VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS)

ERODE – 12

DEPARTMENT OF COMPUTER SCIENCE

B.Sc. Computer Technology

B.Sc., CT 2015-2016 onwards

Course Contents, Scheme of Examinations, Credits and Syllabus

(for students admitted during 2015-2016 and onwards)

DEPARTMENT OF COMPUTER SCIENCE

B. Sc., Computer Technology

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)**

B.Sc., CT 2015-2016 onwards

<table>
<tr><td colspan="10">Vellalar College for Women (Autonomous), Erode - 12.</td></tr>
<tr><td colspan="10">Bachelor of Computer Technology</td></tr>
<tr><td colspan="10">2015 - 2016 onwards</td></tr>
<tr><td colspan="10">Scheme of Examinations (CBCS Pattern)</td></tr>
<tr><td colspan="10">Semester I</td></tr>
</table>

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	15ITUC101/ 15CTUC101	Data Structures and C Programming	5	3	25	75	100	4
		11ITUCP01 / 11CTUCP01	Data Structures using C Lab	5	3	40	60	100	3
	Allied I	11CAUA101 / 11ITUA101 / 08CTUA101	Mathematics - I (Computer Oriented Numerical Methods and Statistics)	6	3	25	75	100	5
IV	Foundation Course	09FOCU1ES	Environmental Studies	2	3	-	100	100	2
			Total					600	20

<table>
<tr><td colspan="10">Semester II</td></tr>
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Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	CIA	ESE	Total	Credits
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	08ITUC511 / 15CTUC202	Relational Database Management Systems	4	3	25	75	100	4
		11CTUC203	Digital Computer Fundamentals	4	3	25	75	100	4
		15CTUCP02	Digital Lab	3	3	40	60	100	1
	Allied II	15CAUA202/ 15CTUA202	Mathematics - II (Optimization Techniques) ***	5	3	25	75	100	5
IV	Value Education	14VEDU2HR	Value Education and Human Rights	2	3	-	100	100	2
			Total					700	22

Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	Max. Marks			Credits
						CIA	ESE	Total	
Semester III									
III	Core	15CTUC304	Computer Organization and Architecture	5	3	25	75	100	4
		11CSUC305 / 11CAUC305 / 11CTUC305	Object Oriented Programming with Java	5	3	25	75	100	4
		11ITUC407 / 11CTUC306	Operating System	5	3	25	75	100	4
		15CSUCP03/ 15CAUCP03/ 15CTUCP03	Java Programming Lab	5	3	40	60	100	3
	Allied III	11ITUA303/ 15CTUA303	Microprocessors and its Architecture	5	3	25	75	100	5
IV	Skill Based Subject I			3	3	40	60	100	3
	Basic Tamil				-	100	-		
	Advanced Tamil			2	3	25	75	100	2
	Non-Major Elective I				3	-	100		
Total								700	25

Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	Max. Marks			Credits
						CIA	ESE	Total	
Semester IV									
III	Core	11CTUC407	Principles of Compiler Design	5	3	25	75	100	4
		08ITUC510 / 11CTUC408	GUI Design Tools	5	3	25	75	100	4
		11CTUC409	Computer Networks and Security	5	3	25	75	100	4
		11CTUCP04	GUI Design Lab	5	3	40	60	100	3
	Allied IV	15CTUA404	Embedded Systems	5	3	25	75	100	5
IV	Skill Based Subject II		Multiskill Development Paper	3	1*	40	60	100	3
	Basic Tamil				-	100	-		
	Advanced Tamil			2	3	25	75	100	2
	Non-Major Elective II				3	-	100		
Total								700	25

* On line Examination

B.Sc., CT 2015-2016 onwards

Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	CIA	ESE	Total	Credits

Semester V

Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	CIA	ESE	Total	Credits
III	Core	15ITUC408/ 15CTUC510	PC Hardware and Troubleshooting	5	3	25	75	100	4
		15CTUC511	Software Engineering	6	3	25	75	100	4
		11CTUC512	.NET Programming	5	3	25	75	100	4
		08ITUCP04 / 08CTUCP05	PC Hardware and Troubleshooting Lab	5	3	40	60	100	3
	Elective I	09CTUE511	Parallel Processing						
		15CSUE531/ 15CAUE521/ 15ITUE531/ 15CTUE521	Big Data Analytics	6	3	25	75	100	5
		08CTUE531	GSM Architecture						
IV	Skill Based Subject III			3	3	40	60	100	3
	Total							600	23

Semester VI

Part	Study Component	Subject Code	Title of the Paper	Inst. Hrs./ Week	Exam. Dur. Hrs.	CIA	ESE	Total	Credits
III	Core	15CAUC409/ 15ITUC409/ 15CTUC613	Client / Server Computing	5	3	25	75	100	4
		08CTUC614	Web Technology	5	3	25	75	100	4
		08CTUCP06	Web Technology Lab	5	3	40	60	100	3
		09CTUC6PV	Project **	6	-	-	100	100	5
	Elective II	09ITUE632 / 11CTUE612	Mobile Computing						
		15CSUE622/ 15CAUE632/ 15ITUE612/ 15CTUE622	Internet of Things	6	3	25	75	100	5
		11CSUE612 / 11CAUC613 / 11CTUE632	Wireless Application Protocol						
IV	Skill Based Subject IV			3	3	40	60	100	3
V	Extension Activitiy		NSS / NCC / Physical Education / YRC/Green Society/EDP/CCC	-	3	-	-	100	1
	Total							700	25
					Total (I - VI Semesters)		**4000**		**140**

Note : **   Project - 80%   Viva - 20%

B.Sc., CT 2015-2016 onwards

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	Multiskill Development Paper
3	11CSUSP03 / 11CAUSP03 / 11ITUSP03 / 11CTUSP03	Image Editing Tool (Photoshop) - Lab (Cafeteria System)
4	11CSUSP04 / 11CAUSP04 / 11ITUSP04 / 11CTUSP04	DTP Design Tools (Pagemaker & Coreldraw) - Lab (Cafeteria System)
NON-MAJOR ELECTIVES		
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 (Dreamweaver) - Lab

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

S.No.	Subject Code	Title of the Paper	Exam. Dur. Hrs.	Max. Marks	Credits
		SELF LEANING PAPERS (Optional)			
1	13CSUSL01	Computer Ethics	3	100	5
2	13CSUSL02	Internet Concepts	3	100	5
3	13CSUSL03	Green computing	3	100	5
4	13CSUSL04	Security in Computing	3	100	5
5	13AUGSL05	General Awareness -Online examination	1	100	5

B.Sc., CT 2015-2016 onwards

SEMESTER – I

Core Paper – I

DATA STRUCTURES AND C PROGRAMMING

Instructional Hrs: 75   Sub. Code: 15CTUC101/

                                                                                   15ITUC101

Max. Marks: CIA – 25; ESE – 75   Credits: 4

Objective: To understand Problem Solving aspects and basic concepts in data structures using 'C'.

UNIT I   **15 Hrs.**

Programming Development Methodologies – Programming Style – **Problem solving Techniques:** Algorithm, Flowchart, Pseudo code - Structure of a C program – C Character Set – Delimiters – *Keywords* – Identifiers – Constants – Variables – Rules for Defining Variables – Data Types – Declaring and Initializing Variables – Type Conversion. Operators and Expressions – Formatted and Unformatted I/O Functions – Decision Statements – Loop Control Statements.

UNIT II   **15 Hrs.**

Arrays – String and its Standard Functions. Pointers – Functions – **Preprocessor Directives:** #define directive*, #include directive*.

UNIT III   **15 Hrs.**

Structure and Union: Features of Structure, Declaration and Initialization of Structure, Structure within Structure, Array of Structure, Pointer to Structure, Bit Fields, *Enumerated Data Types*, Union. **Files:** Streams and File Types, Steps for File Operation, File I/O, Structures Read and Write, Other File Functions, Command Line Arguments, I/O Redirection.

UNIT IV   **15 Hrs.**

Linear Data Structures: Introduction to Data Structures – List: Implementations, Traversal, Searching and Retrieving an Element, Predecessor and Successor, Insertion, Deletion, Sorting,

Merging Lists – **Stack:** Representation, Terms, Operations on Stack, Implementation. Single Linked List, Linked List with and without Header, Insertion, Deletion, *Double Linked List* – **Queues:** Various Positions of Queue, Representation.

UNIT V   **15 Hrs.**

Searching and Sorting – Searching: Linear, Binary. Sorting – Insertion, Selection, Bubble, Quick, *Tree*, Heap.

Note: *Italics* **denotes Self Study Topics**

TEXT BOOK

1. **Ashok N Kamthane**, *Programming and Data Structures*– Pearson Education, First Indian Print 2004,   ISBN 81-297-0327-0.

REFERENCE BOOK

1. **Aaron M Tanenbaum, Yedidyeh Langsam, MosheJ hugenstein**, *Data Structure Using C,* PHI Pub
2. **Balagurusamy E**, *Programming in ANSI C*, Tata Mcgraw Hill, 1998.
3. **Ellis Horowitz and Sartaj Sahni,** *Fundamentals of Data Structure***,** Galgotia Book Source, 1999.

SEMESTER - I

Practical – I

DATA STRUCTURES USING C-LAB

Instructional Hrs: 75   **Sub. Code: 11ITUCP01/**

                                                     11CTUCP01

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

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

1. Write a C program to generate 'n' Prime numbers.

2. Write a C program to create and manipulate array.

3. Write a C program to find the number of Palindromes in a given sentence.

4. Write a C program to display students detail using array of Structure.

5. Write a C program to write data to text file and read it.

6. Write a C program to calculate binomial co-efficient using NCR function

7. Write a C program to implement the operation of STACK.

8.   Write a C program to implement QUEUE and perform the following:

    i.   Insertion

    ii. Deletion

    iii. Modification

    iv. Listing of elements using pointers

9. Write a C program to insert an element at the end of the LINKED LIST.

10. Write a C program to demonstrate Sequential Search.

11. Write a C program to demonstrate Binary search.

12. Write a C program to arrange a set of numbers in ascending order using QUICK-SORT.

SEMESTER - I
Allied - I
MATHEMATICS – I
(Computer Oriented Numerical Methods and Statistics)

Instructional Hrs: 90   **Sub. Code: 11CAUA101 /**
                                                                      11ITUA101 /
                                                                      08CTUA101

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 and Regression.

UNIT I   **18 Hrs.**

The Solution of Numerical Algebraic & Transcendental Equations – Bisection method – Newton-Raphson method – The method of false position.The solution of Simultaneous Linear Algebraic Equation – Gauss Elimination method – Gauss Jordon Elimination method – Gauss Seidal method of iteration – *Gauss – Jacobi method.*

UNIT II   **18 Hrs.**

Numerical Differentiation – Newton's Forward Difference formula – Newton's backward difference formula – numerical Integration – Trapezoidal rule – Simpson's One-third rule – *Simpson's three* – eighth rule.

UNIT III   **18 Hrs.**

Interpolation – Newton forward interpolation formula – Newton backward interpolation formula – LaGrange's formula – Numerical solution of ordinary differential equations – Taylor method – *Euler method* – Range Kutta method.

UNIT IV   **18 Hrs.**

Measures of central tendency – Mean, Median and *mode* – Relation between mean, median and mode Dispersion – Range – Mean deviation & standard deviation.

<div align="right">B.Sc., CT 2015-2016 onwards</div>

UNIT V   **18 Hrs.**

Correlation – Karl Pearson's Coefficient of Correlation – Rank correlation regression – *Regression* – Equations – Difference between correlation & Regression.

Note: *Italics* denotes Self Study Topics

TEXT BOOKS

1. **Kandasamy P, Thilagavathi K, Gunavathi K**, *Numerical Methods,* Sultan& Company Ltd. New Delhi Revised Edition 2005 (Unit I, II & III)**.**

2. **Pillai R S N, Bagavathi V**, *Statistical***,** Sultan Chand and Sons & Company Ltd. New Delhi. Reprint 2005 (Unit IV & V)**.**

REFERENCE BOOKS

1. **Balagurusamy.E** , *Numerical methods* **,** Tata MC Graw Hill.

2. **Gupta.S.C, Kapoor V K**, *Fundamental of Mathematical Statisitics***",** Sultan Chand and Sons**.**

3. **Rajaraman.V**, *Computer oriented numerical methods,* PHI Pub.

SEMESTER I

Foundation Course - A
ENVIRONMENTAL STUDIES

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

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

Objective: To get awareness about the environmental 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: *Italics* **denotes Self Study Topics**

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

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

.

SEMESTER - II

Core Paper - II

RELATIONAL DATABASE MANAGEMENT SYSTEMS

Instructional Hrs: 75   **Sub. Code: 08ITUC511 /**

                                                                                        15CTUC202

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.

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

UNIT IV   **15 Hrs.**

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

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.

UNIT V   **15 Hrs.**

PL/SQL Composite Data Types: Records – Tables – Varrays. **Named Blocks**: Procedures – *Functions* – Packages –Triggers – Data Dictionary Views.

Note: Self Study Topics are denoted in *Italics*.

TEXTBOOK

1. **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.

SEMESTER – II
Core Paper – III
DIGITAL COMPUTER FUNDAMENTALS

Instructional Hrs: 60   **Sub. Code: 11CTUC203**

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.**

Number System: Decimal, Binary, Octal, Hexadecimal — Conversion from one to another - Binary Addition, Subtraction, Multiplication and Division - Negative Numbers- Use of Complements to Represent Negative Numbers- *Binary Number Complements* - Complements in other number systems. Codes: BCD weighted - Excess Three- Gray- Error Detection Codes.

UNIT II   **12 Hrs.**

Basic Logic Gates - Basic Laws of Boolean algebra - Simplification of Expressions - De Morgan's Theorems - *Derivation of a Boolean Expression*- Sum of Products- Product of Sums - the Map Method for Simplifying Expressions - Sub cubes and Covering- Don't Care Condition.

UNIT III   **12 Hrs.**

Arithmetic Logic Unit: Construction of ALU - Integer Representation Binary Half Adder - Full Adder - Parallel Binary Adder - *Full Adder Designs*- Binary Coded Decimal Adder - Basic Operations — Shift Operation - Logical Operations Multiplexers - Demultiplexers.

UNIT IV   **12 Hrs.**

Flip-flops - Transfer Circuits - Clocks – Flip-flop- Designs Gated Flip-flop-Master Slave Flip-flop- Shift Register- Binary Counters - *BCD Counters*- Integrated Circuits - Counter Design-

B.Sc., CT 2015-2016 onwards

State Diagrams and State Tables - Design of a Sequential Magnitude Comparator- Mealy Machines- Programmable Arrays of Logic Cells.

UNIT V **12 Hrs.**

Memory Random Access Memories - Linear Select Memory Organization- Decoders - Random Access Semiconductor Memories - Static and Dynamic Random Access Memories - Read Only Memories- Magnetic Disk Memories. Input Output Devices- Character Recognition- *Keyboards*- Printers- Interconnecting System Components - interfacing Buses - Interfacing a Keyboard - Interfacing a Printer - Digital to Analog Converters - Analog to Digital Converters.

Note: *Italics* **denotes Self Study Topics**

TEXT BOOK

1. **Thomas C. Bartee**, Digital Computer Fundamentals, Tarn McGraw Hill, 1996

SEMESTER – II
Practical - II
DIGITAL LAB

Instructional Hrs: 45   **Sub. Code: 11CTUCP02**

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

Objective: To gain the practical knowledge of IC and Assembly language Programming.

1. Design a code converter - Binary to gray and Gray to binary.
2. Verify De-Morgan's Law - I.
3. Verify De-Morgan's Law - II.
4. Construct a Half adder and Full adder.
5. Construct a Half subtractor and Full subtractor.
6. Design of n-bit parallel adder.
7. Verify – NAND as universal building block.
8. Write 8086 Assembly Language Program to add two 32 – bit signed numbers.
9. Write 8086 Assembly Language Program to add two ASCII number.
10. Write 8086 Assembly Language Program to add two BCD number.
11. Write 8086 Assembly Language Program to compare two strings.
12. Write 8086 Assembly Language Program to display number of character present in a string.

Allied Paper II :Mathematics II

(Optimization Techniques)

(Derivations Not Included – Problems Only)

Instructional Hrs: 75   Sub. Code: 15CAUA202 /

                                                                                 15CTUA202

Max. Marks: CIA – 25; ESE – 75   Credits: 5

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

UNIT I   **14 Hrs.**

Linear Programming: 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.

Assignment Problem: Mathematical Formulation of an Assignment Problem – Hungarian Assignment Method – Unbalanced Assignment Problems.

UNIT III   **16 Hrs.**

Inventory Control: Introduction – Various Costs involved in Inventory – EOQ models without Shortage - *EOQ models with Shortage* - Buffer Stock & Reorder Level.

UNIT IV   **15 Hrs.**

Replacement Problems: Introduction – Replacement of Equipments that deteriorates gradually - Replacement of Equipment that fails suddenly. **PERT – CPM:** Introduction - Rules of Network Construction – *Critical Path Method* – PERT Calculations.

UNIT V   **15 Hrs.**

Queueing Theory: Introduction – Characteristics of Queueing System – Traffic Intensity – Poisson Process & Exponential Distribution – *Classification of Queues* – Problems from Single Server Infinite and Finite Population Model.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

   Kanti Swarup, Gupta P K & Man Mohan, *Operations Research*, S.Chand & Company Pvt. Ltd, New Delhi, 9th Edition , 2001.

REFERENCE BOOK

   Gupta P K , Hira D S, *Introduction to Operations Research*, S.Chand &
    Company Pvt. Ltd, New Delhi,

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.

Core Paper IV: Computer Organization and Architecture

Instructional Hrs: 60   **Sub. Code: 15CTUC304**

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

Objective: To learn memory organization and architecture of a computer.

UNIT I   **12 Hrs.**

Data and instruction formats - Data types - Fixed point and floating-point number representation - Representation of signed numbers - Alphanumeric representation. Register transfer and micro operations: Register transfer language - Inter register transfer - Arithmetic micro operations - Logic micro operations - Shift micro operations – Control functions.

UNIT II   **12 Hrs.**

Arithmetic and logical unit: Addition/Subtraction, Multiplication and Division with signed numbers - Floating-point arithmetic operations - Decimal arithmetic operations – Logical operations - Implementation of ALU.

UNIT III   **12 Hrs.**

Central processor unit - Processor bus organization - Stack organization - Instruction formats - three address, two address, Single address and zero address instruction formats – Addressing modes - Data transfer and manipulation - **RISC** and **CISC** machine characteristics - Hardwired and micro programmed control - Address sequencing.

UNIT IV   **12 Hrs.**

Memory and input output units: Memory hierarchy - main memory: RAM and ROM address spaces - Associative memory - Virtual memory - Cache memory.

Peripheral devices - I/O interface - I/O bus verses memory bus - Isolated verses memory mapped I/O - Example of I/O interface - Input output processor.

UNIT V   **12 Hrs.**

Multiprocessor system organization: Characteristics of multiprocessors − Interconnection structures - Cross bar switch Time-shared common bus - Multiport memory.

Note: Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Morris Mano M**, *Computer System Architecture***,** Prentice-Hall of India, IInd Edition, 1993.

2. **Hayes J.P**, "Computer Architecture and Organization", McGraw Hill, 1983.

3. **Hamachar, V.C, Vranesic. Z.G, Zaky. S.G,** "Computer organization", McGraw Hill, 1978

REFERENCE BOOK

Carter, Computer Architecture, Schaum's Outline Series, TMH, 2007.

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: *Italics* denotes Self Study Topics

TEXT BOOK

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

REFERENCE BOOKS

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

SEMESTER - III

Core Paper - VI

OPERATING SYSTEM

Instructional Hrs: 75   **Sub. Code: 11ITUC407 /**

11CTUC306

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

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

UNIT I   **15 Hrs.**

Introduction: What is an Operating System? – *Process Concepts* – Asynchronous Concurrent Processes

UNIT II   **15 Hrs.**

Deadlock and Indefinite Postponement - *Storage Management Real Storage*- Introduction-Storage Organization-Storage Management-Storage Hierarchy-Storage Management Strategies-Contiguous Vs Noncontiguous Storage Allocation-Single User Contiguous Storage Allocation-Fixed Partition Multiprogramming-Variable Partition Multiprogramming- Multiprogramming with Storage Swapping.

UNIT III   **15 Hrs.**

Virtual Storage Organization: Introduction – Evolution of Storage Organizations – Virtual Storage – Multilevel Storage Organization – *Block Mapping* – Paging – Segmentation – Paging / Segmentation Systems.

UNIT IV   **15 Hrs.**

Virtual Storage Management: Introduction - Virtual Storage Management Strategies – Page Replacement Strategies – Locality – Working Sets – Page Fault Frequency Page Replacement – Demand Paging. **Job and Processor Scheduling:** Introduction – Scheduling levels – Objectives

– Criteria – Preemptive vs Nonpreemptive Scheduling – Interval Timer – Priorities – Deadline Scheduling – FIFO – RR – *Quantum Size* – SJF – SRT – HRN – Multilevel Feedback Queues.

UNIT V   **15 Hrs.**

Disk Performance Optimization: Introduction – Operation of Moving-Head Disk Storage – Need for Disk Scheduling – Seek Optimization – Rotational Optimization – System Consideration – *Disk Caching* – Other Performance – Enhancement Techniques – RAM and Optical Disks.

File and Database Systems : Introduction – The File System – File System Functions – The Data Hierarchy – Blocking and Buffering – File Organization – Queued and Basic Access Methods – Allocating and Freeing Space – File Descriptor – Access Control Matrix – Access Control by User Classes – Backup and Recovery.

Note: *Italics* **denotes Self Study Topics**

TEXT BOOK

1. **Deitel H.M,** *Operating Systems,* Pearson Education Publication, , 2nd Edition, 2005.

REFERENCE BOOK

1. **Achyut S Godbole**, *Operating System*, TMH Publications, 2003.
2. **Schillbertz,** *Operating System*,

SEMESTER – III

Practical - III

Java Programming LAB

Objective: To **i**mplement the concept 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.

Allied Paper III: Microprocessors and Its Architecture

Instructional Hrs: 75   **Sub. Code: 11ITUA303 /**

15CTUA303

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

Objective: To understand the architecture of Intel 8086, Intel 386 and

Intel 486 Microprocessor.

UNIT I   **15 Hrs.**

Introduction to microprocessors: Evolution of microprocessors – Single -chip Microcomputer - Embedded Microprocessors – Bit - Slice processors -Microprogramming - RISC and CISC Processors - *Scalar and Superscalar Processors* - Vector Processors - Array Processors - Symbolic Processors – Digital Signal Processors. Intel 8086 - Pin Description of Intel 8086 - Operating modes of 8086 - Register organization of 8086 - BIU and EU - Interrupts - 8086 based computer system - Addressing Modes of 8086.

UNIT II   **15 Hrs.**

8086 Instruction Set - Instruction Groups - Addressing Mode Byte -Segment Register Selection - Segment Override - 8086 Instructions. **Assembly Language Programs for 8086:** Largest Number, Smallest Number in a Data Array - *Numbers in Ascending and Descending order* - Block Move or Relocation -Block Move using REP instruction - Sum of a series -Multibyte Addition.

UNIT III   **15 Hrs.**

Intel 386 and 486 Microprocessors: Intel 386 and 486 Microprocessor -486DX Architecture - Register Organization of 486 Microprocessor - Memory Organization - Operating Modes of Intel 486 - *Virtual Memory* - Memory Managament UNIT Gates -Interrupts and Exceptions - Addressing Modes of 80486 - Pin Configuration.

UNIT IV   **15 Hrs.**

Input devices - Output devices - Memory and VO addressing - 8086 Addressing and Address Decoding - Programmable VO Ports - DMA Data Transfer. Other Microprocessors - PowerPC Microprocessors - Pentium Microprocessors - *Pentium Pro-microprocessor* - Alpha Microprocessor - Cyrix Microprocessor - MIPS Microprocessor – AMD Microprocessor.

UNIT V   **15 Hrs.**

MOTOROLA 68000, MOTOROLA 68020, MOTOROLA 68030, **MOTOROLA 68040**
Interfacing of AID Converter and Applications: Introduction -Interfacing of ADC 0808 or ADC 0809 to Intel 8086 - Bipolar to Unipolar Converter - Sample and Hold Circuit, LF 398 – Microprocessor based Measurement and Control of Physical Quantities.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

    Badri Ram, *Advanced Microprocessors and Interfacing*, Tata McGraw-Hill Publishing Company Limited, Fourteenth Reprint, 2007.

REFERENCE BOOK

    A.K. Ray, K.M. Bhurchandi, *Advanced Microprocessors and Peripherals*, Tata McGraw Hill Publishing Company Limited, Second Edition, 2007.

SEMESTER III

Skill Based Subject I: Database Management through Access Lab

Instructional Hrs: 45   **Sub. Code: 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 years.

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.

Non-Major Elective I: Data Processing Through Excel Lab

Instructional Hrs: 30   **Sub. Code: 11CTUNP01**

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.

    (I)   Aligning entries –Indent, Rotate etc.

    (II) Formatting Borders, Date and Numbers.

    (III) Conditional Formatting.

    (IV) 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.

    (I)   Sort the data by Region, Vendor name and sales.

    (II) 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.

    (I)   Use Filtering on Region and Helmet type.

    (II)   Use sub total function to count the no. 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.

    (I) Create a list of vendor and total sales by consolidating the total sales.

         Compute sub totals with no detail data.

    (II) 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 pie chart to show the sales results for different Helmet type and to the following formats.

   (I) Add a Secondary axis.

  (II) Create picture markers.

SEMESTER- IV
Core Paper – VII
PRINCIPLES OF COMPILER DESIGN

Instructional Hrs: 75   **Sub. Code: 11CTUC407**

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

Objective: To learn the basic concepts and the phases of compilers.

UNIT I   **15 Hrs**

Introduction to Compiling: Compilers - Analysis of the source program - phases of a compiler - Cousins of the compiler - Grouping of phases - A simple one pass compiler: Overview- Syntax Definition - Syntax directed translation- Parsing- A translator for simple expressions. **Lexical Analysis**: Removal of white spaces and comments - Constants recognizing identifiers and keywords - role of lexical analyzer - *Input buffering*- specification of tokens-Recognition of tokens.

UNIT II   **15 Hrs**

Syntax analysis- The role of a parser - Context free grammars - Top down parsing- Bottom up parsing.

Syntax directed Translation: Syntax directed definitions- Construction of syntax trees - Bottom up evaluation of S-attributed definitions - *L-attributed definitions* -Top down translation.

UNIT III   **15 Hrs**

Type Checking: Type systems- Specification of a simple type checker. Run time environment: Source language issues- *Storage Organization*- Symbol tables. **Intermediate code generation:** Intermediate languages-Declarations.

UNIT IV   **15 Hrs**

Code Generation: Issues in the design of code generators- The target machine- Runtime storage management- *Basic blocks and flow graphs*- Next use information- Dag representation for basic blocks- Peephole Optimization

B.Sc., CT 2015-2016 onwards

UNIT V   **15 Hrs**

Code Optimization: Introduction- The principle source of optimization- *Optimization of basic blocks*- Loops in flow graphs- Introduction to global data flow analysis.

Note: *Italics* **denotes Self Study Topics**

TEXT BOOK

1. Alferd V. Aho, Ravi sethi, Jeffrey D. Ullam, *Compliers-Principles,Techniques, and Tools,* Pearson Education, 18th Indian Reprint, 2005.

REFERENCE BOOKS

1. Alferd V. Aho and Jeffrey D. Ullam, *Principles of Compiler Design*, Narosa Publishing house, Indian student Edition.

2. **Santanu Chattopadhyah,** *Compiler Design,* PHI Learning private Ltd., New Delhi – 110001, 2009.

SEMESTER - IV

Core Paper – VIII

GUI DESIGN TOOLS

Instructional Hrs: 75   **Sub. Code: 08ITUC510 /**

                                                                    11CTUC408

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

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

UNIT   I   **15 Hrs.**

Introduction to Visual Basic – Visual Basic Programming Environment – Variables, data types & modules – Working with forms – Procedures, *functions* and control structure – Arrays – operators – Built-in functions.

UNIT   II   **15 Hrs.**

Creating and using Standard controls – Text box – Command Button – Check Box – Combo Box – *List Box* – Label – Option button – Timer control – Frames – Scroll Bars – Working with control arrays – Graphics for applications.

UNIT III   **15 Hrs.**

Menus - Mouse events – Dialog Boxes – *Rich Text Box* – Single Document Interface – Multiple Document Interface – Flex grid control.

UNIT   IV   **15 Hrs.**

Data Access Objects(DAO) – Creating a Database – creating a record set – Type of Record sets – Opening a database – Add, Edit, Update& Delete a records – *moving to the first, last, next & previous records* – searching & sorting a record set.

UNIT V   **15 Hrs.**

Active X Data Objects (ADO) – Data Environment Designer – Data Report - Creating a simple data report – *Data Bound control* – MS Hierarchical Flex-grid.

B.Sc., CT 2015-2016 onwards

Note: *Italics* **denotes Self Study Topics**

TEXT BOOK

1. **Content Development Group**, *Visual Basic 6 Programming,* TMH Publishers 2002.

REFERENCE BOOKS

1. **Scott Warner**, *Teach Yourself Visual Basic 6*", Tata Mc Graw Hill Edition, 2000.
2. **Gray cornel** ,*Visual Basic 6 from the Ground up*,2007.

Core Paper - IX

COMPUTER NETWORKS AND SECURITY

Instructional Hrs: 75   **Sub. Code: 11CTUC409**

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

Objective: To learn architecture and security mechanisms in computer network.

UNIT I   **15 Hrs.**

Evolution of Computer Networks: Introduction – Routes of Computer Networks – First Computer Networks – Convergence of Networks. **Network Architecture and Standardization**: Introduction – Decomposition of Network node interaction – OSI Model – *Network Standardization* – Information and Transport Services.

UNIT II   **15 Hrs.**

Network Characteristics: Introduction – Types of Characteristics – Performance – Reliability – Security – Provider-only Characteristics. **Methods of Insuring QoS**: Introduction – Application and QoS – Queue analysis – QoS Mechanisms – *Queue Management Algorithms* – FIFO and Priority Queuing – Traffic Engineering.

UNIT III   **15 Hrs.**

Transmission Links: Introduction – Taxonomy – Transmission link characteristics – Cable types**. Data Encoding and Multiplexing:** Introduction – Modulation – *Digitizing analog signals* – Encoding methods – Choosing encoding methods – Manchester code – Data compression – Error detection and Correction.

UNIT IV   **15 Hrs.**

Network Security: Introduction - Why Network Security is needed – Management principles – Security principles - Network management - Security attacks – *Qualities of a Good Network.* **Organizational Policy and Security:** Security policies, Standards and Guidelines – Information

Policy – Security Policy - Physical Security – Social Engineering – Security Procedures – Building a Security Plan. **Security Infrastructure:** Infrastructure Components – Goals of Security Infrastructure – Design Guidelines – Security Models.

UNIT V   **15 Hrs.**

Cryptography: Terminology and background – Data Encryption Methods – Cryptographic Algorithms- Secret Key Cryptography - Public key cryptography – Message Digest – Security Mechanisms – Speech Cryptography. **Hardware and Software Security:** Hardware security – Smart Card – *Biometrics* – Virtual Private Networks (VPNs) - Trusted Operating Systems – Pretty Good Privacy (PGP) – Security Protocols. **Database Security:** Introduction to Database – Characteristics of a Database Approach – Database Security Issues - Database Security – Vendor-Specific Security – Data Warehouse Control and Security.

Note: *Italics* **denotes Self Study Topics**

TEXT BOOKS

1. **Brijendra singh** , *Network Security and Management*, PHI 2007 [Unit IV & V].

2. **Natalia Olifer and Victor Olifer**, *Computer Networks Principles, Technologies and Protocols for network Design*, Wiley Student Edition, Reprint 2006 [Unit I – III].

REFERENCE BOOK

1. Andrew S. Tanenbaum, *Computer Networks*, Pearson Education, Fourth Edition, Asia 2003.

SEMESTER - IV

Practical - IV

GUI DESIGN LAB

Instructional Hrs: 75   **Sub. Code: 11CTUCP04**

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

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

1. Develop a VB Project to Check User Name & Password Given by User.

2. Develop a VB Project to Add & Remove Items From List Box.

3. Develop a VB Project to Copy all Items in a List Box to Combo Box.

4. Develop a VB Project to Enter and Display Student Information.

5. Develop a VB Project to Scroll Text from Left to Right Using Timer.

6. Develop a VB Project to Mini Calculator Functions.

7. Develop a VB Project to Documents typing using MDI Form.

     Use Employee Information For the Following Projects.

8. Develop a VB Project to Search a Record in MS-ACCESS database using data control.

9. Develop a VB Project to Delete a Record from MS-ACCESS database using data control.

10. Develop a VB Project to Perform following Operations in MS-ACCESS database using DAO. A). Move First Record. B).Move Next Record C).Move Previous Record. D).Move Last Record.

11. Develop a VB Project to Insert a Record in MS-ACCESS database using ADO.

12. Develop a VB Project to modify a record in MS-ACCESS database using ADO.

SEMESTER - IV
Allied Paper – IV
EMBEDDED SYSTEMS

Instructional Hrs: 75   **Sub. Code: 15CTUA404**

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

Objective: To learn the basic concepts of architecture, programming and design of an embedded system.

UNIT I   **15 Hrs.**

Introduction to Embedded System: An Embedded System – Processor in the System - Software embedded into a system – Exemplary system - embedded system on chip and in VLSI circuit. **Processor and Memory organization:** Structural units in a chip and in VLSI circuit. Processor selection – Memory devices – Memory selection – *DMA*.

UNIT II   **15 Hrs.**

Devices and buses for device network: I/O devices – Timer and counting devices – Host system. **Device drivers and interrupts servicing mechanism:** Device drivers – Device drivers for IPTD – *Interrupt servicing mechanism* – Context and the periods for context – Switching, dead-line and interrupt latency

UNIT III   **15 Hrs.**

Programming concepts and embedded programming in C and C++: Software programming in ALP and C – C program elements – Header and source files and processor directives – Macros and functions – Data types – Data structures – Modifiers – Statements – Loops and pointers – Queues – *Stacks* – Lists and ordered lists – Embedded programming in C++ - Source code for engineering tools for embedded C / C++ - Optimization of memory needs.

UNIT IV   **15 Hrs.**

Program modeling concepts in single and multi processor system: Modeling process for software analysis before software implementation – Programming model for event controlled or

response time constrained real time programs. ***Software engineering practices:*** Software algorithm complexity – Software development process life cycle and its models – Software analysis – Software designs – Implementation – Testing, Validation and debugging – Software maintenance.

UNIT V   **15 Hrs.**

Inter – **Process communication and synchronization of processes, tasks and threads**: Multiple processor – Problem of sharing data by multiple tasks and routines – Inter process communication. **Real time operating system**: Operating system service – I/O subsystem – Network operating system – *Real time and embedded operating system.*

Note: ***Italics*** **denotes Self Study Topics**

TEXT BOOK

1. **Raj kamal**, *Embedded Systems – Architecture, Programming and Design*, TMH, 2007.

REFERENCE BOOKS

1. **Oliver H.Bailey**, *Embedded Systems Design***,** Dream Tech Press, 1st Edition, 2005.
2. **Steve Heath**, *Embedded Systems Design***,** Newnes – London, 2ND Edition, 2005.

SEMESTER IV

Skill Based Subject II: Multiskill Development Paper

Instructional Hrs: 45   Sub.Code: **13CSUS402/**

13CAUS402/

13ITUS402/

13CTUS402

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

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

UNIT I   **9Hrs.**

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 Examinations. 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 Examinations –4th edition*, Tata McGraw-Hill Publishing Company Limited, New Delhi. (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.

Non-Major Elective II: Web Designing (Dreamweaver) Lab

Instructional Hrs: 30   **Sub. Code: 11CTUNP02**

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

Objective: To design simple web pages using Dream Weaver.

1. Design a new web site consisting of some html files for a product of your choice. Name the home page file as index.html.

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

PC HARDWARE AND TROUBLESHOOTING

Instructional Hrs: 90   **Sub. Code: 15ITUC408 /**

                                                     15CTUC510

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

Objective: To learn the hardware concepts and troubleshooting of a computer.

UNIT I   **15 Hrs.**

PC-Hardware Overview: Introduction-Hardware-BIOS-DOS Interaction-The PC family-PC Hardware-Interconnections Between Boxes-Inside the System Box-Motherboard Logic-*DMA Channel*-Floppy Disk Controller (FDC)- Memory Refresh-Post Sequence-*Overview of advanced PCs..*

UNIT II   **15 Hrs.**

Support Chips in the Motherboard : Introduction-Dumb and Smart Chips- Clock generator-Bus Controller-Interrupt Controller-Programmable Interval Timer-8255A-5 Programmable Peripheral Interface(PPI)-DMA Controller-*Support chips for advanced microprocessors.* **Print Controller:** Controller Hardware overview. **Hard disk Controller Subsystem:** Overview of HDC Organization.

UNIT III   **15 Hrs.**

PC Bus and Motherboard: PC Bus and Motherboard Functions-Reset Logic (8088-PC)-DMA Logic (8088-PC)-wait State Logic (8088-PC)-Time of Day (TOD) Logic (8088-PC)-Speaker Logic (8088-PC)-Keyboard Interface (8088-PC)-SMPS

Display Adapter: Introduction-CRT Display-CRT Controller Principle-CRT Controller-Color/Graphics Adapter-*Second Generation Graphics Adapters*-New Trends in Display Controllers-Display Adapters Interface.

UNIT IV   **15 Hrs.**

Installation and Preventive Maintenance-System Configuration-Pre-Installation Planning-*Installation Practice*-Routine Checks-PC Assembling and Integration -Engineering Version and Compatibility-Preventive Maintenance-Virus-Data recovery.

UNIT V   **15 Hrs.**

Keyboard Maintenance and Troubleshooting–Correcting problem keyboards-vacuum cleaners and keyboards-replacing the spacebar-preventing problems-Dealing with large objects-Dealing with spills-disabling a keyboard-**Troubleshooting a Pointing Device -**mouse/trackball interfaces-serial mice-bus mice-PS/2 mice-USB mice-mouse driver software issues-mouse keys under windows 9x-adjusting mouse properties-common detection issues- **Modem Troubleshooting-**check the command processor-check the dialer and telephone line-typical communication problems-Modem troubleshooting in windows 98-resolving resource conflicts-other issues-checking modem firmware-**Troubleshooting a Soundboard**-dos drivers and driver order- full duplex drivers-soundboard acceleration-multiple codecs-WAV playback problems-**Troubleshooting Video Adapters-**Basic problem isolation-multiple display support guide-missing display options.

Note: Self study topics are denoted in *Italics*

TEXT BOOKS

1. **Govindarajalu B**, *IBM PC and Clones Hardware, Troubleshooting and Maintenance*, Tata McGraw-Hill Publishing Company Limited, New Delhi-Second Edition, 2008. [Unit I-IV]

2. **Bigelow's**, *Troubleshooting,Maintaining &Rerparing PCs* , Tata McGraw-Hill Edition 2001,Fifth Edition. [Unit V]

REFERENCE BOOKS

1. **Craig Zacker and John Rourke**, *The Complete Referenec-PC Hardware*, Tata McGraw-Hill Publishing Company Limited, New Delhi Edition-2001.

2. **Ron Glister**, *PC Hardware a Beginner's Guide*, Tata McGraw-Hill Publishing Company Limited, New Delhi Edition-2001.

3. **Sanjay K Bose**, *Hardware and Software of Personal Computers*, New Age International (P) Limited, Publishers, New Delhi, 2000.

SEMESTER - V

Core Paper – XI

SOFTWARE ENGINEERING

Instructional Hrs: 75   **Sub. Code: 15CTUC511**

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- The RAD Model-Evolutionary software process models- Component based Development- The Formal methods- Fourth generation Techniques.

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- **Reengineering** – Software Reengineering- Reverse Engineering.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

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

REFERENCE BOOKS

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

SEMESTER – V
Core Paper – XII
.NET PROGRAMMING

Instructional Hrs: 75   **Sub. Code: 11CTUC512**

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

Objective: To understand the basic concepts of .NET Programming.

UNIT   I   **15 Hrs.**

Introducing.NET : .NET framework overview - Common type system-Common language specifications-Common intermediate language - Just in time compiler-Virtual execution system-.NET framework class library-Namespace-Languages in .Net - Visual studio.net-Why vb.net?-Win forms-Console applications-Assemblies. Our first vb.net program - Data types & Operators - **Control statements**: *If statement - Block if-Nested if-Looping* - Select case statement-Goto statement-Exit-Intrinsic control list-Form control-Events-Labels-Text box-Group box-Check box-Radio button-Scroll bar control.

UNIT   II   **15 Hrs.**

Arrays-Procedures & Structures: Subroutine procedures - Function procedures Property procedure – *Functions* - Calling a functions - Call by reference - Function with arrays - Function with param Arrays - Function Overloading – Subprocedures - Invoking a sub procedures – Structure - Nested structure - Message box - Input box.

UNIT   III   **15 Hrs.**

Creating Menus & Using Dialog Boxes – *Library Functions* in VB.net.

UNIT   IV   **15 Hrs.**

Data Access With ADO.NET – Making *reports* in VB.net.

UNIT   V   **15 Hrs.**

ASP.NET 2.0 Essentials – *Navigation Controls* - Validation Controls.

Note: *Italics* denotes Self Study Topics

TEXT BOOKS

1. **P.Radhaganesan,** *VB.NET*, Scitech Pub Pvt Ltd,Chennai.(Unit 1,2,3,4) Reprint Sep 2008.
2. **Vikas Gupta & Kogent solutions Inc**. *Comdex.Net programming Course Kit***, Dreamtech Press 2007(Unit 5).**

REFERENCE BOOKS

1. **Matt J.Couch**, *ASP.NET & VB.NET programming*, Pearson Education,2002.
2. **David I.Schneider,** *An Introduction To Programming Using VB.Net*, Prentice-Hall of India' , **P**vt Ltd, New Delhi-110 001,Fifth Edition.
3. **Shirish Ehavan,** *VB.Net*, Pearson Education,2009.

SEMESTER - V

Practical - V

PC HARDWARE AND TROUBLESHOOTING LAB

Instructional Hrs: 75   **Sub. Code: 08ITUCP04 /**

                                                                            08CTUCP05

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

Objective: To develop the skill of troubleshooting and assemble computer

hardware.

1. Create a Partition in a given Hard Disk.

2. How to install the new modem and connect the internet.

3. Configure the given printer and take the print out successfully.

4. What are the types of SMPS and measure the given SMPS output voltage.

5. Install the given virus scanner software and detect any virus found in your
   machine.

6. Install the Microsoft office XP for given PC.

7. How to configure the given web camera and activate it.

8. What are the steps involved in Sound Card Driver Installation.

9. Install the Network Interface Card and assign the IP Address for the NIC and check
   the connectivity between two machines.

10. Trouble shoot the problem – System hangs during booting.

11. Trouble shoot the problem – Keyboard not working.

12. Trouble shoot the Problem – Wrong character print out.

Elective I: E 1.1 Parallel Processing

Instructional Hrs: 90   Sub. Code: 09CTUE511

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

Objective: To learn basic concepts and techniques of parallel processing, Pipelining

and Vector Processing.

UNIT I   **18 Hrs.**

Introduction to Parallel Processing: Evolution of computer systems - Parallelism in uniprocessor systems - Parallel computer structures - Architecture *classification schemes*.

UNIT II   **18 Hrs.**

Parallel Processing Application - Principles *of Pipelining and Vector Processing Pipelining* – Instruction and Arithmetic Pipelines.

UNIT III   **18 Hrs.**

Principles of Designing Pipelined Processors – *Vector Processing Requirements*.

UNIT IV   **18 Hrs.**

Vectorization Methods - Recent Vector Processors – *Vectorization and optimization methods.*

UNIT V   **18 Hrs.**

Structures and Algorithms for Array Processor: SIMD Array Processors – SIMD Interconnection Networks - *Parallel Algorithms for Array Processor*.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

1.**Kai Hwang and Faye A.Briggs,** *Computer Architecture and Parallel Processing,* Mc Graw
   Gill Book Company, International edition 1985.

Elective I: E.1.2 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   **18Hrs.**

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 Method, First Edition, Macmillan Publishers Limited, 2014.

REFERENCE BOOKS

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

ELECTIVE I: E.1.3 GSM Architecture

Instructional Hrs: 90   **Sub. Code: 08CTUE531**

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

Objective: To understand the architecture and concepts of mobile communication
            system.

UNIT I   14 Hrs.

GSM Overview: Introduction – History of Mobile Communication – Cellular Concepts – GSM Network Architecture – Hierarchical Structure of GSM Network – GSM Communication Paradigm – GSM Protocol architecture – *GSM Architecture and Identities* – GSM Procedures – GSM Services - GSM Air Interface – multiple Access Scheme – GSM Frame Hierarchy – GSM Synchronization.

UNIT II   17 Hrs.

GSM bursts and their Types – GSM Logical Channels – GSM Traffic Channels – GSM Control Channels – Allocation of GSM Logical Channel – GSM Channel Combinations – *GSM Physical Layer Functions* – Frequency Hopping.

Mobile Station: Introduction – Mobile Station Components – Interface of Mobile Station – MS Functions – MS Protocol.

UNIT III   18 hrs.

Core Network: Introduction – Core Network Entities – *Core Network Interfaces* – Core Network Functions.

UNIT IV   18 Hrs.

GSM Procedure: Introduction – Latching on the BCCH Frequency –System Information Broadcast – Establishing RR Connection – Releasing the RR Connection – Assignment Procedure – *Cipher Mode Setting* – Paging Procedure - Timing Handling – Measurements – Power Control.

UNIT V   **23 Hrs.**

Supplementary services: Introduction – Supplementary Service Concepts – Value-Added Services – Introduction- Short Massage Service – Cell Broadcast Service – Multimedia Message Service.

Circuits-Switched Data Services: Introduction – Data Service in PSTN – CSD Service in GSM – CSD Connection Types and Services – Rate Adaptation for GSM CSD Services. High-Speed Circuit. **Switched data (HSCSD):** Introduction Basic Principles and Architecture – *Air Interface Aspects* – Call Handling.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

  Nishit Narang. Sumit Kasera, *GSM Architecture*, Tata Mc Graw Hill Publising

  Company Limited.

Skill Based Subject III: Image Editing Tool (Photoshop) – Lab

Instructional Hrs: 45   **Sub. Code: 11CTUSP03**

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

Objective: To get hands on experience in image editing using Photoshop.

1. Design a greeting card for birthday using different text effects.
2. Apply various filter effects for an image.
3. Design the front page of the college calendar using gradient.
4. Create a pattern using pattern stamp tool & clone stamp tool.
5. Design wallpaper using pattern maker.
6. Create a digital drawing.
7. Create a wedding card using various texts formatting.
8. Design a web page layout.
9. Merge images using layer palette.
10. Apply different editing and color options for an image.

Core Paper X1I1: Client / Server Computing

Instructional Hrs: 75   **Sub. Code: 15CAUC409 /**

15ITUC409 /

15CTUC613

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

Objective: To learn the basic concepts of Client / Server computing, operating

systems and SQL Database servers.

UNIT I   **15 Hrs.**

Client / Server computing - What is client / server? – File servers, database servers, Transaction servers, Groupware servers, Object servers, Web server – *FAT server* or client / server -Client / Server building blocks

UNIT II   **15 Hrs.**

Client / Server and operating systems – the Anatomy of a server program – Needs of Client / Server from an OS – server scalability – Client anatomy – *Client and server OS trends* – Client OS and server OS. NOS: Creating the single system image - Remote procedure Calls (RPC) – Messaging and Queuing: The MOM Middleware

UNIT III   **15 Hrs.**

SQL Database servers: What does SQL do? – The ISO standards – What does a database server do? – Stored procedures, Triggers and Rules. **Data warehouses** – OLTP (Online Transaction Processing) – *Decision Support System (DSS)* – Executive Information System (EIS) – comparing Decision Support and OLTP system – Production vs. Information Database – The data ware house

UNIT IV   **15 Hrs.**

Client / Server Transaction Processing – The ACID properties – Transaction Models – TP monitors – Client / Server groupware – *Importance of Groupware* – What is Groupware – The components of Groupware. Distributed Object,

CORBA style – CORBA : ORB- The Anatomy of a CORBA ORB.

UNIT V   **15 Hrs.**

Web client / server – The Evolution of the Web – Client / Server, Web style -What is URL? – Shortest HTML tutorial – HTTP – 3tier client / server – HTML web based forms – CGI: The server side of the Web.

Note: Self study topics are denoted in *Italics*

TEXT BOOK

    Robert Orfali, Dan Harkey and Jeri Edwards, *Client /Server Survival Guide*, Wiley India Edition, Third Edition, 2008.

REFERENCE BOOKS

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

Core Paper XIV: Web Technology

Instructional Hrs: 75   **Sub. Code: 08CTUC614**

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

Objective: To impart the skills for designing web pages.

UNIT I   **8 Hrs.**

HTML: Introduction – HTML Elements – HTML syntax – Document types – html, head, title and body elements – Block level elements – Text level elements – Links – Images – Fonts – Colors – *Style Sheets* – Character Entities.

UNIT II   **12 Hrs.**

Active Server Pages: Introduction – *ASP Objects*: The Request Object – The Response Object – The Server Object – Using the Request, Response and Server Objects.

UNIT III   **15 Hrs.**

ASP Objects: global.asa file – The Application Object – *The Session Object* – Using Application and Session Objects.

UNIT IV   **20 Hrs.**

ASP Components : The Ad Rotator Component – The Browser Capabilities Component – The Content Linking Component – The Content Rotator Component – The Counters Component – *The Page Counter Component* –The Permission Checker component

UNIT V   **20 Hrs.**

Database Connectivity in ASP: AxtiveX Data Objects – The Connection Object – The Command Object - *The Recordset Object* – The Record Object – The Stream Object.

Note: Self study topics are denoted in *Italics*

B.Sc., CT 2015-2016 onwards

TEXT BOOKS

1. **Dave Mercer**, *ASP 3.0: A Beginners Guide,* Tata McGraw Hill, 2001.

2. **Thomas A. Powell, Dan Whitworth**, *HTML Programmer's Reference,* Tata McGraw Hill, 2001.

REFERENCE BOOK

Xavier C, *World Wide Web with HTML*, Tata McGraw Hill Publishing Company Ltd, New Delhi, 2001.

SEMESTER VI

Practical VI: Web Technology Lab

Instructional Hrs: 75   **Sub. Code: 08CTUCP06**

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

Objective: To know how to design the web page effectively.

1. Design a personal web page using HTML.
2. Design a data entry form in HTML.
3. Write a Program in ASP to get data using a form, validate the data and returns the same data for correction if any using the same form.
4. Write a program in ASP to display the Session properties.
5. Write a program in ASP that makes use of Ad Rotator component.
6. Write a program in ASP that makes use of Browser Capabilities component.
7. Write a program in ASP that makes use of Content Rotator component.
8. Write a program in ASP that makes use of page counter component.
9. Write a program in ASP to get the data of students using forms and stores them in database.
10. Write a program in ASP to perform record navigation using a form.

Elective II: E 2.1 Mobile Computing

Instructional Hrs: 90 Hrs   **Sub. Code: 09ITUE632 /**

                                                                    11CTUE612

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

Objective: To learn technical concepts of GSM, GPRS and CDMA technology.

UNIT I   **18 Hrs.**

Introduction : Mobility of Bits and Bytes – Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – *Middleware and Gateways* – Application and services – Developing Mobile computer Applications – security in mobile computing – Standards – Why is it necessary – Standard bodies. **Mobile Computing Architecture**: History of computers and Internet – Architecture for mobile computing – Three – tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting application mobile enabled.

UNIT II   **18 Hrs.**

Mobile Computing Through Telephony: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – *IVR Application* – Voice XML – TAPI

UNIT III   **18 Hrs.**

Emerging Technologies: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 Java Card. GSM: Global System for mobile communications – *GSM Architecture* – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM-GSM Frequency allocations – Authentication and Security SMS.

UNIT IV   **18 Hrs.**

GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Application for GPRS – Limitations – Billing and Charging. **WAP:** MMS – *GPRS Applications*

UNIT V   **18 Hrs.**

CDMA and 3G: Spread spectrum technology – IS 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802. II standards Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile ad hoc networks and sensor networks – *Wireless LAN Security WiFi vs. 3G.*

Note: Self study topics are denoted in *Italics*

TEXT BOOK

   Asoke K Talukder, Roopa R Yavagal, Mobile *Computing*, TMH, 2005.

REFERENCE BOOKS

1. **Jeyasri Arokiamary.V**, Mobile *Computing*, Technical publication, 1st Edition, 2007.

2. **Naseer Hussain**, *Mobile Computing*, Rajalaxmi Publishers, 1st Edition, 2003.

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   **18 Hrs.**

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

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.*

Elective II: E 2.3 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, Wireless Markup Languages and Bluetooth Technology.

.UNIT I   18 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   18 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   18 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   18 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   **18 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.

Skill Based Subject - IV

DTP DESIGN TOOLS (PAGEMAKER & CORELDRAW) – LAB

Instructional Hrs: 45   **Sub. Code: 11CTUSP04**

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

Objective: To gain practical knowledge in DTP design using 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, Third Edition, 2001.

B.Sc., CT 2015-2016 onwards

SELF LEARNING PAPER
2. Internet Concepts

Sub. Code: 15CSUSL02

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

Objective: To understand the working of various components of Internet.

UNIT I
Understanding the Internet's Underlying Architecture: What is the Internet – How Computer Networks Send Data across the Internet – How TCP/IP Works – How Internet Addresses and Domains Work – How Routers Work.

UNIT II
Communicating on the Internet - **How Email Works:** How Email is delivered over the Internet – How Email Software Works – How a Mailing List Works – How Email is sent between Networks – How Encryption Can Keep Email Private. **How the World Wide Web Works**: How Web Page Work – How Web Browser Work.

UNIT III
Using the World Wide Web: How Internet Searching Works – How Google Works – How Map Sites Work – How Wikis and Wikipedia Work.

UNIT IV
Using Common Internet Tools: How Agent Work – How Java, ActiveX and JavaScript Work – How CGI Scripting Works. **Enjoying Entertainment and Multimedia on the Internet:** How iPods, iTunes and Podcasting Work. **Shopping and Doing Business on the Internet:** Shopping on the Internet.

UNIT V
Protecting yourself on the Internet: How firewalls Work – How Hackers can cripple the Internet and Attack your PC - How Viruses Work – How Internet Sites can invade your Privacy – The Dangers of Spyware and Phishing – Cryptography, Privacy and Digital Certificates.

TEXT BOOK

1. **Preston Gralla**, *How the Internet Works,* Pearson Education, Eighth Edition, 2012.

SELF LEARNING PAPER

3. Green Computing

Sub. Code: 13CSUSL03

Max. Marks: ESE -100   Credits: 5

Objective: To learn the measures in protecting environment through proper usage of computers and components.

UNIT I

What Is Green Computing?: Knowing What Green Computing Means - Getting Started with Green Computing - Speaking Green Jargon. **Checking Out Your Carbon Footprint**: Knowing Your Carbon Footprint ABCs - Facing the Facts - Reducing Your Footprint. **Assessing What You've Got**: Starting an Inventory of Your Computing Equipment - Understanding How You Use Devices - Working Better with What You Have- Developing computer habits that save energy - Making the Case for a New Purchase.

UNIT II

Giving Your Computer a Green Makeover:Weighing Your Makeover Possibilities - Shrinking the Elephant on Your Desktop - Gaming and More with a Greener Video Card -Adding Memory without Ginseng - What's a Terabyte among Friends? Improving Your Laptop Battery - Greening Your Power Supply. **Buying a Green Computer**: Understanding what makes a computer green- Matching a computer to your needs- Researching Your Options - Checking Out Small, Green, Niche Computers - Making Your Purchase.

UNIT III

Choosing Earth-Friendly Peripherals: Planning Your Purchases of Green Peripherals - Sharing Peripherals - Picking Printers - Seeing Some Specialty Drives - Selecting Keyboards and Mice - Calling Router Rooter - Making the Purchase — and What to Do Afterward.

UNIT IV

Recycling Your Computer: Facing the e-Waste Facts - Exporting the e-Waste Problem -Seeing Reasons to Recycle Computers - Planning Your Computer's Retirement - Wiping Your System Clean - Finding Great New Uses for an Old Computer - Going Back to the Source (Almost) - Recycling Computer Supplies, Too - Taking Local Action to Clean Up Global Computer Waste.

UNIT V

Print Less, Breathe More - Seamless Sharing across Systems: Sharing at Home - Benefits of networking - Types of networks - Setting Up a Home Network -Securing the wireless airwaves - Sharing the Easy Stuff - Sharing printers - Sharing media files - Figuring out what it is: hardware, software, or both? - Keeping Your Footprint Low at Home - Working with backups - Cleaning things up- Monitoring your resources **Ten Best Ways to Make Your Computer Greener.**

TEXT BOOK

Woody Leonhard and Katherine Murray, *Green Home Computing for Dummies,* Wiley Publishing, Inc.

REFERENCE BOOKS
1. **John Lamb**, *The Greening of IT* , IBM Press, 2009.
2. **Jason Harris,** Green *computing and Green IT Best Practices.*

4. Security in Computing

Sub. Code: 13CSUSL04

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

Objective: To learn about nature of system vulnerability and measures to control it.

UNIT I

What does "Secure" Mean? – Attacks – The meaning of computer security – computer criminals – methods of defense. **Elementary cryptography:** Terminology and Background – substitution ciphers.

UNIT II

Transpositions – Making good Encryption Algorithms – The data encryption standard (DES) – The AES Encryption Algorithm – Public key encryption – The uses of Encryption.

UNIT III

Program Security: Secure programs – non malicious program errors – virus and other malicious code – controls against program threats.

UNIT IV

Security in networks: Network concept - Threats in networks – network security controls secure E-Mail.

UNIT V

Protection in General purpose operating systems: protected objects and methods of protection – control of access of general objects – File protection mechanisms – user authentication.

Database Security: Introduction to databases – security requirements. **Administering security:** security planning.

TEXT BOOK

    Charles P.Pfleeger & Shari Lawrence Pfleeger, *Security in Computing,* Pearson Education, Third Edition 2004.