VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS)

ERODE – 12

Department of Computer Science

Course contents, Scheme of Examination, Credits and Syllabus

(for students admitted during 2016-2017 and onwards)

DEPARTMENT OF COMPUTER SCIENCE

B. Sc., Computer Science

Question Paper Pattern

CORE, ALLIED AND ELECTIVE PAPERS

Duration: 3.00 hrs **Marks: 75**

Section – A	**(10 × 1 = 10 marks)**
Multiple Choice Questions - 5 (One from each unit)	(Q. No 1 – 5)
Fill in the blanks / True or false - 5 (One from each unit)	(Q. No 6 – 10)
Section – B	**(5 × 5 = 25 marks)**
Answer all the Questions (Either or pattern)	
One Question from each unit	(Q. No 11 – 15)
Section – C	**(5 × 8 = 40 marks)**
Answer **five** out of **eight** Questions	
At least **One** Question from each unit	(Q. No 16-23)

SKILL BASED SUBJECTS

Five Questions out of **Eight** **(5 ×15 = 75 marks)**

SELF LEARNING PAPERS AND NON MAJOR ELECTIVE

Five Questions out of **Eight** **(5 ×20 = 100 marks)**

Vellalar College for Women (Autonomous), Erode - 12.									
Bachelor of Computer Science									
2016- 2017 onwards									
Course Content and Scheme of Examinations (CBCS Pattern)									
Semester I									
Part	**Study Component**	**Subject Code**	**Title of the Paper**	**Inst. Hrs./ Week**	**Exam. Dur. Hrs.**	**Max. Marks**			**Credits**
						CIA	**ESE**	**Total**	
I	Language I	15TAMU101 / 14HINU101	Tamil / Hindi	6	3	25	75	100	3
II	Language II	13ENHU101	English	6	3	25	75	100	3
III	Core	15CSUC101 / 15CAUC101	C Programming	5	3	25	75	100	4
		15CSUCP01/ 15CAUCP01	C Programming Lab	5	3	40	60	100	3
	Allied I	15CSUA101	Mathematics - I (Mathematical Structures for Computer Science)	6	3	25	75	100	5
	Foundation Course	09FOCU1ES	Environmental Studies	2	3	-	100	100	2
							Total	600	20
Semester II									
I	Language I	15TAMU202 / 14HINU202	Tamil / Hindi	6	3	25	75	100	3
II	Language II	13ENHU202	English	6	3	25	75	100	3
III	Core	15CSUC202 / 15CAUC202	Digital Fundamentals and Architecture	4	3	25	75	100	4
		10CSUC203 / 10CAUC203	Linux and Shell Programming	4	3	25	75	100	4
		15CSUCP02 / 15CAUCP02	Linux and Shell Programming Lab	3	3	40	60	100	1
	Allied II	15CSUA202	Mathematics - II (Discrete Strctures)	5	3	25	75	100	5
IV	Value Education	14VEDU2HR	Value Education and Human rights	2	3	-	100	100	2
							Total	700	22

Semester III									
Part	**Study Component**	**Subject Code**	**Title of the Paper**	**Inst. Hrs./ Week**	**Exam. Dur. Hrs.**	**Max. Marks**			**Credits**
						CIA	**ESE**	**Total**	
III	Core	15CSUC304 / 15CAUC304	Data Structures and Algorithms	5	3	25	75	100	4
		11CSUC305 / 11CAUC305 / 11CTUC305	Object Oriented Programming with Java	5	3	25	75	100	4
		15CSUC306	Microprocessor and its Applications	5	3	25	75	100	4
		15CSUCP03 / 15CAUCP03 / 15CTUCP03	Java Programming Lab	5	3	40	60	100	3
	Allied III	15CSUA303	Operation Research	5	3	25	75	100	5
IV	Skill based Subject I			3	3	40	60	100	3
	Basic Tamil I			2	-	100	-	100	2
	Advanced Tamil I				3	25	75		
	Non Major Elective I				3	-	100		
							Total	700	25

Semester IV									
III	Core	16CSUC407 / 16CAUC407/ 16ITUC511 / 16CTUC304	Relational Database Management Systems	5	3	25	75	100	4
		15CSUC408 / 15CAUC408	Web Programming	5	3	25	75	100	4
		15CSUC409 / 15CAUC306	Operating System	5	3	25	75	100	4
		15CSUCP04 / 15CAUCP04	Web Programming Lab	5	3	40	60	100	3
	Allied IV	15CSUA404/ 15CAUA303	Business Accounting	5	3	25	75	100	5
IV	Skill based Subject II	13CSUS402/ 13CAUS402 / 13CTUS402 / 13IT US402	Multi Skill Development Paper	3	1*	40	60	100	3
	Basic Tamil II			2	-	100	-	100	2
	Advanced Tamil II				3	25	75		
	Non Major Elective II				3	-	100		
* on line examination							Total	700	25

Semester V									
Part	**Study Component**	**Subject Code**	**Title of the Paper**	**Inst. Hrs./ Week**	**Exam. Dur. Hrs.**	**Max. Marks**			**Credits**
						CIA	**ESE**	**Total**	
III	Core	15CSUC510 / 15CAUC510	Computer Networks	6	3	25	75	100	4
		11CSUC511 / 08CAUC511/ 15ITUC306	Software Engineering	5	3	25	75	100	4
		16CSUC512 / 16CAUC512	Android Programming	5	3	25	75	100	4
		16CSUCP05 / 16CAUCP05	Android Programming Lab	5	3	40	60	100	3
	Elective I	08CSUE511 /	Client / Server Technology	6	3	25	75	100	5
		08CSUE521	Unified Modeling Language						
		15CSUE531/ 15CAUE521/ 15ITUE531/ 15CTUE521	Big Data Analysis						
IV	Skill Based Subject III			3	3	40	60	100	3
							Total	600	23
Semester VI									
III	Core	16CSUC613	Software Testing	5	3	25	75	100	4
		15CSUC614 / 15CAUC614	GUI Tools	5	3	25	75	100	4
		15CSUCP06 / 15CAUCP06	GUI Lab	5	3	40	60	100	3
		09CSUC6PV	Project *	6	-	-	100	100	5
	Elective II	11CSUE612 / 11CAUC613 / 11CTUE632	Wireless Application Protocol	6	3	25	75	100	5
		15CSUE622 / 15CAUE632/ 15ITUE612/ 15CTUE622	Internet Of Things						
		11CSUE632	Analysis and Design of Information Systems						
IV	Skill based Subject IV			3	3	40	60	100	3
V	Extension Activity		NSS/NCC/ Physical Education/ YRC/Green Society/EDP/CCC	-	-	-	-	100	1
							Total	700	25
* Project 80% , Viva-20% - Both Internal & External					Total (I - VI Semesters)			4000	140

SKILL BASED SUBJECTS		
S.No	**Subject Code**	**Title of the paper**
1	11CSUSP01 / 11CAUSP01 / 11ITUSP01 / 11CTUSP01	Database Management through Access - Lab (Cafeteria System)
2	13CSUS402 / 13CAUS402 / 13ITUS402 / 13CTUS402	Multi Skill Development Paper
3	16CSUSP03 / 16CAUSP03 / 16ITUSP03 / 16CTUSP03	Image Editing and Animation Tools - Lab (Cafeteria System)
4	11CSUSP04 / 11CAUSP04 / 11ITUSP04 / 11CTUSP04	DTP Design Tool - Lab (Pagemaker & Coreldraw) (Cafeteria System)
NON MAJOR ELECTIVES		
S.No	**Subject Code**	**Title of the paper**
1	14TMLU301	Basic Tamil *
	14TMLU402	
2	14ADTU301	Advanced Tamil **
	14ADTU402	
3	11CSUNP01 / 11CAUNP01 / 11ITUNP01 / 11CTUNP01	Data Processing through Excel Lab
	11CSUNP02 / 11CAUNP02 / 11ITUNP02 / 11CTUNP02	Web Designing Lab (Dream Weaver)

* For students whose Part I in Secondary Education is not Tamil.
** For students whose Part II in Higher Secondary Education is not Tamil

SELF LEARNING PAPERS (Optional)					
S.No.	**Subject Code**	**Title of the Paper**	**Exam. Dur. Hrs.**	**Max. Marks**	**Credits**
1	13CSUSL01	Computer Ethics	3	100	5
2	13AUGSL05	General Awareness	1*	100	5
3	16CSUSL15	Python	1**	100	5
4	16CSUSL25	PHP and MySQL	1**	100	5

* Online Examination

** Online Examination - Spoken Tutorial , IIT, Bombay

SEMESTER I

Core Paper I: C Programming

Instructional Hrs : 75 **Sub. Code: 15CSUC101 / 15CAUC101**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To understand fundamental principles of Problem Solving aspects, basic concepts and develop skills for writing programs using 'C.

UNIT I **15 Hrs.**

Introduction to Computer Problem Solving: Introduction – The Problem Solving Aspect – Top-Down Design. **Fundamental Algorithms:** Introduction – Exchanging the Values of Two Variables – Summation of a Set of Numbers – Factorial Computation – Generation of the Fibonacci Sequence – Reversing the Digits of an Integer.

UNIT II **15 Hrs.**

Overview of C – Constants, Variables, and Data Types – Operators and Expressions – Managing Input & Output Operations: Introduction – Reading a Character – Writing a Character – *Formatted Input – Formatted Output.*

UNIT III **15 Hrs.**

Decision Making and Branching: Introduction – Decision Making with if Statement – Simple if Statement – The if……else Statement – Nesting of if…..else Statements – The Else if Ladder – The Switch Statement – The?: Operator – *The Goto Statement.* **Decision Making and Looping:** Introduction – The While Statement – The do Statement – The for Statement – Jumps in Loops.

UNIT IV **15 Hrs.**

Arrays : Introduction – One dimensional arrays – Declaration of one dimensional array– Initialization of one dimensional arrays - Two dimensional arrays – Initializing two dimensional arrays – *Multidimensional arrays* – Dynamic arrays – More about arrays - **Character Arrays and Strings – User-defined Functions**.

UNIT V **15 Hrs.**

Structures and Unions: Introduction – Defining a structure – Declaring structure variables – Accessing structure members - Structure initialization – Copying and comparing structure variables – Operations on individual members – Arrays of structures – Array within structures – Structures within structures – Structures and functions - *Unions* – Size of Structures - Bit fields. **Pointers.**

Note: Self study topics are denoted in *Italics*

TEXT BOOKS

1. **R.G.Dromey**, *How to Solve it by Computer*, Pearson Education, Twelfth Impression, 2002
2. **Balagurusamy E.** *Programming in Ansi C*, Tata McGraw-Hill Publishing Company Limited – New Delhi. Sixth Edition, 2012

REFERENCE BOOK

Ashok N. Kamthane, *Programming and Data Structures*, Pearson Education, Pvt Ltd, New Delhi, 2009

SEMESTER I

Programming Lab I: C Programming Lab

Instructional Hrs. : 75 **Sub. Code : 15CSUCP01 / 15CAUCP01**

Max. Marks : CIA -40; ESE -60 **Credits: 3**

Objective : To write 'C' programs for solving simple problems and implement data structures.

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1. Write a program to find the sum, average, standard deviation for a given set of numbers.
2. Write a program to generate n Fibonacci nos.
3. Write a program to determine the prime numbers up to a given number.
4. Write a program to convert a decimal number into binary.
5. Write a program to multiply two matrices using functions.
6. Calculate the binomial co-efficient nCr using functions.
7. Write a program to check whether a given word is a palindrome or not.
8. Implement BINARY SEARCH to find a particular name in a list of names.
9. Write a program that declares and initializes a double, an int and a char. Next declare and initialize a pointer to each of the three variables. Your program should then print the address, value stored in and the memory size of each of the six variables.
10. Arrange a set of number in ASCENDING ORDER using Pointers.
11. Write a program to print the Student's Mark sheet assuming Register number, name, and marks in 5 subjects in a Structure. Create an array of Structures and print the mark sheet in the university pattern.
12. Write a program to count the number of alphabets, special characters and words from a line of text.

SEMESTER I

Allied Paper I: Mathematics - I

(Mathematical Structures for Computer Science)

(Derivations not included – Problems only)

Instructional Hrs. : 90 **Sub. Code : 15CSUA101**

Max. Marks : CIA -25; ESE -75 **Credits: 5**

Objective : To gain knowledge to solve Algebraic & Transcendental Equations, Numerical Differentiation, Interpolation, Measures of central tendency, Correlation, Regression

UNIT I **15 Hrs.**

Matrices – Introduction – Determinant – *Inverse of a Matrix* – Rank of a Matrix – Eigen Values of a Matrix.

UNIT II **20 Hrs.**

System of Simultaneous Linear Algebraic Equations: *Gauss Jordan and Gauss* Seidal Methods. **The Solution of Numerical, Algebraic & Transcendental Equations:** Newton – Raphson Method and False Position Method.

UNIT III **20 Hrs.**

Numerical Differentiation: Newton's Forward Difference Formula – Backward Difference Formula – Striling's Formula. **Numerical Integration**: *Trapezoidal Rule & Simpson's Rule (1/3 only).*

UNIT IV **15 Hrs.**

Measures of Central Tendency: Mean, Median and Mode – Relationship among Mean, Median and Mode. **Measures of Dispersion**: Range, *Mean Deviation and Standard Deviation.*

UNIT V **20 Hrs.**

Correlation: Karl Pearson's Coefficient of Correlation (One variable only) - *Rank Correlation* – Regression - Regression Equations. **Discrete Probability Distributions:** Fitting of Binomial & Poisson Distributions.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Gupta S.P. & Gupta M.P.,** *Business Statistics*, Sultan Chand and Sons, Fourteenth Edition, 2006 (Unit IV & V)
2. **Venkataraman M.K.,** *Numerical Methods in Science & Engineering*, National Publisher, Fifth Edition, 2005 (Unit II & III).
3. **Vital P. R**., *Allied Mathematics*, Third revised Edition (Unit I), Margham Publication, 2009.

REFERENCE BOOKS

1. **Balagurusamy E.,** *Numerical Methods*, Tata MCGraw Hill, Twenty Fifth Edition, 2008.
2. **Gupta S.C., Kapoor V.K.,** *Fundamentals of Mathematical Statistics*, Sultan Chand and Sons, Eleventh Edition, 2003.

SEMESTER I

Foundation Course: Environmental Studies

Instructional Hrs. :30 **Sub. Code : 09FOCU1ES**

Max. Marks : ESE -100 **Credits:2**

Objective : To gain awareness about the environment, hazards and social issues

UNIT I **6 Hrs.**

The multidisciplinary nature of environmental studies: Definition, Scope and importance, need for public awareness. **Natural resources and associated problems:** Forest resources, water resources, mineral resources, food resources, *energy resources*, land resources , role of an individual in conservation of natural resources, equitable use of resources for sustainable lifestyles.

UNIT II **6 Hrs.**

Concept of an ecosystem, structure and function of an ecosystem – *producers, consumers and decomposers*. **Energy flow in the ecosystem:** Food chain, food webs and ecological pyramids, ecological succession.

UNIT III **6 Hrs.**

Biodiversity and its conservation: *Introduction* – definition, genetic, spices and ecosystem diversity. **Conservation of biodiversity**: In-situ and Ex-situ conservation of biodiversity.

UNIT IV **6 Hrs.**

Definition, causes, effects and control measures of air pollution , water pollution , *soil pollution, noise pollution* & Thermal pollution. **Disaster management:** floods, earthquake, cyclone and landslides.

UNIT V **6 Hrs.**

Social Issues: Global warming, ozone layer depletion, acid rain, nuclear accidents and holocaust (case studies). *Consumerism and waste products,* **Environmental Protection Act**: Air, water, wildlife, forest issues involved in enforcement of environmental legislation and public awareness.

Note : Self study topics are denoted in *Italics*

FIELD WORK :

Visit to a local area to document environmental assets – river / forest / grass land / hill / mountain.

Visit to a local polluted site - urban / rural / industrial / agricultural.

Study of common plants, insects, birds.

Study of simple ecosystems – pond, river, hill slope, etc.

REFERENCE BOOK

Bharathiar University, *Environmental studies,* Published by Bharathiar University, Coimbatore.

SEMESTER II

Core Paper II: Digital Fundamentals and Architecture

Instructional Hrs. : 60 **Sub. Code : 15CSUC202/ 15CAUC202**

Max. Marks : CIA -25 ;ESE -75 **Credits:4**

Objective : To learn number systems and boolean algebra, combinational and sequential circuits and basic Architecture of a Computer.

UNIT I **12 Hrs.**

Binary Systems : Digital Computers and Digital Systems – Binary Numbers – Number base conversion – Octal and Hexadecimal Numbers – Complements – Binary Codes. **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 Logic Operations – Digital Logic Gates.

UNIT II **14 Hrs.**

Simplification of Boolean Functions: The Map method – Two and Three variable Maps – Four Variable Map – Product of Sums simplification – Don't Care Condition. **Combinational Logic:** Introduction – Design procedure – *Adders* – Subtractors – Code Conversion – Decoders – Multiplexers. **Flip-Flop:** RS Flip-Flop – JK Flip-Flop – D Flip-flop.

UNIT III **12 Hrs.**

Input – Output Organization: Peripheral Devices - Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – *Example of I/O Interface.*

UNIT IV **12 Hrs.**

Asynchronous data Transfer: Strobe Control and *Handshaking* – **Priority Interrupt**: Daisy-Chaining Priority, Parallel Priority Interrupt – Priority Encoder – Interrupt Cycle – Software Routines – Initial & Final Operations. **Direct Memory Access**: DMA Controller, DMA Transfer.

UNIT V **10 Hrs.**

Memory Organization: *Memory Hierarchy* – Main Memory – Auxiliary Memory - Associative memory. **Cache Memory**: Associative, Direct, Set-associative Mapping – Writing into Cache Initialization.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Morris Mano M.,** *Digital Logic and Computer Design*, Prentice Hall of India, 2006 (I, II Unit).
2. **Morris Mano M.,** *Computer System Architecture,* Pearson Pub, III Edition, 2006 (III, IV & V Unit).

REFERENCE BOOKS

1. **Albert Paul Malvino, Donald P Leach,** *Digital principles and Applications*, McGrawHill, 1996**.**
2. **Carter,** *Computer Architecture*, Schaum's outline series, TMH**,** 2007

SEMESTER II

Core Paper III: Linux and Shell Programming

Instructional Hrs. : 60 **Sub. Code :10CSUC203 / 10CAUC203**

Max. Marks : CIA -25 ;ESE -75 **Credits:4**

Objective : To learn the concept of Linux Operating System and shell programming

UNIT I **10 Hrs.**

Introduction to LINUX Operating System : Introduction - The LINUX Operating System.

UNIT II **10 Hrs.**

Managing Files and Directories : Introduction – Directory Commands in LINUX – *File Commands in LINUX*.

UNIT III **15 Hrs.**

Creating files using the vi editor: Text editors – The vi editor. **Managing Documents**: Locating files in LINUX – Standard files – Redirection – Filters – Pipes.

UNIT IV **15 Hrs.**

Securing files in LINUX : File access permissions – *viewing File access permissions* – Changing File access permissions. **Automating Tasks using Shell Scripts** : Introduction – Variables- Local and Global Shell variables – Command Substitution.

UNIT V **10 Hrs.**

Using Conditional Execution in Shell Scripts: Conditional Execution – Construct. **Managing repetitive tasks using Shell Scripts**: Using Iteration in Shell Scripts – The while construct – The until construct – The for construct – The break and continue commands – *Simple Programs using Shell Scripts*.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Operating System LINUX , NIIT , Prentice-Hall of India Private Limited, Eastern Economy Edition, New Delhi, 2006.

REFERENCE BOOK

Richard Petersen, *Linux: The Complete Reference*, Tata McGraw-Hill Publishing Company Limited, New Delhi, Sixth Edition, Edition 2008.

SEMESTER II

Practical II: Linux and Shell Programming Lab

Instructional Hrs. : 45 **Sub. Code : 15CSUCP02/ 15CAUCP02**

Max. Marks : CIA -40; ESE -60 **Credits: 1**

Objective : To get hands on experience in Shell programming

1. Write a shell script to stimulate the file commands : rm, cp, cat, mv, cmp, wc, split, diff.
2. Write a shell script to show the following system configuration :
    a) currently logged user and his log name
    b) current shell , home directory , Operating System type , current Path setting , current working directory
    c) show currently logged number of users, show all available shells
    d) show CPU information like processor type , speed
    e) show memory information
3. Write a Shell Script to implement the following: pipes, Redirection and tee commands.
4. Write a shell script for displaying current date, user name, file listing and directories by getting user choice.
5. Write a shell script to implement the filter commands.
6. Write a shell script to remove the files which has file size as zero bytes.
7. Write a shell script to find the sum of the individual digits of a given number.
8. Write a shell script to find the greatest among the given set of numbers using command line arguments.
9. Write a shell script for palindrome checking.
10. Write a shell script to print the multiplication table of the given argument using for loop.

SEMESTER II

Allied Paper II: Mathematics II

(Discrete Structures)

Instructional Hrs. :75 **Sub. Code: 15CSUA202**

Max. Marks: CIA -25; ESE -75 **Credits: 5**

Objective: To solve problems in Linear Programming, Transportation, Inventory Control, Replacement and Queuing Theory.

UNIT I **15 Hrs.**

Mathematical Logic: Connectives (Negation, Conjunction, *Disjunction*) – Statement Formulas and Truth Tables - Conditional and Bi-Conditional – Well-formed Formulas - Tautologies – Equivalence of Formulas – Duality Law – Tautological Implications.

UNIT II **15 Hrs.**

Normal Forms – DNF, CNF, PDNF & PCNF - **The Predicate Calculus:** Predicates, Variables, Quantifiers, Free and Bound Variables. **The Theory of Inference for the Statement Calculus:** Validity Using Truth Tables- Rule of Inference.

UNIT III **15 Hrs.**

Relations: Definition - Properties – Relation Matrix - Graph of a Relation – *Equivalence Relations* – Composition of Binary Relations. **Functions:** Definition – Types – Composition of Functions – Inverse Functions.

UNIT IV **15 Hrs.**

Grammar: Definition – Types of Grammars with examples. **Lattices:** Definition and Properties of Lattices. **Boolean algebra:** Definition – *Properties* – Minimization of Boolean Functions using K –Map.

UNIT V **15 Hrs.**

Graph Theory: Basic Concepts – Definitions – *Paths* - Matrix Representation of Graphs – Trees.

Note: **Self study topics are denoted in *Italics***

TEXT BOOK

Tremblay J.P.,and R.P. Manohar R.P., *Discrete Mathematical Structures with applications to Computer Science*, McGraw Hill, Forty Fourth Edition, 2014.

REFERENCE BOOKS

1. **Seymour Lipschutz** , *Schaums Outline Series: Discrete Mathematics*, McGraw Hill, 2nd Edition, 2008.

2. **Sharma J.K,** *Discrete Mathematics* ,Macmillan Publishers India Ltd, 2nd Edition, Reprint 2010.

SEMESTER II

Value Education: Value Education and Human Rights

Instructional Hrs : 30 **Sub Code: 14VEDU2HR**

Max Marks : CIA – Nil; ESE-100 **Credits : 2**

Objective : To gain knowledge about Human Values, Human Rights, Human Rights Issues, Human Rights Enforcements, Indian Constitution.

UNIT I **5 Hrs.**

Aim of Value Education – Concept of Human Values - Types of Values - Components of value education - Personal Development : *Character formation towards positive personality* - National Values

UNIT II **5 Hrs.**

Concept and theories of Human Rights – *Classifications of Human Rights* – Universal Declaration of Human Rights- International Covenant on civil and political rights – International covenant on Economic, Social and Cultural Rights.

UNIT III **10 Hrs.**

Rights Guaranteed by Indian Constitution - Constitutional vision of freedom: Fundamental Rights – *Fundamental duties*- Constitutional vision of Justice: Directive Principles of State policy.

UNIT IV **5 Hrs.**

Human Rights Issues: Gender Discrimination- *Domestic violence*- Child Labour - Bonded Labour.

UNIT V **5 Hrs.**

Human Rights Enforcements : National Human Rights Commission – State Human Rights Commission – Human Rights Courts – Role of NGO's : Amnesty International, Asia Watch – *Peoples Union for Liberties(PUCL),* Peoples Union for Democratic Rights (PUDR).

Note: Self study topics are denoted in *Italics*

REFERENCE BOOKS

1. **Mugammad Naqi**, *Modern Value Education*, Anmol Publications Pvt Ltd, New Delhi, 2007.
2. **Shrimali L.L**, *A Search for Values in Indian Education*, Vikas Publishers, Delhi, 1974.
3. **Acharya. N.K**, *The Constitution of India*, Asia Law House, Hyderabad, 2011.
4. **Misra R.**, *Human Rights*, Sumit Enterprises, New Delhi, First Edition, 2005.
5. **Nirmal S.J**, *Human Rights in India*, Oxford University Press, New Delhi, 2000.
6. **Durgadas Basu,** *Human Rights in Constitutional Law*, Prentice Hall of India, 1994.
7. **Bajwa G.S**., *Human Rights in India*, Anmol Publications, New Delhi,1995.

SEMESTER III

Core Paper IV: Data Structures and Algorithms

Instructional Hrs. : 75 **Sub. Code : 15CSUC304 /15CAUC304**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To learn the concept of data structures and implement fundamental data structures.

UNIT I **15 Hrs.**

Introduction – Overview – *How to Create Programs* - *How to* Analyze Programs **Arrays** – Axiomatization – Ordered Lists – Sparse Matrices - Representation of Arrays.

UNIT II **15 Hrs.**

Stacks and Queues – Fundamentals – Mazing Problem - *Evaluation of Expressions* - Multiple Stacks and Queues.

UNIT III **15 Hrs.**

Linked lists: Singly Linked Lists – Linked Stacks and Queues – The Storage Pool – Polynomial Addition - Sparse Matrices - Doubly Linked Lists and Dynamic Storage Management.

UNIT IV **15Hrs.**

Trees: Basic Terminology – Binary Trees – Binary Tree Representation – *Binary Tree Traversal* – Binary Tree Representation of Trees – **Applications of Trees:** Decision Trees. **Symbol Tables** – Hash Tables: Hashing Functions - Overflow Handling.

UNIT V **15Hrs.**

Internal Sorting: Searching – Insertion Sort – Quick Sort – Two way Merge Sort – Heap Sort. **Files**: File Organizations: Sequential, Random, Linked Organizations, Inverted Files, Cellular Partitions.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Ellis Horowitz and Sartaj Sahni, *Fundamentals of Data Structure*, Galgothia Book Source, 2003.

REFERENCE BOOKS

1. **Samanta**, **D.,** *Classic Data structure,* Prentice Hall of India Pvt Ltd, Ninth edition, 2007.
2. **Jean-Paul Tremblay & Paul G.Sorenson,** An Introduction to *Data Structures with Applications*, Tata McGraw Hill Company, 2nd Edition, 1998.

SEMESTER III

Core Paper V: Object Oriented Programming with Java

Instructional Hrs. : 75 **Sub. Code : 11CSUC305 / 11CAUC305 / 11CTUC305**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective: To have an understanding on the concept of OOPs through Java

UNIT I **15 Hrs.**

Fundamentals of Object-Oriented programming: Introduction-Object – Oriented Paradigm-Basic concepts of Object-Oriented Programming-Benefits of OOP-Applications of OOP. **JAVA Evolution:** History – Features – *How Java Differs from C and C++* - Java and Internet – Java and WWW – Web Browsers. **Overview of Java Language:** Introduction – Simple Java Program – Structure – Java Tokens – Statements – Implementing Java Program – Java Virtual Machine.

UNIT II **15 Hrs.**

Constants – Variables – Data Types - Operators and Expressions. *Decision Making and Branching:* If – If else, Else if ladder, Switch, ?: Operator. **Decision Making and Looping:** While, do, for – Jumps in Loops – Labeled Loops. **Classes**, **Objects and Methods**.

UNIT III **15 Hrs.**

Arrays, Strings and Vectors – **Interfaces:** *Multiple Inheritance* – **Packages**: Putting Classes together – Multi Threaded Programming.

UNIT IV **15 Hrs.**

Managing Errors and Exceptions: Introduction – Types of errors – Exceptions – Syntax of exception handling code - Multiple catch statements – Using finally statement – Throwing our own exceptions – Using exceptions for debugging. **Applet Programming** – *Graphics Programming.*

UNIT V **15 Hrs.**

Files: Introduction – Concept of Streams – Stream Classes – Using Streams - I/O Classes – File Class – I/O Exceptions – Creation of Files – Reading/ Writing Characters/ Bytes – Handling Primitive Data Types – *Random Access Files*.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Balagurusamy E., *Programming with Java* -A primer- TMH pub, 2nd Edition, 2005.

REFERENCE BOOKS

1. **John R.Hubbard**, *Programming with Java,* TMH Publication, 1999**.**
2. **Patrick Naughton and Herbert Schidt,** *The Complete Reference Java 2*, 3rd Edition, TMH Publication, 2000.
3. **Xavier C.,** *Programming with Java 2* , SciTech pub, 2000.

SEMESTER III

Core Paper VI: Microprocessor and Its Applications

Instructional Hrs. : 75 **Sub. Code : 15CSUC306**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective: To understand the concepts of Microprocessor and its Applications.

UNIT I **15 Hrs.**

Architecture and Pin Details of the 8085 Microprocessor: Concept of a Program-Basic Operation-Internal Architecture-Execution of an Instruction - Arithmetic and Logical Operations-Registers – Interrupt and Serial I/O - Pin Details of the 8085 Microprocessor. **Programming the Microprocessor-I**: Instruction Set - Data Transfer Operations - *Arithmetic Operations* - Program Examples - Logical Operations - Branching Operations - Program Examples.

UNIT II **15 Hrs.**

Programming the Microprocessor-II: Introduction-Data Transfer Instructions-Arithmetic Instructions-Logical Instructions - Subroutine and Stack - *PUSH and POP Instructions* - Other Instructions - Timing Diagram. **Interfacing Input and Output Devices:** Introduction - Interfacing and Address Decoding Circuits - I/O mapped input/output method -Memory mapped input/output. **Interrupts**: The Interrupts Concept - Accessing an Interrupt Service Routine - Working of the Interrupt Control Circuit - The Set Interrupt Mask (SIM) Instruction - The Read Interrupt Mask instruction - Keyboard Interrupt Program.

UNIT III **15 Hrs.**

Memory in a Microprocessor Based System: Introduction-Read –Write Memory: SRAM – DRAM – ROM Memory – Memory Device Internal Configurations – Memory Addressing – EPROM Organization – Memory Map and Memory Usage in 8085 Microprocessor System – Separating Address and Data Bus in 8085 System – Memory Address Decoding.

Programmable Peripheral Interface-8255: Introduction-Internal details of 8255-Operational Modes - A Mode O Application - A simple I/O Circuit-Programming the 8255-A Programming Example - Common Applications of Mode 0-Bit Set/Reset Operations-Mode 1 Operation - *A Mode 1 Applications* - A program to read the data from an A/D converter. **Keyboard and Display Interface-8279:** Introduction - Details of 8279 - Display Section-Keyboard Section - Interfacing 8279 with a Microprocessor - Concepts related to Keyboard and Display.

UNIT IV **15 Hrs.**

Priority Interrupt Controller-8259: Introduction-Overview of the 8259A – Connection Diagram of 8259A-Initialising 8259 - *Priority Modes* - Reading the Status. **Direct Memory Access – 8257:** Direct Memory Access operations – The DMA Controller 8257 - DMA Channel – The Concept of Priority – Control Logic to manage Data Transfer – Status Register Format – Accessing the DMA Address Register, Counter Register and Mode Set/ Status Register – The Salve Mode Operation – The Master Mode Operation.

UNIT V **15 Hrs.**

Microprocessor Based Applications: Digital Clock - Traffic Light Controller - Hex Keyboard Interface - *Seven Segment Display Interface* - Washing Machine Controller.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Theagarajan. R, Dhanasekaran. S, Dhanapal. S, Microprocessor and its Applications, New Age International Publications, 2007.

REFERENCE BOOK

Malarvizhi, Microprocessor and Its Applications, Educational Publishers, First edition March 1999.

SEMESTER III

Practical III: Java Programming Lab

List of Practical

Instructional Hrs. : 75 **Sub. Code : 15CSUCP03 / 15CAUCP03 / 15CTUCP03**

Max. Marks : CIA -40; ESE -60 **Credits: 3**

Objective : To implement the concepts of Object Oriented Programming using Java.

1. Write a java program to print Pascal's triangle.
2. Write a program to display multiplication table using default and argument constructors.
3. Write a program to find the area of the square, rectangle and triangle using the method of overloading.
4. Create a class employee which includes employee number, name, year of experience. To accept N number of employee details, and sort it by employee name wise.
5. Write a program to extract a portion of a character string and print the extracted string.
6. Define an interface having one method that takes an integer parameter. For this method, provide two implementations: In the first one, just print the value and in the second one, print the square of the number. Try to call both the versions.
7. Create a package to calculate arithmetic operations of two numbers and another package to calculate logical operations of two numbers. Write a java program to use these packages.
8. Write a program using threads to increment a shared variable.
9. Create a program to handle three types of exceptions.
10. Design an applet program to draw several shapes.
11. Create an applet program to draw human eyes at mouse click position
12. Write a java program to manage purchase details using Random Access file.

SEMESTER III

Allied Paper III: Operation Research

(Derivations Not Included – Problems Only)

Instructional Hrs. 75 **Sub. Code: 15CSUA303**

Max. Marks: CIA -25; ESE -75 **Credits: 5**

Objective: To understand the concepts of Operation Research.

UNIT I **15 Hrs.**

Linear Programming Problem: Introduction – Mathematical Formulation of the Problem – Graphical Solution – General Form of LPP – Canonical & Standard form of LPP – *Simplex Method* – Big-M Method.

UNIT II **15 Hrs.**

The Transportation Problem: Mathematical Formulation of the Problem – Initial Basic Feasible Solution (North-West Corner Rule, Minimum Cost Method, Vogel's Approximation Method) – Moving towards Optimality – *Unbalanced Transportation Problems.*

UNIT III **15 Hrs.**

Assignment Problem: Mathematical Formulation of an Assignment Problem – *Hungarian Assignment Method* – Unbalanced Assignment Problems. **Inventory Control:** Introduction – Various Costs involved in Inventory – EOQ models without Shortage – EOQ models with Shortage – Buffer Stock & Reorder Level.

UNIT IV **15 Hrs.**

PERT – CPM: Introduction – Rules of Network Construction – Critical Path Method – *PERT Calculations.*

UNIT V **15 Hrs.**

Replacement Problems: Introduction – Replacement of Equipments that deteriorates gradually - Replacement of Equipment that fails suddenly. **Queuing Theory:** Introduction – *Characteristics of Queuing System*. Problems from Single Server with Infinite and Finite Population model.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Kanti Swarup, P. K. Gupta & Man Mohan, *Operations Research,* Seventeenth Thoroughly Revised Edition, Sultan Chand & Sons, Educational Publishers, New Delhi, Eleventh Reprinted, 2003.

REFERENCE BOOK

Gupta P.K., Hira D.S., *Introduction to Operation Research,* Sultan Chand & Sons Company Pvt .Ltd, New Delhi, First Edition, 1976.

SEMESTER III

Skill Based Subject I: Data Base Management Through Access (Lab)

Instructional Hrs. : 45 **Sub.Code : 11CSUSP01 / 11CAUSP01 / 11ITUSP01 / 11CTUSP01**

Max. Marks : CIA -40; ESE -60 **Credits: 3**

Objective : To create and manipulate database through Access.

1. Create an employee table with the following fields.
    a) Number, Name, Dept, Designation, Address1, Address2, City.
    b) Set the number as primary key
2. Modify the employee table structure
    a) Delete the address field.
    b) Add experience salary field
    c) Insert the primary key.
3. Update the designation and salary for those who have completed 10 years of service in the employee table.
4. Sort the employee table by name and date of joining.
5. Filter the table content using
    - Filter by form
    - Filter by selection
6. Display the employee details by department wise and date of joining wise.
7. Create a query to display date of joining, designation of those who have completed 15 yrs.
8. Design a form to display employee number, name, department, service and salary.
9. Create a report to display employee number, name, salary and designation.
10. Import data from Excel sheet.

SEMESTER III

Non Major Elective I: Data Processing Through Excel -Lab

Instructional Hrs. : 30 **Sub. Code : 11CSUNP01**

Max. Marks : CIA -Nil; ESE -100 **Credits: 2**

Objective : To create, edit and format Worksheet, analyse data using advanced features in Excel

1. Create a worksheet and perform the following formats for a list containing text, data and number.
    a. Aligning entries –Indent, Rotate etc.
    b. Formatting Borders, Date and Numbers.
    c. Conditional Formatting.
    d. Creating a custom style.

2. Create a sheet containing Nation-wide sales results for Avon Helmets-Region, Vendor name, Helmet type, Helmet Color and Total sales.
    a. Sort the data by Region, Vendor name and sales.
    b. Sort the data according to a custom list of Helmet Color - Red, Blue, Yellow and Green.

3. Create a sheet containing Nation-wide sales results for Avon Helmets- Region, Vendor name Helmet type, Helmet Color and total sales.
    a. Use Filtering on Region and Helmet type.
    b. Use subtotal function to count the number of records and sum of sales for the filtered records.

4. Use Query Wizard to filter East, West Region transaction and sort them on Region and Total sales.

5. Perform the following

   a. Create a list of vendor and total sales by consolidating the total sales.
   b. Compute sub totals with no detail data.
   c. Create Subtotals by both Region and Vendor within Region.

6. Create a PIVOT TABLE to show the sales results by Region and Helmet type and summarize the total sales.

7. Create a PIVOT chart for the pivot table of total sales for the Region and Helmet types.

8. Create a bar chart to show the sales results for different Helmet type and to the following formats.

   a. Add a Secondary axis.
   b. Create picture markers.

SEMESTER IV

Core Paper VII : Relational Database Management Systems

Instructional Hrs: 75 **Sub. Code: 16CSUC407/ 16CAUC407 / 16ITUC511 / 16CTUC304**

Max. Marks: CIA – 25; ESE – 75 **Credits: 3**

Objective: To learn the basic principles of database and design, basics of RDBMS, Object Based Databases and database manipulation using SQL

UNIT I **15 Hrs.**

Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De-normalization.

UNIT II **15 Hrs.**

Oracle9i: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - iSQL *Plus.

Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

Implementing the SQL*Plus Commands using Create, Update, Alter, Drop, Rename, Truncate and Spooling

UNIT III **15 Hrs.**

Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure.

Writing queries to Add, Update, Delete records, Retrieving data from a table using Where and ORDERBY Clause.

UNIT IV **15 Hrs.**

Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations. ***Designing queries using Built in functions.***

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators.

UNIT V **15 Hrs.**

Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements.

Implementing the basic control structures in PL/SQL – sequential structure, selection structure and looping structure.

PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions. **PL/SQL Named Blocks :** Procedures – *Functions* – Packages –Triggers.

Declaring Cursor, Exception, Functions and Triggers.

Note: Lab activities are denoted in ***Bold Italics.***

TEXTBOOK

Nilesh Shah, *Database Systems Using Oracle,* 2nd edition, PHI, 2008.

(UNIT I: Chapters 1 & 2 UNIT II: Chapters 3 & 4 UNIT III: Chapters 5 & 6 UNIT IV: Chapters 10 & 11 UNIT V: Chapters 12, 13 & 14)

REFERENCE BOOKS

1. **Arun Majumdar, Pritimoy Bhattacharya**, *Database Management Systems,* TMH, 2007.
2. **Gerald V. Post**, *Database Management Systems,* TMH, 3rd edition. 2008.

SEMESTER IV

Core Paper VIII: Web Programming

Instructional Hrs. : 75 **Sub. Code: 15CSUC408 / 15CAUC408**

Max. Marks: CIA -25; ESE -75 **Credits: 4**

Objective: To learn Web programming using HTML, CSS and JavaScript.

UNIT I **15 Hrs.**

Introduction : History of the Internet and World Wide Web – Key Software Trend- Object Technology – JavaScript : Object-Based Scripting for the Web. **Introduction to HTML :** Introduction - Editing HTML – Headings – Linking – *Images* –Special Characters, Horizontal Rules – Lists – Tables –Forms - – Internal Linking - Meta Element and Frameset Element.

UNIT II **13 Hrs.**

Cascading Style Sheets (CSS): Introduction – Inline Styles - Embedded Style Sheets - Conflicting Styles – Linking External Style Sheets – Positioning Elements – *Backgrounds* – Element Dimensions – Text Flow and Box Model – User Style Sheets – CSS3.

UNIT III **16 Hrs.**

Introduction to Scripting: JavaScript – Introduction to Scripting – Simple Programs - Memory Concepts – Arithmetic – Decision Making : Equality and Relational Operators –Control Structures – if Selection statement- if..else Selection Statement – while Repetition Statement – Assignment operators- Increment and Decrement Operators - Essentials of counter-controlled repetition – **for** repetition Statement **–** switch Multiple Selection Statement **– do..while** Repetition Statement – The **break** and **continue** Statements – Labeled break and Continue Statements - *Logical operators*.

UNIT IV **16 Hrs.**

Functions: Program Modules in Java Script - Programmer-Defined Functions - Function Definitions – Scope Rules – JavaScript Global Functions - *Recursion* – Recursion vs. Iteration.

Arrays: Arrays - Declaring and allocating Arrays – Examples using Arrays - References and Reference Parameters – Passing Arrays to Functions - Sorting arrays – Searching Arrays : Linear and Binary Search – Multidimensional Arrays.

UNIT V **15 Hrs.**

Objects: Introduction to Object Technology -Math Object - String Object - Date Object - Boolean & Number Objects - *Document Object* - Window Object - using Cookies. **Events :** Introduction – Registering event Handlers – Event onload – Event onmousemove, the event Object and this – Rollovers with onmouseover and onmouseout – Form Processing with onfocus and onblur – More Form Processing with onsubmit and onreset – Event Bubbling – More Events.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

P.J.Deitel & H.M.Deitel, *Internet and World Wide Web – How to Program*, Prentice Hall of India, Fourth Edition, 2009.

REFERENCE BOOKS

1. **Deitel, Deitel & Neito,** *XML – How to Program*, Pearson Education, Asia, 2013.
2. **Shelley Powers, et al.,** *Dynamic Web Publishing Unleashed*, Second Edition, Techmedia, New Delhi, 1998.
3. **Thomas A.Powell,** *HTML: The Complete Reference*, Tata McGraw Hill Second Edition, 2000.
4. **Xavier C.,** *World Wide Web design with HTML*, Tata McGraw-Hill Publishing Company, New Delhi, 2007.

SEMESTER IV

Core Paper IX: Operating System

Instructional Hrs. : 75 **Sub. Code : 15CSUC409 / 15CAUC306**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To learn the basic concepts and functions of Operating System.

UNIT I **14 Hrs**.

Introduction: What is an Operating System?. **Process Concepts:** Definition of Process – Process States – Process States Transitions – The Process Control Block – *Operations of Processes* – Suspend and Resume - Interrupt Processing. **Asynchronous Concurrent Processes** : Mutual Exclusion – Critical Sections – Semaphores. **Deadlock and Indefinite Postponement.**

UNIT II **14 Hrs.**

Storage Management - Real Storage: Real Storage Management Strategies – Contiguous Versus Non-Contiguous Storage Allocation – Single User Contiguous Storage Allocation – Fixed Partition Multiprogramming – Variable Partition Multiprogramming. **Virtual Storage**: Virtual Storage Management Strategies – Page Replacement Strategies – Demand Paging – *Page Size***.**

UNIT III **15 Hrs.**

Processor Management - Job and Processor Scheduling: Introduction – Scheduling Levels, Objectives, Criteria - Preemptive Vs Non-Preemptive Scheduling – *Priorities* – Deadline Scheduling – FIFO – RR – SJF – SRT – HRN

UNIT IV **16 Hrs.**

Auxiliary Storage Management - Disk Performance Optimization: Introduction - Operation of Moving-Head Disk Storage – Need for Disk Scheduling – Characteristics of Disk Scheduling Policies - Seek Optimization – *RAM Disks - Optical Disks.*

UNIT V **16 Hrs.**

File and Database Systems: Introduction – The File System – File System Functions – File Organization – Allocating and Freeing Space – File Descriptor – Access Control Matrix.- Access Control by User Classes.

Case Study: LINUX : *Introduction – Unix and Linux Comparison – Process Management – File Management – Device Drivers – Security.*

Note : **Self study topics are denoted in *Italics***

TEXT BOOK

Deitel H.M, Operating Systems, Pearson Education Publication, 2nd Edition, 2003.

REFERENCE BOOK

Achyut S Godbole, Operating System, TMH Publications, 2002.

SEMESTER - IV

Programming Lab IV : WEB PROGRAMMING LAB

List of Practical

Instructional Hrs. : 75 **Sub. Code : 15CSUCP04 / 15CAUCP04**

Max. Marks : CIA -40; ESE -60 **Credits:3**

Objective : To design web pages using simple HTML, CSS and Javascript

1. Create a web page with
    1. Correct Structure (header and body)
    2. A title
    3. At least two different headings, with separate content following each heading
    4. An unnumbered list with at least 3 items
    5. A numbered list with at least 3 items
    6. At least 4 links to other web pages
    7. At least 1 picture
2. Create a XHTML Document using nested list with indentation
3. Create a XHTML Document using frames and images.
4. Use HTML and CSS to create a 3 column layout with a top banner section, 3 columns, and a bottom footer section. First column contains Buttons, second column shows the main content and third column contains advertisements.
5. Write CSS to make the following style changes:
    a) All elements in the body should have a white background with a text color of #330033 and the font Verdana or any serif available.
    b) The first-level headers are 40px bold serif font. The second-level headers are 24px underlined sans serif.

c) Paragraph text and lists should have a width of 550px and a top and bottom padding of 10px.

d) Ordered lists should have a background color of #FFCC99 and unordered lists should have a background color of #CCFFCC. All list elements should be in italics.

e) Links should never show the default underlining and upon hovering they should become neon green(#33ff33)

6. Write a recursive function GCD that returns the greatest common division of x and y. The GCD of x and y is defined recursively as follows: if y is equal to 0 then GCD(x,y) is x; otherwise GCD(x,y) is GCD(y,x%y) where % is the modulus operator. Write a XHTML document to implement this function.

7. Write a function PERFECT that determines whether the given parameter is a perfect number. Use this function in a script that determines and displays all the perfect numbers between 1 and 1000.

8. Write a program to read numeric data and sort them using bubble sort.

9. Write a program to search for a number using binary search.

10. Create a XHTML document using functions to calculate the volume of a sphere, cylinder and a cube. Use radio buttons for selecting a particular shape.

11. Write a program to read a string and use indexOf, lastIndexOf and split methods of String object.

12. Write a simple drawing program using on mouse move that allows the user to draw inside a box in red or blue by holding down the Shift or Ctrl keys.

SEMESTER IV

Allied Paper IV: Business Accounting

(40% Theory, 60% Problems Only)

Instructional Hrs. 75 **Sub Code: 15CSUA404/ 15CAUA303**

Max. Marks: CIA -25; ESE -75 **Credits: 5**

Objective: To understand the fundamentals of accounting and cost accounting

UNIT I **15 Hrs.**

Accounting: Definition – Objectives – Branches of Accounting – Accounting Concepts – Conventions – *Systems of Accounting* – Rules for Double-Entry System of Book Keeping – Preparation of Journal and Ledger Accounting.

UNIT II **15 Hrs.**

Subsidiary Books: Purchase Book – *Sales Book* – Purchase Return Book – Sales Return Book – Cash Book (Two Columnar only) - Petty Cash Book.

UNIT III **15 Hrs.**

Preparation of Trial Balance – **Final Accounts**: *Trading, Profit and Loss Account* and Balance Sheet with Simple Adjustments.

UNIT IV **15 Hrs.**

Depreciation: Definition - Causes of depreciation – Basic factors - Methods of Depreciation – Straight Line Method and Diminishing Balance Method (Simple Problems). **Pricing of Material Issued**: FIFO – LIFO – Simple and Weighted Average Method.

UNIT V **15 Hrs.**

Cost Accounting: *Elements of Costing* – Types of Costing – Preparation of Simple Cost Sheets. Individual Bonus Plans – Halsay System and Rowan System.

Note : Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Murthy A., T.S. Reddy,** *Advanced Accountancy,* Margham Publication, 1st Edition, 2006.
2. **Jain S.P &.Narang, K.L,** *Cost Accounting Principles and Practice,* Kalyani Publisher, 2005.

REFERENCE BOOKS

1**. Grewal**, **T.S.,** *Double Entry Book Keeping,* Sultan Chand & Sons Publisher, 2004**.**
2. **Vinayakam M.N., Mani P.L., Nagarajan K.L** *Principles of Accountancy,* 3rd Edition, 2008.

SEMESTER IV

Skill based Subject II: Multi Skill Development Paper

Instructional Hrs. : 45 **Sub. Code : 13CSUS402/**
13CAUS402 / 13CTUS402 / 13 IT US402

Max. Marks : CIA-100; ESE - Nil **Credits: 3**

Objective: To acquire soft skill, logical and numerical aptitude to get success in Competitive examinations and Interviews.

UNIT I **9 Hrs.**

Communication: Question tag – Gerund and Infinitives – Spotting the errors – Vocabulary – Synonyms – Antonyms - Prepositions – Articles – One word substitution – Sentence completion.

UNIT II **9 Hrs.**

Numerical Aptitude : Problems on numbers - Problems on Ages – Percentage - Profit and loss - Ratio & Proportion - Time & Work - Time & Distance - *Simple Interest* - Compound Interest.

UNIT III **9 Hrs.**

Critical Reasoning : Logical Inference Questions and Syllogism.

Analytical Reasoning : Arrangement problems – Family / Blood Relation Qualms – Sense of Directions – Age Doubts.

Verbal Reasoning : Verbal Analogy (Letter series and number series only) – Coding and Decoding.

UNIT IV **9 Hrs.**

Self Introduction - **Presentation Skills** - Presentation through PowerPoint – **Soft Skills** - Interpersonal Skills – Employability Skills – Soft Skills Training – *Resume Preparation* – Interview Tips and Questions.

UNIT V **9 Hrs.**

Group Discussion – Importance – Types of GD – GD Skills – GD Etiquette(do's and don'ts) – Essential Elements of a GD – *Movements and Gestures to be avoided in a GD* - **Online Services** – Reservation – Banking – Purchases – Passport application.

REFERENCE BOOKS

1. **Hari Mohan Prasad & Uma Rani Sinha. 2011.** Objective English for Competitive Exminations. New Delhi: Tata McGraw Hill Education Private Ltd. (Unit – I)
2. **R.S. Aggarwal**, *Quantitative Aptitude*, S.Chand 2010. (Unit - II)
3. **Edgar Thorpe**, *Test of Reasoning for Competitive Examination,* , Tata McGraw-Hill Publishing Company Limited, New Delhi, 4th edition (Unit – III)
4. **R.S. Agarwal**, A Modern Approach to Verbal Reasoning (Fully Solved) **–**Revised Edition, S.Chand Company Limited, New Delhi, 2012. (Unit – III)
5. **M. S. Rao,** *Soft Skills Enhanching Employability-Connecting Campus with Corporate,* IK International Publishing House, NewDelhi, 2010. (Unit – IV)
6. **Alex.K,** *Soft Skills-Know Yourself and Know the World,* S.Chand Company Ltd., 2011. (Unit V)
7. *Group Discussions- Pass with Flying Colours,* G. K. Publications, NOIDA, 2012.
8. **Jain T.S.Upkar's** *SBI Clerical Cadre Recruitment Examination*. Agar Upkar Prakashan

SEMESTER IV

Non Major Elective II : Web Designing (Dream Weaver - Lab)

Instructional Hrs. : 30 **Sub. Code : 11CSUNP02**

Max. Marks : CIA -Nil; ESE -100 **Credits: 2**

Objective: To impart practical knowledge of Dreamweaver.

1. Design a new web site consisting of some html files for a product of your choice. Name the home page file as index.htm.
2. Create an order list, un-order list, definition list and some nested list. Change the text alignment, text style, text color in the page.
3. Create your favorite link page that includes links to all your favorite web sites. Use either descriptive words or the URL of the link as the text that displays as hyper link.
4. Insert an image into a web page and use any five Dreamweaver's image editing tools. Use sharpen, cropping & brightness/contrast. Then perform image resizing and image re-sampling.
5. Insert a sound and movie file into a web page and create hyperlinks to the same.
6. Create a table with text in column 1 and numbers in column 2. Perform ascending and descending sorts on both the columns.
7. Insert a table and perform merging and splitting of cells. Insert a nested table into one of the cells in standard mode or in layout mode.
8. Create a form to collect the user data of your choice. Format the form objects and labels with a table, so that they line up nicely. Place the submit and reset buttons in the bottom row of the table and merge the cells.

SEMESTER V

Core Paper X : Computer Networks

Instructional Hrs. : 90 **Sub. Code : 15CSUC510 / 15CAUC510**

Max. Marks : CIA -25; ESE -75 **Credits: 4**

Objective : To learn Computer Network concepts, layers and Network security

UNIT I **15 Hrs.**

Introduction: *Uses of Computer Networks* – Network hardware – Network Software – Reference Models – The OSI Reference Model – The TCP/IP Reference Model.

UNIT II **20 Hrs.**

The Physical Layer: Guided Transmission Media – **The Public Switched Telephone Network:** Switching **Data Link Layer:** Data Link Layer Design Issues – Error Detection and Correction.

UNIT III **20 Hrs.**

Data Link Layer: Elementary Data Link Protocols. **The Medium Access Control: Multiple Access Protocol** – The Channel Allocation Problem - Multiple Access Protocols: Carrier Sense Multiple Access Protocols – Collision-Free Protocols – Limited Contention Protocols – **Bluetooth:** Bluetooth Architecture – Bluetooth Applications – **Data link Layer Switching:** Repeaters, Hubs, Bridges, Switches, Routers and Gateways.

UNIT IV **20 Hrs.**

The Network Layer: Network layer Design issues – Routing Algorithms: The optimality Principle – Shortest path routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Multicast Routing – Routing for Mobile Hosts. **The Transport Layer: The Transport Service**: Services provided to the Upper Layers – Transport Service Primitives – Berkeley Sockets.

UNIT V **15 Hrs.**

The Transport Layer: Elements of Transport Protocols. **The Application Layer:** DNS-*The Domain name System.* **Network Security:** Cryptography – Introduction to Cryptography – Substitution Ciphers – Transposition Ciphers – **Symmetric-Key Algorithms:** DES – Public-Key Algorithms – **Digital Signatures:** Symmetric - Key Signatures – Public-Key Signatures.

Note : Self Study topics are denoted in *Italics*

TEXT BOOK

Andrew S. Tanenbaum, David J. Wetherall, *Computer Networks***,** Pearson Education, Asia, Fifth Edition 2012.

REFERENCE BOOKS

1. **Miller**, *Data and Network Communications*, Vikas Publications, 2001.
2. **William A. Shay,** *Understanding Data Communication and Networks*, Second Edition, Vikas Publications, 2001.

SEMESTER V

Core Paper XI : Software Engineering

Instructional Hrs. : 75 **Sub. Code : 11CSUC511 / 08CAUC511 / 08CTUC511/ 15ITUC511**

Max.Marks : CIA-25;ESE-75 **Credits : 4**

Objective: To learn engineering practices in Software development methodologies and evaluation methods

UNIT I **15 Hrs.**

Introduction – The Evolving Role of Software - Software Crisis – Software Myths – Software Engineering Layered Technology- Software Process- Software Process Models – *Prototyping model*- Evolutionary Software Process models.

UNIT II **15 Hrs.**

Analysis concepts & Principles: Requirements analysis and elicitation for Software – Analysis principles - Software prototyping – Specification. Analysis Modeling: *data modeling* – functional modeling and information flow – behavioral modeling.

UNIT III **15 Hrs.**

Design Concepts & Principles: The design process – design principles – design concepts – effective modular design. User Interface Design – The golden rules – UID – Task analyzing and modeling – Interface Design Activities – Implementation Tools – *Design Evaluation*.

UNIT IV **15 Hrs.**

Component level design: Structured Programming – Comparison of Design notations Software Testing techniques – Software Testing fundamentals – Test case design - White Box testing – Basis path testing – *control structure testing* – Black Box testing.

UNIT V **15 Hrs.**

Software testing strategies – A Strategic approach to Software testing - Unit Testing – Integration testing – Validation testing – *System testing* - Object oriented Design: Design for Object Oriented Systems – System Design process – The object Design Process.

Note*:* Self study topics are denoted in *Italics*

TEXT BOOK

Roger S. Pressman , *Software Engineering*, TMH Publishers, 5th Edition, 2005.

REFERENCE BOOKS

1. **Ian Somerville,** *Software Engineering*, Pearson Education Publishers, 6th Edition, 2001.
2. **Watts S. Humphery,** *A discipline for Software Engineering*, Pearson Education Publishers, 2001.

SEMESTER V

Core Paper XII

CORE PAPER XII : ANDROID PROGRAMMING

Instructional Hrs. : 75 **Sub. Code : 16CSUC512 / 16CAUC512 / 16CTUC614**

Max. Marks : 100 **CIA - 25;** **ESE - 75** **Credits: 4**

Objective: To learn the appropriate tools for Android development and gain experiences in developing applications on mobile platform.

UNIT I **15 Hrs.**

Introduction to Android Operating System: Android - Open Handset Alliance - Android Ecosystem - Android versions - Android Activity - Features of Android - Android Architecture - Stack Linux Kernel. **Create the First Android Application:** Directory Structure. Android User Interface: Understanding the components of a screen.

UNIT II **15 Hrs.**

Designing User Interface with View: TextView - Button - A Standard push button - ImageButton - EditText - CheckBox - ToggleButton - RadioButton and RadioGroup - Progress Bar - Autocomplete TextView - Spinner - ListView - GridView - ImageView - ScrollView - Custom Toast Alert - Time and Date Picker. **Activity:** Introduction - Intent - Intent Filter - Activity Lifecycle - Broadcast Lifecycle –Service.

UNIT III **15 Hrs.**

Multimedia: Android System Architecture - Play Audio & Video - Text to Speech. **SQLite Database in Android:** SQLite Database - SQLite - Creation and Connection of the database - Extracting value from a Cursors - Transactions.

UNIT IV **15 Hrs.**

Telephoning and Messaging: SMS Telephony. **Location - Based Services:** Creating the Project - Getting the maps API Key - Displaying the Map - Navigating to a Specific Location.

UNIT V **15 Hrs.**

JSON: JSON - XML and JSON - Use of JSON - Syntax and rule of JSON - JSON Name/Value pairs - JSON Values - JSON Objects - JSON Arrays - JSON uses JavaScript syntax - Parsing JSON and XML.

TEXT BOOK

Prasanna Kumar Dixit, *Android, Vikas Publishing House Pvt Ltd*, 1st Edition, 2014.

REFERENCE BOOK

Reto Meier, *Professional Android 4 Application Development*, Wiley India Pvt Ltd., 2012.

SEMESTER V

PRACTICAL LAB V : ANDROID PROGRAMMING LAB

Instructional Hrs. : 75 **Sub. Code : 16CSUCP05/16CAUCP05/16CTUCP06**

Max. Marks: 100 **CIA: 40;** **ESE: 60** **Credits: 3**

Objective : To create mobile apps using Android

1. Create an Android Application to demonstrate any five UI components functionality.
2. Creating Simple Converter Application in Android.
3. Creating Calculator App in Android using multiple layouts.
4. Creating Simple Android Camera Application.
5. Create an Android Application to send SMS and auto detects the value.
6. Creating Basic List View Demo in Android.
7. Creating an Audio Player using Media Player when button is clicked the following events has to occur

   (i) Play Song (ii) Pause Song (iii) Stop Song
8. Create an Android Application using Google map and add markers to your home, College and few other locations.
9. Create, insert and update records using SQLite.
10. Create a Simple Login Application using JSON data.

SEMESTER V

Elective I : Client / Server Technology

Instructional Hrs. : 90 **Sub. Code: 08CSUE511**

Max. Marks : CIA -25; ESE -75 **Credits: 5**

Objective : To learn the basic concepts of Client / Server computing, operating systems and SQL Database servers

UNIT I **15 Hrs.**

Client / Server Computing – Client / Server – File Servers – *Database Servers* – Transaction Servers – Groupware Servers – Object Servers – Web Servers or Fat Clients – 2 – Tier versus 3 – Tier – Client / Server Building Blocks – Inside the Building Blocks.

UNIT II **20 Hrs.**

Clients, Servers and Operating Systems: Anatomy of a Server Program – Needs of a Server and a Client from an OS – Server Scalability – Client Anatomy – Client / Server Hybrids. **NOS:** Creating the Single System Image – Peer-to-Peer Communication – Remote Procedure call (RPC) – **Message and Queuing**: *The MOM Middleware* – MOM versus RPC.

UNIT III **20 Hrs.**

SQL Database Servers: Fundamentals of SQL and Relational Databases – SQL Database Server Architectures – *Stored Procedures, Triggers and Rules.*

On Line Analytical Processing (OLTP), Decision-Support (DSS), Executive Information System (EIS) – Comparing DSS and OLTP Systems – Production versus Informational Databases. Data Warehouses – EIS/DSS: Query/Reporting Tools – OLTP and Multi-Dimensional Data – Data Mining.

UNIT IV **20 Hrs.**

Client/Server Transaction Processing: ACID Properties – Transaction Models: File Transaction – Distributed File Transaction – Limitations of File Transaction – *Chained and Nested Transactions.*TP Monitors: TP Monitor – TP Monitors and OSs – TP Monitor Standards – TP Monitor Benefits.

UNIT V **15 Hrs.**

Client/Server Groupware: *Groupware* – Importance of Groupware – Components of Groupware. Distributed Objects to Components: Component, Server-Side Component – OTMs – 3-Tier Client/Server, Object-Style. Basic Concepts Related to CORBA, ORB – CORBA object services, CORBA common facilities, COM Server – COM's dynamic invocation facilities – ODBMS – benefits of ODBMS.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Robert Orfali, Dan Harkey, Jeri Edwards, *Client/Server Survival Guide*, John Wiley & Sons, Inc., 3rd Edition, 2008.

REFERENCE BOOKS

1. **Nein Jenkins**, *Client / Server unleashed*, Tech Media, First Indian Edition, 1998.
2. **Partick N. Smith, Steven L.Guengerich,** *Client / Server Computing*, PHI., 2nd edition, 2002.

SEMESTER V

Elective I : Unified Modeling Language

Instructional Hrs. :90 **Sub. Code : 08CSUE521**

Max. Marks : CIA -25; ESE -75 **Credits: 5**

Objective : To make the students understand the basic concepts UML.

UNIT I **20 Hrs.**

Getting Started: Why We Model, Introducing the UML, *Hello World.*

UNIT II **15 Hrs.**

Basic Structural Modeling: Classes, *Relationships*, Common Mechanisms.

UNIT III **20 Hrs.**

Basic Structural Modeling : Diagrams, Class Diagrams .

UNIT IV **15 Hrs.**

Basic Behavioral Modeling: Interactions, *Use Cases*, Use Case Diagrams.

UNIT V **20 Hrs.**

Basic Behavioral Modeling : Interaction Diagrams , Activity Diagrams.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Grady Booch, James Rumbaugh and Ivar Jacobson, *The Unified Modeling Language User Guide*, Pearson Edition, 1999.

(UNIT I : Chapters 1, 2, 3 UNIT II : Chapters 4, 5, 6. UNIT III : Chapters 7, 8 UNIT IV : Chapters 15, 16, 17 UNIT V : Chapters 18, 19.)

SEMESTER V

Elective I: Big Data Analytics

Instructional Hrs. : 90 **Sub. Code : 15CSUE531/ 15CAUE521/ 15ITUE531/ 15CTUE521**

Max. Marks : CIA -25; ESE -75 **Credits: 5**

Objective: To understand the challenges in architectures to manage and perform analytics on big data for data intensive applications

UNIT I **14 Hrs.**

Introduction: Data mining and predictive analytics - The behavior and benefits of predictive models - Applications of predictive analytics - Reaping the benefits, avoiding the pitfalls - What is Big Data? - *How much value does Big Data add?* - **Using Predictive Models :** objectives - Decision making - challenge – Discussion - Override rules (business rules)

UNIT II **18 Hrs.**

Analytics, Organization and Culture: Embedded analytics - Learning from failure - A lack of motivation - A slight misunderstanding - Predictive, but not precise - Great expectations - *Understanding cultural resistance to predictive analytics.* **The Value of Data:** What type of data is predictive of behavior? - Added value is what's important - Where does the data to build predictive models come from? - The right data at the right time - How much data do I need to build a predictive model?

UNIT III **20 Hrs.**

Ethics and Legislation: A brief introduction to ethics - Ethics in practice - The relevance of ethics in a Big Data world - Privacy and data ownership - Data security – Anonymity - Decision making. **Types of Predictive Models:** Linear models - Decision trees (classification and regression trees) - (Artificial) neural networks - Support vector machines (SVMs) – Clustering - Expert systems (knowledge-based systems) - What type of model is best? - Ensemble (fusion or

combination) systems - *How much benefit can I expect to get from using an ensemble?* - The prospects for better types of predictive models in the future.

UNIT IV **20 Hrs.**

The Predictive Analytics Process: Project initiation - Project requirements - Is predictive analytics the right tool for the job? - Model building and business evaluation – Implementation - Monitoring and redevelopment - How long should a predictive analytics project take? **How to Build a Predictive Model** : Exploring the data landscape - Sampling and shaping the development sample - Data preparation (data cleaning) - Creating derived data - Understanding the data - Preliminary variable selection (data reduction) - Pre-processing (data transformation) - Model construction (modeling) - *Validation: Selling models into the business - The rise of the regulator.*

UNIT V **18 Hrs.**

Text Mining and Social Network Analysis : Text mining - Using text analytics to create predictor variables - Within document predictors - Sentiment analysis - Across document predictors - Social network analysis - Mapping a social network. **Hardware, Software and All that Jazz** : Relational databases – Hadoop - The limitations of Hadoop - *Do I need a Big Data solution to do predictive analytics?* - Software for predictive analytics

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Steven Finlay. *Predictive Analytics, Data Mining and Big Data: Myths, Misconceptions and Methods,* Macmillan Publishers Limited, First Edition, 2014.

REFERENCE BOOKS

1. **Chuck Lam,** *Hadoop In Action*, Manning Publication, USA, First Edition, 2012.
2. **Alan Gates,** *Programming Pi,* O'Reilly Media, USA, First Edition, 2011.
3. **Jimmy Lin and Chris Dyer**, *Data-Intensive Text Processing with Map Reduce,* Morgan and Claypool, USA, First Edition, *2010.*

SEMESTER V

Skill Based Subject III

Skill Based Subject III: Image Editing and Animation Tools – Lab

Sub.Code : 16CSUSP03 / 16CAUSP03 /16ITUSP03 / 16CTUSP03

Max. Marks: 100 **CIA: 40;** **ESE: 60** **Credits: 3**

Image Editing Tool

1. Design a greeting card for birthday using different text effects.
2. Design the front page of the college calendar using gradient.
3. Create a pattern using pattern stamp tool & clone stamp tool.
4. Create a digital drawing.
5. Design a webpage layout.

Animation Tool

1. Perform simple text effect animation.
2. Create an animation using morphology.
3. Create a scene like a tree with rising sun and animate the sun.
4. Design a butterfly and make it fly.
5. Implement walking stickman.

SEMESTER VI

Core Paper XIII : Software Testing

Instructional Hrs. : 75 **Sub. Code : 16CSUC613**

Max. Marks: CIA -25; ESE -75 **Credits: 4**

Objective: To learn various software testing strategies and metrics.

UNIT I **14 Hrs.**

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models.

UNIT II **15 Hrs.**

White-Box Testing: Static Testing – Structural Testing**. Black-Box Testing**: What is Black-Box Testing? - Why Black-Box Testing? –When to do Black-Box Testing? – **How to do Black-Box Testing:** Requirements Based Testing, Positive and Negative Testing, Boundary Value Analysis, Decision Tables, State Based or Graph Based Testing, Compatibility Testing and Domain Testing.

UNIT III **15 Hrs.**

System and Acceptance Testing: System Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional System Testing: Design / Architecture Verification, Deployment Testing, Beta Testing. **Non-functional Testing**: Reliability Testing, Stress Testing. Acceptance Testing.

UNIT IV **15 Hrs.**

Performance Testing: Factors Governing Performance Testing – Methodology of Performance Testing – Process for Performance Testing.

UNIT V **16 Hrs.**

Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting.

TEXT BOOK

Srinivasan Desikan & Gopalswamy Ramesh, *Software Testing Principles and Practices*, Pearson Education, Seventh Edition, 2009.

REFERENCE BOOKS

1. **Renu Rajani, Pradeep Oak**, *Software Testing*, TMH, Fifth Edition, 2007.
2. **William E.Perry,** *Effective Methods of Software Testing*, Wiley India, Third Edition, 2008.

SEMESTER VI

Core Paper XIV: GUI Tools

Instructional Hrs. : 75 **Sub. Code: 15CSUC614 / 15CAUC614**

Max. Marks: CIA -25; ESE -75 **Credits: 4**

Objective: To gain awareness of graphical user interface concepts through Visual Basic.

UNIT I **15 Hrs.**

Visual Basic Building Blocks: Forms – Using Controls – Exploring Properties – A First Look at Methods and Events, **Using Visual Basic's Default Controls**: Introduction to the Intrinsic Controls – Working with Text Box and Label – *Controls for Making Choices* – Special Purpose Controls- Working with Multiple Controls at Design time – Working with the Controls Collection – Working with Control Arrays.

UNIT II **13 Hrs.**

Event Procedures: Introducing Events – Handling Events in Programs – Understanding Event Sequences, **Menus and Toolbars:** Creating Menu Bar – Creating Pop-Up Menus – Using Toolbars in Visual Basic, **Dialog Boxes:** *Message Box* – InputBox – Dialog Boxes – User defined Dialog Box.

UNIT III **16 Hrs.**

Using Variables and Constants: Introduction to Variables – Variable Declarations – Variable Arrays – Option Explicit statement – Constants, **Visual Basic Programming Fundamentals:** Writing Statements – Assignment Statements – Math Operations – Strings – Formatting Results, **Control Statements :** *If statement* – Multiple If statement – For Loop – Do Loop – Debugging Programs – Error Trapping, **Managing Project:** Using Procedures and Functions – Working with Multiple Forms – Managing Components in project.

UNIT IV **16 Hrs.**

Data Access Objects(DAO) : Introduction to DAO – Opening an Existing Database – Recordset types – Placing Information Onscreen – Positioning the Record Pointer – Using Filters, Indexes, and Sorts – Modifying multiple records using loops and SQL statements – Record Manipulation (Add, Edit, Update and Delete) - *Introducing Transaction Processing*.

UNIT V **15 Hrs.**

ActiveX Data Objects (ADO): Introducing ADO – Using the ADO Data Control – Using the DataGrid Control – *Using ActiveX Data Objects*, **Creating Reports:** Creating a Simple Data Reports – Enhancing Data Reports.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Brian Siler and Jeff Spotts, *Special Edition Using Visual Basic 6*, PHI Private Ltd., New Delhi, 2001.

REFERENCE BOOKS

1. **Gray cornel**, *Visual Basic 6 from the Ground up*, TMH, 1st Edition, 2007.
2. **Scott Warner**, *Teach Yourself Visual Basic 6*, Tata McGraw Hill Edition, 2000.
3. *Visual Basic 6 Programming* by Content Development Group, TMH Publishers 2002.

SEMESTER - VI

Practical VI: GUI LAB

Instructional Hrs. : 75 **Sub. Code: 15CSUCP06 / 15CAUCP06**

Max. Marks: CIA -40; ESE -60 **Credits: 3**

Objective : To develop simple programs and applications using Visual Basic.

1. Write a code to Scroll the text "Visual Programming" from left to right and right to left on client area.
2. Write a code for adding, removing and clearing items using Dropdown Combo Box.
3. Create a simple calculator using control array.
4. Using Flex Grid Control write a program that calculate addition, subtraction, multiplication and division of numbers ranging from 1 to 12.
5. Create a Note pad using Rich Text Box. (Use the required dialog boxes)
6. Write a code to maintain an Inventory Database and Display it using Data Grid Control. (Perform Connection through Data Control)
7. Build a master form to manipulate (add, delete, update) the Train master. (Create the required Train master table)
8. Design a transaction form (new, save) for Railway ticket reservation. (Create the required Train master and Ticket book transaction tables)
9. Build a master form to manipulate (add, delete, update) the Employee master. (Create the required Employee master table)
10. Design a transaction form (new, save) for Employee Payslip preparation. (Build the required Employee master and Payslip transaction tables)
11. Build a master form to manipulate (add, delete, update) the Student master. (Create the required Student master table)
12. Design a transaction form (new, save) for Student fees payment transaction.(Build the required Student master and Fees_pay transaction tables)

SEMESTER VI

Elective II: Wireless Application Protocol

Instructional Hrs. : 90 **Sub. Code : 11CSUE612 / 11CAUC613 / 11CTUE632**

Max. Marks : CIA -25; ESE -75 **Credits: 5**

Objective : To gain knowledge in WAP Architecture, Gateways and Hosting, Security, Wireless Markup Languages and Bluetooth Technology

UNIT I **15 Hrs.**

Introduction to WAP : Wireless Application Protocol (WAP) overview- Work of WAP - WAP and Internet Standards-*Merits and Demerits of using WAP*- WAP Components.

UNIT II **20 Hrs.**

WAP Architectural Issues : WAP Architecture- WAP Protocol stack-Wireless application environment - How does WAP work? - optimal WAP bearer - Wireless Session Protocol - Wireless Transaction Protocol - *Wireless Datagram Protocol* - Wireless Transport layer Security - WAP devices - WAP is based on XML - Wireless Markup Language - Mobile originated Examples of WAP Architecture - WAP Component Technologies.

UNIT III **20 Hrs.**

WAP Gateways and Hosting: WAP Gateway – Kannel: Open source4 WAP and SMS Gateway - Requirements - External Interfaces - Internals: Hosts, Modules, Threads - *Special Servers/gateways* - Free hosting for WAP pages - Wireless Operating Systems - Registering a WAP domain - WAP browsers – WAP gateway services – Architecture of the WAP gateway.

UNIT IV **20 Hrs.**

Wireless Markup Language: Wireless Markup Language – Understanding Wireless Markup Language – Functions of WAP – Necessity of an Emulator – Basic structure of WML – *WML Architecture*. 3G and beyond: Mobile Wireless – What is 3G? – Applications – Bluetooth Technology.

UNIT V **15 Hrs.**

WAP Security: WLAN Security Issues: Wired Versus Wireless – Physical Security – User Authorization – Eavesdropping counter measures – Wireless Security Considerations – Security Concerns – WAP Security Roadmap – Wireless Security Risks – *Firewall* – Firewall and Complete Security.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Er.V.K.Jain, *Programming WAP, WAP Servlets with WML, WML Script, Smart Card and 3G*, Published by Dream tech press.

REFERENCE BOOK

Steve Mann, Scott Sbihli, The Wireless Application Protocal, First edition, Published by Wiley.

SEMESTER VI

Elective II: Internet of Things

Instructional Hrs. : 90 **Sub. Code : 15CSUE622 / 15CAUE632/ 15ITUE612/ 15CTUE622**

Max. Marks :CIA-25 ; ESE -75 **Credits:5**

Objective: To learn IoT concepts and technologies.

UNIT I **14 Hrs.**

Introduction – Concepts behind the Internet of Things: The IoT paradigm- Smart objects-Bits and atoms-Goal orientation-Convergence of technologies, Internet in general and Internet of Things.

UNIT II **18 Hrs.**

Technologies behind the Internet of Things: RFID + NFC - Wireless networks + WSN - RTLS + GPS- Agents + Multi agent systems- layers-protocols-packets- services- performance parameters of a packet network as well as applications such as web- Peer-to-peer- sensor networks, and multimedia.

UNIT III **20 Hrs.**

Creative thinking techniques: Modifications - Combination scenarios - Breaking assumptions - Solving problems, Transport services: TCP, UDP, socket programming-Network layer: forwarding & routing algorithms (Link, DV), IP-addresses, DNS, NAT, and routers-Local Area Networks, MAC level, link protocols such as: point-to-point protocols, Ethernet, WiFi 802.11, cellular internet access, and Machine-to-machine.

UNIT IV **20 Hrs.**

Mobile Networking: Roaming and handoffs-mobile IP- and ad hoc and infrastructure less networks. Realtime networking: soft and real time- quality of service/information- resource reservation and scheduling and performance measurements.

UNIT V **20 Hrs.**

IoT : overview, applications, potential & challenges, and architecture. IoT examples: Case studies, e.g. sensor body-area-network and control of a smart home.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

Lu Yan , Yan Zhang , Laurence T. Yang , Huansheng Ning, *The Internet of Things: From RFID to the Next-Generation*, Pervasive Networked Systems, 2008.

REFERENCE BOOK

Kurose James F., Ross Keith W.*, Computer networking: a top-down approach*, Boston, Mass. Pearson Co., Fifth Edition, 2010.

SEMESTER VI

Elective III: Analysis & Design of Information Systems

Instructional Hrs. : 90 **Sub. Code : 11CSUE632**

Max. Marks:CIA-25 ; ESE: 75 **Credits:5**

Objective : To make the students understand the basic concepts of analysis and design of information system.

UNIT I **20 Hrs.**

Information and Management: Types of information – Why do we need a Computer Based Information System – Management and Information Requirements – *Qualities of Information* – *Examples of Information Systems.*

UNIT II **20 Hrs.**

Information Systems Analysis Overview: Overview of Design of an Information System – *The Role and Task of a System Analyst* – Attributes of a Systems Analyst – Tools used by the Systems Analyst – **Information Gathering:** Strategy to Gather Information – Information Sources – Methods of Searching for Information – Interviewing Techniques – Questionnaires – Other Methods of Information Search Case Study.

UNIT III **20 Hrs.**

System Requirement Specification: System Requirement Specification - Example - Data Dictionary - Steps in Systems Analysis – Modularizing Requirements Specification – Feasibility Analysis: Deciding on Project Goals – *Examining Alternative Solutions* – Evaluating Proposed System – Cost-Benefit Analysis – Payback Period – Feasibility Report – System Proposal – **Data Flow Diagram**: Symbols used in DFDs Describing a System with a DFD – Good Conventions in developing DFDs – Logical and Physical DFDs.

UNIT IV **15 Hrs.**

Process Specification: Process Specification Methods – Structured English – **Decision Tables**: Decision Table Terminology and Development – Extended Entry Decision Table-Establishing the Logical Correctness of Decision Table – *Use of Karnaugh Maps to Detect Logical Errors in Decision Table – Eliminating Redundant Specifications.*

UNIT V **15 Hrs.**

Data Input Methods: Data Input – Coding Techniques – Detection of Error in Codes – Validating Input Data – *Interactive Data Input – Designing Outputs*: Output Devices – Objectives of Output Design – Design of Output Reports – Design of Screens – Use of Business Graphics – **Control, Audit, Testing and Security of Information System:** System Design Example.

Note : Self study topics are denoted in *Italics*

TEXT BOOK

Rajaraman V., *Analysis and Design of Information System,* Prentice Hall of India, 2nd Edition, 2004.

REFERENCE BOOK

James A Senn, *Analysis & Design of Information Systems,* MCH International Edition, 2nd Edition, 1989.

SEMESTER – VI

Skill Based Subject IV: DTP Design Tools (Pagemaker and Coreldraw) - Lab

Instructional Hrs: 45 **Sub. Code: 11CSUSP04**

Max. Marks: CIA -40; ESE -60 **Credits: 3**

Objective: To make the students understand the concepts of PageMaker and CorelDraw.

PageMaker

1. Prepare a Bio-data. Apply font size, tabs, alignment, indentation and Text wrap.
2. Create a greeting card for New Year.
3. Create an Advertisement for a job in well-known form.
4. Create a Newspaper Report.
5. Create a Document by importing graphic image from Clip Art.

CorelDraw

6. Create a Document. Apply different formats to design it.
7. Combine a Text in the word processor and the graphic in Corel draw by using Print Merge.
8. Create a Nested shapes. Apply rotation, lock and fill color options.
9. Create any design using Line Drawing Method.
10. Create an Advertisement using an object, with combine and group options.

SELF LEARNING PAPER

1. Computer Ethics

Sub. Code: 13CSUSL01

Max. Marks: 100 **Credits: 5**

Objective: To learn about the moral and legal issues of using computers in social context.

UNIT I

Computer Ethics: Introduction – New possibilities and Vacuum of Politics – Filling the Vacuum, Clarifying conceptual muddles – Computers and used in a Social Context, Moral and Legal Issues - Are Computer Ethical issues Unique? The role of Analogy in Computer Ethics.

UNIT II

Professional Ethics: Characteristics of professions – The system of profession – Is Computing a Profession? – Are Computer Professionals "Professionals?" – Software Engineering – Professional Relationships – Conflicting Responsibilities – Code of Ethics and professional conflicting Responsibilities – Code of Ethics of Professional conduct – Collective Responsibility.

UNIT III

Ethics and the Internet: Ethics online – Three morally significant Characteristics – Hacking Ethics – New Species of old Crime – Netiquette – Policy Approaches.

UNIT IV

Privacy: Understanding the "Computers and Privacy Issue" – Reframing the Computers and Privacy as a social Good – Legislative Background – Global perspective – proposals for Better privacy protection.

UNIT V

Property Rights in Computer Software: Definitions – The problem current legal protection – The philosophical Basis of property - Consequentiality Arguments – Conclusions from the philosophical analysis of property – software copying is immoral of illegal.

TEXT BOOK

Deborah G.Johnson, *Computer Ethics*, Pearson Education, 3rd Edition, 2001.

SELF LEARNING PAPER

3. PYTHON

Max. Marks: 100 **Sub.Code: 14CSUSL15**

Credits: 5

Objective: To learn and develop programs in Python through free online resources.

UNIT I

Getting started with ipython - Using the plot command interactively - Embellishing a plot - Saving plots - Multiple plots - Additional features of IPython.

UNIT II

Loading data from files - Plotting the data - Other types of plots - Getting started with sage notebook - Getting started with symbolics.

UNIT III

Using Sage - Using sage to teach - Getting started with lists - Getting started with for - Getting started with strings - Getting started with files.

UNIT - IV

Parsing data – Statistics - Getting started with arrays - Accessing parts of arrays – Matrices

Least square fit - Basic datatypes and operators - I O- Conditionals.

UNIT – V

Loops - Manipulating lists - Manipulating strings - Getting started with tuples – Dictionaries- Sets - Getting started with functions - Advanced features of functions - Using python modules - Writing python scripts - Testing and debugging.

Material : Video Tutorials of Spoken Tutorial, IIT Bombay

SELF LEARNING PAPER

4. PHP and MySQL

Max. Marks: 100 **Sub.Code: 14CSUSL25**

Credits: 5

Objective: To learn and develop programs in PHP and MySQL through free online resources.

UNIT I

XAMPP in Windows - XAMPP in Linux - Echo Function - Variables in PHP - IF Statement - Switch Statement - Arithmetic Operators - Comparison Operators - Logical Operators - Arrays - Multi Dimensional Arrays.

UNIT II

Loops While Statement - Loops Do While Statement - Loops For Statement - Loops For ..each Statement - Functions Basic - Functions Advanced - GET Variable - POST Variable - Embedding PHP.

UNIT III

Common Way to Display HTML - Common Errors Part 1, 2 & 3 - MySQL Part 1,2,3,4,5,6,7 & 8 - Simple Visitor Counter.

UNIT IV

PHP String Functions Part 1 & 2 - File Upload Part 1& 2 - Cookies Part 1 & 2 – Sessions - MD5 Encryption.

UNIT V

Sending Email Part 1, 2 & 3 - Display Images from a Directory - User Login Part 1, 2 & 3 - User Password Change Part 1, 2 & 3 - User Registration Part 1, 2, 3, 4, 5 & 6.

Material: Video Tutorials of Spoken Tutorial, IIT Bombay.