

I SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S239	English – I	4		3	25	75	100
2	S132	Applied Mathematics - I	4+1		3	25	75	100
3	S232	Engineering Chemistry	4+1		3	25	75	100
4	S170	Computer Programming	4+1		3	25	75	100
5	S143	Basic Electrical Engineering	4		3	25	75	100
6	L140	Engineering Chemistry Lab		3	2	25	50	75
7	L126	Computer Programming Lab		3	2	25	50	75
8	L144	English Communication Lab		3	2	25	50	75
9	L154	IT Workshop		3	2	25	50	75
Total					23	225	575	800

II SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S240	English – II	4		3	25	75	100
2	S133	Applied Mathematics – II	4+1		3	25	75	100
3	S238	Engineering Physics	4		3	25	75	100
4	S191	Digital Logic Design	4+1		3	25	75	100
5	S178	Data Structures	4+1		3	25	75	100
6	L131	Digital Electronics Lab		3	2	25	50	75
7	L123	Computer Aided Engineering Drawing		3	2	25	50	75
8	L128	Data Structures Lab		3	2	25	50	75
9	L142	Engineering Physics Lab		3	2	25	50	75
Total					23	225	575	800

III SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S134	Applied Mathematics - III	4+1		3	25	75	100
2	S197	Discrete Mathematics	4+1		3	25	75	100
3	S169	Computer Organization	4+1		3	25	75	100
4	S324	Object Oriented Programming through C++	4+1		3	25	75	100
5	S253	Free Open Source Software	4+1		3	25	75	100
6	S295	Managerial Economics and Financial Analysis	4+1		3	25	75	100
7	S243	Environmental Studies	3			25	75	100
8	L148	Free Open Source Software Lab		3	2	25	50	75
9	L167	Object Oriented Programming through C++ Lab		3	2	25	50	75
Total					22	225	625	850

IV SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S351	Probability and Statistics	4+1		3	25	75	100
2	S180	Database Management Systems	4+1		3	25	75	100
3	S381	Software Engineering	4+1		3	25	75	100
4	S284	JAVA Programming	4+1		3	25	75	100
5	S167	Computer Graphics	4+1		3	25	75	100
6	S350	Principles of Programming Languages	4+1		3	25	75	100
7	S355	Professional Ethics and Human Values				25	75	100
8	L130	Database Management Systems Lab		3	2	25	50	75
9	L155	JAVA Programming Lab		3	2	25	50	75
Total					22	225	625	850

V SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S181	Design and Analysis of Algorithms	4+1		3	25	75	100
2	S401	Theory of Computation	4+1		3	25	75	100
3	S327	Operating Systems	4+1		3	25	75	100
4	S168	Computer Networks	4+1		3	25	75	100
5	S312	Micro Processor and Interfacing	4+1		3	25	75	100
6	S262	Human Computer Interaction	4+1		3	25	75	100
7	L125	Computer Networks and Operating Systems Lab		3	2	25	50	75
8	L119	Communication and Presentation skills lab		3	2	25	50	75
9	L176	Seminar			2	75	-	75
Total					24	275	550	825

VI SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S415	UML Design	4+1		3	25	75	100
2	S163	Compiler Design	4+1		3	25	75	100
3	S425	Web Technologies	4+1		3	25	75	100
4	S272	Information Security	4+1		3	25	75	100
5	Program Elective-I		4+1		3	25	75	100
	S200	Distributed Operating Systems						
	S335	Parallel Algorithms						
	S418	Visual Programming						
	S198	Distributed Databases						
6	Program Elective-II		4+1		3	25	75	100
	S137	Artificial Intelligence						
	S103	Advanced Computer Architecture						
	S268	Image Processing						
	S257	GPU Programming using CUDA						
7	L183	UML Design Lab		3	2	25	50	75
8	L184	Web Technologies Lab		3	2	25	50	75
9	L164	Mini Project			2	25	50	75
Total					24	225	600	825

VII SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S177	Data Mining and Data Warehousing	4+1		3	25	75	100
2	S316	Mobile Computing	4+1		3	25	75	100
3	S186	Design Patterns	4+1		3	25	75	100
4	S153	C# and NET Programming	4+1		3	25	75	100
5		<u>Program Elective-III</u>	4+1		3	25	75	100
	S383	Software Testing Methodologies						
	S205	E-Commerce						
	S315	Middleware Technologies						
	S326	Object Oriented Software Engineering						
		<u>Open Elective-I</u>	4+1		3	25	75	100
	S249	Fault Tolerant Systems						
	S270	Industrial Management						
	S397	System Modeling and Simulation						
	S417	Virtual Reality						
6	L165	Mobile Computing Lab		3	2	25	50	75
7	L116	C# and NET Programming Lab		3	2	25	50	75
8	L153	Internship			2	75		75
		Total			24	275	550	825

VIII SEMESTER

S. No.	Subject code	Name of the Subject	Contact hours/week		Credits	Scheme of Valuation		Total Marks
			L+T	P		Internal (CIE)	External (SEE)	
1	S329	Operations Research	4+1		3	25	75	100
2		Program Elective-IV	4+1		3	25	75	100
	S157	Cloud Computing						
	S377	Service Oriented Architecture						
	S228	Embedded Systems						
	S322	Neural Networks and Fuzzy Logic						
3		Open Elective-IV	4+1		3	25	75	100
	S296	Managing Innovation and Entrepreneurship						
	S332	Optimization Techniques						
	S373	Robotics and Automation						
	S241	Enterprise Information Systems						
4	L157	Main Project		3	9	50	150	200
5	L121	Comprehensive viva-voce			2	75		75
		Total			20	200	375	575

S239 - ENGLISH – I
(Common to all branches)

Prerequisite: None

Course Educational Objectives

In this course, the students will learn

1. The standard vocabulary along with the meaning and usage of the words
2. The concepts of functional grammar and syntax for better writing and speaking skills
3. The concepts of skimming, scanning and critical reading for better comprehension abilities.
4. The effective pronunciation, language usage through extensive reading
5. The concepts of writing reports, resume, statement of purpose, memos and e-mails etc.

Course Outcomes

After the completion of this course, students will have the ability to

1. Read, write and understand what ever is written and spoken in English
2. Speak fluently with acceptable pronunciation and write using appropriate words, spellings, grammar and syntax
3. Read the lines, between lines and beyond lines excelling in comprehension skills
4. Speak grammatically error free English
5. Draft reports, memos, mails & letters as part of their work.

UNIT – I

Astronomy (Learning English)

Grammar: Parts of Speech

Vocabulary: Antonyms

Analytical Writing: Unscrambling words in a sentence; Un-jumbling the sentences into a paragraph; Types of sentences; Paragraph writing

UNIT – II

Travel and Transport (Learning English)

The Trailblazers - **Jagadis Chandra Bose**(Masterminds)

Grammar: prepositions; word plurals; sentence completion

Vocabulary: Synonyms

Analytical Writing: Drafting E-Mails; Letter writing (Formal & Informal)

UNIT - III

Humour (Learning English)

The Trailblazers – **Prafulla Chandra Ray** (Masterminds)

Grammar: Active & Passive Voices

Vocabulary: Pre-fixes & Suffixes

Analytical Writing: Note-making

UNIT - IV

Health and Medicine (Learning English)

The Trailblazers – **SrinivasaRamanujam** (Masterminds)

Grammar: Tenses

Vocabulary: Deriving words

Analytical Writing: Abstract writing/Synopsis writing

UNIT - V

The World of Figures and Physics – **Chandra SekharaVenkataRaman** (Masterminds)

Grammar: Articles

Vocabulary: One-Word substitutes

Analytical Writing: Essay writing; Dialogue writing (Formal & Informal)

TEXT BOOKS

- 1 “Learning English”, Orient Longman Private Limited. 2008 JNTU edition
- 2 EnakshiChatterjee, “Masterminds”, Orient Longman Private Limited. 2002 (Reprint)

REFERENCES

1. Andrea J Rutherford, “Basic Communication Skills for Technology”, Pearson Education, New Delhi, 1st edition, 2009
2. Murphy, “English Grammar with CD”, Cambridge University Press, New Delhi, 2004
3. Rizvi& M. Ashraf, “ Effective Technical Communication”, T MH Publications, New Delhi, 2008.
4. Blum Rosen, “Word Power”, Cambridge University Press, New Delhi, 2009.

S132 - APPLIED MATHEMATICS-I

(Common to AE, CE, CSE, EEE, EIE, IT, ME)

Prerequisite: None**Course Educational Objectives**

In this course, the students will learn about

1. The concepts of Differential Equations and solving the first order and the first degree differential equations.
2. The concepts of Higher Order Differential Equations and solving such equations with constant and variable coefficients.
3. The concepts of theory of Matrices which are used to solve linear simultaneous equations.
4. The concept of Eigen Values and Eigen Vectors and solving an Eigen Value Problem.
5. The concepts of partial differentiation and formation of partial differential equations

Course Outcomes

After the completion of this course, students will able to :

1. Know fundamental mathematical skills required to form a necessary base to analyze first order differential equations.
2. Know the Higher Order Differential Equations, Procedures to solve them and their physical applications.
3. Find the solutions of System of Homogeneous and Non Homogeneous Linear equations using matrices for different physical applications.
4. Find Eigen values and Eigen vectors, higher powers and inverse of a given matrix, and can apply it in the concept of free vibrations of two- mass systems.
5. Find the solutions of linear partial differential equations.

UNIT – I

Differential Equations of First Order and First Degree

Differential equations of first order and first degree – Exact, Linear and Bernoulli. Applications to Orthogonal trajectories, applications to LCR circuits.

UNIT – II

Higher Order Differential Equations

Linear differential equations of second and higher order with constant coefficients and with variable coefficients, method of variation of parameters , Linear differential equations of second and higher order with variable coefficients – Cauchy's Equation and Legendre's Equations.

UNIT – III

Functions of Several variables

Generalized Mean Value Theorem(without proof), Maclaurin's series, Functions of several variables, Jacobians (polar, cylindrical, spherical coordinates), Functional dependence , , Maxima and Minima of functions of two variables with constraints and without constraints – Lagrangian Multiplier Method. Formation of Partial Differential Equations by the elimination of arbitrary constants and arbitrary functions. Solution of first order and first degree linear partial differential equation – Lagranze's method

UNIT –IV

System of Linear Equations.

Matrices - Rank- Echelon form, Normal form , PAQ form– Solution of Linear Systems – Homogeneous system of equations and Non Homogeneous System of Equations, Gauss Elimination, Gauss - Seidal and Jacobi Methods.

UNIT – V

Eigen Values and Eigen Vectors

Eigen values – Eigen Vectors – Properties – Cayley Hamilton Theorem – Inverse and Powers of a matrix by using Cayley Hamilton Theorem.

TEXT BOOKS

1. Dr. B.S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers,42ndEdition ,2012.
2. Dr. B. V. Ramana, “Higher Engineering Mathematics”, TMH Publications ,1stEdition ,2010.

REFERENCES

1. M. D. Greenberg , “Advanced Engineering Mathematics”, TMH Publications, ,2ndEdition,2011.
2. Erwin Krezig, “Advanced Engineering Mathematics”,John Wiley & Sons ,8thEdition ,2011.
3. W. E. Boyce and R. C. Diprima, “ Elementary Differential equations”, John Wiley & sons,7thEdition,2001.

S232 - ENGINEERING CHEMISTRY
(Common to all branches)

Prerequisite: None

Course Educational Objectives:

Through this course the student will learn

1. The concept of water technology with special focus on hardness & softness of water, methods of softening and desalination of brackish water.
2. The concept of conventional and alternative fuels and working of petrol and diesel engines.
3. The concept of corrosion and control measures.
4. The concept of polymers and polymerization.
5. The concept of green chemistry and applications of liquid crystals.

Course Outcomes:

After completion of the course the students will acquire the ability to:

1. Analyze the quality of water and its maintenance for industrial purposes.
2. Analyze issues related to fuels and their synthesis and able to understand working of IC and Diesel engines.
3. Realize the principles of corrosion and make use of the principles for maintenance of various equipments more effectively.
4. Get hands on experience in various processes like polymerization, preparation, properties and applications of plastics and rubbers.

Realize the use of liquid crystals in various technological applications.

UNIT - I

WATER TECHNOLOGY: Sources of water and quality. Hardness of Water - Temporary and Permanent hardness. Units and their interrelation. Problems on Temporary and Permanent hardness. Disadvantages of hard water in various industries.

Boiler troubles – scale & sludge formation, Caustic Embrittlement, boiler corrosion, priming & foaming (carryover).

Internal Treatment – Colloidal Phosphate, Calgon, Carbonate, Sodium aluminate Conditioning of Water.

External Treatment - Lime-Soda Process, Zeolite process, Ion-Exchange Process merits and demerits. (Note-Problems on lime-soda process are not included)

Desalination of brackish water-Electrodialysis, reverse osmosis

UNIT - II

Fuel Technology: Definition and classification of Fuels, merits and demerits of solid liquid and gaseous fuels. Gross and net calorific values – (definition only).

Solid fuels- coal - analysis, Proximate and ultimate analyses of coal – significances.

Liquid Fuels – petroleum-origin and refining of petroleum- cracking- fixed bed and moving bed methods, synthetic petrol – Bergius and Fischer Tropsch's methods.

Working of I.C and C.I engines –Knocking in I.C and C.I engines, antiknocking agents Octane number, Cetane number (Definitions only)

Gaseous fuels- Natural gas, CNG Advantages of CNG, Flue gas analysis – Orsat's apparatus.

UNIT - III

CORROSION: Definition, Examples.

Dry Corrosion(Direct Chemical corrosion), Types of dry corrosion-oxidative corrosion, Pilling Bed worth rule, corrosion by other gases, liquid metal corrosion.

Wet Corrosion (Electro Chemical corrosion) Mechanism- Oxygen absorption Hydrogen evolution type, Types of wet corrosion, Galvanic Corrosion, passivity, Galvanic Series Concentration Cell Corrosion, intergranular corrosion, stress corrosion, Soil corrosion.

Factors Influencing Corrosion- Nature of metal and nature of environment.

Control of Corrosion - Proper Design, Use of pure metals and metal alloys, Cathodic Protection - Sacrificial anode and Impressed Current, Modifying the Environment and use of Inhibitors.

UNIT - IV

Polymer Science and Technology: Definition, classification of polymers, Functionality, Types of polymerization-addition, condensation, copolymerization

Plastics preparation, properties and engineering applications of, PVC, Teflon, Bakelite ,PMMA.

Conducting polymers: Polyacetylene, Polyaniline, conduction, doping, application.

Rubbers Natural rubber and it's processing, disadvantages of Natural rubber , Vulcanization and significance.

Elastomers- preparation, properties and engineering applications of Buna S, Buna N, Thiokol.

Fibers- preparation, properties and engineering applications of Polyester, fiber reinforced plastics (FRP).

UNIT – V

(a) **Green chemistry**—Goals and significance of green chemistry. Basic components (alternative starting materials, reagents, reaction conditions, final products) of greenchemistry research.

(b) **Liquid crystals** –Classification of liquid crystals (Thermo tropic, lyotropic) and applications.

TEXT BOOKS

1. Jain & Jain, A text book of Engineering Chemistry by DhanpatRai Publishing Company, New Delhi (15th Edition) (2006).
2. Dr. S.S Dara, Dr.S.SUMare A Text book of Engineering Chemistry by S.Chand Publications, 12th Edition, 2010.
3. ShashiChawla, A Text book of Engineering Chemistry by DhanpatRai Publishing Company, Third Edition, 2003.

REFERENCES

1. Dr. Y. BharathiKumari and Dr. JyotsnaCherukuri, A Text book of Engineering Chemistry by VGSPublications, First Edition, 2009
2. R.V. Gadag, A.NityanandaShetty, I.K. International publishing house 1st edition 2006
3. Dr. M. R. Senapati, Advanced Engineering Chemistry by University Science Press (Impart from Laxmi Publications), 3rd Edition 2009.

S170 - COMPUTER PROGRAMMING

(Common to all branches)

Course Educational Objectives:

The Students will learn

1. The basic elements C programming structures like data types, expressions, control statements, various I/O functions and how to solve simple mathematical problems using control structures.
2. Modular programming using functions.
3. The derived data types like arrays, strings, various operations and Memory management using pointers.
4. User defined structures and various operations on it.
5. The basics of files and its i/o operations.

Course Outcomes:

After undergoing the training in this course the students will acquire the ability to:

- Identify basic elements of C programming structures like datatypes, expressions, control statements, various I/O functions and Evaluation of simple mathematical problems using control structures.
- Implementation of derived data types like arrays, strings and various operations.
- Understanding of memory management using pointers and designing of modular programming.
- Construct user defined structures and implements various applications.
- Create text & binary type files and understanding of various file I/O operations.

Pre Requisite: The students should have basic knowledge in Maths & computers

UNIT – I

Algorithm / pseudo code, flowchart, example flow charts, structure of C program, identifiers, basic data types and sizes, Constants, variables, Input-output statements, A sample c program, operators: arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence of operators and order of evaluation. Conditional statements: if, ifelse, else if ladder and switch statements, continue, go to and labels. Loops: while, do-while and for statements, break, programming examples.

UNIT – II

Arrays- one dimensional arrays-concept, declaration, definition, accessing elements, storing elements, two dimensional and multi-dimensional arrays.**Character Strings:** declaration, initialization, reading, writing strings, arithmetic operations on characters, string handling functions programming examples

UNIT – III

Pointers- concepts, declaring & initialization of pointer variables, pointer expressions, address arithmetic, pointers and arrays, pointers and character strings, pointers to pointers, Pre-processor Directives and macros. **Functions:** basics, category of functions, parameter passing techniques, recursive functions, Functions with arrays, storage classes-extern, auto, and register, static, scope rules, Standard library functions., dynamic memory management functions, command line arguments, c program examples.

UNIT – IV

Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self-referential structures, unions, typedef, C program examples.

UNIT - V

Files – concept of a file, text files and binary files, streams, standard I/O, Formatted I/O, file I/O operations, error handling, C program examples.

TEXT BOOKS

1. B.W. Kernighan, Dennis M.Ritchie, The C Programming Language, PHI/Pearson Education.
2. N.B.Venkateswarlu and E.V.Prasad ,C and Data Structures.

REFERENCES

1. ReemaThareja, Programming in c ,Oxford Publications.
2. Stephen G. Kochan, Programming in C Pearson Eductaion, 3rd Edition.
3. PradeepDey, Programming in c, Oxford Publications.

S143 - BASIC ELECTRICAL ENGINEERING
(Common to AE, CSE, IT)

COURSE EDUCATIONAL OBJECTIVES

- Students understand Kirchhoff's Laws and how to apply them.
- Students understand Ohm's Law.
- Students understand nodal analysis methods and how to apply them.
- Students understand mesh and loop analysis methods and how to apply them.
- Students understand the concept of linearity.
- Students understand superposition and how to use it.
- Students understand how to analyze circuits containing ideal operational amplifiers.

COURSE OUTCOMES:

- After the completion of the course, the student should be able
- To predict the behavior of any electrical and magnetic circuits.
- To identify the type of electrical machine used for that particular application.
- To wire any circuit depending upon the requirement.

Pre requisite: Knowledge on circuits

UNIT – I**Electrical Circuit Fundamentals**

Basic definitions, Types of elements-active and passive, Ohm's Law, Kirchhoff's Laws-Network reduction techniques-series, parallel, star to delta, delta to star transformations, source transformations(for resistive networks).

UNIT – II**DC Machines**

DC Generator: Principle of operation of DC Generator- E.M.F Equation-Types of DC Generator - Magnetization and Load characteristics of DC Generators.

DC Motor: Principle of operation of DC Motor- Types of DC motors- 3 Point Starter-losses and Efficiency

UNIT – III**AC Fundamentals & Transformers**

AC Fundamentals : Peak, R.M.S, average, instantaneous values, Form factor and Peak factor– periodic waveforms – Phase and Phase difference –Concepts of Reactance, Impedance, Susceptance and Admittance, Real, Reactive and apparent Powers, Power Factor.

Transformers: Principle of operation of single phase transformers, ideal transformer, Practical transformer –Emf equation-Losses- efficiency and regulation-O.C and S.C tests.

UNIT – IV**A.C Machines**

Alternators: Fundamentals of Alternating Current-Principle of operation of Alternators – Salient pole and Non-Salient pole rotors, Voltage Regulation by synchronous impedance method only.

Induction Motor: Principle of operation of Induction Motors –Slip ring and Squirrel cage motors –Slip-Torque characteristics.

UNIT – V**Electrical Measuring Instruments.**

Basic Principles of indicating instruments – permanent magnet moving coil and moving iron instruments.

TEXT BOOKS

1. WH Hayt, JE Kemmerly, SMDurbin, “Engineering Circuit Analysis” , TMH Publication, 6th Edition.
2. M.S Naidu and S. Kamakshaiah, “Introduction to Electrical Engineering”, TMH Publication.

REFERENCES

1. Kothari and Nagarath, “Basic Electrical Engineering” ,TMH Publications, 2nd Edition.
2. V.K.Mehta, “Principles of Electrical Engineering” , S.Chand Publications.

L140 - ENGINEERING CHEMISTRY LAB
(Common to all branches)

Prerequisite: None

Course Educational Objectives:

Through this course the student will learn

1. To analyze water for its quality and to determine the important parameters like alkalinity and hardness.
2. To distinguish types of titrations used in volumetric analysis.
3. To gain hands on experience in practical aspects of preparation of polymers.

Course Outcomes:

After undergoing the training in this course the students will acquire the ability to:

1. Assess quality of water based on the procedures given.
2. Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus.
3. Acquire practical knowledge related to preparation of polymers.
4. Exhibit skills in performing experiments based on theoretical fundamentals.

Model experiment

1. Estimation of sodium hydroxide by using hydrochloric acid.

Water analysis

2. Determination of alkalinity of water sample
3. Determination of total Hardness of water by EDTA method
4. Determination of permanent hardness of water by EDTA method.
5. Determination of Dissolved Oxygen (D.O) content by Winkler's method

Preparation of polymers

6. Preparation of Urea formaldehyde resin.
7. Preparation of Phenol formaldehyde resin.

Redox titrations

8. Determination of amount of potassium dichromate in given solution by using sodium thiosulphate.
9. Determination of the amount of Oxalic acid and Sulphuric acid in 1 liter solution by Using given standard Sodium Hydroxide and Potassium Permanganate solution.
10. Estimation of Mohr's salt by using potassium permanganate.
11. Estimation of Mohr's salt by using potassium dichromate.
12. Estimation of Mohr's salt by using Oxalic acid.

Estimation of Vitamin content

13. Estimation of Vitamin-C

REFERENCES

Lab manual.

L126 - COMPUTER PROGRAMMING LAB
(Common to all branches)

LIST OF LAB PROGRAMS:

- I) write a programme in 'C' language to cover the following problems.
- Example program which shows the usage of various preliminary Data types available in C Language.
 - Example program which shows the usage of various Operators available in C Language.
 - Example programs to illustrate the *order of evaluation*.

II) WRITE EXAMPLE PROGRAMS:

- To check whether the given year is leap year (or) not
- Roots of Quadratic Equation.
- Finding smallest & biggest number from the given set of 4 numbers using 'if' statement.
- Calculate the student grade in the examination – assume suitable constraints.
- Prepare electricity bill for the consumed units – assume suitable constraints.
- Converting given two digit number into words using switch statement
- To illustrate the usage of 'goto' statement.

III) EXAMPLE PROGRAMS:

- To Display first N natural numbers
- To find whether the given number is Armstrong (or) not
- To find reverse of the given number and to check whether it is palindrome (or) not.
- To find whether given number is strong number (or) not.
- To check whether given number is Prime (or) not
- To display prime numbers with in the given range (Nesting of Loops).
- To display the following structure (Nesting of Loops)

i)			1			ii)	5	4	3	2
				1	2		4	3	2	1
		1	2	3			3	2	1	
	1	2	3	4	5		2	1		
1	2	3	4	5			1			

- IV) Write example programs in C Language to perform following operations:
- Finding the sum and average of given numbers using Arrays.
 - To display elements of array in reverse order
 - To search whether the given element is in the array (or) not using linear search & binary search.
 - Write a C program to perform the following operations
 - Addition, subtraction and multiplication of Matrices
 - Transpose of given matrix

- (The above operations are to be exercised using functions also by passing arguments).
- e) Write a C program to find whether the given string is palindrome (or) not.
 - f) To accept line of text and find the number of characters, number of vowels and number of blank spaces in it.
 - g) Write an example program to illustrate the use of any 5 string handling functions.
- V)
 - a) Example program to bring clarity on pointer declaration & initialization and Pointer arithmetic.
 - b) Write an example program to describe the usage of *call by reference*.
 - c) Write a program to find sum of the elements of the array using functions.
- VI) Write example programs in C Language:
 - a) To find factorial of a given number using functions.
 - b) Swap two numbers using functions.
 - c) To find GCD of two numbers using recursion
 - d) Write a recursive function to solve Towers of Honai problem.
 - e) Write an example program to illustrate use of external & static storage classes.
 - f) Write an example program to illustrate the usage of command line arguments.
 - g) Program to illustrate the usage of dynamic memory management functions.
- VII)
 - a) Write an example program using structures to process the student record. Assume suitable fields for student structures (Different kinds of initialization of structure variables are to be exercised)
 - b) Write a program to read records of 10 employees and find their average salary (exercise array of structures & Nested structures concepts through this program).
 - c) Write a program to handle a structure variable using pointers and implement self referential structure(i.e. A structure variable having a pointer to itself)
- VIII) Write an example program on file to perform following operations:
 - a) Accessing content from files and writing content in to it.
(Exercise different file operation modes)
 - b) Copy the contents of one file into another (Exercise different file operation modes).

L144 - ENGLISH COMMUNICATION LAB
(Common to all branches)

Prerequisite: English-I

Course Educational Objectives

In this course, the students will learn to

1. Better pronunciation through emphasis on word accent.
2. Use language effectively to face interviews, group discussions and public Speaking
3. Possess Positive attitude and inculcate group behavior
4. Negotiate well with inter personal skills and intra personal skills
5. Speak spontaneously on any topic given

Course Outcomes

After the completion of this course, students will have the ability to

1. Withstand the global competition in the job market with proficiency in English communication.
2. Articulate English with good pronunciation.
3. Face competitive exams like GRE, TOEFL, IELTS etc.
4. Face interviews and skillfully manage themselves in group discussions
5. Communicate with the people effectively.

The following course content is prescribed for English Language Communication Skills Laboratory sessions:

1. Introduction to English Phonemes; Phonetic Transcription, Stress.
2. JAM
3. Role Play
4. Information Transfer
5. Group Discussions

SUGGESTED SOFTWARE

1. Digital Mentor: Globarena,Hyderabad,2005
2. Sky Pronunciation Suite: Young India Films, Chennai, 2009
3. Mastering English in Vocabulary, Grammar, Spelling, Composition, DorlingKindersley,USA,2001
4. Dorling Kindersley Series of Grammar, Punctuation, Composition, USA, 2001
5. Oxford Talking Dictionary, The Learning Company, USA, 2002
6. Learning to Speak English - 4 CDs. The Learning Company,USA,2002
7. Cambridge Advanced Learners English Dictionary (CD). Cambridge University Press, New Delhi, 2008.

L154 - IT WORKSHOP

(Common to CE, CSE, IT)

Course Educational Objectives

- To understand the need of PC Hardware, internet & world wide web and office suites
- To be able to use different software.
- Will show understanding about the need of PC hardware, internet & world wide web and office suites.

Course Outcomes

After the completion of this Lab, students will have the ability to

- Identify the components of a computer
- Will be able to install and use different software like Windows XP, Linux, MSOffice suite components.

Pre requisite: Know the basic information about computer.

Week 1

PC Hardware

Task 1: Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Task 2: Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 2

Task 1: Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 3

Task 1: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Task 2: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Week 4

Task 1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email.

Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, and search toolbars. Also, plug-ins like Macromedia Flash and you tube downloader should be configured.

Task 3: Search Engines: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.

Task 4: Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti-virus software, configure their personal firewall.

Week 5

Task 1: Word Orientation: The mentor needs to give an overview Microsoft word: Importance of word tool, Details of toolbars, saving files, Using help and resources, rulers.

Task 2: Using word to create project certificate. Features to be covered:-Formatting Fonts in word, Applying Text effects, Using Character Spacing, Borders and Colours, Inserting Header and Footer, Using Date and Time option in Word.

Week 6

Task 3: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check.

Task 4: Creating a Newsletter: Features to be covered: - Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs.

Week 7

Task 1: Excel Orientation: The mentor needs to tell the importance of MS Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel-Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 2: Calculating GPA - Features to be covered:- Cell Referencing, Formulae in excel - average, std.deviation, Charts, Split cells, Sorting, Boolean and logical operators, Conditional formatting.

Week 8

Task1: power pointOrientation Students will be working on basic utilities and tools which help them create basic power point presentation. Topic covered during this week includes:- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Lines and Arrows in PowerPoint.

Task 2: Topic covered during this task includes: Hyperlinks, Inserting -Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Week 9

Task 1: photo shop Orientation Students will be working on Basic utilities and tools which help them to edit a photograph. Topic Covered during this week includes: -Details of toolbars, saving files, Using help and resources.

Week 10

Task 1: Students will be working on *www.blogspot.com* to create a own free blog with Blogger.

Week 11

Task 1: Tips and tricks. Keyboard shortcuts, taskbar, screen shot, Taking advantage of search, Task Manager, Power option, schedule tasks, user accounts, disk management, device manager, shared folders and folder options.

REFERENCES

1. Vikas Gupta, Comdex Information Technology course tool kit, WILEY Dreamtech.
2. Cheryl A Schmidt, The Complete Computer upgrade and repair book, WILEY Dreamtech, 3rd edition.
3. Introduction to Information Technology, IITL Education Solutions limited, Pearson Education.
4. Kate J. Chase ,PC Hardware and A+Handbook, PHI (Microsoft)
5. Leslie Lamport, LaTeX Companion, PHI/Pearson.

S240 - ENGLISH – II
(Common to all branches)

Prerequisite: ENGLISH-I**Course Educational Objectives**

In this course, the students will learn

1. English with emphasis on LSRW skills.
2. To make decisions, while thinking logically analyzing situations carefully.
3. To read speedily and meaningfully.
4. Both active and passive vocabulary.
5. To write letters and reports effectively in formal and professional situations.

Course Outcomes

After the completion of this course, prospective engineers will have the ability to

1. Use English language effectively.
2. Express right ideas in right context
3. Manage the situation and negotiate business with good English communication
4. Think and analyze the situations and make good presentations of their work and decisions
5. prepare themselves to face interviews and also to participate in group discussions

UNIT - I**Environment** (Learning English)

The World of Figures and Physics – **Satyendranath Bose** (Master Minds)

Grammar: Correction of sentences

Analytical Writing: Report Writing

UNIT - II**Inspiration** (Learning English)

The Institution Builders– **SantiSwarupBhatnagar** (Masterminds)

Grammar: If-clause; Question tags

Vocabulary: Idioms and Phrases

Analytical Writing: Resume'; Statement of Purpose

UNIT - III**Human Interest** (Learning English)

The institution builders – **MeghanadhSaha** (Master Minds)

Grammar: Direct & Indirect Speeches

Vocabulary: Phrasal Verbs

Analytical Writing: Memo Drafting

UNIT – IV**Media** (Learning English)

The New Age – **HomiJehangirBhabha** (Master Minds)

Grammar: Concord

Vocabulary: Analogy

Analytical Writing: Information Transfer/ Data Interpretation (Tables, Pie charts, Bar graphs, Tree diagrams, Pictograms, etc.)

UNIT – V

The New Age – **Vikram Sarabhai** (Master Minds)

Grammar: Gerunds & Infinitives; Correction of Sentences

Vocabulary: Words often confused

Analytical writing – Comprehension, Expansions (of a given topic/ proverbs)

TEXT BOOKS

1. “Learning English”, Orient Longman Private Limited.JNTU edition,2008
2. EnakshiChatterjee, “Masterminds”, Orient Longman Private Limited ,Reprint-2002

REFERENCES

1. KoneruAruna, “Professional Communication”, TMH Publications, New Delhi, 2007.
2. Rizvi, “Effective Technical Communication”, TMH Publications,New Delhi, 2009.
3. Andrea J. Rutherford, “Basic Communication Skills for Technology”, Pearson Education., 1st edition, 2009
4. Kaplan and Baron's, “GRE and TOEFL’, Latest editions.2008

S133 - APPLIED MATHEMATICS – II
(Common to AE, CE, CSE, EEE, EIE, IT, ME)

Prerequisite: None

Course Educational Objectives:

In this course student will learn about

1. The basic concepts of Laplace Transforms and their applications in solving the Differential Equations.
2. The expansion of function in an infinite series of sine and cosines.
3. Fourier Integral Theorem, Fourier Integral Transforms along with their properties and applications.
4. Z-transform and its role in discrete analysis and in solving Difference equations.
5. The concepts of multiple integrals and changing of order of integration

Course outcomes:

At the end of this course student will be able to

1. Understand the importance of mathematics and its techniques to solve real life problems.
2. Apply the concepts of Laplace Transforms on Operational Calculus and solve Differential Equations of any order.
3. Express most of the single valued functions in the form of Fourier series and extend the ideas and techniques to non-periodic functions also.
4. Express a function as a continuous frequency resolution using Fourier Transforms.
5. Understand the analogy between Laplace Transform and Z-Transform and apply it wherever necessary & apply Multiple Integrals in various coordinate systems.

Pre requisite: Must know the concepts of integration and differential equations

UNIT – I

Laplace Transforms

Laplace transforms of standard functions – Shifting Theorems, Transforms of derivatives and integrals – Unit step function – Dirac’s delta function. Inverse Laplace transforms– Convolution theorem - Applications of Laplace transforms to ordinary differential equations.

UNIT – II

Fourier Series

Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval– Half-range sine and cosine series

UNIT – III

Fourier Transforms

Fourier integral theorem (only statement) – Fourier sine and cosine integrals – Fourier transform – sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

UNIT – IV

Z-Transforms

Z-transform – properties – Damping rule – Shifting rule – Initial and final value theorems - Inverse Z – transform - Convolution theorem – Solution of difference equation by z-transforms.

UNIT – V

Multiple Integrals

Multiple integrals - double and triple integrals (Cartesian, polar, spherical coordinates) – Changing of order of Integration and applications to areas and volumes.

TEXT BOOKS

1. Dr. B.S. Grewal, “Higher Engineering Mathematics”, Khanna Publishers, 42nd Edition, 2012.
2. Dr. B. V. Ramana, “Higher Engineering Mathematics”, T MH Publications, 1st Edition, 2010.

REFERENCES

1. Michael D. Greenberg , “Advanced Engineering Mathematics”, TMH Publications, 2nd Edition, 2011.
2. Erwin Krezig, “Advanced Engineering Mathematics”, John Wiley & sons, 8th Edition, 2011.

S238 - ENGINEERING PHYSICS
(Common to all branches)

Pre-requisite course: NONE

Course Educational Objectives:

In this course student will learn about

- The basic concepts of Optics such as Interference, Diffraction and Polarization.
- The principle of quantum mechanics, dual nature of matter waves.
- The principle and working of different Lasers.
- The principle and classification of optical fibers
- classification of magnetic materials and their properties.
- Concept of Superconductivity, types and their applications

Course Outcomes:

At the end of this course student will be able to

CO1: Understand the nature of polarization, Diffraction and interference.

CO2: Understand the dual nature of particle and significance of the wave function .

CO3: Understand the principle of LASER and optical fibers. Types of lasers and optical fibers and their applications.

CO4: Understand the different types of magnetic materials and their uses.

CO5: Understand the phenomenon of superconductivity, critical parameters, types of super conductors and their applications

UNIT – I

INTERFERENCE, DIFFRACTION, POLARIZATION

INTERFERENCE: Introduction, super position principle, coherent sources, thin films, Newton's rings (in reflected system only).

DIFFRACTION:

Introduction, Fresnel and Fraunhofer diffractions – comparison between Fresnel's and Fraunhofer's diffraction-Difference between interference and diffraction-Fraunhofer diffraction at single slit - Fraunhofer diffraction at Double slit –Diffraction Grating- Grating spectrum.

POLARIZATION:

Introduction-plane of vibration and plane of polarization -Polarization by reflection Brewster's law –geometry of calcite crystal- Double refraction -nicol prism construction ,Quarter wave plate- Half wave plate.

UNIT - II

PRINCIPLES OF QUANTUM MECHANICS:

De Broglie hypothesis- Matter waves- Davison and Germer experiment- GP Thomson experiment , Heisenberg Uncertainty principle-Schrodinger time independent wave equation- Physical significance of the wave function-particle in a box.

UNIT – III

LASERS AND FIBER OPTICS

LASERS:

Introduction – Characteristics of Lasers- Principle of laser (Absorption, Spontaneous and stimulated emission of Radiation), Population Inversion- Einstein Coefficients ,three and four level pumping schemes, block diagram of laser. Ruby Laser- Helium Neon Laser, Applications of Lasers.

FIBER OPTICS

Introduction- Principle of optical Fiber- Acceptance angle and Acceptance cone- Numerical aperture – Types of optical fibers-refractive index profile- Application of optical fibers.

UNIT – IV

MAGNETIC MATERIALS:

Magnetic properties -Origin of magnetic moments-Classification of magnetic materials- Dia, Para, Ferro magnetic , Antiferromagnetic , Ferrimagnetic materials- Domain theory of ferromagnetism(qualitative), Hysteresis curve- Soft and Hard magnetic materials. Applications of magnetic materials.

UNIT – V

SUPER CONDUCTORS

Phenomenon, critical parameters, Meissner effect, Type-I, Type-II Super conductors, BCS theory of super conductivity, Flux Quantization, London Eqs., Penetration depth, Josephson Effects- Applications of Super conductors.

TEXT BOOKS

1. V RAJENDRAN, Engineering Physics, TMH Publications.
2. P K PalaniSamy , Engineering Physics, Scitech Publications.

REFERENCES

1. M R Srinivasan, Engineering Physics, New age international, 2014.
2. M.N. Avadhanulu and P.G. Kshirsagar, Engineering physics, S.Chand, New Delhi.
3. RK GAUR & SL GUPTA , Engineering Physics, Dhanpat Rai Publication, 2008.
4. Dr. P. Srinivasa Rao & Dr. K. Muralidhar, Basic Engineering Physics , Himalaya Publishing House.

S191 - DIGITAL LOGIC DESIGN

(Common to CSE, IT)

Course Educational Objectives:

This course enables the students to know about

- Apply the knowledge of mathematics, Computer science and engineering.
- Realize complex logic functions utilizing programmable logic.
- Design digital circuitry, analyze and interpret data

Course Outcomes:

The specific course outcomes supporting the program outcomes are:

- Able to perform arithmetic operations in many number systems & manipulate Boolean Algebraic structures.
- Able to Simplify the Boolean expressions using Karnaugh Map & implement the Boolean Functions using NAND and NOR gates.
- Able to analyze and design various combinational logic circuits such as Decoder, Encoder, Multiplexer, Demultiplexer, Half adder, Full adder, half subtractor, Full Subtractor.
- Able to understand the basic functions of flip-flops such as RS, JK, D, T flip-flops & Conversion of one flip-flop to another flip-flop and vice-versa & analyze and design Clocked sequential circuits & an ability to understand sequential circuits like counters and shift registers
- Able to analyze the importance of programmable logic devices & Design of programmable logic devices such as ROM, PROM, PAL, PLA's

Prerequisites: Basic computer knowledge, Basic Mathematics fundamentals, Number systems

UNIT - I

Binary Systems: Digital Computers and Digital Systems, Binary Numbers, Number base Conversion, Octal and Hexadecimal Numbers, Complements, Binary Codes, Binary Storage and Registers, Binary Logic, Integrated Circuits. **Boolean Algebra And Logic Gates:** Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and Properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms, Other operations, Digital Logic Gates.

UNIT - II

Simplification Of Boolean Expressions: Formulation of simplification problem, Prime Implicants and irredundant disjunctive and conjunctive expression, Karnaugh Maps, Minimal Expressions for complete and incomplete Boolean functions. Five and Six Variable K-Maps, Quine-McCluskey Method, Prime Implicants and Implicate tables and irredundant expressions, and Table reductions.

UNIT - III

Combinational Logic: Design Procedure, Adders, Subtractors, Code Conversion, Analysis Procedure, multilevel NAND and NOR circuits. Combinational Logic with MSI And LSI: Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoders, Multiplexers.

UNIT - IV

Sequential Logic: Flip Flops, Triggering of Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip-Flop Excitation tables, Design Procedure, Design of Counters, Design with state equations Registers, Counters and Memory : Registers. Shift registers, Ripple Counters, Synchronous Counters, Timing sequences, the memory unit.

UNIT - V

Programmable Logic & Clock Circuits: Read – Only Memory (ROM), PROM, Programmable Logic Device (PLD), Programmable Logic Array (PLA), Programmable Array Logic (PAL),555 timer, Astable and Monostable operations.

TEXT BOOKS :

1. M.Morris Mano, Michael D Ciletti ,Digital Design , Pearson,4th editon.
2. Roth ,Fundamentals of Logic Design, Cengage,5/e.

REFERENCES

1. Kohavi, Jha ,Switching and Finite Automata Theory, Cambridge,3/e.
2. Leach, Malvino, Saha,Digital Logic Design, TMH Publications.
3. R.P. Jain, Modern Digital Electronics, TMH Publications.
4. M.Morris Mano, ‘Computer Engineering Hardware Design’, PHI.

S178 - DATA STRUCTURES
(Common to EIE, CSE, EEE, IT)

Course Educational Objectives:

To make a student familiar with :

- Write algorithms to implement operations involved in different data structures
- Implement stack and queue using arrays as well as linked list
- Apply stack and queue to write some complex algorithms
- Implement different types of trees and their application
- Implement various searching and sorting techniques
- Use Hash Tables to handle large amount of data

Course Outcomes:

At the end of the course a student is able to:

CO1: Analyze worst-case running times of algorithms using asymptotic analysis and implement various data structures like linked lists.

CO2: Understand and implement stacks and queues using arrays and linked lists.

CO3: Analyze and implement various searching and sorting algorithms.

CO4: Build various tree structures like Binary Trees, Binary Search Trees and AVL Trees.

CO5: Design and implement appropriate hash function and collision-resolution algorithms.

Pre requisite: Students should have a good knowledge in C Programming Language

UNIT - I**Algorithm Analysis:**

Mathematical Background, Model, Analysis and Run Time Calculations, **Lists:** Abstract Data Types, List using arrays and pointers, Singly Linked, Doubly Linked, Circular Linked Lists, Polynomial ADT.

UNIT – II:

Stacks: The Stack: Definition, operations, implementation using arrays, linked list and **Stack applications:** Infix to postfix expression conversion, Evaluation of Postfix expressions, balancing the symbols. **Queue:** definition, operations, implementation using arrays, linked list & its Applications. **Circular queue:** definition & its operations, implementation, **De queue:** definition & its types, implementation.

UNIT - III

Searching: Linear and Binary Searching. **Sorting:** Insertion Sort, Selection sort, Shell Sort, Heap Sort, Merge Sort, Quick Sort, and Bucket Sort.

UNIT - IV

Trees: Terminology, **Binary Trees:** definition, types of binary trees, Representation, Implementation (linked list), **Tree traversals:** Recursive techniques, Expression Tress, **Search Tree:** Binary Search Tree-search, insert, Delete, **Balanced Tree** –Introduction to AVL tree and Rotations.

UNIT - V

Graphs: Fundamentals, Representation of graphs, **Graph Traversals:** BFS, DFS, **Minimum cost spanning tree:** Definition, Prim's Algorithm, Kruskal's algorithm.

Hashing: Hash Table, Hash Function, Collision resolution Techniques- separate Chaining, open addressing, rehashing, extendible hashing.

TEXT BOOK

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education, 2nd edition.
2. Reema Thareja, Data Structures using C, Oxford Publications.
3. N.B. Venkateswarlu and E.V. Prasad, C and Data Structures.

REFERENCES

1. Langson, Augenstein & Tenenbaum, 'Data Structures using C and C++', 2nd ed, PHI.
2. Robert L. Kruse, Leung and Tando, 'Data Structures and Program Design in C', 2nd edition, PHI.
3. D Samantha, Classic Data Structures.

L131 - DIGITAL ELECTRONICS LAB**Course Educational Objectives:**

This course enables the students to know about

1. Use of basic gates, decoders and Multiplexers.
2. Use of flip-flops, Counters and Shift registers.
3. Use of PLD's.

Course Outcomes

The specific course outcomes supporting the program outcomes are:

1. Able to construct, analyze and troubleshoots simple combinational and sequential circuits.
2. Able to design and troubleshoots a simple state machine.

Pre requisite: Knowledge of gates designing

CYCLE 1

1.a) Basic Gates Function Verification using truth tables.

i) AND Gate using 7408 IC

ii) OR Gate using 7432 IC

iii) NOT Gate using 7404 IC

b) Universal Gates Functional Verification

i) NAND Gate using 7400 IC

ii) NOR Gate using 7402 IC

c) Special Gates Functional verification

i) XOR Gate using 7486 IC

ii) XNOR Gate using XOR followed by NOT Gate

2. Realization of following gates using universal gates and its functional verification.

AND, OR, XOR, NOT

3. a) Design Half-adder and Full-adder circuits and verify its functionality.

b) Verify the functionality of four bit ripple carry adder for signed and unsigned integers with the verification of overflow condition.

4. Design a four bit comparator and verify its functionality(using logic gates or IC's)

5. Design a BCD to Excess-3 code converter and verify its functionality by using gates.

6. Design a BCD to Gray code converter and verify its functionality by using gates.

7. Design and verify the functionality of Decoders and multiplexers of different inputs.

CYCLE 2

8. Verify the functionality of following Flip-Flops.

a) SR Flip-Flop

b) JK Flip-Flop

c) D Flip-Flop

d) T Flip-Flop

9. a) Design a UP-Counter using JK/T Flip-Flop.

b) Design a MOD-3 Counter.

10. Design a Bi-directional Counter using JK/T Flip-Flop.

CYCLE 3

11. **IC555 Timer** – Astable Operations – Monostable Operations

12. PCB Drawing Techniques

13. Project.

L123 - COMPUTER AIDED ENGINEERING DRAWING
(Common to EIE, CSE, ECE, EEE, IT)

At least 10 Exercises are to be conducted using Auto Cad software:

Course Educational Objectives:

The main objectives of this course are

- To learn the basic commands necessary for professional 2D drawings, design, and drafting using AutoCAD essentials.
- To develop orthographic projections and isometric drawings using Auto-CAD.
- To draw the solids by developing the surfaces without any complexity.

Course Outcomes:

After completion of the course students are the able to:

- Use the AutoCAD basics in industries where the speed and accuracy can be achieved.
- Visualize the solids clearly without any complexity.

Pre requisite: Knowledge on basic commands.

BASIC AUTO CAD COMMANDS:

1. Basic drawing commands (line, circle, arc, ellipse, polygon, and rectangle).
2. Edit commands (copy, move, erase, zoom).
3. Array commands (polar array, rectangular array, P-edit, divide a line, offset).
4. Hatching & line commands (hatching with different angles & different types of lines).
5. Mirror & trim commands (mirror an object, trim, extend a line, chamfer & fillet, explode).
6. Dimensioning & text commands (linear, angular, radius, diameter & text).

PROJECTION OF POINTS AND LINES:

1. Projection of points (I, II, III, & IV quadrants).
2. Projection of lines parallel to both reference planes.
3. Projection of lines parallel to one reference plane & inclined to other reference plane.

ORTHOGRAPHIC PROJECTIONS:

1. Conversion of plane figures.
2. Conversion of circular figures.
3. Conversion of both combination of plane figures and circular figures.

ISOMETRIC PROJECTIONS:

4. Conversion of plane figures.
5. Conversion of circular figures.
6. Conversion of both combination of plane figures and circular figures.

REFERENCES:

- 1.M. Kulkarni, A.P Rastogi, and A.K. Sarkar, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, 2009.
2. Bethune, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, 2009.
3. N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar Publishers, 2012.

CYCLE: 1

SNO	SHEETS	EXERCISE	COMMANDS TO BE COVERED	REFERENCE	PAGE NUMBER
1	SHEET-1	Basic drawing commands	line, circle, arc, ellipse, polygon and rectangle	PLATE 2.1& 2	26
2	SHEET-2	Edit commands	copy, move, erase, zoom, measure, divide, pan, change properties	PLATE 2.3& 2	27
3	SHEET-3	Array commands	polar array, rectangular array, edit, divide, offset	PLATE 2.5& 2	28&29
4	SHEET-4	Hatching & line commands	hatching with different angles & different types of lines	PLATE 2.8& 2	31&32
5	SHEET-5	Mirror & trim commands	mirror an object, trim, extend a line, chamfer & fillet, explode	PLATE 2.7 2.13	30&35
6	SHEET-6	Dimensioning & text commands	linear, angular, radius, diameter & text	PLATE 4.1	69
7	SHEET-7	Projection of points	Points & lines	Case-1,2,3,4	171
8	SHEET-8	Projection of lines (parallel to both reference planes)	line	Fig:9.4(a & b)	172&173
9	SHEET-9	Projection of lines (parallel to one reference plane & inclined to other reference plane)	lines	Fig:9.4(c)	173

CYCLE: 2

SNO	SHEETS	EXERCISES	REFERENCE	PAGE NUMBER
Orthographic projections				
10	SHEET-10	Conversion of plane figures	PLATE 5.1& 5.3	82&83
11	SHEET-11	Conversion of circular figures	PLATE 5.9& 5.13	86&88
12	SHEET-12	Conversion of both combination of plane figures and circular figures	PLATE 5.25,5.26 PLATE 5.27,5.28	94&95
Isometric projections				
13	SHEET-13	Conversion of plane figures	PLATE 6.3	122
14	SHEET-14	Conversion of circular figures	PLATE 6.4	123
15	SHEET-15	Conversion of both combination of plane figures and circular figures	PLATE 6.8&6.10	125&126

Note: References and Page numbers have been given from below text book

M. Kulkarni, A.P Rastogi, and A.K. Sarkar, Engineering Graphics with AutoCAD, PHI Learning Private Limited, New Delhi, 2009.

L128 - DATA STRUCTURES LAB

(Common to EIE, CSE, EEE, IT)

Course Objectives:

To make a student familiar with :

- Write algorithms to implement operations involved in different data structures
- Implement stack and queue using arrays as well as linked list
- Apply stack and queue to write some complex algorithms
- Implement different types of trees and their application
- Implement various searching and sorting techniques
- Use Hash Tables to handle large amount of data

Course Outcomes:

At the end of the course a student is able to:

- CO1:** Analyze worst-case running times of algorithms using asymptotic analysis and implement various data structures like linked lists.
- CO2:** Understand and implement stacks and queues using arrays and linked lists.
- CO3:** Analyze and implement various searching and sorting algorithms.
- CO4:** Build various tree structures like Binary Trees, Binary Search Trees and AVL Trees.
- CO5:** Design and implement appropriate hash function and collision-resolution algorithms
- Pre requisite: Knowledge of C Programming.

Pre-requisites:

Students should have a good knowledge in C Programming Language

LIST OF LAB PROGRAMS:

1. Write a C program to implement various operations on List using arrays.
2. Write a C program to implement various operations on Single linked List using pointers.
3. Write an interactive C program to create a linear linked list of customer names and their telephone numbers. The program should be menu-driven and include features for adding a new customer, deleting an existing customer and for displaying the list of all customers.
4. Write a C program to create a circular linked list so that the input order of data items is maintained. Add the following functions to carry out the following operations on circular single linked lists. a) Count the number of nodes. b) insert a node c) delete a node
5. Write a C program that will remove a specified node from a given doubly linked list and insert it at the end of the list on an existing list. Also write a function to display the contents of the list.
6. Write a C program to implement a stack using array & linked list in which Push, Pop and display can be performed.
7. Write a program to convert infix expression to post fix expressions using array implementation of stack
8. Write a program for evaluating post fix expressions using array implementation of stack
9. Write a C program to implement a queue using arrays and linked list in which insertions, deletions and display can be performed.
10. Write a C program to implement insertion sort & shell sort
11. Write a C program to implement Selection sort.
12. Write a C Program to implement Merge Sort
13. Sort a sequence of n integers using Quick sort technique and then search for a key in the sorted array using Binary search, linear search techniques.
14. Write a C program to Heap sort
15. Write a C program to construct a binary tree and do inorder, preorder and postorder traversals, printing the sequence of nodes visited in each case.
16. Write a C program to implement BST operations- insert, search and delete
17. Write a C program to implement the following graph Traversals a) BFS b) DFS

L142 - ENGINEERING PHYSICS LAB
(Common to all branches)

Pre-requisite course: NONE

Course Educational Objectives:

In this course student will learn about

- The scientific method of experiments in the laboratory.
- The procedures and observational skills for appropriate use of simple and complex apparatus.
- Analytical techniques, statistical analysis and graphical analysis.
- The theoretical ideas and concepts covered in lecture by completing a host of experiments.
- The radius of curvature of a Plano-convex lens by forming Newton's rings.

Course Outcomes:

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

CO1: Understand to calculate the radius of curvature of a plano-convex lens by forming Newton's Rings.

CO2: Understand the concept of diffraction and also find wavelengths of different spectral lines of the grating.

CO3: Estimate the wavelength of laser radiation.

CO4 : Study the magnetic field along the axis of a current carrying coil and to verify Biot –savart's law .

CO5 : Estimate the Refractive index of the given prism

CO6 : Find the thickness of a thin material using a wedge shaped film.

CO7 : Estimate the width of the slit by forming diffraction pattern.

CO8 : Understand the phenomenon of optical – activity

CO9 : Study the characteristics of LCR circuit

CO10: Understand the Phenomenon of resonance

CO11: Determine the rigidity modulus of given material

CO12 : Understand the longitudinal and transverse vibrations of tuning fork.

List of Experiments: (Any 8 Experiments)

1. Determine the Radius of Curvature of Plano - Convex lens by forming Newton's Rings.
2. Determine the Wavelengths of various spectral lines using grating with the normal incidence method.
3. Determination of wavelength of laser radiation.
4. Study the magnetic field along the axis of a current carrying coil and to verify Biot – Savart's law.
5. Determine the Refractive index of a given prism.
6. Determine the thickness of a thin material using wedge shaped film.
7. Determine the width of the slit by using laser source by forming diffraction pattern.
8. Determine the specific rotation of an optically active substance.
9. Study the characteristics of L.C.R Circuit.
10. Determine the frequency of AC supply by using Sonometer.
11. Determine the rigidity modulus of a given material using Torsional pendulum.
12. Determine the frequency of a vibrating bar or electrical tuning fork using Meldy's apparatus.

Reference Books: Lab Manual prepared by the LBRCE.

S134 - APPLIED MATHEMATICS – III
(Common to AE, CE, CSE, EEE, EIE, IT, ME)

Prerequisite: Applied Mathematics-II, Applied Mathematics-II

Course Educational Objectives:

In this course student will learn about

1. The methodology of interpolation and extrapolation to common problems using different formulae
2. The application of Numerical Techniques in Integration; solving the algebraic and transcendental equations.
3. Solving Differential equations by using Numerical Methods..
4. The concepts of Vector Calculus Vector Differentiation and Conservative Fields.
5. The concepts of line integrals, surface and volume integrals, vector integral theorems and their applications

Course outcomes:

At the end of this course student will be able to

1. Apply the knowledge acquired to identify, formulate and solve problems in engineering using Numerical Techniques.
2. Apply the techniques of numerical interpolation and approximation of functions with ease.
3. Perform integration of functions when the actual function is not given and solve algebraic and transcendental equations.
4. Solve Ordinary Differential Equations with given initial conditions.
5. Apply Integration to find length, area and volume of any given surface.

UNIT – I

Solution of Algebraic and Transcendental Equations and Numerical Integration

Solutions of Algebraic and Transcendental Equations – Regula False Position method and Newtons Raphson Method in one variable. Numerical Integration – Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

UNIT – II

Interpolation and Finite Differences

Interpolation: Introduction – Finite differences- Forward Differences- Backward Differences- Backward differences – Central differences – Symbolic relations and separation of symbols-Differences of a polynomial- Newton's formulae for interpolation – Lagrange's Interpolation formula.

UNIT – III

Numerical solution of Ordinary Differential Equations

Numerical solution of Ordinary Differential equations, Solution by Taylor's series - Picard's Method of successive Approximations - Euler's Method - Runge- Kutta Methods.

UNIT – IV

Vector Differentiation

Vector Differentiation: Gradient- Directional Derivatives -Divergence – Solenoidal fields-Curl –Irrotation fields-potential surfaces - Laplacian and second order operators and related properties of sums and products

UNIT – V**Vector Integration**

Vector Integration - Line integral – work done –area - surface and volume integrals Vector integral theorems: Greens, Stokes and Gauss Divergence Theorems (Without proof) and related problems.

TEXT BOOKS

1. S. S. Sastry, “Introductory Methods of Numerical Analysis”, PHI, 5th Edition, 2005.
2. Dr. B. V. Ramana, “Higher Engineering Mathematics”, TMH Publications, 1st Edition, 2010.

REFERNCES

1. Dr. B.S. Grewal , “Higher Engineering Mathematics”, Khanna Publishers, 42nd Edition, 2012.
2. Steven .C. Chopra and Ra. P. Canale, “Numerical Methods for Engineers with programming and software application”, TMH Publications, 4th Edition, 2002.
3. M. K. Jain, S. R. K. Iyengar, R.K. Jain, “Numerical Methods for Scientific and Engineering Computation”, New Age International Publishers., 5th Edition, 2007.

S197 - DISCRETE MATHEMATICS
(Common to CSE, IT)

Course Educational Objectives:

- Explain with examples the basic terminology of functions, relations, and sets.
- Perform the operations associated with sets, functions, and relations.
- Relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- Use formal logic proofs and/or informal but rigorous logical reasoning to, for example, predict the behavior of software or to solve problems such as puzzles.
- Describe the importance and limitations of predicate logic.
- Relate the ideas of mathematical induction to recursion and recursively defined structures.

Course outcomes:

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

- Outline basic proofs for theorems using the techniques of - direct proofs, example, and proof by contradiction, mathematical induction.
- Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
- Designing Network application, data structures using Graph terminology.
- Construct compilers, error detection code, solve practical applications with the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
- To solve scientific problems, mathematical issues with recurrence relations.

Pre requisite: Basic mathematical knowledge

UNIT - I**Mathematical Logic :**

Propositional Calculus: Statements and Notations, Connectives, Truth Tables, Tautologies, Equivalence of Formulas, Duality law, Tautological Implications, Normal Forms, Theory of Inference for Statement Calculus, **Consistency of Premises, Indirect Method of Proof.**

Predicate calculus: Predicative Logic, Statement Functions, Variables and Quantifiers, Free & Bound Variables, Inference theory for predicate calculus.

UNIT - II**Set Theory:**

Introduction, Operations on Binary Sets. Relations: Properties of Binary Relations, Relation Matrix and Digraph, Operations on Relations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering Relations, Hasse Diagrams. **Functions:** Bijective Functions, Composition of Functions, Inverse Functions, Permutation Functions, Recursive Functions

UNIT - III**Graph Theory:**

Basic Concepts of Graphs, Sub graphs, Matrix Representation of Graphs: Adjacency Matrices, Incidence Matrices, Isomorphic Graphs, Eulerian and Hamiltonian Graphs, Multigraphs, Graph Theory II: Planar Graphs, Euler's Formula, Graph Coloring, Chromatic Number, Trees, Spanning Trees: Properties, Algorithms for Spanning trees and Minimum Spanning Trees.

UNIT - IV

Algebraic Structures: Algebraic Systems with one Binary Operation, Properties of Binary operations, Semi groups and Monoids: Homomorphism of Semi groups and Monoids, Groups: Abelian Group, Cosets, Subgroups (Definitions and Examples of all Structures), **Combinatorics:** Basic of Counting, Permutations, Permutations with Repetition of Objects, Restricted Permutations, Combinations, Restricted Combinations, Pigeonhole Principle and its Application, Binomial Theorem, Binomial and Multinomial Coefficients.

UNIT - V

Recurrence Relation: Generating Function of Sequences, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving linear homogeneous recurrence Relations by substitution, generating functions and The Method of Characteristic Roots. Solving Inhomogeneous Recurrence Relations

TEXT BOOKS

1. Tremblay, Manohar, Discrete Mathematical Structures with Applications to Computer Science, TMH Publications.
2. Mott, Kandel, Baker, Discrete Mathematics for Computer Scientists & Mathematicians, PHI, 2/e.

REFERENCES

1. S.Santha, Discrete Mathematics, Cengage
2. Thomas Koshy, Discrete Mathematics with Applications, Elsevier
3. JK Sharma, Macmillan Discrete Mathematics, 2nd edition,
4. Chandrasekaran, Umaparvathi, Discrete Mathematics, PHI, 2010
5. Ralph. P. Grimaldi, Ramana, Discrete and Combinational Mathematics, Pearson, 5th edition.
6. CL Liu, Mahapatra, Elements of Discrete Mathematics, TMH Publications.

S169 - COMPUTER ORGANIZATION

(Common to EIE, CSE, ECE, EEE, IT)

Course Educational Objectives:

- Students will be able to make use of the binary number system to translate values between the binary and decimal number systems, to perform basic arithmetic operations (i.e. addition, subtraction, multiplication, and division) and to construct machine code instructions.
- Students will be able to design logical expressions and corresponding integrated logic circuits for a variety of problems including the basic components of a CPU such as adders, multiplexers, the ALU, a register file, and memory cells.
- Students will be able to explain the fetch-execute cycle performed by the CPU and how the various components of the data path are used in this process.

Course outcomes:

The specific course outcomes supporting the program outcomes are:

- Able to understand register transfer, micro operations such as arithmetic logic and shift.
- Able to analyze the basic concepts and elements of a computer system.
- Able to learn how to design a CPU.
- Able to perform arithmetic operations.
- Able to study memory and I/O management.

Pre requisite: Digital Logic Design

UNIT – I

Register Transfer and Micro Operations: Register Transfer language, Register Transfer Bus and Memory Transfers, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit.

Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions– Instruction cycle, Memory – Reference Instructions, Input – Output and Interrupt.

UNIT – II

Micro Programmed Control: Control Memory, Address Sequencing, Micro program example, Design of Control unit, hard wired control, Micro programmed control.

Central Processing Unit: STACK organization, Instruction formats, Addressing modes, DATA Transfer and Manipulation, Program control, Reduced Instruction Set computer.

UNIT - III

Pipelining and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC pipeline, Vector Processing.

Computer Arithmetic: Data Representation, Fixed Point Representation, Floating Point Representation, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating Point Arithmetic operations, Decimal Arithmetic unit, Decimal Arithmetic operations.

UNIT- IV

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory. Associative Memory, Cache Memory, Virtual Memory.

UNIT – V

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input –Output Processor, Serial communication.

TEXT BOOK

1. M.Morris Mano, “Computer Systems Architecture”, Pearson Education publishers.

REFERENCES

1. Carl Hamacher, ZvonksVranesic, SafeaZaky, “Computer Organization”, TMH publications.
2. William Stallings, “Computer Organization and Architecture”, Pearson/PHI publishers, Sixth Edition.
3. Andrew S. Tanenbaum, “Structured Computer Organization”, Pearson/PHI publishers.
4. SivaraamaDandamudi, “Fundamentals or Computer Organization and Design”, Springer publishers.

S324 - OBJECT ORIENTED PROGRAMMING THROUGH C++

(Common to CSE, EEE)

Course Educational Objectives:

This course enables the students to know about

- Object Oriented concepts, C++ language .
- Classes & Objects, Inheritance, Polymorphism.
- Templates , Streams, Files.

Course Outcomes

After the completion of the course, students are be able to,

CO1: Able to Understand OOPs Concept , C++ language features.

CO2: Able to Understanding and Applying various Datatypes, Operators, Conversions in program design.

CO3: Able to Understand and Apply the concepts of Classes & Objects, friend function , constructors & destructors in program design.

CO4: Able to Design & implement various forms of inheritance, String class, calling base class constructors lled .

CO5: Able to Apply & Analyze operator overloading, runtime polymorphism , Generic Programming.

CO6: Able to Analyse and explore various Stream classes, I/O operations and exception handling.

Pre requisite: Knowledge of C programming.

UNIT – I**Overview of C++:**

Object Oriented paradigms, Data abstraction/control abstartction, OOPS principles, Origin of C++, Sample C++ program, dynamic initialization of variables , *new* and *delete* operators, C++ keywords, General form of C++ program, Type casting, Introducing C++ classes, Difference between class and structure.

UNIT - II**Classes and Objects:**

Defining Classes in C++, accessing class members, access specifiers (Public and Private), defining member functions, static data members, static member functions, friend functions, friend classes, inline functions, nested classes, passing objects to functions, returning objects, object assignment, Array of objects, Constructor and Destructors

UNIT – III**Inheritance:**

Base-class access control, access specifier (Protected), scope rules, Inheriting Multiple Base classes, constructors, destructors & inheritance passing parameters to base class constructors. Virtual base class. **String class**-Usage of standard library *string class* with example programs.

UNIT – IV**Polymorphism:**

Pointers: Pointers to objects, 'this' Pointer, Pointers to derived types.

Operator Overloading: Overloading Unary Operators, and Overloading Binary Operators using friend functions, Function Overloading,

Virtual functions: Pure Virtual Functions, Abstract classes

Templates: Introduction, simple generic classes & generic function, simple example programs. STL-List, Vector, Array

UNIT – V

Files and Exception Handling:

Exception Handling: Fundamentals, exception handling options.

C++ I/O Systems Basics: C++ Streams, C++ Stream classes, Unformatted I/O Operations, Formatted I/O Operations, Formatting using Manipulators.

C++ File I/O: Introduction, Classes for file stream Operations, Opening and closing a file, detecting end-of-file.

TEXT BOOK

1. Herbert Schildt, The Complete Reference C++, Fourth Edition, TMH Publications.
2. Deitel&Deitel, C++ How to Program, Pearson Education, 3rd Edition.

REFERENCES

1. E.Balaguruswamy, Object Oriented Programming with C++, TMH Publications, 3rd Edition.
2. Ashok N Kamthane, Object Oriented Programming with ANSI& Turbo C++.

S253 - FREE OPEN SOURCE SOFTWARE**Course Educational Objectives:**

- Study the open source application in the field of pedagogy.
- To learn the efficiency of open source software in the orientation of information literacy.
- To know about the usage of model in information literacy orient.

Course Outcomes

- Ability to install and run open-source operating systems.
- Ability to gather information about Free and Open Source Software projects from software releases and from sites on the internet.
- Ability to build and modify one or more Free and Open Source Software packages.
- Ability to use a version control system and to interface with version control systems used by development communities.
- Ability to contribute software to and interact with Free and Open Source Software development projects.

Pre requisite: Knowledge of operating systems

UNIT – I**Introduction to UNIX:**

The Unix Operating system, Architecture of Unix, Features of Unix, Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, telnet, ftp.

Introduction to Unix file system :

The File System Hierarchy, The Unix file system, Unix file system commands: pwd, cd, mkdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, zip, zip. File attributes-ls, file permissions: chmod, unmask, file system and inodes. In file ownership.

UNIT- II**Introduction to Shell:**

The shell as process command, pattern matching, Escaping, Quoting, Redirection, Pipes, Tee, Command Substitution.

Shell Programming:

vi editor, Shell variables, Shell scripts : read , exit Conditional Statements : if, test, case, expr ,sleep & wait Looping Statements : While and until looping-Examples

UNIT – III

The Process: Process basics- init, ps, The process creation mechanism, Process attributes, signals Running jobs control. at ,batch, cron and crontab.

Filters: Simple Filters-pr, cmp, comm, diff, head, tail, cut, paste, sort, uniq, tr

Filters using Regular Expressions:

Sample Database, grep, egrep, fgrep, Sed -line addressing, context addressing, text editing, and substitution.

UNIT – IV**Programming with awk:**

awk Preliminaries, print & printf statements, numbering processing, Variables and Expressions, Comparisons and logical operators, Begin and End Sections, Positional Parameters, Arrays, Built-in Variables, Decision and Looping statements, Functions.

UNIT-V

Introduction to R-tool, octava and SCI LAB, Introduction to PHP.

TEXT BOOK

1. Sumitabha Das.,Your Unix The Ultimate Guide, TMH Publications, 2001.
2. M.G. Venkatesh Murthy,Introduction to UNIX & SHELL programming, Pearson Education.
3. Sumitabha Das, Unix concepts and applications, TMH Publications, 4th Edition,.
4. Gaham Glass & K. Ables ,Unix for programmers and users, pearson education,3rd edition,.
5. B.A. Forouzan& R.F. Giberg, Thomson ,Unix and shell Programmin,.
6. E. Foster – Johnson & other ,Beginning shell scripting, Wile Y- India.
7. N.B.VENKATESWARLU ,Advanced unix programming,BS PUBLISHERS.

S295 - MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to CE, CSE, EEE, EIE, IT)

Course Educational Objectives:

In this course student will learn about

1. The concepts of economics and accounting to make them effective business decision makers;
2. To help to the students of engineering to understand the concepts of demand, production, cost, and market structures for various business decisions.
3. Fundamentals of Economics, which is an important social science subject helps to engineers to take certain business decisions in the processes of optimum utilization of resources:
4. An overview on capital investment appraisal methods and sources of raising capital to promote the students to start new enterprises
5. Fundamental skills about accounting and to explain the process of preparing accounting statements & analysis for effective business decisions.
6. Fundamentals of Balance sheet and financial accounting.

Course Outcomes:

After completion of the course, students will be able to

1. Capable of analyzing fundamentals of economics such as demand, production, price, supply and investment concepts which helps in effective business administration.
2. Choose the right type of business activity, establish the business unit and invest adequate amount of capital in order to get maximum return from select business activity.
3. Prepare and analyse accounting statements like income & expenditure statement, balance sheet apart from the fundamental knowledge, to understand financial performance of the business and to initiate the appropriate decisions to run the business profitably.
4. Take the effective business decision & analyze the accounting statements.
5. Prepare the Balance sheet and calculate the financial accounts.

UNIT - I

Introduction to Managerial Economics: Economics – Definitions, Micro, Macro & Welfare economics – Managerial Economics - Definition, Nature and Scope of Managerial Economics, Limitations – Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Types of demand. Definition, Types Measurement and Significance & types of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand Forecasting

UNIT - II

Theory of Production and Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs. Laws of Returns, Internal and External Economies of Scale. **Cost Analysis:** Cost concepts, Cost & output relationship in short run & long run, Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

UNIT - III**Introduction to Markets & Pricing Policies:**

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, oligopoly - Price-Output Determination in case of Perfect Competition and Monopoly, Monopolistic competition. Objectives and Policies of Pricing- Methods of Pricing

UNIT - IV

Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Components of working capital & Factors determining the need of working capital. Methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method, Profitability Index, Internal rate of return (simple problems)

UNIT - V

Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts with simple adjustments. **Financial Analysis through ratios:** Importance, types: Liquidity Ratios, Activity Ratios, Capital structure Ratios and Profitability ratios

TEXT BOOK

Aryasri, Managerial Economics and Financial Analysis, TMH, 2nd Edition, 2005.

REFERENCES

1. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.
2. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
3. Lipey & Chrystel, Economics, Oxford university Press.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Thomson, 4th Edition.

S243 - ENVIRONMENTAL STUDIES
(Common to all branches)

Prerequisite: None

Course Educational Objectives:

In this course the student will learn about

- Environmental issues related to local, regional and global levels.
- Concepts of ecosystems and threats to global biodiversity.
- Environmental pollution problems.
- Environmental issues in the society.
- Problems associated with over population and burden on environment.

Course Outcomes:

After the completion of this course, the students will be able to

1. Evaluate local, regional and global environmental issues related to resources and management.
2. Understand the implications of the ecosystems and identify the threats to global biodiversity
3. Realize the problems related to pollution of air, water and soil.
4. Investigate and solve social issues of the environment.
5. Create awareness on the concept of sustainable population growth.

UNIT – I

Natural Resources: Definition, Scope and importance of Environmental Studies – Need for Public Awareness. Renewable and non-renewable resources –

Natural resources and associated problems – Forest resources, Water resources, Mineral resources, Food resources and Energy resources.

UNIT - II

Ecosystems: Concept of an ecosystem - Structure and functions of an ecosystem - Producers, consumers and decomposers. Energy flow in the ecosystem, Ecological succession, Food chains, Food webs and ecological pyramids. Bio-Geo Chemical Cycles.

Biodiversity and its conservation: Introduction – Definition & Levels of Measuring Biodiversity: Genetic, Species, Community and Ecosystem diversity.

Bio-geographical classification of India, India as a mega diversity nation, Values of Biodiversity: Direct and Indirect Values, Hot-spots of biodiversity, Threats to biodiversity, Man-wildlife conflicts, Endangered and endemic species of India. Conservation of biodiversity.

UNIT - III

Environmental Pollution: Definition, Sources, Effects and Control measures of

- a) Air pollution
- b) Water pollution
- c) Soil pollution
- d) Noise pollution
- e) Radioactive Pollution

Solid waste Management: Sources of waste, Effects of improper handling of waste and measures to reduce the waste production and management methods of Municipal solid waste.

Disaster management: Floods, Earthquakes, Cyclones, Landslides and Tsunami.

UNIT - IV

Social Issues and the Environment: From Unsustainable to Sustainable development & Equitable use of resources for sustainable life style - Environment and human health - Resettlement and Rehabilitation of people, its problems and concern & Case Studies - Climate change: Global warming, Acid rains, Ozone layer depletion, Nuclear accidents and Holocaust & Case studies - Consumerism and waste products.

UNIT -V

Human Population and the Environment: Population growth & Variations among Nations, Population explosion – Family Welfare Program - Human Rights - Value Education - HIV/AIDS - Women and Child Welfare - Role of Information Technology in Environment and human health & Case Studies. Environmental legislation in India.

TEXT BOOKS

- 1 P.N.Palanisamy et al., “Environmental Science”, , Dorling Kindersley (India) Pvt.Ltd. Licenses of Pearson Education in South Asia, 2nd edition ,2013.
- 2 R. Rajagopalan, “Environmental Studies (From Crisis to Cure)”, by Oxford University Press, 2011, Second Edition.

REFERENCES

1. M. Anji Reddy, “Textbook of Environmental Sciences and Technology” by BS Publications, 2011 Second Edition.
2. ErachBharucha, “Textbook of Environmental Studies for Undergraduate Courses”, by University Grants Commission, University Press (India) Private Limited, 2005. (2010 Reprinted).

L148 - FREE OPEN SOURCE SOFTWARE LAB**Course Educational Objectives:**

- Implementing the open source application in real projects.
- To learn the efficiency of open source software in the orientation of information literacy.
- To know about the usage of model in information literacy orient.

Course Outcomes

- Know how to install and run open-source operating systems.
- Know how to gather information about Free and Open Source Software projects from software releases and from sites on the internet.
- Know how to build and modify one or more Free and Open Source Software packages.
- Know how to contribute software to and interact with Free and Open Source Software development projects.

Pre requisite: Knowledge of rules for implementing open softwares.

Week1

Session-1

- a)Log into the system.
- b)Use vi editor to create a file called myfile.txt which contains some text.
- c)Correct typing errors during creation.
- d)Save the file.
- e)Logout of the system

Session-2

- a)Log into the system
- b)open the file created in session 1
- c)Add some text
- d)Change some text
- e>Delete some text
- f)Save the Changes
- g)Logout of the system.

Week2

- a)Log into the system
- b)Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields.

1425 Ravi 15.65

4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

- c)Use the cat command to display the file, mytable.
- d)Use the vi command to correct any errors in the file, mytable.
- e)Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name).
- f)Print the file mytable.
- g)Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
- h)Print the new file, mytable
- i)Logout of the system.

Week3

Session:1

- a)Login to the system
- b)Use the appropriate command to determine your login shell
- c)Use the /etc/passwd file to verify the result of step b.
- d)Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.
- e)Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

Session:2

- a)Write a sed command that deletes the first character in each line in a file.
- b)Write a sed command that deletes the character before the last character in each line in a file.
- c)Write a sed command that swaps the first and second words in each line in a file.

Week4

- a)Pipe your /etc/passwd file to awk, and print out the home directory of each user.
- b)Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
- c)Repeat
- d)Part using awk.

Week5

- a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
- b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
- c) Write a shell script that determines the period for which a specified user is working on the system.

Week6

- a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
- b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

Week7

- a) Write a shell script that computes the gross salary of a employee according to the following rules:
 - i) If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
 - ii) If basic salary is ≥ 1500 then HRA =Rs500 and DA=98% of the basic
 The basic salary is entered interactively through the key board.
- b) Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

Week8

- a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.
- b) Write shell script that takes a login name as command – line argument and reports when that person logs in
- c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

Week9

- a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
- b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.
- c) Write a shell script to perform the following string operations:
 - i) To extract a sub-string from a given string.

ii) To find the length of a given string.

Week10

Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:

- i) File type
- ii) Number of links
- iii) Read, write and execute permissions
- iv) Time of last access

(Note : Use stat/fstat system calls)

Week11

Write C programs that simulate the following unix commands:

a) mv

b) cp

(Use system calls)

Write a C program that simulates ls Command

(Use system calls / directory API)

Week 12 &13

Programs on R-tool/octava/SCI lab

TEXT BOOKS

- 1) M.G. Venkatesh Murthy, Introduction to UNIX & SHELL programming, Pearson Education.
- 2) Sumitabha Das, Unix concepts and applications, Fourth Edition, TMH Publications.
- 3) Gaham Glass & K. Ables, Unix for programmers and users, Pearson education, 3rd edition.
- 4) B.A. Forouzan & R.F. Giberg, Unix and shell Programming, Thomson.
- 5) E. Foster – Johnson & other, Beginning shell scripting, Wile Y- India.
- 6) .B.VENKATESWARLU, Advanced UNIX programming, NBS PUBLISHERS.

L167 - OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB

Course Educational Objectives:

- Knowing the concepts of c++ and developing them..
- Implementing simple projects using c++.
- apply the concepts of class, method, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism.

Course Outcomes

- articulate the principles of object-oriented problem solving and programming.
- outline the essential features and elements of the C++ programming language.
- explain programming fundamentals, including statement and control flow and recursion.
- program with basic data structures using array, list, and linked structures.

Pre requisite: Knowing the syntaxes and notations of c++

1. Write a C++ program to find the sum of individual digits of a positive integer.
2. Write a C++ program to generate the first 'n' terms of the sequence. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are formed by adding the preceding two terms in the sequence.
3. Write a C++ program to generate all the **prime numbers** between 1 and n. Where 'n' is a value supplied by the user.
4. Write a C++ programs that use both **recursive** and **non-recursive** functions
 - a) To find the factorial of a given integer.
 - b) To find the GCD of two given integers.
 - c) To find the nth Fibonacci number.
5. Write a C++ program to perform addition, subtraction and multiplication operations on two complex numbers using **classes and objects**.
6. Write a C++ program to find out the total and average marks of 10 students using **Classes and objects?**
7. Write a C++ program to implement **static data members** and **static member Functions?**
8. Write a C++ program to implement the **matrix ADT using** a class. The operations Supported by this ADT are:

a) Reading a matrix.	c) Addition of matrices.
b) Displaying a matrix	d) Multiplication of matrices.
9. Write a C++ program to illustrate the usage of following:
Default Constructor, Parameterized Constructor, Copy Constructor and Destructor
10. Write a C++ program that illustrates the following:
 - a) **Friend Function**
 - b) **inline function**
11. Write C++ programs that illustrates the usage of following forms of **inheritance**. (Exercise the access specified *protected* also)

a) Single Inheritance	b) Multiple Inheritance
c) Multi level Inheritance	d) Hierarchical Inheritance
12. Write a C++ program to count the lines, words and characters in a given text using standard library **string object**.
13. Write a C++ program that illustrates the concept of **Function over loading?**
14. Write a C++ program that overloads the **binary + operator** to concatenate two strings and to add two complex numbers.
15. Write a C++ program that overloads the **unary ++ operator** to increment each element of the given one dimensional array by '1'?
16. Write a C++ program that illustrates **run time polymorphism** by using virtual functions.
17. Write a **template** based C++ program to implement Stack ADT.
18. Write a **template** based C++ program to implement QUEUE ADT.
19. Write a C++ program to display the contents **of a text file**.
20. Write a C++ program which **copies the contents of one file to another**.

S351 - PROBABILITY AND STATISTICS

(Common to CSE, IT, ME)

Course Educational Objectives:

The main objectives of this course are

- To revise elementary concepts and techniques encountered in probability.
- To extend and formalise knowledge of the theory of probability and random variables.
- To introduce new techniques for carrying out probability calculations and identifying probability distributions.
- To motivate the use of statistical inference in practical data analysis.
- To study elementary concepts and techniques in statistical methodology.

Course Outcomes:

This course is intended to contribute to the following program outcomes:

- An ability to apply the knowledge of mathematics, science and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to identify, formulate and solve engineering problems.
- An ability to use the techniques, skills and modern probabilistic and statistical tools necessary for engineering practice

Pre requisite: Knowledge of mathematical statistics.

UNIT-I**PROBABILITY AND RANDOM VARIABLES**

Conditional probability – Multiplication theorem-Bayes's theorem.

Random variables – Discrete and continuous Random Variables and their distribution functions, Mathematical Expectation of Univariate Random Variable.

UNIT –II**PROBABILITY DISTRIBUTIONS**

Probability Distributions-. Binomial, Poisson, Normal and Gamma distributions- related properties, simple applications. Moment Generating Function and properties. Moment Generating Function for standard distributions.

UNIT –III**SAMPLING DISTRIBUTION AND ESTIMATION**

Population and samples. Sampling distribution of mean (with known and unknown variance), proportion, variances. - Sampling distribution of sums and differences. Point and interval estimators for mean, variance and proportions.

UNIT –IV**TESTING OF HYPOTHESIS**

Null and Alternative Hypothesis, One tail and two tailed tests, Type I and Type II errors.

Testing of hypothesis concerning means, proportions and their differences using Z-test.

Tests of hypothesis using Student's t-test, F-test and χ^2 test. Applications of decision making using the above tests.

UNIT –V**CORRELATION AND CURVE FITTING**

Simple Bivariate Correlation and Regression lines.

Curve fitting: Fitting a straight line –Second degree curve-exponential curve by method of least squares and goodness of fit.

TEXT BOOK

1. Miller & Freund's "Probability and Statistics for Engineers" PHI, New Delhi, 8th edition. 2011.
2. William W. Hines "Probability and Statistics in Engineering" John Wiley & Sons, 4th edition.2002

REFERENCES.

1. Jay L.Devore "Probability and Statistics for engineering and the sciences." Cengage Learning india, 8th edition, 2012.
2. S.C.Gupta&V.K.Kapoor "Fundamentals of Mathematical Statistics" Sultan Chand and sons, New Delhi. 11thedition 2002.
3. T.K.V.Iyengar "Probability and Statistics" S.Chand& Company, New Delhi, edition 2012.
4. B.V.Ramana "Higher Engineering Mathematics" TMH Publications, New Delhi, 1st Edition, 2010.

S180 - DATABASE MANAGEMENT SYSTEMS
(Common to AE, CSE, EEE, EIE, IT)

Prerequisite: Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries)& File Concepts.

Course Educational Objectives:

This course enables the students to know about

- DBMS basic concepts, Database Languages.
- Data base Design.
- Normalization process and Transaction processing.
- Indexing.

Course Outcomes:

After the completion of the course, students should be able to

CO1: Understand DBMS concepts, architecture, Database languages, data models and design of database.

CO2: Applying the concepts of relational algebra, calculus, and also SQL.

CO3: Applying the normalization process for data base design.

CO4: Understand the issues in transaction processing, Analyzing different Concurrency and recovery strategies of DBMS

CO5: Analyzing different file organization techniques & Indexing Techniques.

UNIT - I

Introduction: An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.

Data modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

UNIT - II

Relational data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra.

Introduction to SQL: Characteristics of SQL, Advantage of SQL. SQL data types and literals. Types of SQL commands. SQL operators and their procedure. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus, Cursors in SQL.

UNIT - III

Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

UNIT – IV

Transaction Processing Concepts: Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, log based recovery, checkpoints, ARIES algorithm, deadlock handling. **Concurrency Control Techniques:** Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Recovery with concurrent transactions.

UNIT-V

Storage and Indexing: RAID levels, page formats, record formats, file types and organization, ISAM, B-tree, B+-tree.

TEXT BOOK

1. Korth, Silbertz, Sudarshan, "Database Concepts", TMH Publications.
2. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley.

REFERENCES

1. Raghu Ramakrishnan, "Database Management System", TMH Publications.
2. Maheshwari Jain, "DBMS: Complete Practical Approach", Firewall Media, New Delhi.
3. Date C J, "An Introduction To Database System", Addison Wesley.

S381 - SOFTWARE ENGINEERING
(Common to CSE, EEE, IT)

Course Educational Objectives:

After learning the software engineering the student:

- An understanding of different software processes and how to choose between them
- How to understand requirements from a client and specify them
- Design in the large, including principled choice of software architecture, the use of modules and interfaces to enable separate development, and design patterns
- Understanding good code practices, including documentation, contracts, regression tests and daily builds.
- Various quality assurance techniques, including unit testing, functional testing and automated analysis tools.

Course Outcomes:

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

- Students will understand importance of software engineering and software process concepts.
- Students will learn about different software development process models and how to choose an appropriate one for project.
- Students will demonstrate the ability to manage a project including planning, scheduling and risk assessment/management
- Students will gain confidence at having conceptualized, designed and implemented a working, medium sized project with their team.
- Students will learn about and go through the software development cycle with emphasis on different processes- requirements, design and implementation phases.
- Students will author a software testing plan

Pre requisite:C programming, Database Management Systems

UNIT - I

Introduction to software engineering: The evolving role of Software, software, changing nature of sswsoftware, legacy software, software myths.

Software process: layered technology, process frame work, CMMI, process patterns, assessment, personal and team process models, process technology, product and process.

UNIT - II

Process models: Prescriptive models, water fall model, incremental, evolutionary and specialized process models, unified process.

Software engineering practice: communication practices, planning practices, modelling practices, construction practice and deployment.

UNIT – III

Requirements Engineering: A bridge to design and construction, RE tasks, initiating the RE process, Eliciting Requirements, developing use cases, building the analysis models, negotiating and validating requirements.

Building the analysis model: requirements analysis, analysis modelling approaches, data Www modelling concepts, OOA, scenario based modelling, flow rated modelling, class based modelling, creating a behaviour model.

UNIT - IV

Design Engineering: Design within the context of software engineering, design process and software quality, design concepts, design model, pattern based software design Creating an architectural design: software architecture, data design, architectural styles and patterns, architectural design.

UNIT - V

Testing Strategies: A strategic to software testing, strategic issues, test strategies for conventional software, object oriented software, validation testing, system testing, the art of debugging Testing tactics : software testing fundamentals, white box testing: basis path testing, control structure testing. Black box testing, OO testing methods

TEXT BOOK

Roger S.Pressman, Software engineering- A practitioner's Approach, TMH International Edition, 6th edition, 2005.

REFERENCES

1. Ian Sommerville, Software engineering, Pearson education, 8th edition, 2008.
2. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.
3. Stephan Schach, Software Engineering, TMH Publications, 2007.
4. Pfleeger and Lawrence Software Engineering: Theory and Practice, Pearson education, 2001,1995, PHI,2nd edition.

S284 - JAVA PROGRAMMING

Course Educational Objectives:

To make students enable to

- Concentrates on the methodological and technical aspects of software design and programming based on OOP.
- Acquire the basic knowledge and skills necessary to implement object-oriented programming techniques in software development through JAVA.
- Know about the importance of GUI based applications and the development of those applications through JAVA.
- Get sufficient knowledge to enter the job market related to Web development.

Course Outcomes:

After completion of this course student shall able to,

- Learn the basic reasons about why JAVA has entered into the market and how it is suitable for internet programming and will able to know the primary concepts of OOP and will know about the basic constructs of java(as per OOP).
- Implement OOP concepts in JAVA.
- Understand the importance of packages and Exception handling and will have the ability to implement them as per real time scenarios.
- Know how we work with grouping of objects, concurrent execution and how we handle dynamic activities/actions/events.
- Analyze the importance of GUI and he/she can implement both stand alone and web browser based GUI applications.
- Learn the basic concepts of networking and he/she can develop the network based applications.

Prerequisite: The basic knowledge of Object oriented programming methodology and Graphical User Interface components.

UNIT - I

Java Language: History of Java, The Byte code, Java Buzzwords , arrays, type conversion and casting, simple java program,

Introducing classes: class fundamentals, declaring objects , access control , constructors, methods, garbage collection, Simple example programs of String and StringBuffer classes, Wrapper classes.

UNIT - II

Packages and Interfaces: Defining a package, Accessing a Package, Understanding CLASSPATH, importing packages, exploring java.util package (String tokenizer, date classes)

Interfaces:

Defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces and abstract classes. differences between classes and interfaces, object serialization

Exception handling: Exception handling fundamentals, exception types, usage of try & catch, throw, throws and finally, java's built in exceptions, creating own exception sub classes.

UNIT - III

Multithreading - Differences between multi threading and multitasking, java thread model, creating thread, multiple threads, synchronizing threads.

Applet Class : Concepts of Applets, differences between applets and applications, applet architecture, skeleton, creating applets, passing parameters to applets, working with graphics class.

UNIT - IV

Event Handling: Events handling mechanisms, Events ,Event sources, Event classes, Event Listeners interfaces, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes.

AWT controls :label ,button, scrollbars, text components, check box, check box groups, choices controls, lists, scrollbar, text field, layout managers – border, grid, flow, card, Containers.

UNIT - V

JDBC: Introduction, Types of Drivers, Procedure to establish a connection between java application and database, types of statements,Result set types.

Networking:basics, address,ports,sockets.

TEXT BOOK

Herbert schildt,Java; the complete reference, TMH Publications,5th editon,.

REFERENCES

1. E. Balaguruswamy, ‘ Programming with JAVA’,TMH Publications,2nd Edition.
2. Patrick Niemeyer & Jonathan Knudsen ,Learning Java, O’Reilly P.
3. David Flanagan ,Java – In a nutshell – A desktop quick reference, O’REILLY
4. Java Examples In a nutshell – A Tutorial companion to java in a nutshell(O’REILLY)
5. N.B.Venkateswarlu, E.V.Prasad ,OOP through java,S chand 2010.

S167 - COMPUTER GRAPHICS

(Common to CSE, IT)

Course Educational Objectives:

- Students will have an appreciation of the history and evolution of computer graphics, both hardware and software. Assessed by written homework assignment.
- Students will have an understanding of 2D graphics and algorithms which includes line drawing, polygon filling, clipping, and transformations.
- Students will understand the concepts of and techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture mapping.

Course Outcomes:

After completion of the course, students will able to:

CO1: Understand the graphics applications and various interactive input and output devices.

CO2: Implement the drawing algorithms such as line, circle and ellipse.

CO3: Apply different geometrical transformations in 2D

CO4: Understand 2D Coordinate transformation, viewing functions and clipping algorithms

CO5: Understand the 3D display methods, geometrical transformations

CO6: Apply coordinate transformations.

Pre requisite: The student should have knowledge of C programming Language, Algorithms and basic mathematics.

UNIT - I

Introduction: Usage of Graphics and their applications, Presentation Graphics-Computer Aided Design-ComputerArt- Entertainment- Education and Training-Visualization- Image Processing- Graphical User Interfaces. Over view of Graphics systems: Video Display Devices- Raster Scan systems-random scan systems-Graphics monitors and workstations- Input devices.

UNIT - II

Output primitives: Points and Lines-Line Drawing Algorithms- Loading the Frame buffer-Line function- Circle- Generating Algorithms- Ellipse Generating Algorithms-Other Curves- Parallel Curve Algorithms-Curve Functions-Pixel Addressing- Filled Area Primitives-Filled Area Functions.

UNIT - III

Two Dimensional Geometric Transformations: Basic Transformations- Matrix Representations - Homogeneous Coordinates - Composite Transformations - Other Transformations-Transformations between Coordinate Systems - Affine Transformations- Transformation Functions- Raster methods for Transformation.

UNIT - IV

Two Dimensional Viewing: The viewing Pipeline-Viewing Coordinate Reference Frame-Window-to-Viewport Coordinate Transformation-Two Dimensional Viewing Functions- Clipping Operations-Point Clipping-Line Clipping-Polygon Clipping.

UNIT - V

Three Dimensional Concepts and Object representations: 3D display methods- 3DGraphics-Polygon Surfaces- Curved Lines and Surfaces- Quadratic Surfaces, Three Dimensional Geometric and Modeling Transformations: Translation-Rotation-scaling-Other Transformations-Composite Transformations-3D Transformation Functions-Modeling and Coordinate Transformations.

TEXT BOOK

Donald Hearn & M. Pauline Baker, “Computer Graphics C Version”, Pearson Education, New Delhi, 2004 (Chapters 1 to 12 except 10-9 to 10-22 of the Text book)

REFERENCES

1. David F. Rogers; “Procedural Elements for Computer Graphics”; TMH Publications.
2. J. D. Foley, S. K Feiner, A Van Dam F. H John; “Computer Graphics: Principles & Practice in C”; Pearson.
3. Franscis S Hill Jr; “Computer Graphics using Open GL”; Pearson Education, 2004.

S350 - PRINCIPLES OF PROGRAMMING LANGUAGES**Course Educational Objectives:**

- Introducing the fundamental principles of language design.
- Introducing formal syntax and semantics. I Discussing control structures and abstractions.
- Introducing data typing and abstractions
- Aiming at conducting Tutorial, seminars and remedial classes.

Course Outcomes:

- To be able to express computational solutions in the main programming idioms.
- To be able to select an appropriate programming language for solving a computational problem, with justification
- To know and understand the principal programming abstractions.
- To know and understand the functional programming language.

Pre requisite: Knowledge of different languages.

UNIT – I

Preliminary Concepts: Reasons for studying concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming Environments.

UNIT - II

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars. **Names, Bindings, and Scopes** Introduction, Names, Variables, The Concept of Binding, Scope and Lifetime.

UNIT – III

Data types: Introduction, primitive, character, user defined, array, associative, record, union, Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. **Abstract Data types:** Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java.

UNIT – IV

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT – V

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, parameters that are sub-program names, design issues for functions user defined overloaded operators. Synchronization, Concurrency concepts.

TEXT BOOK

Robert .W. Sebesta - Concepts of Programming Languages Pearson Education,6th edition.

REFERENCES

1. Ghezzi , Programming languages, John Wiley,3rd edition.
2. Pratt and Zelkowitz - Programming Languages Design and Implementation PHI/Pearson Education,4th edition.

S355 - PROFESSIONAL ETHICS AND HUMAN VALUES
(Common to all branches)

COURSE EDUCATIONAL OBJECTIVES:

- To create an awareness on engineering ethics and human values.
- To adumbrate the inevitability of different intellectual property rights like patents, copyrights, trademarks, and trade secret.
- To give an impetus on achieving higher positions in profession, with ethical and human values as a base and support for the growth.
- To explicate the professional and societal responsibilities of the engineers.
- To make the student realize the sensitiveness associated with experimentation process

COURSE OUTCOMES:

- At the end of the course, the student
- Acquires the basic concepts of Professional ethics and human values & Students also gain the connotations of ethical theories.
 - Knows the duties and rights towards the society in an engineering profession
 - Would realize the importance and necessity of intellectual property rights.
 - Can take all the necessary precautions while conducting the experiments, which may reduce the risk.
 - Understands the importance of risk evacuation system in reality and takes the utmost responsibility while handling the risky situations.

Pre requisite: Knowledge of ethics in society.

UNIT - I**ETHICS**

Senses of 'Engineering Ethics' -Variety of moral issues - Types of inquiry -Moral dilemmas Moral autonomy -Kohlberg's theory Gilligan's theory -Consensus and controversy – Models of Professional Roles -Theories about right action- Self interest - Customs and religion -Uses of Ethical theories.

UNIT - II**HUMAN VALUES**

Morals, Values and Ethics – Integrity – Work Ethic – Service Learning - Civic Virtue – Respect for Others –Living Peacefully – Caring – Sharing - Honesty – Courage– Valuing Time - Cooperation – Commitment – Empathy – Self Confidence – Character – Spirituality

UNIT – III**ENGINEERING AS SOCIAL EXPERIMENTATION**

Engineering as experimentation - Engineering Projects VS. Standard Experiments - Engineers as responsible experimenters – Codes of ethics - Industrial Standards - A balanced outlook on law- The challenger case study.

UNIT - IV**SAFETY, RESPONSIBILITIES AND RIGHTS**

Safety and risk- Assessment of safety and risk- Risk benefit analysis and reducing risk- Three Mile Island and Chernobyl case study - Collegiality and loyalty -Respect for authority - Collective bargaining – Confidentiality- Conflicts of interest- Occupational crime - Professional Rights- Employee rights- Intellectual Property Rights (IPR) discrimination.

UNIT - V**GLOBAL ISSUES**

Multinational Corporation's -Environmental ethics-computer ethics -weapons development
Engineers as managers - consulting engineers-engineers as expert witnesses and advisors
Moral leadership - sample code of Ethics (Specific to a particular Engineering Discipline).

TEXT BOOKS

1. R.S.Nagarajan, a Textbook on "Professional Ethics and Human Values", New Age Publishers – 2006.
2. Mike Martin and Roland Schinzinger, "Ethics in engineering", TMH Publications, New York 1996.

REFERENCES

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, " Engineering Ethics", PHI, New Delhi, 2004.
2. Charles D. Fleddermann, "Engineering Ethics", Pearson Education/ PHI, New Jersey,2004 (Indian Reprint now available)
3. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Leatning, United States, 2000 (Indian Reprint now available).
4. John R Boatright, "Ethics and the conduct of business", Pearson Education, New Delhi,2003.
5. Edmund G Seebauer and Robert L Barry, "Fundamentals of ethics for scientists and engineers", Oxford University Press, Oxford, 2001.

L130 - DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE, IT)

Pre requisite: Knowledge of basic SQL commands.

Course Educational Objectives:

The major objective of this lab is to provide a strong formal foundation in database concepts, technology and practice to the participants to groom them into well-informed database application developers.

The sub-objectives are:

1. To give a good formal foundation on the relational model of data
2. To present SQL and procedural interfaces to SQL comprehensively
3. To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design

Course Outcomes

After undergoing this laboratory module, the participant should be able to:

CO1: Understand and effectively explain the underlying concepts of database design.

CO2: Design and implement a database schema for a given problem-domain

CO3: Populate and query a database using SQL DML/DDDL commands and applying enforce integrity constraints on a database.

CO4: Executing PL/SQL including stored procedures, stored functions, cursors, packages.

CYCLE-1

1) Create a table **STUDENT** with appropriate data types and perform the following queries.

Roll number, student name, date of birth, branch and year of study.

1. Insert 5 to 10 rows in a table?
2. List all the students of all branches
3. List student names whose name starts with 's'
4. List student names whose name contains 's' as third literal
5. List student names whose contains two 's' anywhere in the name
6. List students whose branch is NULL
7. List students of CSE & ECE who born after 1980
8. List all students in reverse order of their names
9. Delete students of any branch whose name starts with 's'
10. Update the branch of CSE students to ECE
11. Display student name padded with '*' after the name of all the students

2) Create the following tables based on the above Schema Diagram with appropriate data types and constraints and perform the following queries.

SAILORS (Sailid, Salname, Rating, Age)

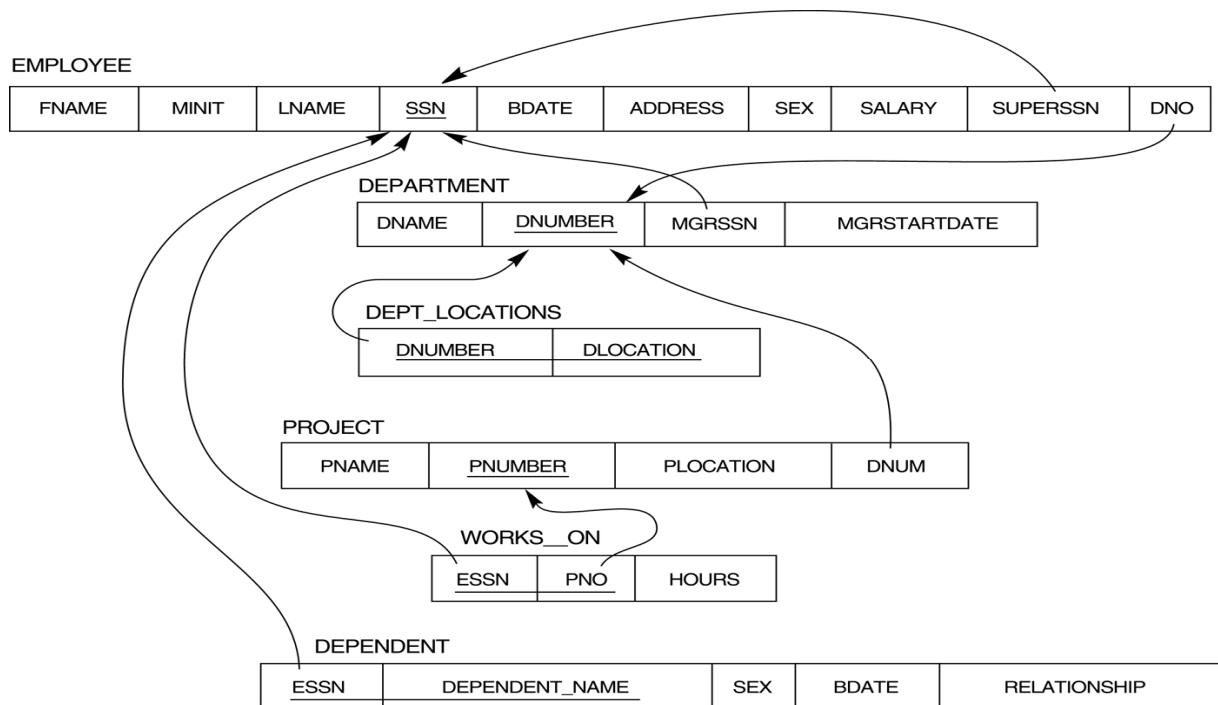
RESERVES (Sailid, boatid, Day)

BOATS (Boatid, Boat-name, Color)

1. Insert 5 to 10 rows in all tables?
2. Find the name of sailors who reserved boat number 3.
3. Find the name of sailors who reserved green boat.
4. Find the colors of boats reserved by "Ramesh".
5. Find the names of sailors who have reserved atleast one boat.
6. Find the all sailid of sailors who have a rating of 10 or have reserved boated 104.
7. Find the Sailid's of sailors with age over 20 who have not registered a red boat.
8. Find the names of sailors who have reserved a red or green boat.
9. Find sailors whose rating is better than some sailor called 'Salvador'.

10. Find the names of sailors who are older than the oldest sailor with a rating of 10.

3) Schema Diagram for the rest of the SQL and PLSQL Programs.



Create the following tables based on the above Schema Diagram with appropriate data types and constraints.

EMPLOYEE (Fname, Mname, Lname, SSN, Bdate, Address, Gender, Salary, SuperSSN, Dno)

DEPARTMENT(Dnumber, Dname, MgrSSN, Mgrstartdate)

DEPENDENT (ESSN, Dependent_Name, Gender, Bdate, Relationship)

- 1) Insert 5 to 10 rows into all the tables.
- 2) Display all employee's names along with their department names.
- 3) Display all employee's names along with their dependent details.
- 4) Display name and address of all employees who work for 'ECE' department.
- 5) List the names of all employees with two or more dependents.
- 6) List the names of employee who have no dependents.
- 7) List the names of employees who have at least one dependent.
- 8) List the names of the employees along with names of their supervisors using aliases.
- 9) Display name of the department and name of manager for all the departments.
- 10) Display the name of each employee who has a dependent with the same first name and gender as the employee.
- 11) List the names of managers who have at least one dependent.
- 12) Display the sum of all employees' salaries as well as maximum, minimum and average salary in the entire departments department wise if the department has more than two employees.
- 13) List the departments of each female employee along with her name.
- 14) List all employee names and also the name of the department they manage if they happen to manage a dept.

15) Display the name of the employee and his / her supervisor's name.

4) Create the following tables based on the above Schema Diagram with appropriate data types and constraints in addition to the tables in Experiment 2.

DEPT_LOCATIONS (Dnumber, Dlocation)

PROJECT (Pname, Pnumber, Plocation, Dnum)

WORKS_ON(ESSN, Pno, Hours).

- 1) Insert 5 to 10 rows into all the tables.
 - 2) Find the names of the employees who work on all the projects controlled by the department 'ECM'.
 - 3) List the project number, name and no. Of employees who work on that project for all the projects.
 - 4) List the names of all the projects controlled by the departments department wise.
 - 5) Retrieve the names of employees who work on all projects that 'John' works on.
 - 6) List the project numbers for projects that involve an employee either as worker or as a manager of the department that controls the project.
 - 7) List the names of all employees in one department who work more than 10 hours on one specific project.
 - 8) For each project, list the project name and total hours (by all employees) spent on that project.
 - 9) Retrieve the names of all employees who work on every project.
 - 10) Retrieve the names of all employees who do not work on any project.
 - 11) Display the name and total no. of hours worked by an employee who is working on maximum no. of projects among all the employees.
 - 12) Display the names of all employees and also no. of hours, project names that they work on if they happen to work on any project(use outer join).
 - 13) List the employee name, project name on which they work and the department they belong to for all the employees using alias names for the resulting columns.
 - 14) Retrieve the names of all employees who work on more than one project department wise.
 - 15) List all the departments that contain at least one occurrence of 'C' in their names.
- 5) Create a view that has project name, controlling department name, number of employees and total hours worked on the project for each project with more than one employee working on it.
- 1) List the projects that are controlled by one department from this view.
 - 2) List the managers of the controlling departments for all the projects.
 - 3) Demonstrate one update operation on this view.
 - 4) List the Location of the controlling departments for all the projects.
 - 5) Retrieve the data from the view.

PL/SQL LAB CYCLE

CYCLE-II

6. Write a PL/SQL Block to find whether the number is Armstrong or not.
7. Write a PL/SQL program for generating Fibonacci series
8. Write an anonymous PL/SQL block that fetches and displays the data from employee table to the console.
9. Write a program that updates salaries of all employees with 10 % hike (use cursors).

10. Write a program to fetch salary and employee name from employee table for a given user input. When no data found raise an exception that prints the message “no data found”.
11. Write a program to find the number of records of any given table using % ROWCOUNT.
12. Write a cursor to display the list of employees and total salary department wise.
13. Write a database trigger on employee table so that the trigger fires when all the DML statements are executed (print appropriate message).
14. Write a trigger in such a way that it should not allow insert or update or delete on Wednesday and Thursday and display the proper message.
15. Write a procedure to display the name and salary of employee when user inputs SSN using IN/OUT parameters.
16. Write a function to check the validity of the given employee number from the employee table (print the appropriate message using PL/SQL block).
17. Visit TPC and submit report.

L155 - JAVA PROGRAMMING LAB
(Common to CSE, IT)

Course Educational Objectives:**To make students enable to**

- Know the importance of implementing application in JAVA.
- Understand and Execute applications through JAVA (at core level).
- Implements concurrent execution of processes (threads), handling exceptions and OOP principles.
- Introduce the base for developing GUI based applications and Networking concepts.

Course Outcomes:

After completion of this course student shall able to,

1. Concentrates on the methodological and technical aspects of software design and programming based on OOP through JAVA.
2. Implement an application in JAVA (Stand alone and web browser based).

Pre requisite: Knowledge of java syntaxes and notations.

- 1 a). Write a java program to generate Fibonacci series?
b). Write a java program to check whether given number is prime or not?
- 2 a). Write a java program to find out area of a circle
b). Write a java program to reverse the given number
- 3 a). Write a java program to find the sum of the numbers by using Command line arguments.
b). write a java program to find the roots of a quadratic equation
- 4 (a) Write a java program to find the factorial of a given number using recursion.
(b) Write a java program to find sum of 'n' numbers using Recursion?
- 5 (a). Write a java program to find min and max number of given Array
(b). Write a java program to perform matrix Multiplication
- 6 (a). Write a java program to search an element by using linear search
(b). Write a java program by using Bubble sort?
- 7 (a). Write a java program to implement Over Loading?
(b). Write a java program using Constructors.
- 8 (a). Write a java program using StringBuffer?
(b). Write a java program to check whether the given string is palindrome (or) not?
(c). Write a java program length and capacity using StringBuffer class.
- 9 (a). Write a java program to sort the Strings in ascending order
(b)? Write a java program to implement stack ADT?
- 10 (a) Write a java program using Inheritance
(b) Write a java program by using super key word

- 11 (a). Write a java program using Abstract class
(b). Write a java program by using final variables and final methods
- 12 (a). Write a java program to implement Overriding?
(b) Write a java program to implement Dynamic method dispatch?
- 13 (a). Write a java program to demonstrate Packages.
(b) Write a java program to implement Multiple inheritance using interfaces
- 14(a). Write a java program by using Exception handling mechanism
(b) Write a java program to create Multiple Threads
- 15(a). Write a java program to find sum of n numbers using String Tokenizer
(b). Write a java program to find sum of the numbers using String Tokenizer
- 16(a.) Write a simple Applet program
(b). Write an applet program using Graphics
- 17(a).? Write an applet program to pass parameters to Applet
(b). Write an applet program to display information an applet
- 18(a). Write an applet program to handle Mouse events
(b). Write an applet program using Key events?
- 19 (a) Write a java program by using AWT components.
(b) Write a java program to implement arithmetic calculator.
- 20 (a) Write a java program to establish a connection with data base and perform some SQL commands like create, insert, update delete.
(B) Write a JDBC program to perform SQL commands using prepared statement.
21. a) Write a JDBC Program to execute stored procedure using Callable statement.
b) Write a JDBC program to execute stored function using callable statement.

S181 - DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE, IT)

Course Educational Objectives

- To explain the fundamental concepts of various algorithm design techniques
- To make the students familiar to conduct performance evaluation of algorithms.
- To Expertise the students with the various existing algorithm design techniques
- To motivate the students to design a new algorithms for various problems.
- To introduce the concepts of NP-Hard problems.

Course Outcomes:

Upon successful completion of this course, students will be able to:

- CO1.** Able to discuss different computational models (e.g., divide-and-conquer), order notation () and various complexity measures (e.g., running time, disk space) to analyze the complexity/performance of different algorithms.
- CO2.** Able to understand the difference between the lower and upper bounds of various problems and their importance in deciding the optimality of an algorithm.
- CO3.** Able to analyze various techniques for efficient algorithm design (divide-and-conquer, greedy, and dynamic algorithms) and be able to apply them while designing algorithms.
- CO4.** Able to know various advanced design and analysis techniques such as greedy algorithms, dynamic programming .
- CO5.** Able to understand the techniques used for designing fundamental graph theory algorithms (e.g., breath-first and depth-first algorithms) and apply them to solve other related problems.
- CO6.** Able to the know the concepts of tractable and intractable problems and the classes P, NP and NP-complete problems.

Pre requisite: Knowledge of different notations .

UNIT - I

Introduction: Algorithm definition, Specifications, Performance Analysis- Time Complexity, Asymptotic Notations-Big-Oh, Omega, Theta. **Divide and Conquer:** General Method, Binary Search, Finding Maximum and Minimum, Merge Sort, Quick sort.

UNIT - II

The Greedy Method – General Method, Knapsack Problem, Job sequencing with deadlines, Minimum-cost spanning trees, Optimal storage on tapes, Optimal merge pattern, Single source shortest paths.

UNIT - III

Dynamic Programming - General method, Multistage graph, All pairs shortest path, Single-source shortest path, Optimal Binary search trees, 0/1 Knapsack, Reliability design, the traveling salesman problem.

UNIT - IV

Back tracking - The General Method, The 8-Queens Problem, Sum of subsets, Graph coloring, Hamiltonian cycles. **Branch and Bound** - The method, 0/1 Knapsack problem, Traveling salesperson

UNIT-V

NP-hard and NP-Complete Problems - Basic concepts, Cook's Theorem, NP- Hard Graph problems. **Amortized Analysis:** An Unrelated Puzzle, Binomial Queues, Skew Heaps, Fibonacci Heaps, Splay Trees.

TEXT BOOK

1. Ellis Horowitz, Sartaj Sahni, 'Fundamentals of Computer Algorithms', Galgotia Publications
2. Data Structures and Algorithm Analysis in C++, 3/e, Mark Allen Weiss, Pearson, 2007.

REFERENCES

1. Aho, Hopcroft & Ullman, 'The Design and Analysis of Computer Algorithms', Addison Wesley publications
2. Thomas H. Corman et al, 'Introduction to Algorithms', PHI.

S401 - THEORY OF COMPUTATION
(Common to CSE, IT)

Course Educational Objectives

- Basic understanding of the notion of a regular set and its representation by DFA's, NFA's, and regular expressions.
- To study abstract models of information processing machines and limits of digital computation
- Basic understanding of the notion of a context-free language and its representation by context-free grammars and push-down automata.

Course Outcomes

As a result of the content and structure of this course, students should be able to:

- Able to Understand the functioning of Finite-State Machines, Deterministic Finite-State Automata and Nondeterministic Finite-State Automata.
- Able to Create Automata to accept strings from various simple languages.
- Able to Discuss the different languages like Regular, Context-Free and Context-Sensitive languages;
- Able to Convert from Push Down Automata to Context –Free Grammars and Vice-Versa.
- Able to Design the Turing Machines and understanding of the notion of an undecidable problems.

Pre requisite: Knowledge in mathematics, including a course in Discrete mathematics, and in programming.

UNIT - I

Introduction to Finite Automata: Strings, alphabets and languages ,finite state systems, basic definitions, non deterministic finite automaton, NFA with λ -transitions - Significance, acceptance of languages, Equivalence between NFA with and without λ -transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT - II

Regular Expressions: Regular sets, regular expressions, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets.

UNIT - III

Context Free Grammar: Regular grammars-right linear and left linear grammars, Context free grammar, derivation trees, Right most and leftmost derivation of strings, Ambiguity in context free grammars. Simplification of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages, closure properties of CFL's

UNIT - IV

Push Down Automata: Introduction, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty stack and its equivalence. Equivalence of CFL and PDA and Interco version.

UNIT - V

Turing Machine: Introduction, The Turing machine model, Computable languages and functions, Techniques of Turing Machine Construction. **Undesirability:** Properties of Recursive and Recursively Enumerable Languages; Universal Turing Machines, undesidability of posts- Correspondence problem. **The Chomsky Hierarchy:** Regular grammars, unrestricted grammars, Context sensitive languages.

TEXT BOOKS

1. John E. Hopcraft and J.D.Ullman "Introduction to Automata Theory Languages and Computation", Narosa Publications, 1999
2. Daniel I.A. Cohen "Introduction to Computer Theory", John Wiley, 2nd Edition 1997

REFERENCES

1. John C Martin "Introduction to languages and the Theory of Computation", TMH.
2. Lewis H.P. & Papadimition C.H. "Elements of Theory of Computation", Pearson /PHI.
3. Mishra and Chandrashekar, "Theory of Computer Science – Automata languages and computation –" 2nd edition, PHI
4. Sipser "Introduction to Theory of Computation" Thomson, 2nd Edition

S327 - OPERATING SYSTEMS

(Common to CSE, ECE, IT)

Course Educational Objectives:

- The main objective of the course is to provide basic knowledge of computer operating system structure and functioning.
- Students able to understand how Operating Systems evolved with advent of computer architecture.
- Comprehend the different CPU scheduling algorithms, page replacement algorithms and identify best one.
- Able to understand and find the best mechanism for handling deadlocks. Also understand File and directory management.

Course Outcomes

After successful completion of this course student shall able to,

- Understand the Operating System (OS) in different viewpoints. Learn the basic reasons for necessity of an OS in our computer and what necessary services it provides to the computer users. Also know the primary concepts of different operating systems structure.
- Understand the concept of process management, CPU scheduling algorithms and able to identify which CPU scheduling algorithm is efficient.
- Understand the importance of synchronization and how to handle deadlocks.
- Know how memory management strategies such as paging and segmentation. Appreciate concepts of virtual memory, demand paging and page replacement algorithms.
- Comprehend and analyze the importance of different file structures that are used in file storage system.
- Learn the basic concepts of directory implementation, free-space management and file recovery.

Pre requisite: Knowledge of system and its resources for running a process.

UNIT - I

Introduction Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations , Process Management , Memory Management, Storage Management, Protection and Security , Distributed Systems , Special-Purpose Systems .**Operating-System Structures-** Operating-System Services , User Operating-System Interface, System Calls , Types of System Calls, System Programs , Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation, System Boot.

UNIT - II

Processes-Concept, Process Scheduling, Operations on Processes, Inter-process Communication, Examples of IPC Systems, Communication in Client-Server Systems
Multithreaded Programming- Multithreading Models, Thread Libraries, Threading Issues.
Process Scheduling-Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling.

UNIT - III

Synchronization-The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples, and Atomic Transactions. **Deadlocks-** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention. Deadlock Avoidance, Deadlock Detection. Recovery from deadlock.

UNIT - IV

Memory Management Strategies- Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation. **Virtual Memory Management-** Demand Paging, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory.

UNIT - V

File-System - The Concept of a File, Access Methods, Directory Structure, File-System Mounting, File Sharing, Protection. **Implementing File system-** File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery.

TEXT BOOK

Silberschatz & Galvin, 'Operating System Concepts', 7th edition, Wiley.

REFERENCES

1. William Stallings-"Operating Systems"- 5th Edition - PHI
2. Charles Crowley, 'Operating Systems: A Design-Oriented Approach', TMH Publications, 1998 edition.
3. Andrew S.Tanenbaum, 'Modern Operating Systems', 2nd edition, 1995, PHI.

S168 - COMPUTER NETWORKS
(Common to EIE, CSE, ECE, EEE, IT)

Course Educational Objectives:

- Give students an understanding of the basic principles of computer networking
- Give students an overview of the main technologies used in computer networks.
- Give students an overview of internetworking principles and how the Internet protocols, routing, and applications operate.
- Give students the basic background in computer networks that will allow them to practice in this field, and that will form the foundation for more advanced courses in networking

Course Outcomes:

- CO1: able to understand the concepts various network architectures, physical media, channel access techniques.
- CO2: able to interpret of Data Link Layer and medium access protocols for direct link networks.
- CO3: able to analyze and implement internetworking and Routing Algorithms
- CO4: able to visualize Adaptive Flow control, Adaptive retransmission and congestion avoidance mechanisms in TCP
- CO5: able to understand various applications like e-mail, DNS, SNMP, and PGP.

Pre requisite: Basic knowledge on networking in internet.

UNIT - I

Introduction: Use of Computer Networks- Network Hardware- Network software-Reference models Example Networks- Network Standardization. Physical Layer: The theoretical basis for Data communication- Guided Transmission Media.

UNIT - II

Data link layer: design issues- framing, error detection and correction, CRC, Elementary data link protocols- Simplex, Stop&Wait protocols, Sliding window protocols-one-bit,go-back-n,selective repeat. Medium Access Control Sub layer: Channel allocation problem- multiple access protocols-ALOHA,CSMA protocols, token bus,token ring, Ethernet, Collision free protocols, Data link layer switching, Bridges, Bridge learning algorithms,bridges from 802.x to 802.y, Local internetworking,spanning Tree bridges, Remote bridges.

UNIT – III

Network layer: Network layer design issues- Routing algorithms- Shortest path, Flooding, Distance vector routing, Link State routing , Hierarchical Routing, Broadcast routing & Multicast Routing,ICMP,ARP,RARP,BOOTP,DHCP, Congestion control algorithms- Leaky Bucket, TokeBucket,Quality of service, Internetworking- network layer in the Internet.

UNIT - IV

Transport layer: Transport service- Elements of transport protocols- Internet transport protocols: TCP & UDP, Flow control-Segments, TCP Timers.

UNIT - V

Application Layer: Domain Name System- Electronic Mail -the World Wide Web, Network Security.

TEXT BOOK

Andrews S. Tanenbaum; “Computer Networks”; Fourth Edition, PHI.

REFERENCES

1. William Stallings; “Data and Computer Communications”; seventh Edition, Pearson Education.
2. Behrouz A .Fourouzan; “TCP/IP Protocol Suite“;TMH Publications, Fourth Edition.
3. James F.Kurose, Keith W.ROSS; “Computer Networking - A Top-Down Approach featuring the Internet”; Pearson Education.

S312 - MICRO PROCESSORS AND INTERFACING

(Common to CSE, IT)

Course Educational Objectives:

- To provide a theoretical & practical introduction to microcontrollers and microprocessors, assembly language programming techniques.
- Design of hardware interfacing circuit.
- Microcontroller and microprocessor system design considerations.

Course Outcomes:

- Identify the basic elements and functions of contemporary microprocessors (8085, 8085, 80386) and microcontrollers (8051).(Knowledge)
- Explain the architecture and operation of microprocessors (8085, 8086 and 80386) and microcontroller (8051).(Comprehension)
- Identify and explain the operations of peripherals and memories typically interfaced with microprocessors and microcontrollers.(Knowledge & Comprehension)
- Analyze instruction sets of 8085, 8086 & 80386 microprocessor and 8051 microcontroller. (Analysis)
- . Analyze timing sequence of different instruction and applying programming in the instruction sets of microprocessors and microcontrollers (Basically Intel family). (Analysis).

Pre requisite: Knowledge on peripherals of computer.

UNIT-I

Microprocessor Architecture: Introduction to Microprocessors-Purpose of a Microprocessor, different types of Microprocessors, their features and their comparison; 8086 Microprocessor-Architecture, Special functions of General purpose registers, 8086 flag register and function of 8086 Flags, Addressing modes of 8086, Instruction set of 8086.

UNIT-II

8086 Assembly Language Programs: Pin diagram of 8086, Minimum mode and maximum mode of operation, Assembly language programs involving logical, Branch and Call instructions, Sorting, Evaluation of Arithmetic Expressions, String manipulation, Assembler directives, simple programs, procedures, and macros.

UNIT-III

8086 Memory & I/O Interfacing

Machine cycles, T- States, Timing diagrams, Memory interfacing, I/O Interfacing, Need for DMA. DMA data transfer Method, Interfacing with 8237/8257

UNIT-IV

Peripherals and Interfacing: 8255 PPI – various modes of operation and interfacing to 8086, Keyboard and Seven segment Displays, Stepper Motor, D/A and A/D converter interfacing.

UNIT-V

Data transfer: Serial data transfer schemes, RS 232C, 8251 USART architecture and interfacing

Interrupts: Interrupt structure of 8086, Interrupt Vector table, Interrupt service routines, Introduction to DOS and BIOS interrupts, 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.

Introduction to microcontrollers

TEXT BOOKS

1. A.K.Ray and K.M. Bhurchandi, Advanced Microprocessor and Peripherals (2/e), TMH Publishers.
2. Douglas V. Hall, “Micro Processors & Interfacing”, TMH, 2007

REFERENCES

1. J.K.Uffenbeck, “The 8088 and 8086 Micro Processors”, PHI, 4th Edition, 2003.
2. Ajay Deshmukh, “Micro Controllers-Theory and Applications”, TMH Publications.
3. Kenneth J.Ayala, “The 8051 Micro Controller”, Cenage Learning Publishers.

S262 - HUMAN COMPUTER INTERACTION (Common to CSE, IT)

Course Educational Objectives:

- To provide basic methodologies and processes for designing interfaces.
- To improve the interaction between users and computers by making computers more usable and receptive to the user's needs.
- To provide relevant principles of behaviour, mostly derived from cognitive science and psychology and other sources that describe human ethology in particular environment, especially technological ones.
- To make the students familiar with developing new interfaces and interaction techniques.

Course Outcomes.

At the end of the course students can

- Ability to develop an aptitude for identifying and manifesting important principles of quality interface design.
- Ability to isolate features of an existing interface design with flaws and improve them.
- Ability to assess tools for appropriate use in implementing those design elements.
- Ability to demonstrate an accommodation of constraints imposed by special kinds of interfaces, such as those on mobile devices.
- Ability to establish target users, functional requirements, and interface requirements for a given computer applications.

Pre requisite: Basic knowledge on computer interfaces.

UNIT - I

Introduction: Importance of user Interface – definition, importance of good design, benefits of good design. A brief history of Screen design.

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT – II

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT - III

Screen Designing : Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT - IV

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT - V

Components – text and messages, Icons and images – Multimedia, colors – uses, problems with choosing colors.

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOK

Wilbert O Galitz, The essential guide to user interface design, Wiley DreamaTech.

REFERENCES

1. Ben Shneidermann, Designing the user interface, Pearson Education Asia, 3rd Edition.
2. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.

L125 - COMPUTER NETWORKS AND OPERATING SYSTEMS LAB**Course Educational Objectives:**

- This course will introduce the basic principles in Operating System and providing error detection methods.
- It will cover all the management modules present in the OS like process management, Memory management, File management, Disk management, Network management, I/O management.

Course Outcomes:

- Know how data is transmitted and checking of errors.,
- Inter process communication including shared memory, pipes and messages
- Simulation of CPU Scheduling Algorithms. (FCFS, RR, SJF, Priority, Multilevel Queuing)
- Simulation of Banker's Algorithm for Deadlock Avoidance, Prevention
- Program for FIFO, LRU, and OPTIMAL page replacement algorithm.

Pre requisite: Knowledge on Operating system principles and network principles.

PART-A

1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP .
3. Implement Dijkstra 's algorithm to compute the Shortest path thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
5. Take an example subnet of hosts. Obtain broadcast tree for it.
6. Take a 64 bit playing text and encrypt the same using DES algorithm.
7. Write a program to break the above DES coding
8. Using RSA algorithm Encrypt a text data and Decrypt the same.

PART-B

1. Simulate the following CPU scheduling algorithms
a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
a) FIFO b) LRU c) LFU Etc. ...
8. Simulate Paging Technique of memory management.
9. Experiments on fork, shared memory and semaphores

L119 - COMMUNICATION AND PRESENTATION SKILLS LAB
(Common to all branches)

Prerequisite: English -I, English - II

Course Educational Objectives

In this course, the students will learn to

1. Gather information and to organize ideas relevantly and coherently
2. Participate in group discussions and debates, Face interviews
3. Write project/research reports/technical reports/ formal letters
4. Make oral presentations
5. Transfer information from non-verbal to verbal texts and vice versa

Course Outcomes

After the completion of this course, prospective engineers will have the ability to

1. Make power point presentations and oral presentations
2. Articulate English with good pronunciation
3. Face competitive exams like GRE, TOEFL, IELTS etc.
4. Face interviews and skillfully manage through group discussions
5. Negotiate skillfully for better placement

Syllabus:

The following course content is prescribed for the Communication and presentations Lab:

- Vocabulary building – synonyms and antonyms, one-word substitutes, analogy, idioms and phrases, verbal & alphabet series.
- Oral Presentations – JAM
- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Making power point presentations.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, practicing mock-interviews.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, and critical reading.

Minimum Requirement:**The English Language Lab shall have two parts:**

The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.

The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

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

- i. P – IV Processor
 1. Speed – 2.8 GHZ
 2. RAM – 512 MB Minimum
 3. Hard Disk – 80 GB
- ii. Headphones of High quality.

Suggested Software:

- Glob arena’s software,2002
- Young India’s Clarity software,2005

Books Recommended:

1. Stephen Bailey , “Academic Writing- A Practical guide for students”, RontledgeFalmer, London & New York, 2004.
2. Dr A Ramakrishna Rao,Dr G Natanam& Prof SA Sankaranarayanan, “English Language Communication : A Reader cum Lab Manual, Anuradha Publications, Chennai, ,1st edition,2006
3. DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice, New Age International (P) Ltd., Publishers, New Delhi,2007
4. Barron’s cup, Books on TOEFL/GRE/GMAT/CAT ,15th edition,2010
5. IELTS series with CDs by Cambridge University Press.3rd Edition,2007.

S415 - UML DESIGN**Course Educational Objectives**

- The main objectives is the students become familiar with all phases of Object-Oriented Analysis and Design (OOAD)
- Master the main features of the Unified Modeling Language (UML)
- Master the main concepts of Object Technologies and how to apply them at work and Develop the ability to analyze and solve challenging Problem in various Domains.
- Learn the Object Design Principles and understand how to apply them towards implementation

Course Outcomes:

By the end of this course you should be able to:

- Learn how to use the UML modeling language and apply an iterative process such as the Unified Process.
- Analyze software requirements and document those using Use Cases.
- Perform software analysis and record the results using the UML notation.
- Perform software design and record the results using the UML notation and apply object-oriented patterns.
- Use the notation of the UML diagrams such as Use Case, Class, Sequence, Activity, State chart, deployment and Package Diagrams
- The students will comprehend the UML notation and able to draw all kinds of diagrams necessary to visualize the system under development

Pre requisite: Basic knowledge of object oriented methods.

UNIT - I

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

UNIT - II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages, case studies.

UNIT - III

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

UNIT - IV

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

UNIT - V

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

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams, case studies

TEXT BOOK

Grady Booch, James Rumbaugh, Ivar Jacobson "The Unified Modeling Language User Guide, Pearson Education, 2nd edition.

REFERENCES

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt.Ltd.
3. AtulKahate: Object Oriented Analysis & Design, TMH Companies.
4. Craig Larman, Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Pearson Education.

S163 - COMPILER DESIGN

(Common to CSE, IT)

Course Educational Objectives

- To introduce the major concept areas of language translation and compiler phases.
- To develop an awareness of the function and complexity of modern compilers.
- To provide theoretical and hands on experience in compilers.

Course Outcomes

- Able to describe the theory and practice of compilation, in particular, the lexical analysis, syntax, and semantic analysis, code generation and optimization phases of compilation.
- Able to create lexical rules and grammars for a programming language.
- Ability to implement a parser such as a Top-Down and bottom-up SLR parsers.
- Ability to implement semantic rules into a parser that performs attribution while parsing.
- To learn the new code optimization techniques to improve the performance of a program in terms of speed & space
- Ability to design a compiler for a concise programming language.

Pre requisite: Knowledge on theory of computation.

UNIT - I

Introduction to Compiler: Compiler, The Phases of Compiler, Approaches to compiler Development-Boot Strapping, Lexical Analysis: The role of lexical analyzer, Input buffering, Specification of tokens, Recognition of Tokens, A language for specifying lexical analyzers (LEX).

UNIT - II

Syntax Analyzer: The role of parser, Writing a Grammar-Elimination of Left recursion and Left factoring. **Top down parsing** –Recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing, LL (1) grammar.

UNIT - III

Bottom up parsing: Shift/Reduce parsing, Operator Precedence Parsing, LR parsers-SLR, CLR and LALR, Error recovery in LR parsing, YACC – automatic parser generator.

UNIT - IV

Syntax Directed Translation: Syntax directed Definitions, Construction of syntax trees Attribute Grammars- S-attributed and L-attributed grammars, Type checking. **Run time storage:** Storage organization, storage allocation strategies. **Intermediate code generation:** Intermediate code forms-Syntax tree, polish notation and three address code, implementation of three-address code, Declarations, Boolean Expressions and Control-flow statements.

UNIT - V

Code optimization: Introduction, The principle sources of optimization, Loop optimization, and Peephole optimization, optimization of basic blocks.

Code generation: Design issues, object code forms, A simple code generator, Register allocation and assignment, DAG representation of Basic Blocks, Code generation using DAG.

TEXT BOOK

Alfred V.Aho, Jeffrey D.Ullman, Ravi sethi “Compilers Principles, Techniques and Tools”, Pearson Education, 2nd Edition, 2008.

REFERENCES

1. ParagH.Dave, HimanshuB.Dave “Compilers Principles and Practice” Person Education, First Edition, 2012.
2. Andrew W.appel “Modern compiler implementation in C” Cambridge, Revised Edition, 2010.

S425 - WEB TECHNOLOGIES

(Common to CSE, ECE, IT)

Course Educational Objectives

- Write a valid standards-conformant HTML document involving a variety of element types, including hyperlinks, images, lists, tables, and forms
- Use CSS to implement a variety of presentation effects in HTML and XML documents, including explicit positioning of elements.
- Identify and correct problems related to concurrency in server-side programs
- Develop a reasonably sophisticated web application that appropriately employs the MVC architecture

Course Outcomes

- Understand, analyze and apply the role of languages like HTML, DHTML, CSS and JavaScript.
- Understand, analyze and create XML documents, XML Schema and Java Beans.
- Use server side components like servlets to build dynamic websites.
- Create websites using server-side components like JSP.
- Design and construct various data base tables using JDBC and produce various results based on given query.

Pre requisite: Students should have the knowledge of Java Programming Language.

UNIT – I**HTML Common tags**

List, Tables, images, links, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT – II**Extensible Markup Language**

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX. **Java Beans:** Introduction to Java Beans, Advantages of Java Beans, Persistence, Java Beans API, Introduction to EJB's.

UNIT – III**Servlets**

Introduction to Servlets: Lifecycle of a Servlet, The Servlet API, The javax.servelet Package, Servlet parameters, Initialization parameters. The javax.servlet HTTP package, Http Request & Responses, Cookies- Session Tracking, accessing database from servlet

UNIT – IV**Introduction to JSP:**

Introduction to JSP, Components of JSP, Implicit objects. Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data between JSP, accessing database from jsp page

UNIT – V

Introducing Swing:– Introduction, key features of swings, limitations of AWT, components & containers, swing packages, creating swing applet- JApplet class, JFrame and JComponent, Labels, text fields, buttons – The JButton class, Tabbed Panes, Scroll Panes, Trees, and Tables.

Struts Framework: Introduction to Struts, Overview of MVC Design Pattern, Struts main Components, Controller components (Action Servlet, Request Processor, Action, Action Mapping, Action Form Beans, Struts Configuration files).

TEXT BOOK

1. Chris Bates ,Web Programming, building internet applications, WILEY Dreamtech.(UNITS-1,2,3,4) 2nd edition,.
2. Bill Siggelkow, S P D ,Jakarta Struts Cookbook , O'Reilly (UNIT-5)

REFERENCES

1. Sebesta ,Programming world wide web, Pearson
2. Marty - Hall and Larry Brown ,Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES , Pearson
3. Dietel and Nieto ,Internet and World Wide Web , How to program by PHI/Pearson Education Asia.
4. Sebesta ,Programming world wide web, Java Server Pages, Pekowsky, Pearson.

S272 - INFORMATION SECURITY**Course Educational Objectives**

- Understand the basic concept of Cryptography and Network Security, their mathematical models.
- Various types ciphers, DES, AES, message Authentication, digital Signature.
- Network security, virus, worms and firewall.

Course Outcomes:

- Acquire knowledge in security services, mechanism and Encryption and decryption of messages using block ciphers.
- Sign and verify messages using well-known signature generation, verification & analyzing the existing authentication protocols for two party communications.
- Acquire the knowledge of providing Email security & IP security
- Acquire the knowledge of providing the security to data during the web transactions
- Knowledge of Prevention from Malware and restricting the unwanted data in a network using firewalls.

Pre requisite: Knowledge of security issues in using a network.

UNIT - I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs Conventional Encryption Principles, Conventional encryption algorithms(DES, Triple DES), cipher block modes of operation(CBC,CFB), location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT - II

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management, Kerberos, X.509 Directory Authentication Service.

UNIT - III

Email privacy: Pretty Good Privacy (PGP) and S/MIME. IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations

UNIT - IV

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - V

Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems, Introduction to data base security and authorization.

TEXT BOOK

William Stallings, Network Security Essentials (Applications and Standards), Pearson Education.

REFERENCES

1. Stallings,,Cryptography and network Security, PHI/Pearson, Third edition,
2. Whitman, Principles of Information Security, Thomson.
3. Robert Bragg, Mark Rhodes, Network Security: The complete reference, TMH
4. Buchmann, Springer Introduction to Cryptography,.

S200 - DISRIBUTED OPERATING SYSTEMS**Course Educational Objectives:**

- This course provides a comprehensive introduction to understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating systems.
- In particular, the course will consider inherent functionality and processing of program execution .
- The emphasis of the course will be placed on understanding how the various elements that underlie operating system interact and provides services for execution of application software.

Course Outcomes

- Master functions, structures and history of operating systems.
- Master understanding of design issues associated with operating systems.
- Be familiar with multithreading.
- Master concepts of memory management including virtual memory.
- Master system resources sharing among the users.
- Master issues related to file system interface and implementation, disk management

Pre requisite: Knowledge of operating system concepts.

UNIT-I**Introduction to Distributed Systems:**

Distributed systems, goals, hardware concepts, software concepts, design issues.

Communoication Distributed Systems:

Layered protocols,ATM Networks, Client Server model,RPC, Group communication

UNIT-II

Process and Processors: Threads, system models, processor allocation,Scheduling, Fault Tolerance, real Time Distributed Systems.

Distributed File Systems: File system design anfd implementation, trends inDistributed File Systems

UNIT-III

Clock synchronization, Mutual Exclusion, Election Algorithms, Atomic Transactions and Deadlocks.

UNIT-IV

Distributed Shared Memory: Introduction, Bus based multiprocessors, Ring based multiprocessors, Switched multiprocessors , NUMA multiprocessors, Comparision of Shared Memory Systems.

UNIT-V

CASE Studies: MACH and CHORUS

TEXT BOOK

Andrew S Tanenbaum, Distributed Operating Systems, Pearson Education,1995.

S335 - PARALLEL ALGORITHMS

Course Educational Objectives

- To study paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.
- It also ensures that students understand how the worst-case time complexity of an algorithm is defined, how asymptotic notation is used to provide a rough classification of algorithms,
- How a number of algorithms exists for fundamental problems in computer science and engineering work and compare with one another.

Course Outcomes:

- Use different computational models (e.g., divide-and-conquer), order notation and various complexity measures (e.g., running time, disk space) to analyze the complexity/performance of different algorithms.
- Understand the difference between the lower and upper bounds of various problems and their importance in deciding the optimality of an algorithm.
- Use various techniques for efficient algorithm design (divide-and-conquer, greedy, and dynamic algorithms) and be able to apply them while designing algorithms.
- Know various Text pattern matching, tries, Ukonnen's algorithm.

Pre requisite: Knowledge of Design and analysis of algorithms.

UNIT - I

Introduction: Parallel Processing, Background, Parallel Models, Performance of parallel Algorithms, The Work-Time Presentation Framework, The Optimality Notion.

UNIT - II

Basic Techniques: Balanced Trees, Pointer Jumping, Divide and Conquer, Partitioning, Pipelining, Accelerated Cascading, Symmetry Breaking. **Lists and Trees:** List Ranking, Euler-Tour Techniques, Tree Contraction, Lowest Common ancestors.

UNIT - III

Searching, Merging, and Sorting: Searching, Merging, Sorting, Sorting Networks, Selection.

UNIT - IV

Graphs: Connected Components, Minimum Spanning Trees, Biconnected Components, Ear Decomposition, Directed Graphs.

UNIT - V

Realistic Models of Parallel Computation: Bulk Synchronous Parallel (BSP), LogP, Shared-Memory (SMP), **Clusters of SMPs**, Communication Primitives, Sorting, 2D FFT.

TEXT BOOK

Joseph, "Introduction to Parallel Algorithms", Pearson Edition Wesley.

REFERENCES

David Culler and J. P. Singh with Anoop Gupta, "*Parallel Computer Architecture: A Hardware/Software Approach*"; Morgan Kaufmann Publishers.

S418 - VISUAL PROGRAMMING**Course Educational Objectives**

- The student will use Visual programming to build Windows applications using structured and object-based programming techniques.
- Students will be exposed to the following concepts and/or skills at an Introductory concepts level:
- Analyze program requirements and Design/develop programs with GUI interfaces

Course Outcomes

- Students select relevant goal-related activities, rank them in order of importance, allocate time to these activities, and understand, prepare and follow schedules.
- Acquire and evaluate information.
- Organize and maintain information.
- Interpret and communicate information.
- Use computers to process information.
- Understand overall intent and proper procedure for setup and operation of equipment.
- Students locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.

Pre requisite: Knowledge of programming languages including GUI.

UNIT - I

WINDOWS PROGRAMMING: Windows environment – a simple windows program – windows and messages – creating the window – displaying the window – message loop – the window procedure – message processing – text output – painting and repainting – introduction to GDI – device context – basic drawing – child window controls

UNIT - II

VISUAL C++ PROGRAMMING – INTRODUCTION: Application Framework – MFC library – Visual C++ Components – Event Handling – Mapping modes – colors – fonts – modal and modeless dialog – windows common controls – bitmaps

UNIT - III

THE DOCUMENT AND VIEW ARCHITECTURE: Menus – Keyboard accelerators – rich edit control – toolbars – status bars – reusable frame window base class – separating document from its view – reading and writing SDI and MDI documents – splitter window and multiple views – creating DLLs – dialog based applications

UNIT - IV

ACTIVEX AND OBJECT LINKING AND EMBEDDING (OLE): ActiveX controls Vs. Ordinary Windows Controls – Installing ActiveX controls – Calendar Control – ActiveX control container programming – create ActiveX control at runtime – Component Object Model (COM) – containment and aggregation Vs. inheritance – OLE drag and drop – OLE embedded component and containers – sample applications

UNIT - V

ADVANCED CONCEPTS: Database Management with Microsoft ODBC – Structured Query Language – MFC ODBC classes – sample database applications – filter and sort strings – DAO concepts – displaying database records in scrolling view – Threading – VC++ Networking issues – Winsock – WinInet – building a web client – Internet Information Server – ISAPI server extension – chat application – playing and multimedia (sound and video) files

TEXT BOOK

Charles Petzold, “Windows Programming”, Microsoft press, 1996 (Unit I – Chapter 1-9)

REFERENCES

1. David J.Kruglinski, George Shepherd and Scot Wingo, “Programming Visual C++”, Microsoft press, 1999 (Unit II – V)
2. Steve Holtzner, “Visual C++ 6 Programming”, Wiley Dreamtech India Pvt. Ltd., 2003.

S198 - DISTRIBUTED DATABASES**Course Educational Objectives**

- List reasons for client-server processing, parallel database processing, and distributed data.
- Describe two-tier, three-tier, and multiple-tier client-server database architectures.
- Describe common architectures for parallel database processing.
- Describe differences between technology for tightly integrated and loosely integrated distributed databases.
- Understand the nature of query processing and transaction processing for distributed databases.

Course Outcomes

- Evaluate simple strategies for executing a distributed query to select the strategy that minimizes the amount of data transfer.
- Explain how the two-phase commit protocol is used to deal with committing a transaction that accesses databases stored on multiple nodes.
- Describe distributed concurrency control based on the distinguished copy techniques and the voting methods.

Pre requisite: Knowledge of parallel processing and data base.

UNIT - I

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases , Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases. Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT – II

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries. The Management of Distributed Transactions, A Framework for Transaction Management , Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT – III

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, and Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control. Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection.

UNIT - IV

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution , Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

UNIT - V

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies.

TEXT BOOKS

Stefano Ceri, Giuseppe Pelagatti ,Distributed Database Principles & Systems, TMH

REFERENCES:

M.TamerOzsu, Patrick Valduriez ,Principles of Distributed Database Systems,Pearson Education.

S137 - ARTIFICIAL INTELLIGENCE
(Common to CSE, IT)

Course Educational Objectives

- This course is used to provide the description of agents and various types of agents and how they used to solve various AI problems.
- This gives a clear view of analysing AI problems, types of problems techniques of solving problems.
- It gives a clear view of knowledge, representation of knowledge, types of logic and its algorithms.
- It provides a better understanding of uncertainty and certainty, its factors various theories of uncertainty and appropriate examples.
- It provides a clear view of state space in search, game playing procedures, expert systems and advanced concepts like swarm intelligent systems.

Course Outcomes:

- After the completion of the course, students should be able to,
- **CO1:** Understand about AI techniques and different ways to implement them and deals about the techniques and set of rules to find solutions in problem solving.
- **CO2:** Implement and understand about various searching strategies, presenting various searching algorithms in searching techniques and also deals about problem solving techniques in search trees.
- **CO3:** Understand about knowledge, represent different issues in knowledge, and present various ways to represent it, implement predicate and propositional knowledge and present logic resolution and unification techniques.
- **CO4:** Present different types of knowledge and reasoning techniques, understand about logic programming and PROLOG, and implement indexing and matching techniques.
- **CO5:** Present uncertainty in knowledge and various techniques to solve it. Present efficient techniques to remove uncertainty in knowledge domain.

Pre requisite: Knowledge of neural networks.

UNIT - I

Introduction: History of AI - Intelligent agents – Structure of agents and its functions – Problem spaces and search - Heuristic Search techniques – Best-first search - Problem reduction - Constraint satisfaction - Means Ends Analysis.

UNIT -II

Knowledge Representation: Approaches and issues in knowledge representation- Knowledge - Based Agent- Propositional Logic – Predicate logic – Unification – Resolution - Weak slot – filler structure – Strong slot - filler structure.

UNIT - III

Reasoning under uncertainty: Logics of non-monotonic reasoning - Implementation- Basic probability notation - Bayes rule – Certainty factors and rule based systems-Bayesian networks – Dempster - Shafer Theory - Fuzzy Logic.

UNIT - IV

Planning and Learning: Planning with state space search - conditional planning-continuous planning - Multi-Agent planning. Forms of learning - inductive learning - Reinforcement Learning - learning decision trees - Neural Net learning and Genetic learning

UNIT - V

Advanced Topics: Game Playing: Minimax search procedure - Adding alpha-beta cutoffs. **Expert System:** Representation - Expert System shells - Knowledge Acquisition. **Robotics:** Hardware - Robotic Perception – Planning - Application domains. **Swarm Intelligent Systems** – Ant Colony System, Development, Application and Working of Ant Colony System.

TEXT BOOKS

1. Elaine Rich, Kevin Knight and Shivashankar B. Nair, “Artificial Intelligence”, TMH, Third edition, 2009. (UNITs I, II, III & V)
2. Stuart J. Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", Pearson Education Asia, Second edition, 2003. (UNIT IV)
3. N. P. Padhy, “Artificial Intelligence and Intelligent System”, Oxford University Press, Second edition, 2005. (UNIT V)

REFERENCES

1. Rajendra Akerkar, “Introduction to Artificial Intelligence”, PHI, 2005.
2. Patrick Henry Winston, “Artificial Intelligence”, Pearson Education Inc., Third edition, 2001.
3. Eugene Charniak and Drew Mc Dermott, “Introduction to Artificial Intelligence", Addison-Wesley, ISE Reprint, 1998.
4. Nils J. Nilsson, “Artificial Intelligence - A New Synthesis", Harcourt Asia Pvt. Ltd., Morgan Kaufmann, 1988.

S103 - ADVANCED COMPUTER ARCHITECTURE
(Common to CSE, IT)

Course Educational Objectives

- To analyse and apply techniques for static, dynamic and hybrid branch prediction.
- To use the Tomasulo Algorithm to identify and satisfy true data dependencies in the design of superscalar processors.
- To analyse and use various advanced control flow techniques.
- To design memory system for multi processors using integrated memory circuits.
- To analyse and use techniques that guarantee cache coherence and correct sequential memory access across multiprocessor systems.

Course Outcomes

- To learn technology trends , quantitative principles to design computers
- To summarise the instruction sets and various addressing modes for processing operations in computers
- To Identify data hazards and overcome, to improve performance in instruction delivery and examine different ILP software approaches
- To analyse the cache performance and virtual memory protection in various issues of memory organization.
- To describe shared memory architectures and multithreading techniques

Pre requisite: Knowledge of computer organization.

UNIT- I

Fundamentals of computer design.-technology trends-cost-measuring and reporting Performance. Quantitative principles of computer design.

UNIT – II

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of Operands- addressing modes for signal processing-operations in the instruction set- instructions for control Flow- encoding an instruction set.-the role of compiler

UNIT- III

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- ILP software approach- compiler techniques- static branch protection - VLIW approach

UNIT- IV

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

UNIT- V

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

TEXT BOOK

John L. Hennessy & David A. Patterson Morgan Kaufmann (An Imprint of Elsevier)
Computer Architecture A quantitative approach 3rd edition

REFERENCES

1. Advanced Computer Architectures, DezsoSima, Terence Fountain, Peter Kacsuk, Pearson.
2. David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier Parallel Computer Architecture, A Hardware / Software Approach
3. H. Stone. Advanced Computer Architecture, Addison Wesley, 1989.
4. H. J. Siegel. Interconnection Network for Large Scale Parallel Processing, TMH Publications, 1990.
5. K. Hwang and F. A. Briggs. Computer Architecture and Parallel Processing, TMH Publications, 1985

S268 - IMAGE PROCESSING

(Common to CSE, IT)

Course Educational objectives:

- To explain the different magma geochemistry derived from partial melting of the mantle in different tectonic regime.
- To familiarize students with a number of substantive eighteenth century texts. Students will be trained in the close reading of language and its relation to literary form.
- To demonstrate the application of molecular graphics to drug design.
- Use topographic maps and employ these maps to interpret the physiography and history of an area.

Course Outcomes:

This course will enable you to:

- convert color images from one coordinate system to another
- exploit human visual perception to enhance images
- enhance poor contrast images
- apply 2D DCT and wavelet transform to images and analyze the coefficients
- apply spatial and frequency-domain filtering to images.

Pre requisite: Knowledge of computer graphics.

UNIT – I

Introduction: What is Digital Image Processing, Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels.

UNIT – II

Image Enhancement In The Spatial Domain: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters.

UNIT – III

Image Restoration: A model of the image degradation/restoration process, noise models, restoration in the presence of noise—only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function.

Color Image Processing: Color fundamentals, color models.

UNIT – IV

Image Compression: Fundamentals, image compression models, Lossless Compression: Huffman coding, Run length coding contour coding, A brief discussion on Lossy Compression Image compression standards.

Morphological Image Processing: Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms.

UNIT – V

Image Segmentation: Detection of discontinuous, edge linking and boundary detection, threshold, region-based segmentation. Computer Science & Engineering 49

TEXT BOOK

Rafeal C. Gonzalez, Richard E. Woods, Digital Image Processing, Pearson Education/PHI, 2nd edition.

REFERENCES

1. Milan Sonka, Vaclav Hlavac and Roger Boyle, Image Processing, Analysis, and Machine Vision, Thomson Learning, Second Edition.
2. Alasdair McAndrew, Introduction to Digital Image Processing with Matlab, Thomson Course Technology
3. Computer Vision and Image Processing, Adrian Low, B.S. Publications, 2nd edition
4. Rafeal C. Gonzalez, Richard E. Woods, Steven L. Eddins, Digital Image Processing using Matlab, Pearson Education.

S257 - GPU PROGRAMMING USING CUDA**Course Educational objectives:**

- Understand how to access GPU functionality with Apple's OpenCL or NVidia's CUDA
- Understand how to construct kernels for GPUs
- Explain the differences between CPUs and GPUs

Course Outcomes:

- On completion of this course students should be able to:
- Understand the GPU hardware.
- Understand and use common methods for programming GPUs.
- Optimise GPU applications.
- Use GPU programming directives.

Pre requisite: Knowledge of CUDA programming.

UNIT – I

Introduction: GPUs as Parallel Computers, Architecture of a Model GPU, Why More Speed or Parallelism? Parallel Programming Languages and Models, Overarching Goals.

History of GPU Computing: Evolution of Graphics Pipelines, GPU Computing.

Introduction to CUDA: Data Parallelism, CUDA Program Structure, A Matrix-Matrix Multiplication Example, Device Memories and Data Transfer, Kernel Functions and Threading.

UNIT – II

CUDA Threads: CUDA Thread Organization, Using blockIdx and threadIdx, Synchronization and Transparent Scalability, Thread Assignment, Thread Scheduling and Latency Tolerance.

CUDA Memories: Importance of Memory Access Efficiency, CUDA Device Memory Types, A Strategy for Reducing Global Memory Traffic, Memory as a limiting Factor to Parallelism.

Performance Considerations: More on Thread Execution, Global Memory Bandwidth, Dynamic Partitioning of SM Resources, Data Perfecting, Instruction Mix, Thread Granularity, Measured Performance and Summary.

UNIT – III

Floating Point Considerations: Floating Point Format, Representable Numbers, Special Bit Patterns and Precision, Arithmetic Accuracy and Rounding, Algorithm Considerations.

Parallel Programming and Computational Thinking: Goals of Parallel Programming, Problem Decomposition, Algorithm Selection, Computational Thinking.

UNIT – IV

Introduction to OPENCL: Background, Data Parallelism Model, Device Architecture, Kernel Functions, Device Management and Kernel Launch, Electrostatic Potential Map in OpenCL.

Goals of Programming GPUs, Memory Architecture Evolution, Kernel Execution Control Evolution, Core Performance, Programming Environment.

UNIT – V

Application Case Study - Advanced MRI Reconstruction: Application Background, Iterative Reconstruction, Computing FHD, Final Evaluation.

Application Case Study – Molecular Visualization and Analysis: Application Background, A Simple Kernel Implementation, Instruction Execution Efficiency, Memory Coalescing, Additional Performance Comparisons, Using Multiple GPUs.

TEXT BOOK

David B Kirk, Wen-mei W. Hwu, “Programming Massively Parallel Processors – A Hands-on Approach”, First Edition, Elsevier and nvidia Publishers, 2010.

REFERENCES

1. Kai Hwang and NareshJotwani “Advanced Computer Architecture – Parallelism, Scalability, and Programmability, Second Edition, TMH, 2011.
2. Mattson, Sanders, Massingill: Patterns for Parallel Programming, AddisonWesley, 2005, ISBN0-321-22811-1.

L183 - UML DESIGN LAB

Course Educational Objectives

- Understand what object-oriented design is
- Understand the principles behind object-oriented design
- Be able to apply those principles in a project setting
- Use the principles to design packages for large scale software projects
- Be able to express object-oriented design in Unified Modeling Language formats
- Be able to analyze applications in terms of Use Cases and express your designs using UML Use Case Diagrams
- Learn how to take a pragmatic approach to software design and development.

Course Outcomes

- be familiar with standard UML notation
- understand how to model requirements with Use Cases
- be able to describe the dynamic behaviour and structure of the design.

Prerequisites: Experience of system development.

The student should take up the following case studies which are mentioned below, and Model it in different views i.e. Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

1. Unified Library application
2. Automatic Teller Machine(ATM)
3. Student Admission Procedure
4. Online Book Shopping
5. Hospital Management System
6. Cellular Network

TEXT BOOK

1. Grady Booch, James Rumbaugh, Ivar Jacobson “The Unified Modeling Language User Guide”, Pearson Education,2/e.

REFERENCES

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.
3. AtulKahate: Object Oriented Analysis & Design, The McGraw-Hil Companies.
Craig Larman, Applying UML and Patterns: An introduction to Object – Oriented Analysis and Designand Unified Process, Pearson Education.

L184 - WEB TECHNOLOGIES LAB
(Common to CSE, IT)

Course Educational Objectives

- Creation of static web pages with HTML & dynamic web pages with HTML, JavaScript & CSS
- Use a variety of tags and technologies for development of web sites.
- Create various client side , server side components using Servlets,JSP
- Manage HTML forms and controls over a form & Provide interactiveness with web pages
- Have knowledge in JDBC and Presentation, Application and DB Tier.

Course Outcome:

- **CO1:** Create various types of websites (static & dynamic)
- **CO2:** Understand the importance of Cascading Style Sheets(CSS) for the refinement of the web site without the changing the content
- **CO3:** Understand and create XML documents and XML schema
- **CO4:** Create various client side , server side components using Servlets,JSP
- **CO5:** Understand how to store/retrieve data from Data Base of any choice

Pre requisite: Students should have the knowledge of Java Programming Language

Design the following static webpages required for an online book store website.

Homepage

Login Page

Catalogue Page

Design the following static webpages required for an online book store website.

Cart Page

Registration Page

Design a webpage using CSS which includes the following styles.

Using different font, styles

Set a back ground image for both page and single elements on the page

Control the background repetition of image with background repeat property

Define styles for link as visited, active, hover & link

Work with layers

Add a customized cursor

Write a JavaScript to validate the fields of a registration page.

Create an XML document for maintaining a CD catalog

Display XML document data using HTML

Display XML data using XSL

Write a program to create a Java Bean for user login management component

Write program to Install Apache Tomcat Web Server and deploy a static website & Access it.

Install Apache Tomcat Server on port number 8080

Deploy html pages in a webserver

Access static website from a webserver

Write a program to create a Servlet to AUTHENTICATE user details

Write a program to implement session management concept in Servlets

Write a program to access a database using JDBC & Servlets

Write a Program to print multiplication table for any number upto required level using JSP

Write a program to display user credentials using useBean tag of JSP

a) Write a swing application to create tabbed panes.

b) Write a swing application to create a table.

S177 - DATA MINING AND DATA WAREHOUSING
(Common to CSE, IT)

Course Educational Objectives

- Define the basic concepts of data mining and Interpret the contribution of data warehousing and data mining to the decision support level of the organizations.
- Categorize and carefully differentiate between situations for applying different data mining techniques: mining frequent pattern, association, correlation, classification, prediction, and cluster analysis;
- Propose data mining solutions for different applications

Course Outcomes:

- By the completion of the course, the students should be able to:
- Understand the concept of Data Mining, Data Warehouse and Data Marts.
- Assess raw input data and apply data pre-processing techniques, generalization techniques and data characterization techniques to provide suitable input for a range of data mining algorithms.
- Identify Associations in large databases using different techniques.
- Differentiate various classification and clustering techniques .
- Analyze how data mining techniques can be applied to complex data objects like spatial data, multimedia data and web mining.

Pre requisite: Student should possess the knowledge of DATABASE MANAGEMENT SYSTEMS, basic mathematics.

UNIT - I

Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT - II

Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures

UNIT - III

Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

UNIT - IV

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis.

UNIT - V

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

TEXTBOOK

J. Han, M. Kamber, “Data Mining: Concepts and Techniques”, Harcourt India / Morgan Kauffman, 2001.

REFERENCES

1. SamAnahory,DennisMurry, “DataWarehousing in the real world”, Pearson Education 2003.
2. DavidHand,HeikkiManila,PadhraicSymth,“Principles of Data Mining”, PHI 2004.
3. W.H.Inmon,“Building the Data Warehouse”, Wiley, 3rd Edition, 2003.
4. PaulrajPonniah, “Data Warehousing Fundamentals”, Wiley-Interscience Publication, 2003

S316 - MOBILE COMPUTING
(Common to CSE, ECE, IT)

Course Educational Objectives

- Various types of MAC protocols and Routing protocols and architectures over a network.
- To understand the issues involved in mobile communication system design and analysis.
- Various Hybrid wireless network architecture and issues over them.
- Recent advances in wireless networks

Course Outcomes

- Able to analyze and design wireless and mobile cellular systems.
- Able to understand impairments due to multipath fading channel and be able simulate standard stochastic channel models for various environments.
- Able to understand the fundamental techniques to overcome the different fading effects.
- Detailed understanding of current and proposed cellular technologies.
- Ability to work in advanced research wireless and mobile cellular technologies.

Pre requisite: Knowledge of computer networks in mobile applications.

UNIT – I

Introduction to Mobile Computing : Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture.

GSM : Mobile services, System architecture, Protocols, Localization and calling, Handover, Security, and New data services.

(Wireless) Medium Access Control : Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT – II

Mobile Network Layer : Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunnelling and encapsulation, optimizations).

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT – III

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

Ad Hoc Wireless networks: Introduction, Issues in Ad Hoc Wireless networks, Routing Protocols: Table Driven: DSDV, WRP, On Demand: AODV, DSR.

UNIT –IV

Introduction to Android: What is Android? Setting up development environment, Dalvik Virtual Machine & .apk file extension, Fundamentals: Basic Building blocks Activities, Services, Broadcast Receivers & Content providers, UI Components - Views & notifications, Components for communication -Intents & Intent Filters, Android API levels (versions & version names)

Application Structure (in detail)

AndroidManifest.xml, uses-permission & uses-sdk, Resources & R.java, Assets, Layouts & Drawable Resources, Activities and Activity lifecycle, First sample Application

UNIT –V

Protocols and Tools : VOIP(what is voip? voip issues, voip architectures, voip protocol stack), Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management), IOS: What is ios? history, features, applications

TEXT BOOKS

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. (Chapters 4,7,9,10,11), second edition, 2004.
2. C. Siva Ram Murthy, B.S. Manoj, " Ad Hoc Wireless Networks: Architectures and Protocols", Pearson Education, 2004
3. Android for Programmers : An App-Driven Approach 1st Edition
4. Voice Over IP Fundamentals, 2nd Edition, Cisco Press; Cisco Press, 2006.

REFERENCES

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", Cambridge University Press, October 2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Stefano Basagni, Marco Conti, Silvia Giordano, Ivan Stojmenović, "Mobile ad hoc networking", IEEE Press, Wiley InterScience, 2004.

S186 - DESIGN PATTERNS

(Common to CSE, IT)

Course Educational Objectives

- To understand that design patterns are standard solutions to common software design problems.
- To be able to use systematic approach that focus and describe abstract systems of interaction between classes, objects, and communication flow.

Course Outcomes

- Have a deeper knowledge of the principles of object- oriented design.
- Understand the design patterns that are common in software applications
- Understand how these patterns related to object- oriented design.

Pre requisite: Knowledge of Unified modelling language.**UNIT – I**

Introduction: What is Design pattern?, Design patterns in Smalltalk MVC, Describing Design patterns, the catalog of Design patterns, Organizing the catalog, How design patterns solve design problems, How to select a design pattern, How to use a design pattern.

UNIT – II

A Case study: Designing a document editor: Design problems, Document structure, Formatting, Embellishing the user interface, Supporting multiple look-and-feel standards, Supporting multiple window systems, User operations spelling checking and Hyphenation summary.

UNIT – III

Creational Patterns: Abstract factory, Builder, Factory method, Prototype singleton, Discussion on creational patterns. **Structural pattern part –I:** Adapter, Bridge, Composite. **Structural pattern part –II:** Decorator, Acade, Flyweight, Proxy.

UNIT – IV

Behavioral pattern part –I: Chain of responsibility, Command, Interpreter, Iterator. **Behavioral pattern part –II:** Mediator, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral patterns.

UNIT – V

What to expect from Design patters, A brief history, The pattern community, An invitation, A pattern thought.

TEXTBOOKS

1. Erich Gamma ,Design Patterns, Pearson Education.
2. Eric Freeman,Head First Design patterns , Oreilly-SPD.

REFERENCES

1. Mark Grand,Pattern's in JAVA Vol-I Wiley DreamTech.
2. Alan Ahaloway,Design patterns Explained Pearson Education.
3. F. Buschmann& others, J Pattern oriented Software Architecture, John Wiley & Sons.
4. Mark Grand,Pattern's in JAVA Vol-II , Wiley DreamTech.

S153 - C# AND .NET PROGRAMMING**Course Educational Objectives**

- Get complete knowledge of MS.NET Framework and its internals.
- Use VS.NET - Integrated Development Environment.
- Develop deep understanding of C# language features.
- Build strong concepts of OOP's and implement the same in C#.
- Create and manage strings, arrays, collections and enumerators using .NET framework library.
- Perform file input and output operations - read and write data streams, serialize and de-serialize an object graph.

Course Outcomes

- After completion of this course, the students would be able to
- Understand, analyze and explain .NET Framework and C#.
- Understand, analyze and use basic C# constructs, delegates and events.
- Understand, analyze and use language interfaces, and inheritance.
- familiar with using .NET collections (sets, lists, dictionaries).
- Understand, analyze and exposed to the Common Language Runtime (CLR), garbage collection, and assemblies.
- Understand, analyze and use exceptions, Windows Forms, .NET Remoting and Serialization.
- Build interactive web applications using ASP.NET and C#.

Pre requisite: Basic knowledge of programming language like "C" or C++ or JAVA or PHP or VB.

UNIT - I**INTRODUCTION TO C#**

Introducing C#, Understanding .NET, overview of C#, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

UNIT - II**OBJECT ORIENTED ASPECTS OF C#**

Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

UNIT - III**APPLICATION DEVELOPMENT ON .NET**

Building windows application, Creating our own window forms with events and controls, menu creation, inheriting window forms, SDI and MDI application, Dialog Box (Modal and Modeless), accessing data with ADO.NET, DataSet, typed dataset, Data Adapter, updating database using stored procedures, SQL Server with ADO.NET, handling exceptions, validating controls, windows application configuration.

UNIT - IV**WEB BASED APPLICATION DEVELOPMENT ON .NET**

Programming web application with web forms, ASP.NET introduction, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web.config, web services, passing datasets, returning datasets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

UNIT - V

CLR AND .NET FRAMEWORK

Assemblies, Versioning, Attributes, reflection, viewing meta data, type discovery, reflection on type, marshalling, remoting, security in NET

TEXT BOOKS

1. Herbert Schildt, "The Complete Reference: C# 4.0", TMH, 2012.
2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.

REFERENCES

1. Andrew Troelsen , "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.
2. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", O'Reilly, 6th edition 2010.

S383 - SOFTWARE TESTING METHODOLOGIES

(Common to CSE, IT)

Course Educational Objectives

- Purpose of testing
- Path testing
- Data flow testing, domain testing
- Regular expressions and flow anomaly
- Logic based testing
- Testability tips

Course Outcomes

The students understands the process to be followed in the software development life cycle

- find practical solutions to the problems
- solve specific problems alone or in teams
- manage a project from beginning to end
- work independently as well as in teams
- define, formulate and analyse a problem.

Pre requisite: Knowledge of different testing methods.

UNIT - I

Introduction: Purpose of Testing Dichotomies, model for testing, consequences of bugs, Taxonomy of bugs.

UNIT - II

Flow Graphs and Path testing: Basic concepts , Predicates, Path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing. **Transaction flow testing:** Transaction flows, transaction flow testing techniques. **Data flow testing:** Basics of Data flow testing, strategies in dataflow testing, application of dataflow testing

UNIT - III

Domain Testing: Domains and paths, Nice and ugly domains, domain testing, domains and interfaces testing, domains and testability

UNIT - IV

Paths, path products and Regular expressions: Path products & Path expression, reduction procedure, applications, regular expressions and flow anomaly detection. **Logic Based Testing:** Overview, decision tables, path expressions, kv charts, specifications

UNIT - V

State, state graphs and Transition Testing: State Graphs, good and bad state graphs, state testing, testability tips. **Graph matrices and Application:** Motivational overview, matrix of graph relations, power of a matrix, node, node reduction algorithm, building tools.

TEXT BOOK

BarisBeizer; “Software Testing Techniques”; International Thomson computer Press, Second edition.

REFERENCES

1. Brain Marick; “The Craft of Software Testing”; Prentice Hall Series in innovative technology.
2. RenuRajaniPradeep Oak; “Software Testing,Effective methods,Tools and Techniques”;TMHI
3. Dr.K.V.K.K.Prasad,Software Testing Tools –Dreamtech.
4. Edward Kit,Software Testing in the Real World –Pearson.
5. Perry,Effective methods of Software Testing, John Wiley.

S205 - E-COMMERCE**Course Educational Objectives**

- Understanding of a broad range of Internet tools
- Exposure to options for developing basic Internet applications (Front Page; a little Javascript for form validation and totalling; VB.Net, and Active Server Pages for linkages to databases)
- Business models and applications and Benefits and risks
- Developing an Internet Business Plan
- Explain how electronic commerce can be used to create a strategic competitive advantage for an enterprise.

Course Outcomes

- To have an advanced understanding of internet and planning of network infrastructure and web architecture
- To understand the internet protocols and mobile TCP/IP based networking
- To have in-depth knowledge of principles of web hosting and promotion
- To understand various business models of ecommerce
- Knowledge of cyber laws.

Pre requisite: Knowledge of security concepts and also networking.

UNIT- I

Overview of Electronic Commerce (EC), Electronic Commerce-Frame work, anatomy of E-Commerce applications, features and functions of e-commerce, e-commerce practices v/s traditional practices, scope and limitations of e-commerce

UNIT- II

Business Model for E- Commerce: B2B, B2C, C2C, C2B. Inter Organizational Commerce - EDI, EDI Implementation, Value added networks. Intra Organizational Commerce - work Flow, Automation, Customization and internal Commerce, Supply chain Management.

UNIT- III

Modes of Electronic Commerce: Electronic Data Interchange, Electronic Commerce with www/Internet, Commerce Net Advocacy, web Commerce Going Forward. Approaches to Safe Electronic Commerce: Secure Transport Protocols, Secure Transactions, Secure Electronic Payment Protocol (SEPP), Secure Electronic Transaction (SET), Certificates for authentication Security on web Servers and Enterprise Networks.

UNIT – IV

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Security of e-commerce: Setting up Internet security, maintaining secure information, encryption, digital signature and other security measures.

UNIT- V

Internet Resources for Commerce: Introduction, Technologies for web Servers, Internet Tools Relevant to Commerce, Internet Applications for Commerce, Internet Charges, Internet Access and Architecture, Searching the Internet. Advertising on Internet: Issues and Technologies. Introduction, Advertising on the Web, Marketing creating web site, Electronic Publishing Issues, Approaches and Technologies: EP and web based EP.

TEXT BOOK

1. Daniel Minoli, Emma Minoli, Web Commerce Technology Handbook, TMH Publications.
2. Kalakata, Whinston, Frontiers of electronic commerce –Pearson.

REFERENCES

1. Bharat Bhasker, Electronic Commerce -Framework, technologies and Applications - TMH Publications
2. Joseph PT: e-Commerce –A Managerial Perspective (PHI) & TMH.
3. Daniel Amor, E Business R(Evolution), Pearson Edude.
4. Krishnamurthy, E-Commerce Management, Vikas Publishing House.
David Whiteley, E-Commerce: Strategy, Technologies and Applications, TMH.

S315 - MIDDLEWARE TECHNOLOGIES**Course Educational Objectives**

- IT systems are more and more integrated with other software systems. The knowledge of integrating these systems
- By using middleware technologies can be a key competence for IT engineers.
- Middleware is commonly understood as an intermediary software layer between the application and the operating system, which encapsulates the heterogeneity of the underlying communication network, operating system or hardware platform.

Course Outcomes

- This course provides details about the modern component platforms. Based on practical examples, details about modern middleware technologies are studied.
- Students get the chance to gain in-depth knowledge popular middleware platforms.

Pre requisite: Knowledge of networking principles.

UNIT - I

Introduction to client server computing: Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

UNIT - II

CORBA with Java: Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web: CORBA with Java.

UNIT - III

Introducing C# and the .NET Platform; Understanding .NET Assemblies; Object –Oriented Programming with C#; Callback Interfaces, Delegates, and Events. Building c# applications: Type Reflection, Late Binding, and Attribute-Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services.

UNIT - IV

Core CORBA / Java: Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multi count. Existential CORBA: CORBA initialization protocol, CORBA activation services, CORBAIDL mapping CORBA java- to- IDL mapping, The introspective CORBA/Java object.

UNIT - V

Java Bean Component Model: Events, properties, persistency, Introspection of beans, CORBA Beans. EJBs and CORBA: Object transaction monitors CORBA OTM's, EJB and CORBA OTM's, EJB container frame work, Session and Entity Beans, The EJB client/server development Process The EJB container protocol, support for transaction EJB packaging EJB design Guidelines.

TEXT BOOK

Robert Orfali and Dan Harkey, Client/Server programming with Java and CORBA, John Wiley & Sons, SPD 2nd Edition.

REFERENCES

1. G.Brose, A Vogel and K.Duddy, Java programming with CORBA 3rd Edition, Wiley-dreamtech, India John wiley and sons.
2. M.L.Liu, Distributed Computing, Principles and applications, Pearson Education
3. Client/Server Survival Guide 3rd edition Robert Orfali Dan Harkey & Jeri Edwards, John Wiley & Sons
4. D T Dewire, Client/Server Computing TMH.
5. Kit Ron Ben Natan Ori Sasson, IBM Webspere Starter TMH, New Delhi
6. Jesse Liberty, SPD-Programming C#, O'Reilly.
7. Peter Sestoft and Henrik I. Hansen, C# Preciesely, PHI
8. Intoduction to C# Using .NET Pearson Education
9. C# How to program, Pearson Education
10. Andrew Troelsen, Apress, C# and the .NET Platform Wiley-dreamtech, India Pvt Ltd.

S326 - OBJECT ORIENTED SOFTWARE ENGINEERING

(Common to CSE, IT)

Course Educational Objectives

- To have detailed knowledge of the object-oriented software development method, and to be able to apply it.
- To master the development of a medium size software application from the conception stage to deployment, using modern technologies.
- To experience working in a team. To master written technical communication.
- To study and experiment with alternative models of the software development process from the classical waterfall model to Extreme programming.

Course Outcomes

- Develop a substantial team-oriented software application using the major aspects of software development: definition/requirements, analysis, planning, design, implementation, testing and deployment.
- Understand advanced concepts in O-O analysis, planning, design, implementation, testing and deployment of software.
- Collaborate in a team environment.

Pre requisite: Knowledge of object oriented principles and software engineering concepts.**UNIT - I****INTRODUCTION**

System Concepts – Software Engineering Concepts – Development Activities – Managing Software Development – Unified Modelling Language – Overview – modelling concepts – deeper view into UML - Project Organization – Communication

UNIT - II**ANALYSIS**

Requirements Elicitation – Concepts – Activities – Management – Arena Case Study - Analysis Object Model – Analysis – Concepts – activities - Managing analysis – Case Study

UNIT - III**SYSTEM DESIGN**

Decomposing the system – Overview of System Design – System Design Concepts – System Design Activities – Addressing Design Goals – Managing System Design – Case Study

UNIT - IV**OBJECT DESIGN AND IMPLEMENTATION ISSUES**

Reusing Pattern Solutions – Concepts – Activities – Managing Reuse – Case Study - Specifying Interfaces – Concepts – Activities – Management – Case Study - Mapping Models to Code – Concepts – Activities – Management – Case Study – Testing – Concepts – Activities – Management

UNIT - V**MANAGING CHANGE**

Rationale Management – Concepts – Activities – Management - Configuration Management – Concepts – Activities – Management - Project Management - Concepts – Activities – Management – Software Life Cycle

TEXT BOOKS

1. Bernd Bruegge and Alan H Dutoit, “Object-Oriented Software Engineering”, 2nd edition, Pearson Education, 2010.
2. Timothy Lethbridge and Robert Laganieri, “Object-oriented Software Engineering: Practical Software Development using UML and Java”, TMH Publication, 2010.
3. Waman S Jawadekar: “Software Engineering Principles and Practice”. TMH Publications V edition.

S249 - FAULT TOLERANT SYSTEMS

(Common to CSE, IT)

Course Educational Objectives

- To provide basic/Fundamentals understanding of Fault Tolerance.
- To make the students familiar with factors of fault tolerance.
- To know the Measures of fault tolerance.
- How to attain fault tolerance using different techniques like redundancy and codes.
- To provide fault tolerance using software systems techniques.

Course Outcomes

- Ability to identify principles of fault tolerance.
- Ability to calculate or measure different factors of fault tolerance.
- Ability to implement different techniques for improving fault tolerance.
- Ability to evaluate fault tolerance of a system using different techniques.
- Ability to Design self-checking software in the fault tolerance.

Pre requisite: Knowledge of software engineering.**UNIT - I****Introduction**

Definition of fault tolerance, Redundancy, Applications of fault-tolerance, Fundamentals of dependability.

UNIT - II**Attributes**

Reliability, availability, safety, Impairments: faults, errors and failures,
Means: fault prevention, removal and forecasting.

UNIT - III**Dependability evaluation**

Common measures: failures rate, mean time to failure, mean time to repair, etc. Reliability block diagrams, Markov processes.

UNIT - IV**Redundancy**

Hardware redundancy, Redundancy schemes, Evaluation and comparison, Applications, Information redundancy, Codes: linear, Hamming, cyclic, unordered, arithmetic, etc., Encoding and decoding techniques, Applications, Time redundancy.

UNIT - V**Programming**

Software fault tolerance, Specific features, Software fault tolerance techniques: N-version programming, recovery blocks, self-checking software, etc.

TEXT BOOKS

1. Anderson, T., and P.A. Lee, Fault-Tolerant Principles and Practices, PHI
2. Hwang, K., and F.A. Briggs, Computer Architecture and Parallel Processing, TMH Publications.

REFERNCES

1. Johnson, B.W., Design and Analysis of Fault-Tolerant Systems, Addison Wesley
2. Leveson, Nancy G., Safeware, system safety and computers, Addison Wesley.
3. Pradhan, D.K., Fault-Tolerant Computing — Theory and Techniques, (2 Volumes), Prentice-Hall.
4. Pradhan, Dhiraj K., Fault-Tolerant Computer System Design, ISBN 0-13-057887-8, Prentice-Hall PTR

S270 - INDUSTRIAL MANAGEMENT
(Common to CSE, ECE, EEE, EIE, IT, ME)

Prerequisite: None

Course Educational Objectives (CEOs):

In this course student will learn about

1. The fundamental concepts and contributions of Management.
2. Human Resource Practices, Quality controls and Project Management which plays a vital role in the organization.
3. Study techniques for increased productivity.
4. Human Resource Management practices.
5. Various network analysis techniques.

Course Outcomes:

After completion of the course, students will be able to

1. Apply the conceptual knowledge of management and organization in work environment.
2. Take decisions relating to location of plant and layout of plant.
3. Conduct work study techniques for increased productivity and also able to control quality of products.
4. Manage human resources efficiently and effectively with best HR practices.
5. Plan and control projects through network analysis techniques.

UNIT - I

Introduction: Management - Definition, Nature, Importance of management Functions of Management - Taylor's scientific management theory, Fayal's principles of management, Contribution of Elton mayo, Maslow, Herzberg, Douglas MC Gregor, basic concepts of Organisation- Authority, Responsibility Delegation of Authority, Span of control, Departmentation and Decentralization - Organisation structures (Line organization, Line and staff organization, Functional organization, Committee organization, Matrix organization)

UNIT - II

Operations Management: Plant location, Factors influencing location, Principles and types of plant layouts - Methods of production (job, batch and mass production), Work study - Basic procedure involved in method study and Work measurement

UNIT - III

Quality and materials management: Statistical quality control – Meaning- Variables and attributes - X chart, R Chart, C Chart, P Chart, (simple Problems) Acceptance sampling, Sampling plans, Deming's contribution to quality. Materials management – objectives, Need for inventory control, Purchase procedure, Store records, EOQ, ABC analysis, Stock levels

UNIT - IV

Human Resource management (HRM): Concepts of HRM, Basic functions of HR manager: Man power planning, Recruitment, Selection, Training and development, Placement, Wage and salary administration, Promotion, Transfers Separation, performance appraisal, Job evaluation and merit rating.

UNIT - V

Project management: Early techniques in project management - Network analysis: Programme evaluation and review technique (PERT), Critical path method (CPM), Identifying critical path, Probability of completing project within given time, Project cost analysis, project crashing (simple problems)

TEXT BOOK

Dr.A.R.Aryasri, Management Science, TMH, 4th edition, 2009

REFERENCES

1. Koontz & weihrich – Essentials of management, TMH, 8th edition, 2010
2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 2004
3. O.P. Khana, Industrial engineering and Management L.S.Srinath, PERT & CPM

S397 - SYSTEM MODELLING AND SIMULATION**Course Educational Objectives**

- Understand transportation network demand and supply models.
- Distinguish among alternative approaches to dynamic traffic assignment and traffic simulation.
- Assess the advantages and disadvantages of alternative network modeling and simulation methods.

Course Out comes

After completion of this course, the students would be able to

- Understand how a simulation model works.
- Understand each of the tasks required for a successful simulation project.
- apply statistics, statistical testing, and probability knowledge to simulation applications.
- understand the background and tools for using simulation technology to improve system performance.
- search independently for solutions to simulation design problems.
- Have an opportunity to apply and expand simulation knowledge through a project application.

Pre requisite: Knowing the concepts of Fourier transforms and signals

UNIT - I

Introduction to Simulation: Areas of Application, Systems and system Environment, Components of a System, Discrete and continuous systems, Types of Models. **General Principles:** Concepts in Discrete-Event Simulation, List Processing.

UNIT - II

Statistical Models in Simulation: Review of Technology and concepts, Useful Statistical Models, Discrete Distributions, Continuous Distributions, Poisson Process, Empirical Distributions. **Queuing Models:** Characteristics and notation, Transient and study state behavior of Queues, Long Run Measures of Performance of Queuing Systems, Study state behavior of Infinite population Markovian Models.

UNIT - III

Random Number Generation: Properties of Random Numbers, Generation of Pseudo-Random Numbers, Techniques for generating random numbers, Tests for Random Numbers. **Random Variate Generation:** Inverse transform technique, Direct Transformation for the Normal Distribution, Convolution Method, Acceptance-Rejection Technique.

UNIT – IV

Input Modeling: Data Modeling, Identifying the Distribution with Data, Parameter Estimation, Goodness-of-Fit Tests, Selecting Input models without Data, Multivariate and Time series Input Models. **Verification and Validation of Simulation Models:** Model Building, verification and validation, verification of simulation models, calibration and validation of Models

UNIT - V

Output Analysis for a Single Model: Stochastic Nature of Output Data, Types of Simulations with Respect to output Analysis, Measure of Performance and their Estimation, Output Analysis for Terminating Simulations, Output Analysis for Steady-state Simulations. **Comparisons and Evaluation of Alternative System Design:** Comparison of Two system designs, comparison of several system designs, Statistical Models for Estimating the Effect if Design Alternatives, Meta Modeling.

TEXT BOOK

Jerry Banks, John S.Carson, II and Barry L. Nelson; “Discrete - Event System Simulation”; 2nd Edition, PHI.

S417 - VIRTUAL REALITY

Course Educational Objectives

- Understand the basic principles of virtual reality.
- Describe the historical development of virtual reality.
- Evaluate current virtual reality hardware and software.
- Identify and describe applications for current virtual reality hardware and software.
- Design and construct a simple virtual environment.
- Identify and describe social, philosophical, and psychological factors and implications of virtual reality.

Course Outcomes

- You can design a new virtual reality application and the required environment on a coarse level. In addition you can create simple VR applications.
- After the course you can describe factors affecting immersion in virtual reality, and you can assess and classify applications based on them.

Pre requisite: Knowledge of Computer graphics.

UNIT – I**INTRODUCTION**

Virtual Reality & Virtual Environment : Introduction – Computer graphics – Real time computer graphics –Flight Simulation – Virtual environments –requirement – benefits of virtual reality- **3D Computer Graphics** : Introduction – The Virtual world space – positioning the virtual observer – the perspective projection – human vision – stereo perspective projection – 3D clipping – Colour theory – Simple 3D modeling – Illumination models – Reflection models – Shading algorithms.

UNIT – II**GEOMETRIC MODELLING**

Geometric Modeling: Introduction – From 2D to 3D – 3D space curves – 3D boundary representation -**Geometrical Transformations**: Introduction – Frames of reference – Modeling transformations – Instances – Picking – Flying – Scaling the VE – Collision detection - **A Generic VR system**: Introduction – The virtual environment – the Computer environment – VR Technology – Model of interaction – VR System.

UNIT – III**VIRTUAL ENVIRONMENT**

Animating the Virtual Environment: Introduction – The dynamics of numbers – Linear and Non-linear interpolation - The animation of objects – linear and non-linear translation - shape & object inbetweening – freeformdeformation – particle system- **Physical Simulation** : Introduction – Objects falling in a graphical field – Rotating wheels – Elastic collisions – projectiles – simple pendulum – springs – Flight dynamics of an aircraft.

UNIT – IV**VR HARDWARES & SOFTWARES**

Human factors: Introduction – the age- the ear- the somatic senses - **VR Hardware**: Introduction – sensor hardware – Head-coupled displays –Aquatic hardware – Integrated VR systems-**VR Software**: Introduction –Modeling virtual world –Physical simulation- VR toolkits – Introduction to VRML.

UNIT – V**VR APPLICATION**

Introduction – Engineering – Entertainment – Science – Training – **The Future**: Introduction – Virtual environments – modes of interaction.

TEXT BOOK

John Vince, “*Virtual Reality Systems* “, Pearson Education Asia, 2002

REFERENCES

1. Adams, “*Visualizations of Virtual Reality*”, TMH, 2000.
2. Grigore C. Burdea, Philippe Coiffet , “*Virtual Reality Technology*” , WileyInterscience,1 Edition,1994.

L165 - MOBILE COMPUTING LAB**Course Educational Objectives**

- Hardware devices and interacting with these devices.
- Mobile operating systems available.
- Programming applications on a mobile system.
- Data and knowledge management.

Course Outcomes

- Learn and understand the terminology related to mobile application development
- Understand how Android applications work, their life cycle, manifest, Intents, and using external resources
- Explain the differences between Android and other mobile development environments
- Learn to utilize the power of background services, threads, and notifications.

1. Write a J2ME program to show how to change the font size and colour.

2. Write a J2ME program which creates the following kind of menu.

- * cut
- * copy
- * past
- * delete
- * select all
- * unselect all

3. Create a J2ME menu which has the following options (Event Handling):

- cut - can be on/off
- copy - can be on/off
- paste - can be on/off
- delete - can be on/off
- select all - put all 4 options on
- unselect all - put all

4. Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.

5. Create an MIDP application which examine, that a phone number, which a user has entered is in the given format (Input checking):

- * Area code should be one of the following: 040, 041, 050, 0400, 044
- * There should 6-8 numbers in telephone number (+ area code)

6. Write a sample program to show how to make a SOCKET Connection from J2ME phone. This J2ME sample program shows how to how to make a SOCKET Connection

from a J2ME Phone. Many a times there is a need to connect backend HTTP server from the J2ME application. Show how to make a SOCKET connection from the phone to port 80.

7. Login to HTTP Server from a J2ME Program. This J2ME sample program shows how

to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a

HTTP server. Many J2ME applications for security reasons require the authentication

- of the user. This free J2ME sample program, shows how a J2ME application can do authentication to the backend server. Note: Use Apache Tomcat Server as Web Server and MySQL as Database Server.
8. The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)
 - Students Marks Enquiry
 - Town/City Movie Enquiry
 - Railway/Road/Air (For example PNR) Enquiry/Status
 - Sports (say, Cricket) Update
 - Town/City Weather Update
 - Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.
 9. Write an Android application program that displays Hello World using Terminal.
 10. Write an Android application program that displays Hello World using Eclipse.
 11. Write an Android application program that accepts a name from the user and displays the hello name to the user in response as output using Eclipse.
 12. Write an Android application program that demonstrates the following:
 - (i) LinearLayout
 - (ii) RelativeLayout
 - (iii) TableLayout
 - (iv) GridView layout
 13. Write an Android application program that converts the temperature in Celsius to Fahrenheit.
 14. Write an Android application program that demonstrates intent in mobile application development.

L116 - C# AND .NET PROGRAMMING LAB**Course Educational Objectives**

- Develop deep understanding of C# language features.
- Build strong concepts of OOP's and implement the same in C#.
- Create and manage strings, arrays, collections and enumerators using .NET framework library.
- Perform file input and output operations - read and write data streams, serialize and de-serialize an object graph.
- Build on applications using N-Tier architecture having Data, DAO and Business classes.

Course Outcomes

- Implementing language interfaces, and inheritance.
- familiar with using .NET collections (sets, lists, dictionaries).
- Usage of Common Language Runtime (CLR), garbage collection, and assemblies.
- use exceptions, Windows Forms, .NET Remoting and Serialization.
- Understand C# documentation and community web sites.

Pre requisite: Knowledge of syntaxes of c# and .net

List of programs:

- Program in C# to check whether a number is Palindrome or not.
- Program in C# to demonstrate Command line arguments processing.
- Program in C# to find the roots of Quadratic Equation.
- Program in C# to demonstrate Boxing and unBoxing.
- Program in C# to implement Stack operations.
- Program to demonstrate Operator overloading.
- Program in C# to find the second largest element in a single dimensional array.
- Program to multiply to matrices using Rectangular arrays.
- Program to Find the sum of all the elements present in a jagged array of 3 inner arrays.
- Program to reverse a given string using C#.
- Using Try, Catch and Finally blocks- program in C# to demonstrate error handling.
- Program to Design a simple calculator using Switch Statement in C#.
- Demonstrate Use Of Virtual and override keyword in C# with a simple Program.
- Implement Linked Lists in C# using the existing collections name space.
- Program to demonstrate abstract class and abstract methods in C#.
- Program in C# to build a class which implements an interface which is already existing.
- Program to illustrate the use of different properties in C#.
- Demonstrate arrays of interface types with a C# program.

S329 - OPERATIONS RESEARCH

(Common to AE, CSE, IT, ME)

Course Educational Objectives:

The objective of this course is to:

- Underline the applications of operations research techniques in Industries.
- Discuss the difference between deterministic and stochastic models.
- Familiarize the concepts of simulation and dynamic programming.
- Describe the concept of feasible region, optimal solution.
- Illustrate the applications of Transportation and Assignment models.

Course Outcomes:

After completion of the course student will be able to:

- Develop mathematical models for real engineering problems.
- Demonstrate the familiarity in identifying the key parameters influencing the production cost.
- Exhibit knowledge in solving inventory control problems.
- Choose optimal strategy using OR techniques.

Pre requisite: Knowledge of linear programming.**UNIT - I****INTRODUCTION:** Operations Research, operations research models, applications, Linear Programming Problem Formulation, Graphical solution, Simplex method, Two Phase simplex**UNIT - II****TRANSPORTATION PROBLEM:** Formulation, Optimal solution, unbalanced transportation problem, Degeneracy. Assignment problem, optimal solution, Variants of Assignment Problem-Traveling Salesman problem.**UNIT - III****THEORY OF GAMES:** Minimax (maximin) Criterion and optimal strategy, Solution of games with saddle points, Rectangular games without saddle points, 2 X 2 games – dominance principle – m X 2 & 2 X n games, and graphical method.**INVENTORY CONTROL:** EOQ model, Shortages not allowed, Deterministic models, Probabilistic models, Price breaks**UNIT - IV****THEORY OF REPLACEMENT:** Introduction, Replacement of Equipment that Deteriorates Gradually, Replacement of Equipment that fails suddenly, Group Replacement.**WAITING LINES:** Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.**UNIT - V****Dynamic Programming:** Bellman's Principle of optimality, Applications of dynamic programming, capital budgeting problem, linear programming problem.**Introduction to Optimization:** Introduction, Engineering Applications of Optimization, Problem Statement – Design Vector, Design Constraints, Constraint surface, Objective function, Objective function Surfaces. Classification of optimization problems, Optimization Techniques – Introduction, Single-variable Optimization.

TEXT BOOKS

1. Kantiswarup. P.K.Gupta, Man Mohan, Operations Research, Sultan Chand& Sons, Educational Publications, New Delhi, 14th Edition, 2008.
2. Hiller & Libermann, Introduction to O.R (TMH), 9TH EDITION, 2009

REFERENCES

1. Singiresu S Rao, Engineering Optimization: Theory and Practice, A Wiley-Interscience Publication, 4th edition, 2009.
2. A.M.Natarajan, P.Balasubramani, A. Tamilarasi, Operations Research, Pearson Education, 2nd edition, 2014.
3. Taha, Introduction to O.R .PHI, 9th edition, 2010.

S157 - CLOUD COMPUTING

(Common to EIE, CSE, IT)

Course Educational Objectives:

After completing this course, students will be able to:

- Discuss, with confidence, what is cloud computing and what are key security and control considerations within cloud computing environments.
- Assess cloud characteristics and service attributes, for compliance with enterprise objectives
- Recognize steps and processes used to perform an audit assessment of a cloud computing environment. Summarize specific environments that would benefit from implementing cloud computing, contrasted against those environments that might not benefit.
- Weight the impact of improperly controlled cloud computing environments on organizational sustainability.

Course Outcomes:

- **CO 1:** Presents fundamental concepts of cloud computing, charting their evolution, Delivery models, and Deployment models, can present models for migrating applications to cloud environments.
- **CO 2:** Cover IaaS, from enabling technologies such as virtual machines and virtualized storage, to sophisticated mechanisms for securely storing data in the cloud and managing virtual clusters.
- **CO 3:** Describe PaaS/IaaS, detailing the delivery of cloud hosted software and applications. The design and operation of sophisticated, auto-scaling applications and environments
- **CO 4:** Presents monitoring and management mechanisms for Cloud Computing. Architectures for federating cloud computing resources are explored, as well as service level agreement (SLA) management and performance prediction.
- **CO 5:** develop some novel applications that have been made possible by the rapid emergence of cloud computing resources. Best practices for architecting cloud applications, describing how to harness the power of loosely coupled cloud resources.

Pre requisite: Knowledge of issues related to computing.

UNIT - I

Foundations: Introduction to Cloud Computing, Migrating into a Cloud Enriching the 'Integration as a Service' Paradigm for the Cloud Era, Cloud Computing for Enterprise Applications

UNIT – II

Infrastructure as a Service (IaaS): Virtual Machines Provisioning and Migration Services, On the Management of Virtual Machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a Cluster as a Service.

UNIT - III

Platform and Software as a Service (PaaS): Aneka – Integration of Private and Public Clouds, CometCloud: An Autonomic Cloud Engine, T-Systems' Cloud-Based Solutions for Business Applications,

UNIT – IV

Software as a Service(SaaS):

Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments, TheMapReduce Programming Model and Implementations

UNIT - V

Monitoring and Management, Applications: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing: A Service Provider's Perspective, Performance Prediction for HPC on Clouds, Architecting Applications for the Amazon Cloud.

TEXT BOOKS

1. RajkumarBuyya,JamesBroberg,AndrzejGoscinski, "Cloud Computing: Principles and Paradigms", Wiley, New York, USA
2. Michael Miller, Cloud Computing – Web Based Applications That Change the way you Work and Collaborate Online, Pearson Education.

REFERENCES

1. George Reese , Cloud Application Architectures, O'Reilly Media, 1st Edition.
2. David S. Linthicum, Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide, Addison-Wesley Professional
<http://www.cloudbus.org/intro.html>

S377 - SERVICE ORIENTED ARCHITECTURE**Course Educational Objectives:**

To make students enable to

- Understand the concepts of Service Oriented Architecture along with the evolution of SOA.
- Know related technologies and implementation basics of SOA.
- Integrate SOA technologies with Web Services paradigms.

Course Outcomes

- Understanding the characteristics , architectures and principles of service orientation.
- Student will get demonstrated the web services , message exchange patterns and different service layers
- Student will demonstrate an understanding of the business and technical challenges
- Student will be able to create a model and simulation of a SOA application using one or more current academic or professional modeling and simulation software tools.
- Understanding the knowledge of web services

Pre requisite: Knowledge on designing and client server application.

UNIT - I

Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- How components in an SOA interrelate - Principles of service orientation

UNIT - II

Web services – Service descriptions – Messaging with SOAP –Message exchange Patterns – Coordination –Atomic Transactions – Business activities – Orchestration – Choreography - Service layer abstraction – Application Service Layer –Business Service Layer – Orchestration Service Layer

UNIT - III

Service oriented analysis – Business-centric SOA – Deriving business services- service modeling - Service Oriented Design– WSDL basics – SOAP basics – SOA composition guidelines – Entity-centric business service design – Application service design – Task centric business service design

UNIT - IV

SOA platform basics – SOA support in J2EE – Java API for XML-based web services (JAX-WS) - Java architecture for XML binding (JAXB) – Java API for XML Registries (JAXR) - Java API for XML based RPC (JAX-RPC)- Web Services Interoperability Technologies (WSIT) - SOA support in .NET – Common Language Runtime - ASP.NET web forms – ASP.NET web services – Web Services Enhancements (WSE)

UNIT - V

WS-BPEL basics – WS-Coordination overview - WS-Choreography, WS-Policy, WSSecurity

TEXT BOOK

Thomas Erl, “Service-Oriented Architecture: Concepts, Technology, and Design”, Pearson Education, 2005.

REFERENCES

1. Thomas Erl, “SOA Principles of Service Design “, PHI ,Service-Oriented Computing Series from Thomas Erl, 2005.
2. Newcomer, Lomow, “Understanding SOA with Web Services”, Pearson Education, 2005.
3. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services, An Architect’s Guide”, Pearson Education, 2005.
4. Dan Woods and Thomas Mattern, “Enterprise SOA Designing IT for Business Innovation” O’REILLY, First Edition, 2006.

S228 - EMBEDDED SYSTEMS

Course Educational Objectives:

- Understand and design embedded systems and real-time systems
- Identify the unique characteristics of real-time systems
- Explain the general structure of a real-time system
- Define the unique design problems and challenges of real-time systems
- Apply real-time systems design techniques to various software programs.
- A survey of contemporary Real-time operating systems like microkernel based system.

Course Outcomes:

- Application of project management techniques to embedded systems projects
- Application of knowledge of embedded systems engineering technology, along with some specialization in at least one area of computer systems engineering technology.
- Application of mathematics including differential and integral calculus, probability, and discrete mathematics to hardware and software problems
- A broad education and knowledge of contemporary issues necessary to reason about the impact of embedded system based solutions to situations arising in society.
- Identification and synthesis of solutions for embedded system problems.
- Design, execution and evaluation of experiments on embedded platforms. Analysis, design and testing of systems that include both hardware and software.

Pre requisite: Knowledge of micro processors.

UNIT - I

Introduction to Embedded System: Components of Embedded System – Classification - Characteristic of embedded system- Microprocessors & Micro controllers- Introduction to embedded processors - Embedded software architectures: Simple control loop - Interrupt controlled system - Cooperative multitasking - Preemptive multitasking or multi-threading - Micro kernels and exokernels - Monolithic kernels - Exotic custom operating systems.

UNIT - II

Embedded Hardware Architecture – 32 Bit Microcontrollers: ARM 2 TDMI core based 32 Bit microcontrollers and family of processors, Register, Memory and Data transfer, Arithmetic and Logic instructions, Assembly Language, I/O operations interrupt structure, ARM cache. ARM Bus, Embedded systems with ARM. **Networks for Embedded systems:** Serial bus protocols: The CAN bus, and the USB bus, Parallel bus protocols: The PCI Bus and GPIB bus.

UNIT - III

Software Development: Embedded Programming in C and C++ - Source Code Engineering Tools for Embedded C/C++ - Program Modeling Concepts in Single and Multiprocessor Systems - Software Development Process - Software Engineering Practices in the Embedded Software Development – Hardware / Software Co-design in an Embedded System.

UNIT - IV

Real Time Operating Systems: Tasking Models, Task States, Services and Transitions - Real-Time Scheduling Algorithms: Round-Robin, FIFO, Priority-Based Preemptive Scheduling - Rate-Monotonic Scheduling - Priority Inversion and Priority Ceiling - Deadlocks - Process Synchronization – IPC - Shared Memory, Memory Locking, Memory Allocation - Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual Sockets.

UNIT - V

Study of Micro C/OS-II or Vx Works: RTOS System Level Functions – Task Service Functions – Time Delay Functions – Memory Allocation Related Functions – Semaphore Related Functions – Mailbox Related Functions – Queue Related Functions – Case Studies of Programming with RTOS.

TEXT BOOKS

1. Rajkamal, "Embedded System: Architecture, Programming and Design" TMH, 2003. (UNITs I, III, IV & V)
2. Wayne Wolf, "Computers as Components – Principles of Embedded Computing System Design", Harcourt India Pvt. Ltd., Morgan Kaufmann Publishers, First Indian Reprint, 2001. (UNIT II)

REFERENCES

1. Steve Heath, "Embedded Systems Design", Newnes, Second edition, 2003.
2. SriramIyer and Pankaj Gupta, "Embedded Real Time Systems Programming", TMH, 2004.
3. Noergaard, "Embedded System Architecture", Elsevier India Private Limited, 2005.

S322 - NEURAL NETWORKS AND FUZZY LOGIC
(Common to CSE, ECE)

Course Educational Objectives:

Upon successful completion of this subject students should be able to

- Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory
- Explore the functional components of neural network classifiers or controllers, and the functional components of fuzzy logic classifiers or controllers
- Develop and implement a basic trainable neural network or a fuzzy logic system for a typical control, computing application or biomedical application.

Course Outcomes

This subject also contributes specifically to the development of the following course

intended learning outcomes:

- Identify, interpret and analyse stakeholder needs.
- Establish priorities and goals
- Identify constraints, uncertainties and risk of the system (social, cultural, legislative, environmental, business etc.)
- Apply systems thinking to understand complex system behaviour including interactions between components and with other systems (social, cultural, legislative, environmental, business etc.)
- Identify and apply relevant problem solving methodologies
- Engineering and IT practice involves the coordination of a range of disciplinary and interdisciplinary activities to arrive at problem and design solutions.

Pre requisite: Knowledge of artificial intelligence

UNIT-I

Introduction to Neural Networks: Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

Essentials of Artificial Neural Networks: Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN-Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules

UNIT-II

Single Layer Feed Forward Neural Networks: Introduction, Perceptron Models: Discrete, Continuous and Multi-Category Training Algorithms, Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications

Multilayer Feed Forward Neural Networks: Credit Assignment Problem, Generalized Delta Rule, Derivation of Back propagation (BP) Training, Summary of Back propagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT-III

Associative Memories: Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem.

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis

UNIT – IV

Classical Sets & Fuzzy Sets:Introduction to classical sets – properties, Operations and relations; Fuzzy sets, Membership,Uncertainty, Operations, Properties, fuzzy relations, cardinalities, membership functions.

UNIT – V

Fuzzy Logic System Components: Introduction, Fuzifications, Membership Value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

TEXT BOOKS

1. S.N.Sivanandam, S.Sumthai, S.N.Deepa, “Introduction to Neural Networks using MATLAB 6.0”, Tata McGraw Hill Publications, India, 2005.
2. S.N.Sivanandam, S.Sumthai, S.N.Deepa, “Introduction to Fuzzy Logic using MATLAB”, Springer Verlag Publishers Ltd, Germany,2007.

REFERENCES

1. S.N.Sivanandam, S.N.Deepa, “Principles of Soft Computing”, Wiley India Ltd, India, 2007.
2. Simon Haykin,” Neural Networks - A comprehensive foundation “, Pearson Education, 2001.
3. James A Freeman and DavisSkapura, Neural Networks, Pearson Education, 2002

S296 - MANAGING INNOVATION AND ENTREPRENEURSHIP**Course Educational Objectives:**

- To understand the nature of entrepreneurship.
- To motivate the Entrepreneurial instincts.
- To give a clear picture about the process and involved in setting up an small scale industrial settings and bigger settings.
- To make the potential entrepreneurs know about the possible risks and failures of the product make them learn how to overcome these problems

Course Outcomes:

- Can develop various business related skills like marketing, quality management, production, distribution and human resource management etc.
- Will be able to startup and handle the own enterprise.
- Will be able to develop team building, planning skills and above all broad vision about the business.
- Would be in a position to convert and innovative thought into a commercial opportunity, which can boost up the economy.

Pre requisite: Knowledge of managerial economics

UNIT – I**Creativity and Innovation**

Concepts, shifting, composition of the economy, purposeful innovation and seven sources of innovative opportunity, the innovation process. Innovative strategies: strategies that aim at introducing an innovation. Innovation and entrepreneurship: can they work together? Planning – incompatible with innovation and entrepreneurship.

UNIT – II**Introduction to Entrepreneurship**

Definition of Entrepreneur, Entrepreneurial Traits, Traditional entrepreneurship vs Modern Entrepreneurship, Entrepreneur vs. Manager, Entrepreneur vs Intrapreneur. The Entrepreneurial decision process. Role of Entrepreneurship in Economic Development, Ethical, Environmental challenges and Social responsibility of Entrepreneurs. Opportunities for Entrepreneurs in India and abroad. Woman as Entrepreneur.

UNIT - III**Creating and Starting the Venture**

Sources of new Ideas, Generation of new entry Opportunity, Opportunity Analysis, creating, problem solving, product planning and development process. SWOT Analysis; first-Mover advantages and disadvantages. Types of business organizations, Features and evaluation of joint ventures, acquisitions, merges, franchising.

UNIT - IV**The Business Plan, Financing and Managing**

Nature and scope of Business plan, Writing Business Plan, Evaluating Business plans, Using and implementing business plans. Marketing plan, Introduction to financial plan and the organizational plan, Assessment of Benefits and Costs Government grants and Subsidies Launching formalities. Survival and Success. Sources of capital, Record keeping, recruitment, motivating and leading teams, financial controls. Marketing and sales controls. E-commerce in Entrepreneurship, Internet advertising.

UNIT - V

Production and Marketing Management

Thrust of production management, Selection of production Techniques, plant utilization and maintenance, requirements at work place, materials management. Marketing functions, market segmentation, market research and channels of distribution, Sales promotion and product pricing.

TEXT BOOK

1. Hisrich : Entrepreneurship, TMH,New Delhi, 2009
2. Martin M.J.,“Managing innovation and entrepreneurship in technology based firm”, 1994, John Wiley

REFERENCES

1. Vasantha Desai Entrepreneurship, TMH,New Delhi, 2009
2. Rajeev Roy: Entrepreneurship, Oxford University Press, New Delhi,2010
3. V.Gangadhar, Narsimha Chary: Entrepreneurship Development, Kalyani Publishers, New Delhi, 2007
4. P.Narayana Reddy: Entrepreneurship. Cengage learning, New Delhi,2010.

S332 - OPTIMIZATION TECHNIQUES
(Common to CSE, EEE, EIE)

Course Educational Objectives

- Demonstrate knowledge and understanding of the basic ideas underlying optimization techniques;
- Demonstrate knowledge and understanding of some of the most common standard optimization models and how they can be solved;
- Appreciate some of the power of using the mathematical approach to optimization problems relevant to engineering;
- Develop mathematical optimization models for a range of practical problems;
- Formulate large-scale Linear and Integer Programming problems, input a problem into a computer efficiently, and then solve the problem.

Course Outcomes

- Graphical Methods of Optimization: with particular emphasis on problems involving two variables.
- Linear Programming: covering the simplex method, two-phase method, duality and sensitivity analysis.
- Integer Programming: covering branch and bound methods.
- Search Methods: including quadratic programs, KKT conditions, Steepest Descent and Newton's method.

Pre requisite: Knowledge Of mathematical functions.

UNIT –I**LINEAR PROGRAMMING (LP)**

Introduction through engineering applications, standard form of LP problem (LPP), Geometrical interpretation, simplex method and algorithm, two phases of simplex method, Numerical problems, Revised simplex method, Duality in LP, Dual simplex method, sensitivity analysis.

UNIT – II**APPLICATIONS AND EXTENSIONS OF LP**

Transportation problem, Assignment problem, Karmarkar's method, Quadratic programming and Applications to Engineering problems.

UNIT –III**NON-LINEAR PROGRAMMING – UNCONSTRAINED MINIMIZATION**

Interpolation methods, quadratic and cubic interpolation methods, Newton's method. Gradient Methods – Steepest descent, conjugate gradient, Newton's and quasi Newton methods, Davidon-Fletcher-Powell method, numerical problems.

UNIT –IV**NON-LINEAR PROGRAMMING – CONSTRAINED MINIMIZATION**

Lagrangian multipliers, Kuhn-Tucker conditions, sequential LP method, methods of feasible directions, Rosen's gradient projection method, Generalized reduced gradient method, Interior and exterior penalty function methods.

UNIT – V**NON-TRADITIONAL OPTIMIZATION TECHNIQUES**

Principle of optimality, computational procedure, engineering applications. Evolutionary Programming Techniques – Genetic Algorithm (GA), the three parameters of GA, computational procedure for both binary and analogue coded inputs. Introduction to Particle swarm Optimization. Numerical examples.

TEXT BOOKS

1. S.S. Rao, "Engineering Optimization – Theory and Practice", III Edition, John Wiley & Sons 1996 and New Age International Pvt Ltd., New Delhi, 2002.
2. Kalyanmoy Deb, "Optimization for Engineering Design - Algorithms and Examples", PHI Learning Private Ltd, New Delhi, 1995.

REFERENCES

1. K.V. Mittal and C Mohan, "Optimization Methods in Operations Research and Systems Analysis", II edition 1983, New Age International Publishers, New Delhi.
2. Christos H Papadimitriou and Kenneth Steiglitz, "Combinatorial Optimization – Algorithms and Complexity", Prentice Hall of India 1997.
3. J C Pant, "Introduction to Optimization & Operations Research", IV Edition, Jain Brothers, New Delhi.
4. D.E. Goldberg, "Genetic Algorithms in Search, optimization and machine learning: Reading, Mass", Addison-Wesley, 1989.
5. Winston, WL and Venkataramanan,M., "Introduction to Mathematical Programming", 4thEdn., Duxbury Press, 2002.

S373 - ROBOTICS AND AUTOMATION
(Common to CSE, EEE, EIE)

Course Educational Objectives

- Make it more orderly.
- Promote the experiments, where the mistake is part of learning and self-discovery.
- Be more responsible with their things.
- Develop greater mobility in their hands.
- Develop our knowledge
- Develop the ability to group, allowing people to socialize.
- Develop their creative abilities.
- Able to observe every detail.
- Develop learning in a fun way.

Course Outcomes

- Foundation in Robotics Technologies.
- Operate/ program / repair industrial robots
- Describe current status of robotics technology and new development.
- Operate CNC machine to produce a part with the process of designing, AutoCAD, format conversion, design input, CNC tool/path configuration, CNC simulation and CNC operation.
- Use various sensors to develop a automation cell.

Pre requisite: Knowledge of simulation

UNIT – I**AUTOMATION**

Introduction, Types and strategies of automation, pneumatic and hydraulic components circuits. Automated Material Handling : Types of equipment, functions, analysis and design of material handling systems, conveyor systems, Automated guided vehicle system

UNIT – II**ROBOTICS**

Introduction - Basic concepts – Robot anatomy –Components of robots- Robot motions – Number of D.O.F – Work volume – Classification of robots by control method – Specifications of robots.

UNIT – III**ACTUATORS**

Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits.

END EFFECTORS: Introduction – Types of end effectors – Mechanical grippers – Vacuum cups, magnetic grippers, adhesive grippers and others – Robot / End effectors interface – Considerations in gripper selection and design

UNIT – IV**ROBOT PROGRAMMING**

Methods of robot programming – Lead through method.-Textual robot languages – Generations of programming languages – Robot language structure – Motion commands – End effector and sensor commands – VAL II programming language.

UNIT – V

SENSORS

Acoustic, Optic, Pneumatic, Force/torque, optical encoders- Machine vision

ROBOT APPLICATION: Robots in Manufacturing and Non-Manufacturing applications – Future applications.

TEXT BOOK

1. Mikell P.Groover,”Automation, Production systems and computer Integrated Manufacturing”, PHI Private Limited,New Delhi.
2. MikellP.Groover, MITCHELL WEISS, ROGER N. Nagel& NICHOLAS G. Odrey; Industrial Robotics, McGraw- HILL International Editions.
3. R.K.Mittal and IJ Nagrath, Robotics and Control ,TMH, publishing company Limited, New Delhi.

REFERENCES

1. P. Radhakrishnan.S.Subramanyan,V.Raju,” CAD/ CAM / CIM”,New age international publishers
2. Robert J.Schilling, Fundamentals of robotics analysis & control, PHI learning private limited, New Delhi
3. SaeedB.Niku, Introduction to robotics analysis systems Application, PHI learning private limited, New Delhi
4. K.S.Fu, R.C Gonzalez and C.S.G.Lee, Robotics control, Sensing, vision, and intelligence; TMH International Editions
5. Richard D.Klafter, Thomus A. Chmielewski, Michael Negin, “ Robotic Engineering – An integrated approach”, PHI Private ltd, New Delhi

S241 - ENTERPRISE INFORMATION SYSTEMS**Course Educational Objectives**

- Be successfully employed in an Information Systems related field or accepted into a graduate program
- Engage in professional development through continuing education, certifications, professional organizations, or experience
- Live and work as contributing, well-rounded members of society

Course Outcomes

- An ability to apply knowledge of computing and mathematics appropriate to the discipline
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired standards
- An ability to function effectively on teams to accomplish a common goal
- An understanding of professional, ethical, legal, security and social issues and responsibilities
- An ability to communicate effectively with a wide range of audience.

Pre requisite: Knowledge of Databases/

UNIT - I**INTRODUCTION**

Data, Information, Intelligence, Information Technology, Information System, evolution, types based on functions and hierarchy, System Analyst – Role, Functions.

UNIT - II**SYSTEMS ANALYSIS AND DESIGN**

SDLC, SSILC, Systems Analysis and System Design, Tools – DFD – ER – Object modeling, DBMS – RDBMS – OODBMS.

UNIT - III**INFORMATION SYSTEM**

Financial, Marketing, Personnel, Production, Materials Information System, DSS, EIS, KMS, GIS, International Information System.

UNIT - IV**SECURITY AND CONTROL**

Security, Testing, Error detection, Controls, IS Vulnerability, Computer Crimes, Securing the Web, Intranets and Wireless Networks, Software Audit, Ethics in IT.

UNIT - V**NEW IT INITIATIVES**

e- business, e-governance, ERP, SCM, e-CRM, Data warehousing and Data Mining, Business Intelligence, Pervasive Computing, CMM.

TEXT BOOKS

1. Robert Schultheis and Mary Summer, Management Information Systems –The Managers View, TMH, 2008.
2. Kenneth C. Laudon and Jane Price Laudon, Management Information Systems – Managing the digital firm, PHI Learning / Pearson Education, PHI, Asia, 2002.

REFERENCES

1. Gordon Davis, Management Information System : Conceptual Foundations, Structure and Development, TMH, 2000.
2. Haag, Cummings and McCubbrey, Management Information Systems for the Information Age, TMH, 2005.
3. Turban, McLean and Wetherbe, Information Technology for Management – Transforming Organisations in the Digital Economy, John Wiley, 2007.
4. Raymond McLeod and Jr. George P. Schell, Management Information Systems, Pearson Education, 2007.
5. James O Brien, Management Information Systems – Managing Information Technology in the E-business enterprise, TMH, 2002.
6. Corey Schou and Dan Shoemaker, Information Assurance for the Enterprise – A Roadmap to Information Security, TMH, 2007.
7. Frederick Gallegor, Sandra Senft, Daniel P. Manson and Carol Gonzales, Information Technology Control and Audit, Auerbach Publications, 2007.