation coefficient- lines of regression – Regression equation X on Y and Y on X- Curve fitting by Principle of least squares – Fitting a straight line $y = ax + b$ and a parabola $y = ax^2 + bx + c$

UNIT III APPLICATION OF DIFFERENTIAL CALCULUS 9+3

Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes

UNIT IV DIFFERENTIAL CALCULUS OF SEVERAL VARIABLES 9+3

Limits and Continuity - Partial derivatives – Total derivatives – Differentiation of implicit functions – Jacobians and properties– Taylor's series for functions of two variables – Maxima and Minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT V MULTIPLE INTEGRALS 9+3

Double integrals in Cartesian and polar coordinates – Change of order of integration – Area enclosed by plane curves - Change of variables in double integrals – Triple integrals – Volume of solids.

TOTAL (L:45+T:15):60 Periods

OUTCOMES:

- This course equips the students to have basic knowledge and understanding of fundamental statistics to analyze and interpret data.
- Basic application of calculus in Engineering problems and to tackle for different geometries.
- To apply the idea of reducing complex Engineering problems into simple form using matrix technique.

TEXT BOOKS:

1. ErwinKreyszig,AdvancedEngineeringMathematics,8thEdition,John Wiley, (1999)
2. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd., (2011).
3. Grewal. B.S, "Higher Engineering Mathematics", 41stEdition, Khanna Publications, Delhi, (2011).

REFERENCES:

1. S C Gupta and V K Kapoor, Fundamentals of Mathematical Statistics, S.Chand Private Ltd.,11th Edition (2005).
2. Glyn James, "Advanced Modern Engineering Mathematics", 3rdEdition, Pearson Education, (2012).
3. Peter V.O'Neil, "Advanced Engineering Mathematics", 7th Edition, Cengage learning, (2012).
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company New Delhi, (2008).
5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics", Volume I, Second Edition, Pearson Publishing (2011).

PH18151 **ENGINEERING PHYSICS** **L T P C**

(Common to all Branches except Marine Engineering) **3 0 0 3**

OBJECTIVE:

- To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology.

UNIT – I CRYSTAL PHYSICS **12**

Unit cell – Bravais Lattices – Miller indices – Distance between Inter planar distance 'd' (derivation) – discussion of various crystal structures : calculation of Atomic radius, Coordination number, effective number of lattice points and Atomic Packing Factor for the SC, BCC, FCC, HCP, Diamond Cubic (derivation) – discussion about the NaCl, Graphite structures. **Crystal defects :** Zero dimensional, one dimensional, Two dimensional and Three dimensional defects.

Diffraction of X-rays by crystal planes - Bragg's spectrometer – Powder Diffraction method

UNIT – II THERMAL PHYSICS **6**

Modes of heat transfer: Newton's law of cooling – thermal conductivity- Lee's disc method (derivation and expt) – Radial heat flow – Rubber tube method – conduction through compound media (series and parallel).

UNIT– III WAVE MECHANICS **9**

Quantum principles: Black body radiation-Planck Hypothesis (qualitative),Compton's effect (derivation).

Wave-particle duality - de-Broglie matter waves – Heisenberg's uncertainty principle - Wave function and its significance - Schrödinger's wave equation (time dependent and Time independent) (derivation) – Application of Schrodinger's wave equation - Particle in one dimensional box (derivation) – Degenerate and non-degenerate energy states.

UNIT– IV ACOUSTICS AND ULTRASONICS **9**

Acoustics: Classification of Sound – Characteristics of Musical Sound : Quality (Timbre), Pitch, Intensity of Sound – Units of Sound – decibel - Reverberation of sound – Reverberation time – absorption of sound energy by materials – Absorption coefficient – Sabine's Formula (derivation) – Factors affecting the acoustics of buildings – Remedies.

Ultrasonics: Introduction to ultrasonics – Properties of ultrasonic waves – Production of Ultrasonics :Magnetostriction method, Piezo electric method – detection of ultrasonics – Ultrasonic Acoustic grating - Applications of ultrasonic waves – SONAR, NDT, Sonogram.

UNIT – V OPTOELECTRONICS AND FIBER OPTICS 9

Lasers: Basic properties of Lasers - Einstein's coefficients (Derivation) – Population inversion – Types of Lasers – Molecular Gas Lasers (CO_2 Laser) – Solid state Laser (Nd: YAG Laser) – Applications of Lasers in Engineering and Medicine.

Fibreoptics:Introduction - Principle and structure of optical fibers-Acceptance angle-Numerical aperture-Types of optical fibers-Optical fiber communication system (block diagram) - Advantages and its applications.

TOTAL :45 Periods

Outcomes:

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

- Working knowledge of fundamental physics and basic engineering principles to include advanced knowledge in one or more engineering disciplines
- Understand and to compute problems in Quantum Physics.
- Use modern engineering physics techniques and tools.
- Enhance knowledge about photonics and optical fiber communication system

TEXT BOOKS

1. Engineering Physics – R.K. Gaur and S.L. Gupta, Dhanput Publications, 2015
2. A text book of Engineering Physics – M. N. Avadhnaulu, and P. G. Kshirsagar, S. Chand & Co. 2006
3. Engineering Physics – V. Rajendran, Tata McGraw Hill, 2009
4. Materials Science – M. Arumugam, Anuradha Publications, 2015

REFERENCE BOOKS

1. Principles of Physics - Resnick, Halliday& Walker (Wiely)
2. Peter Atkins & Julio De Paula, Physical Chemistry 10thEdn., Oxford University Press,2014
3. Concepts of Modern Physics - AurthurBeiser (Mc-Graw Hill)
4. Materials Science and Engineering – V.Raghavan, PHI Learninig Pvt. Ltd. 2010

CY18151	ENGINEERING CHEMISTRY	L	T	P	C
	(*Common to all branches except Marine Engineering*)	3	0	0	3

OBJECTIVES:

- To make the students conversant with boiler feed water requirements, related problems and the water treatment techniques.
- To develop an understanding the principle, types and mechanism of corrosion and protective coatings.
- To acquaint the students with the basics of nanomaterials, their properties and applicants.
- To develop an understanding of the laws of photochemistry and basic spectral analysis.
- To enable the students to understand the types of fuels, its calorific values and significance of flue gas analysis.

UNIT I WATER TECHNOLOGY 9

Sources, hard and soft water, estimation of hardness by EDTA method, boiler feed water, boiler problems, cause and preventive measures, softening of water - zeolite process and demineralization by ion exchangers, internal treatment methods, specifications for drinking water, BIS and WHO standards, treatment of water for domestic use, desalination - reverse osmosis and electrodialysis.

UNIT II CORROSION AND ITS CONTROL 9

Corrosion: Basic concepts - mechanism of chemical, electrochemical corrosion - Pilling Bedworth rule – Types of Electrochemical corrosion - galvanic corrosion - differential aeration corrosion - pitting corrosion – stress corrosion – factors influencing corrosion. Corrosion control: Cathodic protection – sacrificial anodic method - corrosion inhibitors. Protective coatings: surface preparation for metallic coatings - electro plating (copper plating) and electroless plating (Nickel plating) - chemical conversion coatings - anodizing, phosphating and chromate coating.

UNIT III NANOCHEMISTRY 9

Basics - distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nanoparticles, nanocluster, nanorod, - nanotube(CNT) and nanowire. Synthesis: precipitation, thermolysis, hydrothermal, solvothermal, electrodeposition, chemical vapour deposition, laser ablation; Properties and applications of nanomaterials.

UNIT IV PHOTOCHEMISTRY AND SPECTROSCOPY 9

Laws of photochemistry –Grotthuss-Draper law, Stark–Einstein law and Lambert Beer Law. Quantum efficiency – Photo processes - Internal Conversion, Inter-system crossing, Fluorescence, Phosphorescence and Photo-sensitization. Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. UV-visible and IR spectroscopy – principles, instrumentation (Block diagram only) and applications.

UNIT V FUELS AND COMBUSTION 9

Fuel: Introduction- classification of fuels - calorific value- higher and lower calorific values- analysis of coal (proximate and ultimate)- carbonization- manufacture of metallurgical coke (Otto Hoffmann method) - petroleum- refining- manufacture of synthetic petrol (Bergius process)- knocking - octane number - diesel oil- cetane number - natural gas- compressed natural gas(CNG)- liquefied petroleum gases(LPG)- producer gas- water gas. Combustion of fuels: introduction- theoretical calculation of calorific value- calculation of stoichiometry of fuel and air ratio - flue gas analysis by ORSAT Method.

TOTAL (L: 45): 45 PERIODS

OUTCOMES:

The knowledge acquired on fuels, corrosion and its control, nanochemistry and water treatment techniques will make better understanding of engineering processes and applications for further learning.

TEXT BOOKS:

1. Jain P.C. and Monica Jain, "Engineering Chemistry", Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2010.
2. Dara S.S, Umare S.S, "Engineering Chemistry", S. Chand & Company Ltd., New Delhi 2010
3. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company, Ltd., New Delhi, 2008.

REFERENCES:

1. Ozin G. A. and Arsenault A. C., "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2005.
2. B.R. Puri, L.R. Sharma, M.S. Pathania., "Principles of Physical Chemistry" Vishal Publishing Company, 2008.

EE18151	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING *(Common to all branches except ECE, EEE & CE)*	L	T	P	C
		3	0	0	3

OBJECTIVES

- To understand the basic theorems used in Electrical circuits and the principles of measuring instruments.
- To educate the different concepts and function of electrical machines.
- To introduce the fundamentals of semiconductor and applications.
- To explain the principles of digital electronics.
- To impart knowledge of communication.

UNIT I ELECTRICAL CIRCUITS & MEASURMENTS 10

Ohm's Law – Kirchhoff's Laws – Steady State Solution of DC Circuits using Mesh Analysis – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase AC Balanced Circuits. Construction and working Principle of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters (Qualitative treatment only)

UNIT II ELECTRICAL MACHINES 10

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single phase induction Motor-,Single Phase Transformer

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS 9

Characteristics of PN Junction Diode – Zener Effect – Zener Diode – LED, Photo diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation. Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Photo transistors

UNIT IV DIGITAL ELECTRONICS 9

Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts)

UNIT V FUNDAMENTALS OF COMMUNICATION ENGINEERING 7

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations.

Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fiber (Block Diagram Approach only).

TOTAL (L:45): 45 PERIODS

OUTCOMES:

- Study the fundamental laws governing electrical circuits and to describe the working of measuring instruments.
- Understand the construction and characteristics of different electrical machines.
- Describe the fundamental behavior of different semiconductor devices and circuits.
- Learn the fundamental concepts of digital electronics circuits.
- Recognize the type of signals, data transfer and able to apply in communication systems

TEXT BOOKS:

1. Mittle V.N, Arvind Mittal "Basic Electrical Engineering", Tata McGraw Hill(India), Second Edition,2013.
2. Sedha R.S., "A Text Book of Applied Electronics", S. Chand & Co., 2014.

REFERENCES:

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics Engineering", Tata McGraw Hill, 2013.
2. I.J.Nagrath and D.P. Kothari, "Basic Electrical Engineering", Tata McGraw Hill ((India), Third Edition, 2010.
3. Mehta V K, "Principles of Electronics", S.Chand & Company Ltd, 2010.
4. M.Morris Mano, "Digital Logic & Computer Engineering",Printice Hall of India, 2004.
5. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, Fourth Edition,2007.

IT18101	PROGRAMMING FOR PROBLEM SOLVING	L	T	P	C
	(Common to All Branches Except Marine)	3	0	0	3

OBJECTIVES

The students should be made to:

- Learn the organization of a digital computer.
- Learn to think logically and write algorithms or draw flow charts for problems.
- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

UNIT I INTRODUCTION TO PROBLEM SOLVING 9

Simple model of a Computer – Hardware – Software – Data Representation, Introduction to Computer Networks and Internet, Problem Solving Techniques – Bottom up design and top down design - applications, Introduction to Algorithms and Flow Chart.

UNIT II C PROGRAMMING BASICS 9

Introduction to 'C' programming – structure of a 'C' program – compilation and linking processes. Conversion of simple algorithm to program. Constants, Variables – Data Types – Expressions using operators in 'C' – Managing Input and Output operations – Decision Making and Branching – Looping statements – solving simple scientific and statistical problems.

UNIT III ARRAYS AND STRINGS 9

Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays - String- String operations –Arrays of strings.

UNIT IV FUNCTIONS AND USER DEFINED DATA TYPES 9

Function – definition of function – Declaration of function – Pass by value - Pass by reference– Recursion - Enumerators - Structures - Unions.

UNIT V POINTERS AND FILES 9

Macros - storage classes - Pointers- Definition – Initialization – Pointers arithmetic – Double Pointers, Basic file operations-Example problems.

TOTAL (L:45): 45 PERIODS

OUTCOMES:

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

- Design and represent solutions to problems as algorithm and flow chart
- Write simple C Programs
- Develop modularized applications in C

TEXT BOOKS:

1. PradipDey, Manas Ghosh, “Fundamentals of Computing and Programming in C”, First Edition, Oxford University Press, 2009.
2. Byron S Gottfried, “Programming with C”, Schaum’s Outlines, Third Edition, Tata McGraw-Hill, 2010.

REFERENCES:

1. Kernighan,B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2015.
2. Yashavant P. Kanetkar. “Let Us C”, BPB Publications, 2011.
3. Paul J Deitel,Dr.Harvey M.Deitel,"C How to Program", Seventh Edition, Pearson Education, 2016.

PC18161 **PHYSICS AND CHEMISTRY LABORATORY** **L T P C**
(Common to ALL branches) **0 0 2 1**

PHYSICS LABORATORY

OBJECTIVES

To make the student to acquire practical skills in the determination of various physical properties of materials.

List of Experiments (Any 5 experiments to be conducted)

1. Determination of compressibility of the liquid - Ultrasonic interferometer.
2. Determination of thickness of the given object by Air wedge method.
3. Determination of dispersive power of a prism by Spectrometer.
4. Determination of Young's modulus of wooden scale by Non-Uniform bending.
5. Determination of wavelength, particle size and numerical aperture of fibre using Lasers.
6. Lee's Disc – Thermal conductivity of the poor conductor.
7. Torsional Pendulum – Determination of Rigidity modulus and moment of inertia.

OUTCOMES:

- The student will be able to analyze the physical principle using the various instruments, also relate the principle to engineering applications.
- The various experiments in the areas of optics, mechanics and thermal physics will nurture the students in all branches of Engineering.
- The students will be able to think innovatively and also improve the creative skills that are essential for engineering.

LIST OF EQUIPMENTS FOR THE BATCH OF 30 STUDENTS :

Spectrometer, Mercury Vapour lamp, Lee's disc exptl setup, Travelling microscope, ultrasonic interferometer, Sodium vapour lamp, diode laser, optical fiber kit.

CHEMISTRY LABORATORY

OBJECTIVES

- To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
- To acquaint the students with the determination of molecular weight of a polymer by viscometery.

List of Experiments (Any 5 experiments to be conducted)

1. Determination of total, temporary & permanent hardness of water by EDTA method.
2. Estimation of copper by EDTA.
3. Conductometric titration of a strong acid with a strong base
4. Estimation of iron content of the given solution using potentiometer.
5. Estimation of iron content of the water sample using spectrophotometer.
6. Determination of molecular weight of polymer using viscometer.
7. Determination of Alkalinity in water.

OUTCOMES:

The students will be equipped with hands - on knowledge in the quantitative chemical analysis of water quality related parameters.

TEXT BOOKS

1. Vogel's Textbook of Quantitative Chemical Analysis (8 TH edition, 2014)

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Conductivity meter – 10 Nos
2. Spectrophotometer – 10 Nos
3. Ostwald Viscometer – 10 Nos
4. Potentiometer - 10 Nos
5. Electronic Balance - 2 Nos

Common Apparatus: Pipette, Burette, conical flask, iodine flask, porcelain tile, dropper (each 30 Nos.)

TOTAL: 30 PERIODS

GE18161	ENGINEERING PRACTICES LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES :

- To provide exposure to the students with hands on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.

LIST OF EXPERIMENTS

GROUP A (CIVIL & MECHANICAL)

I CIVIL ENGINEERING PRACTICE

Buildings:

(a) Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

Plumbing Works:

(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
(b) Study of pipe connections requirements for pumps and turbines.
(c) Preparation of plumbing line sketches for water supply and sewage works.
(d) Hands-on-exercise: Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
(e) Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:

a) Study of the joints in roofs, doors, windows and furniture.
b) Hands-on-exercise: Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

Welding:

a) Preparation of arc welding of butt joints, lap joints and tee joints.
b) (b) Gas welding practice

Basic Machining:

a) Simple Turning and Taper turning
b) (b) Drilling Practice

Sheet Metal Work:

a) Forming & Bending:
b) Model making – Trays, funnels, etc.
c) (c) Different type of joints.

Machine assembly practice:

a) Study of centrifugal pump
b) (b) Study of air conditioner

Demonstration on:

a) Smithy operations, upsetting, swaging, setting down and bending.
   Example – Exercise – Production of hexagonal headed bolt.
b) Foundry operations like mould preparation for gear and step cone pulley.
c) Fitting – Exercises – Preparation of square fitting and vee – fitting models

GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair case wiring
4. Measurement of electrical quantities – voltage, current, power & power factor in RLC circuit.
5. Measurement and comparison of energy for resistive and LED load using single phase energy meter.
6. Measurement of resistance to earth of an electrical equipment.

IV ELECTRONICS ENGINEERING PRACTICE

1. Identification of circuit components
   a) Resistor, capacitor, diode (PN & Zener),transistors
   b) Soldering practice – Circuits – Using general purpose PCB.
2. Evaluating the parameters for DC power supply and AC power supply (peak-peak, rms, average, period, frequency) using function generator and CRO.
3. Study and implementation of logic functions using NAND, NOR, and NOT gates.
4. VI Characteristics of PN Junction diode.
5. VI Characteristics of Solar photovoltaic panel.
6. Design a 5V/12V Regulated Power Supply: using FWR rectifier and IC7805/IC7812.

TOTAL 45 Periods

COURSE OUTCOMES

- Fabricate carpentry components and to lay pipe connections including plumbing works.
- Use welding equipments to join the structures.
- Wiring of basic electrical system and measurement of electrical parameters.
- Study and implementation of basic electronic components, circuits and solar photovoltaic panel.
- Design a basic regulated power supply.

REFERENCES

1. Jeyachandran K., Natarajan S. & Balasubramanian S., "A Primer on Engineering Practices Laboratory", Anuradha Publications, 2007.
2. Jeyapoovan T., Saravanapandian M. & Pranitha S., "Engineering Practices Lab Manual", Vikas Puplishing House Pvt.Ltd, 2006.
3. Bawa H.S., "Workshop Practice", Tata McGraw Hill Publishing Company Limited, 2007.
4. Rajendra Prasad A. and Sarma P.M.M.S., "Workshop Practice", Sree Sai Publication, 2002.
5. Kannaiah P. & Narayana K.L., "Manual on Workshop Practice", Scitech Publications, 1999.
6. Mittle V.N, Arvind Mittal, "Basic Electrical Engineering", Tata McGraw Hill(India), Second Edition,2013.
7. Sedha R.S., "A Text Book of Applied Electronics", S. Chand & Co., 2014.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

CIVIL

1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. 15 Sets.
2. Carpentry vice (fitted to work bench) 15 Nos.
3. Standard woodworking tools 15 Sets.
4. Models of industrial trusses, door joints, furniture joints 5 each
5. Power Tools:
    a. Rotary Hammer 2 Nos
    b. Demolition Hammer 2 Nos
    c. Circular Saw 2 Nos
    d. Planer 2 Nos
    e. Hand Drilling Machine 2 Nos
    f. Jigsaw 2 Nos

MECHANICAL

1. Arc welding transformer with cables and holders 5 Nos.
2. Welding booth with exhaust facility 5 Nos.
3. Welding accessories like welding shield, chipping hammer, wire brush, etc. 5 Sets.
4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit. 2 Nos.
5. Centre lathe 2 Nos.
6. Hearth furnace, anvil and smithy tools 2 Sets.
7. Moulding table, foundry tools 2 Sets.
8. Power Tool: Angle Grinder 2 Nos
9. Study-purpose items: centrifugal pump, air-conditioner One each.

ELECTRICAL

1. Assorted electrical components for house wiring 15 Sets
2. Electrical measuring instruments 10 Sets
3. Study purpose items: Iron box, fan and regulator, emergency lamp 1 each
4. Megger (250V/500V) 1 No.
5. Power Tools: (a) Range Finder 2 Nos (b) Digital Live-wire detector 2 Nos
6. LED lamp 8W 2 Nos., 16W 2 Nos.

ELECTRONICS

1. Soldering guns 10 Nos.
2. Assorted electronic components for making circuits 50 Nos.
3. Small PCBs 10 Nos.
4. Multimeters 10 Nos.
5. Study purpose ICs: IC7805/IC7812
6. Photovoltaic panel 5W/10W: 2 Nos.
7. Light Source for PV panel 1 Nos.

IT18111	PROGRAMMING FOR PROBLEM SOLVING LABORATORY	L	T	P	C
		0	0	4	2

(Common to All Branches Except Marine)

OBJECTIVES

The students should be made to:

- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

List of Exercises

1. Usage of Basic Linux commands
2. C Programming using Simple statements and expressions
3. Scientific problem solving using decision making and looping.
4. Simple programming for one dimensional and two dimensional arrays.
5. Solving problems using Strings
6. C Programming using Pointers
7. C Programming using user defined functions (Pass by value and Pass by reference)
8. C Programming using Recursion
9. C Programming using structures and union
10. C Programming using enumerated data types
11. C Programming using macros and storage classes
12. C Programming using Files

TOTAL: 60 PERIODS

OUTCOMES:

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

- Write simple C Programs
- Able to solve scientific problems using C.

HS18251	TECHNICAL ENGLISH (Common to all Branches)	L	T	P	C
		3	0	0	3

OBJECTIVES

- To enable learners define and understand technical communication and scientific writing
- To expose learners to nuances of seminar presentation, group discussion, and public speaking
- To expose learners to writing for scientific purposes
- To expose learners to drafting correspondences for business purposes
- To expose learners to writing for documenting purposes
- To enable students have a holistic understanding of job interviews and recruiting process.

UNIT I **9**

Listening – AV files pertaining to manufacturing processes of products, scientific documentaries; **Speaking-** syllable division and word stress, intonation, sharing opinions; **Reading** – news articles related to science and technology; **Writing** – definitions, instruction, recommendation, data interpretation, resume; **Grammar** – tenses and their aspects, sentence connectors - discourse markers, sequential words, active and passive voice, subject-verb agreement

UNIT II **9**

Listening – AV pertaining to marketing strategies, peer reading and pronunciation; **Speaking** - turn taking, sharing opinions; conducting and attending a meeting, understanding the nuances of spoken communication among internal audience and external audience,; **Reading** - analytical documents, descriptive documents; **Writing** - fliers, brochures, resume- letter of application, checklists; **Grammar** - modal verbs, clauses – types and uses, conditional clauses, articles.

UNIT III **9**

Listening – AV related to how to use components, scientific description, **Speaking** - speaking for motivation and initiation, speaking at a seminar presentation; **Reading** – scientific journals, papers; **Writing** – Technical descriptions – process description, purpose and function, PowerPoint, Google forms, user manuals; **Grammar** - phrasal verbs, prepositions, technical and scientific affixes.

UNIT IV **9**

Listening - scientific debates, crisis management; **Speaking** - handling conflicts, speaking about the loss of benefits, progress or decline of business, identifying the connotative meanings, **Reading**- documented evidences of uses and functions of a product, review of a

product, **Writing** – memos, follow-up letters, reports - proposal, project, progress reports, sales reports, reports on industrial visits, executive summary. **Grammar** - reported speech and tag questions, sentence structure – comparative, imperative, cause and effect, infinitive of result.

UNIT V **9**

Listening – AV of Group discussions, panel discussions, face to face interviews for recruitment purposes; **Speaking**- speaking at group discussions, interviewing a personality, answering at the interviews; **Reading** – WebPages of topnotch engineering companies, **Writing** - blogging, e-mails, letter of complaint, minutes of the meeting ; **Grammar** - one word substitution, collocations, better word/sentence substitution (rephrasing the content/improvising ideas).

TOTAL (L:45): 45 PERIODS

Suggested Activities [task based] – case study, guest lectures as models, problem solving, understanding team work.

Assessment:

3 Continuous assessments (reading, writing, grammar, and 3 assignments (1 assignment focuses on listening 2 assignments focus on speaking, evaluation of students' speeches and recorded clippings)

OUTCOMES:

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

- Understand the nuances of technical communication and scientific writing
- Present papers and give seminars
- Discuss in groups and brainstorm
- Draft business correspondences and write for documenting purposes
- Face job interviews with confidence

REFERENCES:

1. Department of English, Anna University. Mindscapes : English for Technologists and Engineers. Orient Blackswan, Chennai. 2012
2. Downes, Colm, Cambridge English for Job-hunting, Cambridge University Press, New Delhi. 2008
3. Murphy, Raymond, Intermediate English Grammar with Answers, Cambridge University Press 2000
4. Thomson, A.J. Practical English Grammar 1& 2 Oxford 1986.
5. Herbert A J, The Structure of Technical English Longman, 1965

WEBSITES

1. http://www.usingenglish.com
2. http://www.uefap.com3
3. https://owl.english.purdue.edu/owl/
4. www.learnenglishfeelgood.com/esl-printables-worksheets.html

SOFTWARE

1. Face2Face Advance – Cambridge University Press, 2014
2. English Advance Vocabulary- Cambridge University Press
3. IELTS test preparation – Cambridge University Press 2017
4. Official Guide to the TOEFL Test With CD-ROM, 4th Edition
5. CAMBRIDGE Preparation for the TOEFL TEST- Cambridge University Press, 2017

MA18251 MATHEMATICS II

L	T	P	C
3	1	0	4

OBJECTIVES:

- To acquaint the student with the concepts of vector calculus needed for problems in all engineering disciplines.
- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated

UNIT I VECTORCALCULUS 9+3

Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green's theorem in a plane, Gauss divergence theorem and Stokes' theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelopipeds.

UNIT II ORDINARYDIFFERENTIALEQUATIONS 9+3

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT III LAPLACE TRANSFORM 9+3

Laplace transform – Sufficient condition for existence – Transform of elementary functions – Basic properties – Transforms of derivatives and integrals of functions - Derivatives and integrals of transforms - Transforms of unit step function and impulse functions – Transform of periodic functions. Inverse Laplace transforms -Statement of Convolution theorem – Initial and final value theorems – Solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

UNIT IV ANALYTIC FUNCTION 9+3

Functions of a complex variable – Analytic functions: Necessary conditions – Cauchy-Riemann equations and sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping-Translation, rotation and inversion ($w = z+c$, cz, $1/z$, z^2) - Bilinear transformation.

UNIT V COMPLEX INTEGRATION 9+3

Complex integration –Statement and applications of Cauchy's integral theorem and Cauchy's integral formula –Taylor's and Laurent's series expansions – Singular points– Residues – Cauchy's residue theorem – Evaluation of real definite integrals as contour integrals around unit circle and semi-circle (excluding poles on the real axis).

TOTAL(L:45+T:15):60 PERIODS

OUTCOMES:

- The subject helps the student to develop the fundamental and basic concepts in vector calculus, ODE, Laplace Transforms and complex functions. Students will be able to solve problems related to engineering applications by using these techniques.

TEXT BOOKS:

1. Erwin Kreyszig, Advanced engineering mathematics, 8th Edition, John Wiley, 1999.
2. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth edition, Laxmi Publications Pvt Ltd., (2011).
3. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, (2011).

REFERENCES:

1. Dass, H.K., and Er.Rajnish Verma, "Higher Engineering Mathematics", S.Chand Private Ltd.,(2011).
2. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, (2012).
3. Peter V.O'Neil, "Advanced Engineering Mathematics", 7th Edition, Cengage learning, (2012).
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company New Delhi, (2008).
5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics", Volume I, Second Edition, PEARSON Publishing, 2011.

GE18151	ENGINEERING DRAWING	L	T	P	C
	(Common to ALL Branches of B.E. / B.Tech)	3	0	2	4

OBJECTIVES :

- This course will introduce students to Engineering Drawing and build their ability to read drawings and interpret the position and form of simple geometry, culminating into understanding of simple technical assemblies.

UNIT 0 ENGINEERING DRAWING FUNDAMENTALS (Not for Exams) 2

Drawing standard: BIS, Lettering,Dimensioning, Type of lines, Conventions, Geometrical constructions: Dividing a straight line into equal parts, Bisecting a given angle, Construction of polygon – Triangle, Square, Pentagon and Hexagon using drawing tools.

UNIT I CURVES AND PROJECTION OF POINTS AND LINES 18

Construction of Engineering Curves: Conic Sections – Ellipse,Parabola, Hyperbola using Eccentricity method, Cycloid, Involute of Circle and Pentagon.

Projection: Orthographic Projection – Principal Planes, Projection of Points using Four Angles of Projection, Projection of Straight Lines – Lines parallel or inclined to one or both planes using Rotating Line Method in First Angle of Projection.

UNIT II PROJECTION OF PLANES AND SOLIDS 15

Projection of Plane Figures – Inclined to any one Principal Plane,

Projection of Solids – Simple Solids (Prisms, Pyramids, Cone and Cylinder) axis inclined to any one Principal Plane.

UNIT III SECTION OF SOLIDS & DEVELOPMENT OF SURFACES 15

Section of Solids –Sectional views of simple vertical solids cut by section plane inclined to any one Principal Plane. Development of Surfaces – Development of lateral surfaces of truncated and frustum of simple solids.

UNIT IV PICTORIAL PROJECTION 15

Introduction to Pictorial Projection, Isometric Projection – Principle, Isometric Planes, Isometric Scales, Isometric Projection of simple solids and their combination.

Free Hand Drawing - Orthographic views of simple blocks from their Isometric view, Isometric view of simple blocks from their Orthographic views.

UNIT V PERSPECTIVE PROJECTION 10

Perspective Projection of full solids in simple positions with respect to projection planes by visual ray and vanishing point method.

TOTAL : 75 PERIODS

OUTCOMES :

Upon successful completion of this course, the student shall be able to:

- Understand the importance of BIS Standards in Engineering Drafting
- Graphically construct and understand the importance of Conic sections and special curves in Engineering applications
- Given a problem statement in geometric elements such as points, lines, planes, solids, Orthographic projections will be drafted.
- Draw the orthographic projections of sectioned solids and also will Develop their surfaces
- Interpret Orthographic ,Isometric and Perspective views of objects

TEXT BOOKS:

1. N.D.Bhatt, V.M. Panchal Pramod, R. Ingle, "Engineering Drawing", Charotar Publishing House, 2014.

REFERENCES :

1. K. Venugopal& V. PrabhuRaja, "Engineering Graphics", New Age International (P) Limited, 2009.
2. M.B. Shah & B.C. Rana, "Engineering Drawing", Pearson Education, 2009.
3. K. R. Gopalakrishna, "Engineering Drawing" (Vol..I&II), Subhas Publications, 2010.
4. K.V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2006.
5. S. Gowri and T. Jeyapoovan, "Engineering Graphics", Vikas Publishing House Pvt Ltd., 2011.

GE18251 ENVIRONMENTAL SCIENCE AND ENGINEERING

L	T	P	C
3	0	0	3

OBJECTIVES:

- To study the nature and facts about environment.
- To study the interrelationship between living organism and environment.
- To implement scientific, technological, economic and political solutions to environmental problems.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 12

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystems, Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity - Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity - man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

UNIT II NATURAL RESOURCES AND DISASTER MANAGEMENT 10

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, 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, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

UNIT III ENVIRONMENTAL POLLUTION 10

Definition – causes, effects and control measures Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards – solid waste management: causes, effects and control measures of municipal solid wastes, e-Waste, risk related to e-Waste – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides, land degradation, man induced landslides, soil erosion and desertification.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT 7

From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – Principles of green chemistry, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste products – Environment protection act – Air (Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act – Wildlife protection act – Forest conservation act – central and state pollution control boards - Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

Population growth, variation among nations – population explosion – family welfare programme – environment and human health – human rights – value education – HIV / AIDS, Swine flu, Dengue fever – women and child welfare – role of information technology in environment and human health management – case studies.

TOTAL (L: 45): 45 PERIODS

OUTCOMES:

On completion of the course, the student will be able to

- Solve problems that cannot be solved by mere environmental laws.
- Acquire awareness on environmental issues at their infant stage.
- Integrate facts, concepts and methods for multiple disciplines and apply them to solve environmental and social problems.
- Analyse the connectivity between manmade activities – pollution – environmental issues – social problem and provide eco-friendly solutions.

TEXT BOOKS:

1. Benny Joseph, Environmental Science and Engineering, Tata McGraw-Hill, New Delhi, 2012.
2. Gilbert M.Masters, Introduction to Environmental Engineering and Science, 2nd edition, Pearson Education, 2010.

REFERENCES:

1. Dharmendra S. Sengar, ‗Environmental law', Prentice hall of India PVT LTD, New Delhi, 2012.
2. Erach Bharucha, ―Textbook of Environmental Studies, Universities Press(I) PVT, LTD, Hydrabad, 2015.
3. Rajagopalan, R, ‗Environmental Studies-From Crisis to Cure, Oxford University Press, 2011.
4. Tyler Miller. G and Scott E. Spoolman, ―Environmental Science, Cengage Learning India PVT, LTD, Delhi, 2013.

CS18201 DIGITAL PRINCIPLES & SYSTEM DESIGN

L	T	P	C
3	0	0	3

OBJECTIVES

- To understand various number systems, different methods used for the simplification of Boolean functions
- To design and implement a system that uses combinational logic for the given specification; Simulate combinational logic systems using verilog or VHDL
- To design and implement synchronous sequential system for the given specification; Simulate sequential logic systems using verilog or VHDL.
- To design and implement Asynchronous sequential system for the given specification.
- To design and implement memory accessing systems and systems using PLA, PAL.

UNIT I BOOLEAN ALGEBRA AND LOGIC GATES 9

Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean algebra and Theorems – Boolean Functions - Logic Gates – Simplification of Boolean Functions using Karnaugh Map and Tabulation Methods-NAND & NOR Implementation

UNIT II COMBINATIONAL CIRCUITS 9

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations, Code Conversion – Decoders and Encoders – Multiplexers and De-multiplexers – Tri-State Gates–Introduction to HDL programs

UNIT III SYNCHRONOUS SEQUENTIAL LOGIC 9

Latches and Flip Flops – Analysis and Design Procedures –Shift Registers – Counters –State Diagram, State Table, State Assignment & Minimization

UNIT IV ASYNCHRONOUS SEQUENTIAL LOGIC 9

Analysis and Design of Asynchronous Sequential Circuits – Reduction of State and Flow Tables – Race-free State Assignment – Hazards

UNIT V MEMORY AND PROGRAMMABLE LOGIC 9

RAM - Memory Decoding – Error Detection and Correction- ROM–Programmable Logic Array – Programmable Array Logic

TOTAL (L:45): 45 PERIODS

OUTCOMES:

- Perform arithmetic operations in any number system & to simplify the Boolean expression using K –Map and Tabulation techniques
- Use Boolean Simplification techniques to design a combinational hardware circuit & Design and analysis of a given digital Combinational circuit
- Design and analysis of a given digital Sequential hardware circuit
- Design and analysis of a given digital asynchronous sequential circuits
- Design using PLD

TEXT BOOKS:

1. **"**Digital Design with An Introduction to Verilog HDL" by M.Morris Mano and Michael D.Ciletti, 5th Edition.

REFERENCES:

1. John F. Wakerly, "Digital Design Principles and Practices", Fourth Edition, Pearson Education,2007.
2. Charles H. Roth Jr, "Fundamentals of Logic Design", Fifth Edition – Jaico Publishing House, Mumbai, 2003.
3. Donald D. Givone, "Digital Principles and Design", Tata Mcgraw Hill, 2003.
4. Kharate G. K., "Digital Electronics", Oxford University Press, 2010.
5. https://www.cs.tcd.ie/John.Waldron/CS1026/lec9adder.pdf
6. http://digitalbyte.weebly.com/code-converters.html
7. http://www.learnabout-electronics.org/Digital/dig44.php
8. http://ece.gmu.edu/~clorie/Spring11/ECE-301/Lectures/Lecture_16.pdf
9. Morris Mano, "Computer System Architecture", Third Edition, Pearson Education
10. https://www.iitg.ernet.in/asahu/cs221/Lects/Lec11.pdf

CS18202 OBJECT ORIENTED PROGRAMMING L T P C

3 0 0 3

OBJECTIVES

- Be familiar with the basics of C++ programming language.
- Be familiar with the basic concepts of Object Oriented Programming Language.
- Be familiar with the advanced concepts of Object Oriented Programming Language.
- Be familiar with file handling in C++.

UNIT I OBJECT ORIENTED FUNDAMENTALS 9

Object oriented programming concepts – objects – classes – data members and member functions - abstraction and encapsulation – inheritance – polymorphism. Introduction to C++ – classes – access specifiers – function and data members – default arguments – function overloading – friend functions – const and volatile functions - static members – Objects – pointers and objects – constant objects – nested classes.

UNIT II COMPILE TIME POLYMORPHISM 9

Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – Copy constructor – destructors – operator overloading – overloading through friend functions – overloading the assignment operator – type conversion.

UNIT III RUNTIME POLYMORPHISM 9

Inheritance – public, private, and protected derivations – multiple inheritance - virtual base class – abstract class – Runtime polymorphism – virtual functions – pure virtual functions – RTTI.

UNIT IV ADVANCED CONCEPTS 9

Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and Unexpected functions – Uncaught exception.

UNIT V FILE HANDLING 9

Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – Standard template library.

TOTAL (L:45): 45 PERIODS

OUTCOMES:

- Apply the concepts of data abstraction, encapsulation and inheritance for problem solutions.
- Critically analyze the problem and apply Object Oriented Concepts for practical problem solving.
- Analyse generic data type for the data type independent programming which relate it to reusability.
- Interpret and design the Exception Handling Techniques for resolving run-time errors and handle large data set using file I/O

TEXT BOOKS:

1. B. Trivedi, “Programming with ANSI C++”, Second Edition, Oxford University Press, 2012.
2. Herbert Schildt, “C++: The Complete Reference”, Fourth Edition, McGraw Hill, 2013.

REFERENCES :

1. Ira Pohl, “ Object oriented programming using C++”, Second Edition, Pearson Education Asia, 2012.
2. Bjarne Stroustrup, "The C++ programming language", Fourth Edition, Addison Wesley, 2012.

CS18211	DIGITAL LABORATORY	L	T	P	C
		0	0	2	1

OBJECTIVES

- To be an adjunct to the "Digital Principles and System design" Course through hands-on experience with design, construction, and implementation of digital circuits like combinational /sequential
- To provide the capability to understand and to simulate digital circuits through Xilinx

List of Experiments

1. Study of logic gates
2. Verification of Boolean theorems.
3. Combinational circuits-Implementation of arbitrary functions and code converters.
4. Design and implementation of Binary adder/subractor.
5. Design and implementation of Parity generator/checker.
6. Design and implementation of magnitude comparator.
7. Design and implementation of applications using multiplexers.
8. Study and Implementation of Flip-Flops.
9. Design and implementation of shift registers.
10. Design and implementation of synchronous and asynchronous counters
11. Coding combinational circuits using hardware description language. (HDL s/w required)
12. Coding sequential circuits using HDL. (HDL s/w required)
13. Design and implementation of simple digital System(Mini Project)

TOTAL: 45 PERIODS

OUTCOMES:

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

- The student will be able to use Boolean simplification techniques to design a combinational hardware circuit
- Design and Implement combinational and sequential circuits.
- Analyze a given digital circuit – combinational and sequential
- Design the different functional units in a digital computer system
- Design and Implement a simple digital system.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Digital Trainer Kits
2. Bread board and components
3. PC s – with Xilinx for HDL
4. IC tester-1

CS18212	OBJECT ORIENTED PROGRAMMING LABORATORY	L	T	P	C
		0	0	4	2

Implement the following topics:

1. Programs Using Functions
   - Functions with default arguments
   - Implementation of Call by Value, Call by Address and Call by Reference

2. Classes with objects, member functions and Constructors
   - Classes with primitive data members
   - Classes with arrays as data members
   - Classes with pointers as data members – String Class
   - Classes with constant data members
   - Classes with data members and member functions
3. Compile time Polymorphism
   - Operator Overloading including Unary and Binary Operators
   - Operator Overloading including friend functions
   - Function Overloading
4. Runtime Polymorphism
   - Inheritance
   - Virtual functions
   - Virtual Base Classes
5. Function Templates
6. Class Templates
7. Exception Handling
8. File Handling
   - Sequential access
   - Random access
9. RTTI
10. Standard Template Library

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

• Standalone desktops with C compiler 30 Nos. (or)

Server with C++ compiler supporting 30 terminals or more

MA18352	DISCRETE MATHEMATICS (Common to CSE and IT)	L	T	P	C
		3	1	0	4

OBJECTIVES

- To extend student's Logical and Mathematical maturity and ability to deal with abstraction and to introduce most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.
- To understand the fundamental concepts of the Graph theory and Network connectivity

UNIT I PROPOSITIONAL LOGIC AND PROOFS 9+3

Propositional Logic – Propositional equivalences –Predicates and Quantifiers – Nested Quantifiers – Rules of inference

UNIT II COMBINATORICS 9+3

Mathematical induction- The basics of counting – The pigeonhole principle – Permutations and combinations – Recurrence relations – Solving linear recurrence relations – Generating functions – Inclusion and exclusion principle and its applications.

UNIT III GRAPH THEORY 9+3

Graphs and Graph models- Graph terminology and special types of Graphs – Matrix representation of Graphs and Graph isomorphism – connectivity – Eulerian and Hamiltonian Graphs

UNIT IV ALGEBRAIC STRUCTURES 9+3

Algebraic systems – Semi groups and monoids - Groups – Subgroups – Homomorphism's – Normal subgroup and cosets – Lagrange's theorem – Definitions and examples of Rings and Fields

UNIT V LATTICES AND BOOLEAN ALGEBRA 9+3

Partial ordering – Posets – Lattices as posets – Properties of lattices - Lattices as algebraic systems – Sub lattices – Direct product and homomorphism – Some special lattices – Boolean algebra.

TOTAL (L: 45+T:15): 60 PERIODS

OUTCOMES:

At the end of the course, students would:

- Have knowledge of the concepts needed to test the logic of a program.
- Have an understanding in identifying structures on many levels.
- Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.

- Be aware of the counting principles.
- Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.

TEXT BOOKS:

1. Bondy J A and Murthy U S R , Graph Theory with Applications, Elsevier Science Publishing Co. Inc. New York, 1982
2. Kenneth H.Rosen, "Discrete Mathematics and its Applications", 7thEdition, Tata Mc Graw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2011.
3. Tremblay J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata Mc Graw Hill Pub. Co. Ltd, New Delhi, 30th Reprint, 2011.

REFERENCES:

1. Ralph P.Grimaldi., "Discrete and Combinatorial Mathematics: An Applied Introduction", 4th Edition, Pearson Education Asia, Delhi, 2007.
2. Thomas Koshy., "Discrete Mathematics with Applications", Elsevier Publications, 2006.
3. Seymour Lipschutz and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 3rd Edition, 2010.

CS18301	DATA STRUCTURES	L	T	P	C
		3	0	0	3

OBJECTIVES

This course will develop the student's ability to

- Become familiar with sorting and searching algorithms.
- Learn to use list ADT.
- Earn a thorough knowledge in Stack and Queue ADT.
- Learn to distinguish linear and non-linear data structures, and make use of Tree ADT.
- Use graph algorithms for various applications.

UNIT I ARRAYS **9**

Array - Abstract Data Type (ADT); Sorting algorithms: Insertion sort - Shell sort - Selection Sort - Bubble sort - Merge sort - Quick sort - Radix Sort ; Searching: Linear search – Binary Search.

UNIT II LISTS **9**

The List ADT - Array implementation - Linked lists - Application of Lists; Doubly Linked Lists; Circular Lists

UNIT III STACK AND QUEUES **9**

The Stack ADT - Conversion of infix to postfix expression, Evaluating a postfix expression; Applications of Stacks; The Queue ADT – Circular Queue- Applications of Queues

UNIT IV TREES **9**

Tree Preliminaries - Binary Trees - Binary Search Tree; AVL Trees; Splay Trees; B-Trees; Priority Queues(Heaps) - Binary Heap

UNIT V GRAPHS **9**

Graphs - Representation of Graphs; Depth First Search and Breadth First Search; Topological Sort; Shortest Path Algorithms - Dijkstra's Algorithm - All Pairs Shortest Path; Minimum Spanning Tree - Prim's Algorithm - Kruskal's Algorithm

TOTAL (L:45): 45 PERIODS

OUTCOMES:

Upon Completion of the course, the students will be able to

- Understand the main ideas of the sorting and searching algorithms.
- Apply the key ideas of list data structures for a given problem.
- Demonstrate the stack and queue ADTs.
- Ability to use the tree ADT.
- Demonstrate the various graph algorithms.

TEXT BOOKS:

1. Weiss, Mark A. Data structures & algorithm analysis in C++. Pearson Education, 2012.

REFERENCES:

1. Michael T Goodrich, Roberto Tamassia, David Mount, “Data Structures and Algorithms in C++”, 7 th Edition, Wiley Publishers, 2004.
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Second Edition, Mc Graw Hill, 2002.

CS18302 DATABASE MANAGEMENT SYSTEMS

L	T	P	C
3	0	0	3

OBJECTIVES:

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To learn about the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the Storage and Query processing Techniques and NoSQL.

UNIT I RELATIONAL DATABASES **9**

Purpose of Database System -– Views of data – Data Models – Database System Architecture Introduction to relational databases - Relational Model - Keys -- Relational Algebra – Relationa Calculus - SQL fundamentals - Advanced SQL features - Triggers- Embedded SQL– Dynamic SQL Database connectivity.

UNIT II DATABASE DESIGN **9**

Entity-Relationship Model – E-R Diagrams - Functional Dependencies – Non-loss Decomposition – Functional Dependencies – First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form - Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form

UNIT III TRANSACTION MANAGEMENT **9**

Transaction Concepts - Transaction Recovery – ACID Properties – System Recovery – Media Recovery – Two Phase Commit -- Save Points – Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Recovery Isolation Levels

UNIT IV IMPLEMENTATION TECHNIQUES **9**

Overview of Physical Storage Media – RAID – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Query Processing Overview – Catalog Information for Cost Estimation - Query Optimization

UNIT V ADVANCED TOPICS **9**

Introduction to Distributed databases - Cloud Databases - Data warehouse and Mining - Mobile Databases - XML Databases - Multimedia Databases-Big Data and NoSQL.

TOTAL: (L: 45): 45 PERIODS

OUTCOMES:

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

- To design database schema models with constraints.
- To design database using E-R modeling and apply normalization techniques over it.
- To manage the transactions that happens in a database.
- To analyze the recent advancements in databases.
- To design and implement database for real world applications.

TEXT BOOKS:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, ― Database System Concepts, Sixth Edition, Tata McGraw Hill, 2010.

REFERENCES:

1. Ramez Elmasri, Shamkant B. Navathe, ―Fundamentals of Database Systems, Sixth Edition, Pearson Education, 2010.

2. C.J. Date, A. Kannan, S. Swamynathan, ― An Introduction to Database Systems, Eighth Edition, Pearson Education, 2006..

3. Leskovec, J., Rajaraman, A., & Ullman, J. D.- Mining of massive datasets. Cambridge university press,2014..

4. Raghu Ramakrishnan, Johannes Gehrke ―Database Management Systems, Fourth Edition, Tata Mc Graw Hill, 2010.

5. G.K.Gupta, ―Database Management Systems, Tata McGraw Hill, 2011..

6. Carlos Coronel, Steven Morris, Peter Rob, ―Database Systems: Design, Implementation and Management, Ninth Edition, Cengage Learning, 2011

7. Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", Wiley and SAS Business Series, 2012.

CS18303 MICROPROCESSORS AND ITS APPLICATIONS

L	T	P	C
3	0	0	3

OBJECTIVES:

- Study the Architecture of 8086 microprocessor
- Learn the design aspects of I/O Interfacing circuits.
- Study about communication and bus interfacing
- Study the Architecture of 8051 microcontroller
- Learn Cross Compilation using microcontroller

UNIT I THE 8086 MICROPROCESSOR **9**

Introduction to 8086 – Microprocessor architecture – Addressing modes - Instruction set and assembler directives – Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros – Interrupts and interrupt service routines – Byte and String Manipulation

UNIT II SYSTEM BUS STRUCTURE **9**

8086 signals – Basic configurations – System bus timing –System design using 8086 – IO programming – Introduction to Multiprogramming – System Bus Structure - Multiprocessor configurations – Features of Pentium Processor

UNIT III I/O INTERFACING **9**

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – D/A and A/D Interface - Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications Case studies: Traffic Light control, LED display.

UNIT IV MICROCONTROLLER **9**

Architecture of 8051 – Special Function Registers(SFRs) - I/O Pins Ports and Circuits - Instruction set – Addressing modes - Assembly language programming.

UNIT V INTERFACING 8051 and IOT **9**

Programming 8051 Timers - Serial Port Programming – LCD & Keyboard Interfacing - ADC, DAC & Interfacing -- Stepper Motor. Interfacing- Cross Compilation using 8051

History of IoT, Overview and Motivation, Examples of Applications, Internet of Things Definitions and Frameworks, IoT Architecture.

TOTAL: (L: 45): 45 PERIODS

OUTCOMES:

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

- Design and implement programs on 8086 microprocessor.
- Understand bus structure and multiprocessors
- Design I/O Interfacing circuits.
- Design and implement programs on 8051
- Able to understand features of IoT

TEXT BOOKS:

1. Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2007.
2. Mohamed Ali Mazidi, Janice Gillispie Mazidi, Rolin McKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson Education, 2011

REFERENCES:

1. DoughlasV.Hall, "Microprocessors and Interfacing, Programming and Hardware:,TMH, 2012
2. Kenneth J.Ayala, Dhananjay .V.Gadre, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", India Edition, CENGAGE Learning , 2012
3. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Willy Publications

CS18304	ADVANCED OBJECT ORIENTED PROGRAMMING	L	T	P	C
		3	0	0	3

OBJECTIVES

- To understand Object Oriented Programming concepts and basic characteristics of Java
- To know the principles of classes and inheritance.
- To define interfaces, strings and exceptions.
- To develop a java application with threads and IO steams.
- To design and build simple applications with applet.

UNIT I INTRODUCTION TO OOP AND JAVA FUNDAMENTALS 9

Object Oriented Programming - Abstraction – objects and classes - Encapsulation- Inheritance - Polymorphism- OOP in Java – Characteristics of Java – The Java Environment - Java Source File -Structure – Compilation. Fundamental Programming Structures in Java – Comments, Data Types, Variables, Operators, Control Flow, Arrays - JavaDoc comments.

UNIT II CLASSES AND INHERITANCE 9

Defining classes in Java – constructors, methods -access specifiers - static members - Inheritance – Super classes- sub classes –Protected members – constructors in sub classes- the Object class – abstract classes and methods- final methods and classes –- Object cloning -inner classes.

UNIT III INTERFACES , STRINGS AND EXCEPTION HANDLING 9

Interfaces – defining an interface, implementing interface, differences between classes and interfaces and extending interfaces -Exceptions - exception hierarchy - throwing and catching exceptions – built-in exceptions, creating own exceptions- String Manipulations.

UNIT IV I/O STREAMS AND MULTITHREADING 9

Input / Output Basics – Streams – Byte streams and Character streams – Reading and Writing Console – Reading and Writing Files. Differences between multi-threading and multitasking, thread life cycle, creating threads, Inter-thread communication.

UNIT V PACKAGES AND APPLETS 9

Package Creation- Introduction and Advantage of Applet-How to create and run an Applet in browser and Applet Viewer-Life cycle of Applet-Using Graphics,Color,Font and other classes in Applet to draw various objects.

TOTAL (L:45): 45 PERIODS

OUTCOMES:

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

- Develop Java programs using OOP principles
- Develop Java programs with the concepts classes and inheritance.
- Build Java applications using interfaces, strings and exceptions.
- Develop Java applications with IO streams and threads.
- Develop interactive Java programs using Applets.

TEXT BOOKS:

1. Herbert Schildt, ―Java The complete reference, 8th Edition, McGraw Hill Education, 2011.

REFERENCES:

1. Paul Deitel, Harvey Deitel, ―Java SE 8 for programmers, 3rd Edition, Pearson, 2015.
2. Steven Holzner, ―Java 2 Black book, Dreamtech press, 2011.
3. Timothy Budd, ―Understanding Object-oriented programming with Java, Updated Edition, Pearson Education, 2000

CS18311	DATA STRUCTURES LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES

This course will develop the student's ability to

- Be familiarized with good programming design methods, particularly Top- Down design.
- Getting exposure in implementing the different data structures
- Appreciate recursive algorithms.

LIST OF EXPERIMENTS

1. Sorting (Insertion Sort, Bubble Sort)
2. Quick Sort, Merge Sort
3. Implementation of Linear search and Binary Search.
4. Array Implementation of a list
5. Linked List Implementation
6. Stack - Array implementation, Stack as a List
7. Application of Stack
8. Queue - Array implementation, Queue as a List
9. Binary Search Tree with Tree traversal Techniques – Preorder, Post order and In order.
10. AVL trees
11. Binary Heaps
12. Breadth-first search
13. Depth-first search
14. Shortest Path Algorithms - Dijkstra’s algorithm, Floyd - Warshall algorithm.
15. Minimum Spanning Trees – Kruskal's and Prim's algorithm

TOTAL : 45 PERIODS

OUTCOMES:

Upon Completion of the course, the students will be able to

- Design and implement C++ programs for implementing sorting, searching algorithms. stacks, queues, linked lists.
- Design and implement C++ programs for implementing stacks, queues, linked lists.
- Apply good programming design methods for program development.
- Apply the different data structures for implementing solutions to practical problems.
- Develop recursive programs to implement trees and graphs.

LABORATORY REQUIREMENT FOR BATCH OF 30 STUDENTS:

Standalone desktops with C++ compiler 30 Nos.

or

Server with C++ compiler supporting 30 terminals or more.

CS18312 DATABASE MANAGEMENT SYSTEMS LABORATORY

L	T	P	C
0	0	3	1.5

OBJECTIVES:

- Learn to create and use a database.
- Be familiarized with a query language.
- Have hands on experience on DDL Commands.
- Have a good understanding of DML Commands and DCL Commands.
- Familiarize advanced SQL queries.
- Be exposed to different applications.

LIST OF EXPERIMENTS:

1. Creation of a database and writing SQL queries to retrieve information from the database.
2. Performing Insertion, Deletion, Modifying, Altering, Updating and Viewing records based on conditions.
3. Creation of Views, Synonyms, Sequence, Indexes, Save point.
4. Creating an Employee database to set various constraints.
5. Creating relationship between the databases.
6. Write a PL/SQL block to satisfy some conditions by accepting input from the user.
7. Write a PL/SQL block that handles all types of exceptions.
8. Creation of Procedures.
9. Creation of database triggers and functions
10. Database Connectivity with Front End Tools
11. Case study of Big Data and NoSQL.
12. Mini project
    a. Inventory Control System.
    b. Material Requirement Processing.
    c. Hospital Management System.
    d. Railway Reservation System.
    e. Personal Information System.
    f. Web Based User Identification System.
    g. Timetable Management System.
    h. h) Hotel Management System

TOTAL: 45 PERIODS

OUTCOMES:

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

- Design and implement a database schema for a given problem-domain
- Populate and query a database.
- Create and maintain tables using PL/SQL.
- Implement triggers for application specific actions.
- Establish database connectivity with Front End tools.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

HARDWARE:

Standalone desktops 30 Nos. (or) Server supporting 30 terminals or more.

SOFTWARE:

OS: Fedora / Linux, Hadoop package.
Front end: VB/VC ++/JAVA or Equivalent,
Back end: Oracle / SQL / MySQL/ PostGress / DB2 or Equivalent.

CS18313	MICROPROCESSOR LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES

The student should be made to:

- Introduce ALP concepts and features
- Write ALP for arithmetic and logical operations in 8086 and 8051
- Differentiate Serial and Parallel Interface
- Interface different I/Os with Microprocessors
- Be familiar with MASM and IoT

LIST OF EXPERIMENTS

8086 Programs using kits and MASM

1. Basic arithmetic and Logical operations
2. Move a data block without overlap
3. Code conversion, decimal arithmetic and Matrix operations.
4. Floating point operations, string manipulations, sorting and searching
5. Password checking, Print RAM size and system date
6. Counters and Time Delay

Peripherals and Interfacing Experiments

7. Traffic light control
8. Stepper motor control
9. Digital clock
10. Key board and Display
11. Serial interface and Parallel interface
12. A/D and D/A interface and Waveform Generation

8051 Experiments

13. Basic arithmetic and Logical operations
14. Square and Cube program, Find 2's complement of a number
15. Unpacked BCD to ASCI
16. Interfacing Switches and LED's with 8051 Using "C" language

Raspberry Pi Experiments (IOT)

17. Peripheral interfacing with IoT kit

TOTAL: 45 PERIODS

OUTCOMES:

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

- Write ALP Programmes for fixed and Floating Point and Arithmetic
- Interface different I/Os with processor
- Generate waveforms using Microprocessors
- Perform Serial and Parallel communication
- Execute Programs in 8051

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

HARDWARE:

- 8086 development kits - 30 nos
- Interfacing Units - Each 10 nos
- Microcontroller - 30 nos

SOFTWARE:

- Intel Desktop Systems with MASM - 30 nos
- 8086 Assembler
- 8051 Cross Assembler

MA18453	PROBABILITY AND QUEUEING THEORY (Common to CSE and IT)	L	T	P	C
		3	1	0	4

OBJECTIVES

- To provide the required mathematical support in real life problems and develop probabilistic models which can be used in several areas of science and engineering.

UNIT I RANDOM VARIABLES 12+3

Discrete and continuous random variables – Moments – Moment generating functions – Binomial,Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions.

UNIT II TWO - DIMENSIONAL RANDOM VARIABLES 8+3

Joint distributions – Marginal and conditional distributions – Covariance – Correlation and Linearregression for two variables– Transformation of random variables.

UNIT III RANDOM PROCESSES 9+3

Classification – Stationary process – Markov process - Poisson process – Discrete parameter Markov chain – Chapman Kolmogorov equations – Limiting distributions.

UNIT IV QUEUEING MODELS 8+3

Markovian queues – Birth and Death processes – Single and multiple server queueing models –Little's formula - Queues with finite waiting rooms - Finite source models

UNIT V ADVANCED QUEUEING MODELS 8+3

M/G/1 queue – PollaczekKhinchin formula - M/D/1 and M/EK/1 as special cases – Series queues – Open Jackson networks.

TOTAL (L:45): 45 PERIODS

OUTCOMES:

- The students will have a fundamental knowledge of the probability concepts.
- Acquire skills in analyzing queueing models.
- It also helps to understand and characterize phenomenon which evolve with respect to time ina probabilistic manner.

TEXT BOOKS:

1. Ibe. O.C., "Fundamentals of Applied Probability and Random Processes", Elsevier, 1st IndianReprint, 2007.
2. Gross. D. and Harris. C.M., "Fundamentals of Queueing Theory", Wiley Student edition, 2004.

REFERENCES:

1. Robertazzi, "Computer Networks and Systems: Queueing Theory and performance evaluation",Springer, 3rd Edition, 2006.
2. Taha H.A., "Operations Research", Pearson Education, Asia, 8th Edition, 2007.
3. Veerarajan. T, “Probability, statistics and random processes”, McGraw Hill Publishers, 3rd edition, 2011.
4. Hwei Hsu, "Schaum’s Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.
5. Yates R.D. and Goodman. D. J., "Probability and Stochastic Processes", Wiley India Pvt. Ltd., Bangalore, 2nd Edition, 2012.

CS18401	COMPUTER ARCHITECTURE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To make students understand the basic structural operation of digital computer and the hardware-software interface.
- To familiarize the students with arithmetic and logic unit and implementation of fixed point and floating-point arithmetic operations.
- To expose the students to the concept of pipelining.
- To familiarize the students with hierarchical memory system including cache memories and virtual memory.
- To expose the students with different ways of communicating with I/O devices and standard I/O interfaces.

UNIT I OVERVIEW AND INSTRUCTIONS 9

Functional units – Basic operational concepts – Bus structures – Performance and metrics – Eight ideas -Technology – Performance – Power wall – Uniprocessors to multiprocessors; Instructions – operations and operands – representing instructions – Logical operations – control operations – Addressing and addressing modes

UNIT II ARITHMETIC OPERATION 9

ALU - Addition and subtraction – Multiplication – Division – Floating Point operations –Subword parallelism

UNIT III CONTROL UNIT 9

Basic MIPS implementation – Building datapath – Control Implementation scheme – Pipelining – Pipelined data path and control – Handling Data hazards & Control hazards – Exceptions

UNIT IV PARALLELISM 9

Instruction-level-parallelism – Parallel processing challenges – Flynn's classification – Hardware multithreading – Multi core processors

UNIT V MEMORY AND I/O SYSTEMS 9

Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - Virtual memory, TLBs - Input/output system, programmed I/O, DMA and interrupts, I/O processors.

TOTAL: (L: 45): 45 PERIODS

OUTCOMES:

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

- Understand Bus structure and Instruction set
- Design Arithmetic and Logic unit.
- Design of Control units
- Understand Parallel processing
- Evaluate performance of Memory

TEXT BOOKS:

1. David A. Patterson and John L. Hennessey, "Computer organization and design, The Hardware/Software Interface", Morgan kauffman /Elsevier, Fifth edition, 2014

REFERENCES:

1. V. Carl Hamacher, Zvonko G. Varanesic and Safat G. Zaky, "Computer Organisation", VI edition, McGraw-Hill Inc, 2012
2. William Stallings "Computer Organization and Architecture", Seventh Edition, Pearson Education, 2006.
3. Vincent P. Heuring, Harry F. Jordan, "Computer System Architecture", Second Edition, Pearson Education, 2005.
4. Govindarajalu, "Computer Architecture and Organization, Design Principles and Applications", first edition, Tata McGraw Hill, New Delhi, 2005.
5. John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGraw Hill, 1998
6. http://nptel.ac.in/.

CS18402 **OPERATING SYSTEMS** **L T P C**
3 0 0 3

OBJECTIVES:

- Understand the basic concepts and functions of operating systems.
- Understand Processes and Threads
- Analyze Scheduling algorithms.
- Understand the concept of Deadlocks.
- Analyze various memory management schemes.
- Understand I/O management and File systems

UNIT I OPERATING SYSTEMS OVERVIEW 9

Computer System Organization - Computer System Architecture – Evolution of Operating System - Operating System Structures - Services and Operations - System Calls - System Programs - Operating System Generation and System Boot – Computing Environments.

UNIT II PROCESS MANAGEMENT AND SCHEDULING 9

Process Concept - Process Scheduling - Operations on Processes - Interprocess Communication – Shared Memory - Message Passing - PIPES. Threads - Overview - Multicore Programming - Multithreading Models - Thread Libraries - Threading Issues - Windows 7 - Thread and SMP Management. CPU Scheduling - Scheduling criteria – Scheduling algorithms – Multiple-processor scheduling – Real time scheduling – Algorithm Evaluation. Case study : Process scheduling in Linux.

UNIT III PROCESS SYNCHRONIZATION AND DEADLOCK 9

Process Synchronization - The critical-section problem – Synchronization hardware – Semaphores – Classic problems of synchronization – critical regions – Monitors. Deadlock - System model – Deadlock characterization – Methods for handling deadlocks – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock.

UNIT IV MEMORY MANAGEMENT 9

Main Memory- Memory Partitioning - Memory Allocation Algorithms – Segmentation – Paging - 32 and 64 bit architecture - Virtual Memory – Data structures – Management Policies – Demand Paging - Replacement Algorithms – Allocation – Thrashing - Allocating Kernel Memory - Case Study : Windows, Solaris OS.

UNIT V FILE SYSTEM AND SECONDARY STORAGE STRUCTURE 9

File System Storage-File Concepts - Access Methods – File Sharing and Protection - File System Structure - File System Implementation - Directory Structure - Allocation Methods - Free Space Management - Mass Storage Structure – Overview - Disk Scheduling and Management - Swap Space Management – RAID Structure - Kernel I/O Systems.Case Study : Mobile OS – iOS and Android

TOTAL: (L: 45): 45 PERIODS

OUTCOMES: At the end of the course, learners will be able to

- Apply the functionality of Operating Systems.
- Design various Scheduling algorithms.
- Apply the principles of concurrency and to design deadlock, prevention and avoidance algorithms.
- Compare and contrast various memory management schemes
- Design and Implement a prototype file systems.

TEXT BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9th Edition, John Wiley and Sons Inc., 2012.

REFERENCES:

1. William Stallings, "Operating Systems – Internals and Design Principles", 7th Edition, Prentice Hall, 2011.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.
3. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Education", 1996.
4. Neil Smyth, ―iPhone iOS 4 Development Essentials – Xcode, Fourth Edition, Payload media, 2011.

CS18403	COMPUTER NETWORKS	L	T	P	C
		3	0	0	3

OBJECTIVES:

The learner should be made to:

- Understand the concepts of computer network and Internet.
- Be familiar with real time applications of networks.
- Learn the Transport Layer, flow control and congestion control algorithms.
- Be exposed to various addressing schemes and routing protocols.
- Understand the link, physical layers and error detection-correction of data.

UNIT I INDRODUCITON TO COMPUTER NETWORK & INTERNET 9

What is Internet-The Network Edge-The Network Core- Delay, Loss, and Throughput in Packet-Switched Networks- Protocol Layers and Their Service Models- Networks Under Attack- History of Computer Networking and the Internet.

UNIT II APPLICATION LAYER 9

Principles of Network Applications- The Web and HTTP- File Transfer: FTP- Electronic Mail in the Internet- DNS—The Internet's Directory Service- Peer-to-Peer Applications- Socket Programming: Creating Network Applications.

UNIT III TRANSPORT LAYER 9

Introduction and Transport-Layer Services- Multiplexing and De-multiplexing- Connectionless Transport: UDP- Principles of Reliable Data Transfer- Connection-Oriented Transport: TCP- Principles of Congestion Control- TCP Congestion Control.

UNIT IV NETWORK LAYER 9

Introduction- Virtual Circuit and Datagram Networks- What's Inside a Router- The Internet Protocol (IP): Forwarding and Addressing in the Internet- Routing Algorithms- Routing in the Internet- Broadcast and Multicast Routing

UNIT V DATALINK & PHYSICAL LAYERS 9

Introduction to the Link Layer- Error-Detection and -Correction Techniques- Multiple Access Links and Protocols- Switched Local Area Networks- Link Virtualization: A Network as a Link Layer- Wireless Links and Network Characteristics- Wireless LANs- Physical Layer: Digital Transmission – Multiplexing and Spread Spectrum - Transmission Media.

TOTAL: (L: 45): 45 PERIODS

OUTCOMES:

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

- Choose the required functionality at each layer for given application
- Detect and Correct the error in the frame
- Apply the knowledge of addressing scheme and various routing protocols in data communication to select optimal path.
- Trace the flow of information from one node to another node in the network
- Develop real time applications of networks

TEXT BOOKS:

1. James F. Kurose, Keith W. Ross, "Computer Networking - A Top-Down Approach Featuring the Internet", Seventh Edition, Pearson Education, 2017.

REFERENCES:

1. Behrouz A. Forouzan, "Data Communications and Networking", Fourth Edition, McGrawHill, 2011.
2. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Fifth Edition, Morgan Kaufmann Publishers, 2011.
3. Andrew S. Tanenbaum; David J. Wetherall, "Computer Networks", 5th Edition, Prentice Hall publisher, 2010.
4. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, "Computer Networks: An Open Source Approach", McGraw Hill Publisher, 2011.

CS18404	SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

OBJECTIVES

The student should be made to:

- Understand generic models to structure the software development process.
- Understand fundamental concepts of requirements engineering and Analysis modeling.
- Understand the major considerations for enterprise integration and deployment.
- Learn various testing and maintenance measures
- Learn the concepts of Software Quality Assurance

UNIT I SOFTWARE PROCESS AND PROJECT MANAGEMENT 9

Software Engineering Process Paradigms- Project management Process and Project Metrics - Software estimation Empirical estimation models- planning Risk analysis -Software project scheduling and Tracking.

UNIT II REQUIREMENTS ANALYSIS AND MODELING 9

Software Requirements: Functional and Non-Functional, User requirements, System requirements, Software Requirements Document – Requirement Engineering Process: Feasibility Studies, Requirements elicitation and analysis, requirements validation, requirements management. Classical analysis: Structured system Analysis, Petri Nets- Data Dictionary.

UNIT III SOFTWARE DESIGN 9

Design process – Design Concepts-Design Model– Design Heuristic – Architectural Design – Architectural styles, Architectural Design, Architectural Mapping using Data Flow- User Interface Design: Interface analysis, Interface Design –Component level Design: Designing Class based components, traditional Components

UNIT IV TESTING AND IMPLEMENTATION 9

Software testing fundamentals-Internal and external views of Testing-white box testing- basis path testing-control structure testing-black box testing- Regression Testing – Unit Testing – Integration Testing – Validation Testing – System Testing and Debugging – Software Implementation Techniques: Coding practices-Refactoring

UNIT V SOFTWARE QUALITY ASSURANCE 9

Software Quality Assurance -Quality Metrics and Models, Software Reliability Theory - Software Maintenance -Software Configuration Management - Reverse Engineering and Re-engineering, Introduction to CASE Tools and Case Studies.

TOTAL (L:45): 45 PERIODS

OUTCOMES:

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

- Identify the key activities in managing a software project.
- Compare different process models. Concepts of requirements engineering and Analysis Modelling.
- Apply systematic procedure for software design and deployment.
- Compare and contrast the various testing and quality assurance techniques.
- Learn the concepts of Software Quality Assurance and Reverse Engineering.

TEXT BOOKS:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Seventh Edition, Mc Graw-Hill International Edition, 2010

REFERENCES:

1. Ian Sommerville, "Software Engineering", 9th Edition, Pearson Education Asia, 2011.
2. David J. Anderson and Eli Schragenheim, ―Agile Management for Software Engineering: Applying the Theory of Constraints for Business Results‖, Prentice Hall, 2003.
3. Kelkar S.A., "Software Engineering", Prentice Hall of India Pvt Ltd, 2007.
4. Rajib Mall, "Fundamentals of Software Engineering", Third Edition, PHI Learning Private Limited ,2009.
5. Stephen R. Schach, "Software Engineering", Tata McGraw-Hill Publishing Company Limited, 2007.

CS18405	DESIGN AND ANALYSIS OF ALGORITHMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

Upon completion of this course, students will be able to do the following:

- Analyze the asymptotic performance of algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design techniques and analysis methods.

UNIT I INTRODUCTION 9

The Role of Algorithms in Computing: Algorithms – Algorithms as a technology. Getting Started: Insertion Sort – Analyzing algorithms – Designing algorithms. Growth of Functions: Asymptotic notation – Standard notations and common functions.

UNIT II DIVIDE-AND-CONQUER 9

Recurrences – The maximum-sub array problem – The Substitution Method for Solving Recurrences – The Recursion-Tree method for Solving Recurrences- The Master Method for Solving Recurrences – Finding Closest Pair of Points.

UNIT III DYNAMIC PROGRAMMING AND GREEDY TECHNIQUE 9

Dynamic Programming: Longest common subsequence – Optimal Binary Search Tree – The Floyd-Warshall Algorithm – Transitive closure of a directed graph.

Greedy Technique: Minimum Spanning Trees – Growing a minimum spanning tree – The algorithms of Kruskal and Prim. Single source Shortest Paths: Dijkstra's Algorithm - Huffman Trees.

UNIT IV LINEAR PROGRAMMING AND COMPUTATIONAL GEOMETRY 9

Linear Programming - Standard and Slack Forms - The Simplex Algorithm – Geometric Interpretation of Linear Programming. Computational Geometry – Line Segment Properties – Graham Scan – Jarvis’s March.

UNIT V NP- COMPLETENESS 9

Decision Problem Vs Optimization Problem – Polynomial Time – Abstract Problems- Encoding. Polynomial Time Verification - NP-Completeness and Reducibility - Circuit Satisfiability - Satisfiability of Boolean Formulas – 3-Conjunctive Normal Form (3-CNF) – Satisfiability – The Clique Problem – Vertex Cover.

TOTAL: (L+ T): 45 PERIODS

OUTCOMES:

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

- Analyze the running time of algorithms using asymptotic analysis.
- Describe the divide-and-conquer techniques and analyze the running time of the algorithms synthesizing those paradigms.
- Describe the dynamic programming and greedy paradigms and analyze the running time of the algorithms using those techniques.
- Employ linear programming and computational geometry methods to solve engineering problems.
- Describe the non-deterministic polynomial algorithms.

TEXT BOOKS:

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, PHI Learning Private Limited, 2012.

REFERENCES:

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Third Edition, Pearson Education, 2012..
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, "Data Structures and Algorithms",
3. Pearson Education, Reprint 2006.
4. Donald E. Knuth, "The Art of Computer Programming", Volumes 1& 3 Pearson Education, 2009.
5. Steven S. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008.
6. http://nptel.ac.in/

CS18411 OPERATING SYSTEMS LABORATORY L T P C

0 0 3 1.5

OBJECTIVES:

- Learn unix commands and shell programming.
- Be exposed to programming in C using system calls.
- Learn to implement process creation and inter process communication.
- Be familiar with implementation of CPU Scheduling Algorithms
- Be familiar with implementation of page replacement algorithms
- Be familiar with implementation of Deadlock avoidance and detection algorithms.
- Be familiar with implementation of File Organization and File Allocation Strategies.

LIST OF EXPERIMENTS:

1. Study of UNIX Commands
2. Study of Shell Programming
3. Implement system calls of UNIX operating system fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Simulate Unix commands cp, mv, ls, grep
5. Implement the following CPU scheduling algorithms
    a) Round Robin b) SJF c) FCFS d) Priority
6. Implement all file allocation strategies
    a) Sequential b) Indexed c) Linked
7. Implement Producer Consumer Problem using Semaphores
8. Implement all File Organization Techniques
    a) Single level directory b) Two level c) Hierarchical d) DAG
9. Implement Bankers Algorithm for Dead Lock Avoidance
10. Implement an algorithm for Dead Lock Detection
11. Implement the following page replacement algorithms
    a) FIFO b) LRU c) LFU
12. Implement Shared memory, message passing and pipes.
13. Implement Paging and Segmentation Technique of memory management.
14. Implement Threading & Synchronization Applications for Reader Writer Problem.
15. Study of Mimix Operating System.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Implement system calls in UNIX.
- Compare the performance of various CPU Scheduling Algorithms
- Implement Deadlock avoidance and Detection Algorithms.
- Implement semaphores, create processes and perform IPC.
- Implement the various Page Replacement Algorithms and File Organization and File Allocation Strategies.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

- Standalone desktops with C / C++ / Java / Equivalent complier 30 Nos.

  (or)
- Server with C / C++ / Java / Equivalent complier supporting 30 terminals

CS18412	COMPUTER NETWORKS LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES

- Learn socket programming.
- Be familiar with simulation tools.
- Have hands on experience on various networking protocols

LIST OF EXPERIMENTS

1. Write a program to implement A. bit stuffing B. CRC.
2. Study of Socket Programming and Client – Server model
3. Applications using TCP Sockets a. Date and Time server & client b. Echo server & client, etc c. Chat
4. Applications using UDP Sockets a. DNS
5. Simulation of Stop and Wait Protocol and Sliding Window Protocol.
6. Simulation of ARP /RARP protocols.
7. Simulation of PING and TRACEROUTE commands
8. Write a program to implement RMI (Remote Method Invocation)
9. Write a program to implement subnetting and find the subnet for a given IP.
10. Using Cisco Packet Tracer, do the following a). Establish a Local Area Network (LAN) with 4 hosts and a switch/Hub b). Connect two LANs using multi-router topology with static routes
11. Study of Network simulator (NS).and Simulation of Congestion Control Algorithms using NS
12. Perform a case study about the following routing algorithms to select the network path with its optimum and economical during data transfer.
    i. Link State routing protocol
    ii. Distance vector routing protocol

TOTAL: 45 PERIODS

OUTCOMES:

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

- Use simulation tools
- Implement the various protocols.
- Analyze the performance of the protocols in different layers.
- Analyze various routing algorithms
- Understand the major software and hardware technologies used on computer networks

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

- C / C++ / Java / Equivalent Compiler 30 Network simulator like NS2/Glomosim/OPNET/ Equivalent

CS18413	SOFTWARE ENGINEERING LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES

- To understand the software engineering methodologies for project development.
- To gain knowledge about open source tools for Computer Aided Software Engineering.
- To develop an efficient software using case tools.

LIST OF EXPERIMENTS

Academic domain

1. Course Registration System
2. Student marks analyzing system

Railway domain

3. Online ticket reservation system
4. Platform assignment system for the trains in a railway station

Medicine domain

5. Expert system to prescribe the medicines for the given symptoms
6. Remote patient monitoring

Finance domain

7. ATM system
8. Inventory maintenance

Human Resource Management

9. Quiz System
10. E-mail Client system.

E-Commerce

11.Online shopping and order tracking (E-shopping)
12. Automated online assistant.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Understand the software engineering methodologies for project development.
- Gain knowledge about open source tools for Computer Aided Software Engineering.
- Develop efficient software using case tools.
- Able to perform unit testing and integration testing.
- Apply various white box and black box testing techniques

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

SOFTWARE : Argo UML / StarUML / UMLGraph / Topcased or Equivalent.
HARDWARE: Standalone desktops 30 Nos.