BACHELOR OF COMPUTER APPLICATIONS
(For students admitted from 2017-18 & onwards)

The curriculum of all programme courses are highlighted with Employability – Pink Color, Entrepreneurship – Yellow Color and Skill-Development – Red Color

BACHELOR OF COMPUTER APPLICATIONS
Course Scheme and Scheme of Examinations
(For students admitted from 2017-18 & onwards)

Part	Category	Course Code	Title of the Course	Contact Hrs/ week	Exam Duration hrs.	Max.Marks			Credits
						CIA	ESE	Total	
SEMESTER - I									
I	Language: I	17LTU01/ 17LHU01/ 17LFU01/ 17LKU01/ 17LMU01/ 17LSU01	Tamil- I/Hindi–I/French-I/ Kannada-I/ Malayalam-1 / Sanskrit-I	6	3	25	75	100	4
II	English: I	17LEU01	English: I	6	3	25	75	100	4
III	Core: I	17CAU01	Computing Fundamentals and C Programming	4	3	25	75	100	4
III	Core :II	17CAU02	Digital Fundamentals and Computer Architecture	4	3	25	75	100	4
III	Core : III	17CAU03	Programming in C -Practical	3	3	40	60	100	4
III	Allied : I	17CAU04	Mathematical Structures for Computer Science	5	3	25	75	100	4
IV	Foundation Course: I	17FCU01	Environmental studies	2	3	-	50	50	2
			TOTAL	30				650	26
SEMESTER - II									
I	Language: II	17LTU02/ 17LHU02/ 17LFU02/ 17LKU02/ 17LMU02/ 17LSU02	Tamil- II/Hindi-II/French-II/ Kannada-II/ Malayalam-II/ Sanskrit-II	6	3	25	75	100	4
II	English: II	17LEU02	English: II	6	3	25	75	100	4
III	Core: IV	17CAU05	Programming in C++	5	3	25	75	100	4
III	Core : V	17CAU06	Programming in C++ - Practical	4	3	40	60	100	4
III	Core : VI	17CAU07	Programming in HTML- Practical	2	3	40	60	100	2
III	Allied : II	17CAU08	Discrete Mathematics	5	3	25	75	100	4
IV	Foundation Course : II	17FCU02	Yoga and Value Education	2	3	-	50	50	2
			TOTAL	30				650	24

SEMESTER - III

III	Core : VII	17CAU09	Data Structures	5	3	25	75	100	4
III	Core : VIII	17CAU10	Java Programming	5	3	25	75	100	4
III	Core : IX	17CAU11	Programming in Java – Practical	5	3	40	60	100	4
III	Core : X	17CAU12	Programming in PHP with Symfony	4	3	25	75	100	4
III	Allied : III	17CAU13	Operation Research	4	3	25	75	100	4
III	Core:XI	17CAU14	Comprehension in Computer Science-I (Online Exam / Self-Study)	-	1 1/2	-	50	50	1
IV	Skill Enhancement Course : I	17SEU01	Information Security	2	3	100	-	100	2
IV	Non - Major Elective : I	17NMU01A/ 17NMU01B	Indian Women and Society / Basic Tamil	2	3	-	50	50	2
IV	Non - Major Elective : II	17NMU02A/ 17NMU02B	Career Enhancement(Online Exam)/ Consumer Rights	3	-	-	-	-	-
			TOTAL	30				700	25

SEMESTER - IV

III	Core: XII	17CAU15	Operating System	6	3	25	75	100	5
III	Core : XIII	17CAU16	Linux Programming	6	3	25	75	100	5
III	Core : XIV	17CAU17	Programming in Linux - Practical	6	3	40	60	100	4
III	Allied : IV	17CAU18	Business Accounting	5	3	25	75	100	4
III	Core:XV	17CAU19	Comprehension in Computer Science-II (Online Exam / Self-Study)	-	1 1/2	-	50	50	1
IV	Skill Enhancement Course : II	17SEUCA2	Programming in PHP with Symfony -Practical	4	3	40	60	100	2
IV	Non - Major Elective : II	17NMU02A/ 17NMU02B	Career Enhancement(Online Exam)/ Consumer Rights	3	1 1/2	-	50	50	2
			TOTAL	30				600	23

SEMESTER - V

III	Core : XVI	17CAU20	Relational Database Management System	6	3	25	75	100	4
III	Core : XVII	17CAU21	VB.Net Programming	6	3	25	75	100	4
III	Core : XVIII	17CAU22	Programming in VB.Net and Oracle - Practical	6	3	40	60	100	4
III	Core :XIX	**	Core Optional	3	3	-	-	100	3
III	Core : XX	17CAU23	Institutional Training	-	-	100	-	100	1
III	Elective : I	17CAU24A/ 17CAU24B/ 17CAU24C/	Introduction to Compiler Design / Computer Networks / Introduction to Image Processing	6	3	25	75	100	4
III	Core:XXI	17CAU25	Comprehension in Computer Science-III (Online Exam / Self-Study)	-	1 1/2	-	50	50	1
IV	Skill Enhancement Course: III	17SEUCA3	Tally- Practical	3	3	40	60	100	2
V	Proficiency Enhancement	17PEUCA1	Software Project Management (Self Study)	-	3	-	100	100	2
			TOTAL	30				850	25

SEMESTER – VI

III	Core : XXII	17CAU26	Research Methodology	6	3	25	75	100	5
III	Core : XXIII	17CAU27	Computer Graphics and Multimedia	6	3	25	75	100	5
III	Core :XXIV	17CAU28	Programming in 3D Max- Practical	6	3	40	60	100	4
III	Elective : II	17CAU29A/ 17CAU29B/ 17CAU29C/	Network Security / Big Data Analytics / Fundamentals of Distributed Computing	5	3	25	75	100	4
III	Elective : III	17CAU30A/ 17CAU30B/ 17CAU30C/	E-Commerce/Green Computing/Web Services	5	3	25	75	100	4
III	Core:XXV	17CAU31	Comprehension in Computer Science-IV (Online Exam / Self-Study)	-	1 1/2	-	50	50	1
IV	Skill Enhancement Course - IV	17SEUCA4	CASE Tools- Practical	2	3	40	60	100	2
			TOTAL	30				650	25
V	Extension Activity		NSS / YRC / RRC / CCC / PHYSICAL EDUCATION	II – VI SEMESTER					1
			Department Extension Activity	II – VI SEMESTER					1
			Total Credits						150

P. H. ebi

Head, Department of Computer Science
P.K.R. Arts College for Women (Autonomous)
Gobichettipalayam - 638 476.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:I	17CAU01	COMPUTING FUNDAMENTALS AND C PROGRAMMING	48	-	4

Preamble

To learn about the Computer fundamentals and the C programming language concepts

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basic fundamentals of computers	K1,K2
CO2	Learn basics of C language	K1,K2
CO3	Understand the control structure	K2,K5
CO4	Familiarize in functions and structure and unions	K3,K4
CO5	Analyze pointers and file	K4,K5

SYLLABUS

UNIT I (9 Hours)   Fundamentals of Computers
Introduction – History of Computers-Generations of Computers - Classification of Computers - Basic Anatomy of a Computer System - Input Devices - Processor-Output Devices - Memory Management – Types of Software- Overview of Operating System - Programming Languages-Translator Programs-Problem Solving Techniques - Overview of C.

UNIT II (10 Hours)   Overview of C
Introduction - Character Set - C Tokens - Keyword & Identifiers - Constants - Variables - Data Types - Declaration of Variables - Assigning Values to Variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement Operators - Arithmetic Expressions - Evaluation of Expression - Precedence of Arithmetic Operators - Type Conversion in Expression – Operator Precedence and Associativity - Mathematical Functions - Reading and Writing a Character - Formatted Input and Output.

UNIT III (9 Hours)   Decision Making and Branching statement
Introduction – If, If….Else, nesting of If …Else Statements- 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. Arrays: Character Arrays and Strings.

UNIT IV (10 Hours)   Functions
User-Defined Functions: Introduction – Need and Elements of User-Defined Functions - Definition - Return Values and their Types - Function Calls – Declarations – Category of Functions - Nesting of Functions - Recursion – Passing Arrays and Strings to Functions - The Scope, Visibility and Lifetime of Variables - Multi file Programs. Structures and Unions.

UNIT V (10 Hours)   Pointers

Introduction-Understanding Pointers-Accessing the Address of a Variable-Declaration and Initialization of Pointer Variable – Accessing a Variable through its Pointer-Chain of Pointers - Pointer Expressions – Pointer Increments and Scale Factor- Pointers and arrays - Pointers and strings – Array of pointers – Pointers as Function Arguments- Functions Returning Pointers – Pointers to Functions – Pointers and Structures. File Management in C.

TEXT BOOK:

1.E Balagurusamy, Computing Fundamentals & C Programming, Tata McGraw-Hill, Second Reprint 2008.

REFERENCE BOOKS:

1. Ashok N Kamthane, Programming with ANSI and Turbo C, Pearson, 2002.
2. Henry Mullish & Hubert L.Cooper, The Sprit of C, Jaico, 1996.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:II	17CAU02	DIGITAL FUNDAMENTALS AND COMPUTER ARCHITECTURE	48	-	4

Preamble

To learn about Computer Fundamentals and its Architecture.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To provide a insight of how basic computer components are specified	K1,K2
CO2	Ability to understand the digital logic circuits and their design	K2,K3,K5
CO3	Acquire knowledge of Input-Output interfaces	K3
CO4	Ability to handle interrupts	K4,K5
CO5	Ability to work with memory organization	K4

SYLLABUS

UNIT I (10 Hours)   **Number System and Binary Codes**
Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal – Binary Addition, Multiplication, Division – Floating Point Representation, Complements, BCD, Excess3, Gray Code. Arithmetic Circuits: Half Adder, Full Adder, Parallel Binary Adder, BCD Adder, Half subtractor, Full Subtractor, Parallel Binary Subtractor - Digital Logic: The Basic Gates – NOR, NAND, XOR Gates.

UNIT II (8 Hours)   **Logical Circuit**
Combinational Logic Circuits: Boolean Algebra – Karnaugh Map – Canonical Form1 – Construction and Properties – Implicants – Don't Care Combinations - Product of Sum, Sum of Products, Simplifications. Sequential Circuits: Flip-Flops: RS, D, JK, and T-Multiplexers – Demultiplexers – Decoder Encoder – Shift Registers-Counters.

UNIT III (12 Hours)   **Input-Output Organization**
Input – Output Organization: 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 Asynchronous Data Transfer: Strobe Control and Handshaking.

UNIT IV (10 Hours) **Interrupts and DMA**

Priority Interrupt: Daisy- Chaining Priority, Parallel Priority Interrupt. Direct Memory Access:
DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication.

UNIT V (8 Hours) **Memory Organization**

Memory Organization: Memory Hierarchy – Main Memory - Associative Memory: Hardware

Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative,

Direct, Set-Associative Mapping – Writing into Cache Initialization.

TEXT BOOKS:

1. V.K. Puri, Digital Electronics Circuits and Systems, TMH.
2. Albert Paul Malvino, Donald P Leach, Digital principles and applications, TMH, 1996.
3. M. Morris Mano , Computer System Architecture - PHI.

REFERENCE BOOK:

 1. M. Carter, Computer Architecture - Schaum's outline series, TMH.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:III	17CAU03	PROGRAMMING IN C –PRACTICAL	-	36	4

Subject Description: This course provides hands on experience on C Programming
Goal: To enable the students to develop software in C language
Objectives: On successful completion of the course the students will
      understand the concepts of C language and expertise in using C

Practical list

1. Write a C program to find the sum, average, standard deviation for a given set of numbers.

2. Write a C program to generate n prime numbers.

3. Write a C program to generate Fibonacci series.

4. Write a C program to print magic square of order n where n > 3 and n is odd.

5. Write a C program to sort the given set of numbers in ascending order.

6. Write a C program to check whether the given string is a palindrome or not using pointers.

7. Write a C program to count the number of Vowels in the given sentence.

8. Write a C program to find the factorial of a given number using recursive function.

9. Write a C program to print the students Mark sheet assuming roll no, name, and marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.

10. Write a function using pointers to add two matrices and to return the resultant matrix to the calling function.

11. Write a C program which receives two filenames as arguments and check whether the file contents are same or not. If same delete the second file.

12. Write a program which takes a file as command line argument and copy it to another file. At the end of the second file write the total i)no of chars ii) no. of words and iii) no. of lines.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE: I	**17FCU01**	**ENVIRONMENTAL STUDIES**	24	-	2

Preamble

To bring about an awareness of a variety of environmental concerns and to create a pro-environmental attitude and a behavioral pattern in society that is based on creating sustainable lifestyle.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To give information about the environment and the resources to act at our own level to protect them.	K1
CO2	To analyse the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems	K4
CO3	Understand the scale dependence of biodiversity and its measurement	K2
CO4	To learn how to assess pollution sources, study exposure pathways and fate, and evaluate consequences of human exposure to pollution and its impacts to environmental quality.	K1,K3
CO5	To balance our economic, environmental and social needs, allowing prosperity for now and future generations	K5

SYLLABUS

UNIT I (4 Hours)   Multidisciplinary Nature of Environmental Studies

i) Definition, Scope and Importance

ii) Need for Public Awareness

iii) Natural Resources

a) Natural Resources and Associated Problems

- **Forest Resources:** Use and Over-exploitation, Deforestation, Case Studies. Timber Extraction, Mining, Dams and their Effects on Forests and Tribal People.
- **Water Resources:** Use and Over-utilization of Surface and Ground Water, Floods, Drought, Conflicts over Water, Dams – Benefits and Problems.
- **Mineral Resources:** Use and Exploitation, Environmental Effects of Extracting and using Mineral Resources, Case Studies.
- **Food Resources:** World Food Problems, Changes Caused by Agriculture and Overgrazing, Effects of Modern Agriculture, Fertilizer-Pesticide Problems, Water Logging, Salinity, Case Studies.
- **Energy Resources:** Growing Energy Needs, Renewable and Non-Renewable Energy Sources, Use of Alternate Sources, Case Studies.

- **Land Resources:** Land as a Resource, Land Degradation, Man Induced Landslides, Soil Erosion and Desertification.

b) Role of an Individual in Conservation of Natural Resources
c) Equitable Use of Resources for Sustainable Lifestyles

UNIT II (5 Hours)   Ecosystems
i) Concept of an Ecosystem
ii) Structure and Function of an Ecosystem
iii) Producers, Consumers and Decomposers
iv) Energy Flow in the Ecosystem
v) Ecological Succession
vi) Food Chains, Food Webs and Ecological Pyramids
vii) Introduction Types, Characteristics Features, Structure and Function of the following Ecosystem:
  a) Forest Ecosystem
  b) Grassland Ecosystem
  c) Desert Ecosystem
  d) Aquatic Ecosystems (Ponds, Streams, Lakes, Rivers, Ocean, Estuaries)

UNIT III (5 Hours)   Biodiversity and its Conservation
   Introduction – Definition – Genetic, Species and Ecosystem Diversity
   i) Bio-geographical Classification of India
   ii) Value of Biodiversity – Consumptive Use, Productive Use, Social, Ethical, Aesthetic and Option Value
   iii) Biodiversity at Global, National and Local Levels
   iv) India as a Mega-Diversity Nation
   v) Hot-Spots of Biodiversity
   vi) Threats to Biodiversity – Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts
   vii) Endangered and Endemic Species of India
   viii)   Conservation of Biodiversity – In-situ and Ex-situ and Conservation of Biodiversity

UNIT IV (5 Hours)   Environmental Pollution
   i) Definition, Causes, Effects and Control Measures of:
      a) Air Pollution
      b) Water Pollution
      c) Soil Pollution
      d) Noise Pollution
      e) Thermal Pollution
   ii) Solid Waste Management – Causes, Effects and Control Measures of Urban and Industrial Wastes
   iii) Role of an Individual in Prevention of Pollution
   iv) Pollution Case Studies
   v) Disaster Management – Floods, Earthquake, Cyclone and Landslides

UNIT V (5 Hours)   Social Issues and the Environment
   i)   Sustainable Development
   ii) Urban Problems Related to Energy
   iii) Water Conservation, Rainwater Harvesting, Watershed Management
   iv) Resettlement and Rehabilitation of People; Its Problems and Concerns, Case Studies
   v)   Environmental Ethics – Issues and Possible Solutions
   vi) Climate Change, Global Warming, Ozone Layer, Depletion, acid Rain, Nuclear
        Accidents and Holocaust, Case Studies
   vii) Consumerism and Waste Products
   viii) Environmental Protection Act
   ix) Air (Prevention and Control of Pollution) Act
   x)   Water (Prevention and Control of Pollution) Act
   xi) Wildlife Protection Act
   xii) Forest Conservation Act
   xiii) Issues Involved in Enforcement of Environmental Legislation
   xiv) Public Awareness
   xv) Human Population and the Environment
   - Population Growth and Distribution
   - Population Explosion – Family Welfare Programme
   - Environment and Human Health
   - Human Rights
   - Value Education
   - HIV/AIDS
   - Women and Child Welfare
   - Role of Information Technology in Environment and Human Health
   - Medical Transcription and Bioinformatics

TEXT BOOK:
   1. Environmental Studies, Bharathiar University, Publication Division, 2004

REFERENCE BOOK:
   1. R.C.Sharma and Gurbir Sangha, Environmental Studies, Kalyani Publishers, 2005.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:IV	17CAU05	**PROGRAMMING IN C++**	60	-	4

Preamble

To learn about Object Oriented Concepts through C++.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basics of OOPS	K1,K2
CO2	Understand functions in C++	K2
CO3	Learn the inheritance concepts	K3,K4
CO4	Ability to learn pointers	K3,K5
CO5	Know about error handling	K4,K5

SYLLABUS

UNIT I (12 Hours)   Introduction to C++

Software Evolution- A look at Procedure-Oriented Programming - Object Oriented Paradigm - Basic Concepts of OOP - Benefits of OOP - Object Oriented Languages - Applications of OOP - Beginning with C++ - Tokens- Expressions and Control Structures.

UNIT II (12 Hours)   Function in C++

Main Function- Function Prototyping - Call by Reference - Return by Reference - Inline Function - Function Overloading – Classes and Objects: C Structures Revisited - Specifying a Class- Defining Member Function - C++ program with Class - Nesting of Member Function - Private Member Function- Memory Allocation for Objects- Static Data Members and Functions - Array of Objects - Objects as Function Arguments - Friendly Functions – Constructors and Destructors: Constructor- Parameterized Constructors - Multiple Constructor in a Class - Copy Constructor - Destructor.

UNIT III (12 Hours)   Operator Overloading

Introduction- Defining Operator Overloading - Overloading Unary Operator - Overloading Binary Operator - Overloading Binary Operator using Friends - Rules for Overloading Operator– Inheritance: Defining derived Classes - Single Inheritance - Making a Private Member Inheritable - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance - Virtual Base Classes - Abstract Classes.

UNIT IV (12 Hours)   **Pointers**

Introduction- Pointers- Array of Pointers- Pointers to Objects- This Pointer- Pointer to Derived Class - Virtual Functions - Rules for Virtual Function - Pure Virtual Function – Managing Console I/O Operations.

UNIT V (12 Hours)   **Exception Handling and Strings**

Working with Files – Templates: Introduction - Class Templates - Class Templates with Multiple Parameters - Function Template - Function Template with Multiple Parameters - Exception Handling: Introduction - Basics of Exception Handling - Exception Handling Mechanism- Throwing Mechanism - Catching Mechanism – Strings: Introduction - Creating (String) Objects- Manipulating String Objects - Relational Operators - String Characteristics.

TEXT BOOK:
1. E.Balagurusamy, "Object Oriented Programming with C++", Fifth Edition, TMH Publication.

REFERENCE BOOKS:
1. John R Hubbard, "Programming with C++", 2nd Edition, TMH Publication, 2002.
2. Maria Litvin & Gary Litvin, "C++ for you", Vikas Publication, 2002.
3. Yashavant Kanetkar, "Let us C++", BPB Publication, 2nd Edition, 2010.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:V	17CAU06	**PROGRAMMING IN C++ - PRACTICAL**	-	48	4

Subject Description: This course provides rich experience on C++ Programming
Goal: To enable the students to develop software in C++ language
Objectives: On successful completion of the course the students will
understand the concepts of C++ language and expertise in using C++

Practical list

1. a) Write a C++ program to find a factorial for a given number using recursive function.
   b) Write a C++ program to find a Fibonacci series using while loop.
2. Define a class to represent a bank account. Include the following members:
   Data members: Name of the depositor, Account number, Type of account Balance amount in the account
   Member functions: To assign initial values, To deposit an amount, To withdraw an amount after checking the balance, To display the name and balance. Write a main program to invoke the member functions.
3. Write a C++ program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.
4. Write a C++ program to swap two numbers using friend function.
5. Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade. Create array of objects for the derived class.
6. Write a C++ program to add two complex numbers using operator overloading concept.
7. Write a C++ Program to check whether the given string is a palindrome or not using Pointers.
8. Write a C++ Program using virtual function for number conversions to Binary, Octal, Hexa decimal.
9. Write a C++ Program to create a File and to display the contents of that file with line numbers.
10. Write a C++ Program to merge two files into a single file.
11. Write a C++ Program to implement exception handling concept using divide by zero.
12. a) Write a C++ program to implement the concept of class template.
    b) Write a C++ Program to implement any four built in string functions.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VI	17CAU07	PROGRAMMING IN HTML- PRACTICAL	-	24	2

Subject Description: This course provide complete knowledge in HTML
Goal: To enable the students to develop HTML web page
Objectives: On successful completion of the course the students will
        understand the applications of HTML and create web page

Practical list

1. A Program to illustrate body , pre tags, text formatting tags

2. A Program to illustrate text Font tag, comment, h1….h6, and div tag

3. A Program to illustrate all types of list tag

4. A Program to illustrate img tag, Hyper Link tag (Anchor tag)

5. A Program to illustrate image map

6. A Program to illustrate Table tag

7. A Program to illustrate Frame tag

8. A Program to illustrate Form tag

9. A Program to illustrate CSS (cascading style sheet)

10. A Program in HTML using JavaScript

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
FOUNDATION COURSE : II	17FCU02	YOGA & VALUE EDUCATION	24	-	2

Preamble

To enable the learners to acquire the knowledge on basic yogasanas and values and practice them in real life.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the basic knowledge on yoga and value education.	K1
CO2	Understand the importance of yoga, mental exercises, principles of life and components of values	K2
CO3	Enhance their physical and mental health by practicing the different types of asanas, kriyas, mental exercises and values.	K3
C04	Lead a meaningful life for the fulfillment of the needs of family, workplace, society and country.	K4

SYLLABUS

UNIT I (5 Hours)   YOGA AND HEALTH
Theory:
Yoga-Meaning - Importance of Yoga – Pancha Koshas - Benefits of Yoga - General Guidelines.
Practice:
Dynamic Exercise - Surya Namaskar - Basic Set of Asanas - Pranayama & Kriya.

UNIT II (5 Hours)   ART OF NURTURING THE MIND
Theory:
Ten Stages of Mind - Mental Frequency – Methods for Concentration. Eradication of Worries - Benefits of Blessings - Greatness of Friendship - Individual Peace and World Peace.
Practice: - Worksheet

UNIT III (5Hours)   PHILOSOPHY AND PRINCIPLES OF LIFE
Purpose and Philosophy of Life - Introspection – Analysis of Thought - Moralization of Desires - Neutralization of Anger. Vigilance and Anti – Corruption - Redressal Mechanism - Urban Planning and Administration. **Practice -** Worksheet

UNIT IV (5 Hours)   VALUE EDUCATION (Part-I)
Ethical Values: Meaning – Need and Significance - Types - Value Education – Aim of Education and Value Education. Components of Value Education: Individual Values – Self Discipline, Self Confidence, Self Initiative, Empathy, Compassion, Forgiveness, Honesty, Sacrifice, Sincerity, Self-control, Tolerance and Courage. **Practice -** Worksheet

UNIT V (4 Hours)   VALUE EDUCATION (Part-II)

Family Values: Constitutional or National Values – Democracy, Socialism, Secularism, Equality, Justice, Liberty, Freedom and Fraternity. Social Values – Pity and Probity, Self Control, Universal Brotherhood. Professional Values – Knowledge Thirst, Sincerity in Profession, Regularity, Punctuality and Faith. Religious Values – Tolerance, Wisdom, Character.

Practice - Worksheet

REFERENCE BOOKS:

1 Vethathiri Maharishi (2015), 'Yoga for human excellence'- Sri Vethathiri Publications.

2. Value Education for human excellence- study material by Bharathiar University.

3. Value Education - Study Material by P.K.R Arts College for Women.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VII	17CAU09	DATA STRUCTURES	60	-	4

Preamble

To learn about the various data structures and algorithms and their applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain basics of computer algorithm	K1,K2
CO2	Understand the tree and table structures	K2,K5
CO3	Familiarize in sorting algorithms	K3,K4
CO4	Analyze file organizations and indexing	K4,K5

SYLLABUS

UNIT I (12 Hours)   Introduction to Algorithms

Introduction to Algorithms, Analysing Algorithms. Arrays: Sparse Matrices - Representation of Arrays. Stacks and Queues. Fundamentals - Evaluation of Expression Infix to Postfix Conversion.

UNIT II (12 Hours)   Linked List and Storage Management

Singly Linked List - Linked Stacks and Queues - Polynomial Addition - Doubly Linked List and Dynamic – Storage Management.

UNIT III (12 Hours)   Trees, Symbol Tables &Hash Tables

Trees: Basic Terminology - Binary Trees - Binary Tree Representations **Symbol Tables:** Static Tree Tables - Dynamic Tree Tables - **Hash Tables:** Hashing Functions - Overflow Handling.

UNIT IV (12 Hours)   External Sorting

Storage Devices - Sorting with Disks: K-Way Merging - Sorting with Tapes.

UNIT V (12 Hours)   Internal Sorting & File Organization

Internal Sorting: Insertion Sort - Quick Sort - 2 Way Merge Sort - Heap Sort - Shell Sort - Sorting on Several Keys. **Files:** Files, Queries and Sequential organizations - Index Techniques - File Organizations.

TEXT BOOK:
1. Ellis Horowitz, Sartaj Shani, Data and File Structures Galgotia Publication.1999

REFERENCE BOOKS:
1.Samanta, D. ,Classic Data structure,Prentice- Hall of India Pvt Ltd, Ninth edition, 2007.
2.Trembly & Sorenson, Data Structures with Applications, Tata McGraw Hill Company, 2nd Edition, 1991 (only for Queue application).

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VIII	17CAU10	JAVA PROGRAMMING	60	-	4

Preamble

To inculcate knowledge on Java Programming concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn basic concepts Java Programming Language	K1,K2
CO2	Acquire knowledge of control structures	K1,K2
CO3	Familiarize in Java Programming	K2,K5
CO4	Create wide range of Applications and Applets using Java	K3,K4
CO5	Ability to work with I/O Streams	K4,K5

SYLLABUS

UNIT I (12 Hours)   Fundamentals of Object-Oriented Programming

Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming Applications of Object-Oriented Programming. Java Evolution: Features – How Java differs from C and C++ - Overview of Java: Simple Java Program – Structure – Java Tokens – Statements –Java Virtual Machine.

UNIT II (12 Hours)   Control Structures

Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: If, If..Else, Nested If, Switch,? : Operator - Decision Making and Looping: While, Do, For – Jumps in Loops - Labeled Loops – Classes, Objects and Methods.

UNIT III (12 Hours)   JAVA Programming

Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting Classes Together – Multithreaded Programming.

UNIT IV (12 Hours)   Programming with JAVA

Applet Programming – Graphics Programming.

UNIT V (12 Hours)   Managing Input / Output Files in Java

Concepts of Streams - Stream Classes – Byte Stream Classes – Character Stream Classes – Using Streams – I/O Classes – File Class – I/O Exceptions - Creation of Files.

TEXT BOOKS:

1. E. Balagurusamy, Programming With Java –A Primer - 3rd Edition, TMH.

REFERENCE BOOKS:

1. Patrick Naughton &Hebert Schildt, The Complete Reference Java 2 , 3rd ed,TMH.
2. John R. Hubbard ,Programming With Java, 2ndEdition, TMH.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:IX	17CAU11	PROGRAMMING IN JAVA - PRACTICAL	-	60	4

Subject Description: This course provides hands on experience on Java Programming.
Goal: Enable to create wide range of Applications and Applets using Java.
Objective: On successful completion of the course the students will understand the concepts of Java Programming language and expertise in using Java.

Practical list

1. Write a Java Program to define a class, define instance methods for setting and Retrieving values of instance variables and instantiate its object.
2. Write a Java Program to demonstrate use of subclass .

3. Write a Java Program to implement array of objects.

4. Write a Java program to practice using String class and its methods.

5. Write a Java program to practice using String Buffer class and its methods.

6. Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
7. Write a program to demonstrate use of implementing interfaces.

8. Write a program to Implementing Thread based applications.

9. Write a program using Applet to display a message in the Applet.

10. Write an applet program Working with Colors and Fonts.

11. Write a program using Applet For configuring Applets by passing parameters.

12. Write programs for using Graphics class
     - to display basic shapes and fill them.
     - draw different items using basic shapes.
     - set background and foreground colors.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:X	17CAU12	PROGRAMMING IN PHP WITH SYMFONY	48	-	4

Preamble

To introduce the details about basic concepts of programming in PHP.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand basics of PHP	K1,K2
CO2	Understand basic concepts File system and Website	K1,K2
CO3	Acquire knowledge of Handling of Database and Table	K2,K5
CO4	Familiarize in Mailing Concepts	K3,K4
CO5	Creating applications using Symfony	K4,K5

SYLLABUS

UNIT I (8 Hours)   Basics of PHP, Files and Website

Basics of Coding in PHP: Mixing PHP and HTML - Introducing Variables and Operators - PHP Variables. Displaying Dynamic Content - Sending E-Mail - Using File System - Uploading Files to Website.

UNIT II (10 Hours)   Handling of Database Table

Establishing a connection - Creating a Database Table - Inserting Data into the Table - Selecting and Displaying Data. System Planning - Adding Contacts - Modifying Contacts - Deleting Contacts - Working with Contacts.

UNIT III (10 Hours)   Mailing Concepts

Managing a Simple Mailing List: Mailing List Software - Developing Subscription Mechanism, Mailing Mechanism. Creating Custom Logs and Reports.

UNIT IV (10 Hours)   Concepts of Symfony

Symfony – Introduction - Installation – Architecture - Components - Service Container - Events & EventListener - Expression - Bundles. Creating a Simple Web Application - Controllers - Routing - View Engine - Doctrine ORM .

UNIT V (10 Hours)   Symfony Editor Management

Forms - Validation - File Uploading - Ajax Control. Cookies & Session Management – Internationalization - Logging - Email Management - Unit Testing - Advanced Concepts - REST Edition - CMF Edition – Complete working example.

TEXT BOOK:

1.Julie Meloni, Matt Telles, PHP 6, 3rd Edition, Cengage Learning India Edition, 2009.

REFERENCE BOOKS:

1. Julie Meloni, Matt Telles, PHP 6 Fast and Easy Web Development, 1st Edition, Cengage
   Learning India Edition, 2008.
2. Steven Holzner, The Complete Reference PHP, Indian Edition, McGraw Hill Education, 2007.

WEB SITE REFERENCE:

1. www.tutorialspoint.com/symfony/symfony_introduction.html.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE : I	17SEU01	INFORMATION SECURITY	24	-	2

Preamble

To learn about the basics of Information Security.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain fundamental knowledge of Information Security	K1,K2
CO2	Learn basic concepts of Risks in Information Security	K1,K2
CO3	Familiarize the ideas of security planning and policies	K2,K3
CO4	Understand with Privacy and Ethical Issues in Information Security	K3,K4
CO5	Learn about Cryptography	K4, K5

SYLLABUS

UNIT I (5 Hours)   Introduction to Information Security

Information Security: Principles, Concepts and definitions - The Need for Information Security - Benefits of Information Security. The Security Problem in Computing: The Meaning of Computer Security - Computer Criminals.

UNIT II (4 Hours)   Information Risk

Information Risk: Threats and Vulnerabilities of Information Systems – Introduction to Risk Management. Information Security Management Policy, Standards and Procedures.

UNIT III (5 Hours)   Security Planning

Administering Security: Security Planning - Security Planning Team Members - Assuring Commitment to a Security Plan - Business Continuity Plan - Incident Response Plan - Organizational Security Policies, Physical Security.

UNIT IV (5 Hours)   Privacy and Ethical Issues in Information Security

Legal Privacy and Ethical Issues in Information Security: Protecting Programs and Data - Information and the Law - Rights of Employees and Employers - Software Failures - Computer Crime - Ethical Issues in Information Security.

UNIT V (5 Hours)   Cryptography

Cryptography: Introduction to Cryptography - What is Cryptography – Plain text – Cipher text – Substitution Ciphers - Transposition Ciphers.

TEXT BOOK:

1. Sumitra Kisan and D. Chandrasekhar Rao, Information Security Lecture Notes, Department of Computer Science and Engineering & Information Technology, Veer Surendra Sai University of Technology (Formerly UCE, Burla) Burla, Sambalpur, Odisha.

REFERENCE BOOK:

1. Andy Taylor (Editor), David Alexander, Amanda Finch and David Sutton Information Security Management Principles An ISEB Certificate , The British Computer Society, 2008.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
NON-MAJOR ELECTIVE:I	17NMU01A	INDIAN WOMEN AND SOCIETY	24	-	2

Preamble

To familiarize students with the specific cultural contexts of women in India

Course Outcomes

On the successful completion of the course, students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate knowledge of the history of women's studies as an academic discipline	K1,K2
CO2	Analyze the various roles of women and the challenges faced by them in the society	K3
CO3	Assimilate and evaluate the importance of women health	K3,K5
CO4	Identify the different issues related to women in general	K4
CO5	Assessing the Women Empowerment and the role of Central & State Government in developing Women	K5

UNIT I (5 Hours)   Historical Background
History of Women's status from Vedic times, Women's participation in India's Pre and Post Independence movement and Economic Independence, fundamental rights and importance of women in Modern Society.

UNIT II (5 Hours)   Role of Women (Challenges & remedies)
Women in Family, Agriculture, Education, Business, Media, Defense, Research and Development, Sports, Civil Services, Banking Services, Social Work, Politics and Law.

UNIT III (5 Hours)   Women and Health
Women and health issues, Malnutrition, Factors leading to anemia, Reproductive maternal health and Infant mortality, Stress.

UNIT IV (5 Hours)   Issues of Women
Women's issues, Dowry Related Harassment and Dowry Deaths, Gender based violence against women, Sexual harassment, Loopholes in Practice to control women issues.

UNIT V (4 Hours)   Women Empowerment
Meaning, objectives, Problems and Issues of Women Empowerment, Factors leading to Women Empowerment, Role and Organization of National Commission for Women, Central and State Social Welfare Board for Women Empowerment, Reality of women empowerment in the era of globalization.

REFERENCE BOOKS:

S.No	Authors	Title	Publishers	Year of Publication
1	Mala Khullar	Writing the Women's Movement: A Reader	Zubaan	2005
2	IAWS	The State and the Women's Movement in India	IAWS, Delhi	1994
3	Kosambi, Meera	Crossing Thresholds: Feminist Essays in Social History	Permanent Black	2007
4	T Rowbotham, Sheila	Hidden from History: Women's Oppression and the Fight against It	Pluto Press, London	1975
5	Susheela Mehta	Revolution and the Status of Women	Metropolitan Book co.pvt ltd, New Delhi	1989

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XII	17CAU15	OPERATING SYSTEM	72	-	5

Preamble

To learn about basic operating system abstractions, mechanisms and their implementations.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand Operating System	K1,K2,K4
CO2	Learn process handling	K2,K3,K4
CO3	Analyze how multi program is handled	K2,K3,K4
CO4	Obtain knowledge in storage	K2,K3
CO5	Learn scheduling algorithms	K2,K3,K4.K5

SYLLABUS

Unit I (14 Hours)   Introduction
Introduction: What is an Operating System? - Distributed Computing - The Key Architectural Trend: Parallel Computation - Open Systems - UNIX .Hardware – Software - Firmware.

Unit II (15 Hours)   Process
Process Concepts: Introduction - Definitions of Process - Process States - Process State Transitions - The Process Control Block - Operations on Processes - Suspend and Resume - Interrupt Processing. Asynchronous Concurrent Processes: Introduction - Parallel Processing- A Control Structure for Indicating Parallelism: Parbegin/Parend - Mutual Exclusion - Critical Sections- Mutual Exclusion Primitives - Implementing Mutual Exclusion Primitives – Semaphores - Process Synchronization with Semaphores.

Unit III (15 Hours)   Deadlock and Multiprogramming
Deadlock and Indefinite Postponement: Introduction - Examples of Deadlock - A Related Problem: Indefinite Postponement - Resource Concepts - Four Necessary Conditions for Deadlock- Major Areas of Deadlock Research - Deadlock Prevention - Deadlock Avoidance and the Banker's Algorithm - Deadlock Detection - Deadlock Recovery. Real Storage: Introduction - Storage Management Strategies - Contiguous vs. Noncontiguous Storage Allocation - Single User Contiguous Storage Allocation - Fixed Partition Multiprogramming – Variable Partition Multiprogramming.

Unit IV (14 Hours)   Virtual Storage Organization
Introduction - Evolution of Storage Organizations- Virtual Storage: Basic Concepts - Multilevel Storage Organization - Block Mapping- Paging: Basic Concepts- Segmentation - Paging/Segmentation Systems. Virtual Storage Management: Page Replacement Strategies.

Unit V (14 Hours)   **Job and Processor Scheduling**

Introduction - Scheduling Levels - Scheduling Objectives - Scheduling Criteria - Preemptive vs. Nonpreemptive Scheduling - The Interval Timer or Interrupting Clock – Priorities - Deadline Scheduling - First-In-First-Out (FIFO) Scheduling - Round Robin (RR) Scheduling - Quantum Size- Shortest-Job-First (Si F) Scheduling - Shortest-Remaining-Time (SRT) Scheduling- Highest-Response-Ratio-Next (HRN) Scheduling - Multilevel Feedback Queues - Fair Share Scheduling.

TEXT BOOK:

1. H.M.Deitel,Operating System,2nd Edition, Addison Wesley Publishing Company.

REFERENCE BOOKS:

1. William Stallings, Operating System: Internals and Design Principals, 6th Edition, Pearson Publication.
2. Flynn, McHoes, Operating System, India Edition.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIII	17CAU16	LINUX PROGRAMMING	72	-	5

Preamble

To learn about Linux programming languages, tools and concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Learn fundamentals of Linux	K1,K2
CO2	Obtain knowledge in files	K2,K3
CO3	Gain information about how Linux environment works	K2,K3,K4
CO4	Learn basics of terminal communication	K1,K2
CO5	Learn about curses	K2,K3,K4

SYLLABUS

UNIT I (14 Hours)   Introduction
An Introduction to UNIX, Linux, and GNU - Programming Linux. Shell Programming: Why Program with a Shell? - A Bit of Philosophy -What Is a Shell? - Pipes and Redirection -The Shell as a Programming Language - Going Graphical - The Dialog Utility.

UNIT II (15 Hours)   Working with Files
Linux File Structure - System Calls and Device Drivers - Library Functions - Low-Level File Access - The Standard I/O Library - Formatted Input and Output - File and Directory Maintenance - Scanning Directories - Errors - The /proc File System - Advanced Topics: fcntl and mmap.

UNIT III (14 Hours)   The Linux Environment
Program Arguments - Environment Variables - Time and Date - Temporary Files - User Information - Host Information - Logging - Resources and Limits.

UNIT IV (14 Hours)   Terminals
Reading from and Writing to the Terminal - Talking to the Terminal - The Terminal Driver and the General Terminal Interface - The Termios Structure -Terminal Output - Detecting Keystrokes.

UNIT V (15 Hours)   Curses
Managing Text - Based Screens with Curses: Compiling with Curses - Curses Terminology and Concepts - The Screen - The Keyboard -Windows - Subwindows - The Keypad - Using Color. Development Tools: Problems of Multiple Source Files - The Make Command and Makefiles.

TEXT BOOK:

1. Neil Mathew, Richard stones, Begining Linux Programming,4th Edition, Wiley India Pvt Ltd, 2007.

REFERENCE BOOK:
1. N.B.Venkateswarlu, Introduction to LINUX : Installation and Programming, BS Publication.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIV	17CAU17	PROGRAMMING IN LINUX -PRACTICAL	-	72	4

Subject Description: This course provides programming knowledge in Linux

Goal: To enable the students to gain skills in shell programming

Objectives: On successful completion of the course the students will understand the concepts of Operating System through Linux

Practical list

1. Simple shell script for basic arithmetic and logical calculations.

2. Write a shell program to find out reverse string of the given string and check the given string is palindrome or not

3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

4. Write a shell script to implement menu driven program to display list of users who are currently working in the system, copying files (cp command), rename a file, list of files in the directory and quit option.(Hint: use case structure)

5. Write awk script that uses all of its features

6. Write a shell script to search an element from an array using binary searching

7. Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex: - ls –l | sort

8. Write a C program to illustrate concurrent execution of threads using pthreads Library

9. Write a Shell script to demonstrate Terminal locking.

10. Write a Shell script to accept the valid login name, if the login name is valid then print its home directory else an appropriate message.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ALLIED:IV	**17CAU18**	**BUSINESS ACCOUNTING**	**60**	**-**	**4**

Preamble

To impart basic accounting knowledge

Course Outcomes

On successful completion of the course the students should have:

CO Number	CO Statement	Knowledge Level
CO1	Understood financial accounting	K1,K2,K4
CO2	Learn accounting concepts	K2,K3,K4
CO3	Learnt transactions	K2,K3,K4
CO4	Acquire knowledge of cost accounts	K3
CO5	Learnt management accounting	K2,K3,K4.K5

SYLLABUS

UINT I (12 Hours)   Introduction
Financial Accounting-Definition and Scope, Objectives of Financial Accounting, Accounting v/s Book Keeping Terms used in Accounting, Users of Accounting Information and Limitations of Financial Accounting.

UNIT II (12 Hours)   Recording of transactions
Accounting Process, Journals, Subsidiary Books, Ledger, Cash Book, and Trial Balance. Depreciation: Meaning, Need & Importance of Depreciation, Methods of Charging Depreciation. (WDV & SLM).

UNIT III (12 Hours)   Preparation of Final Accounts
Trading, Profit and Loss Account and Balance sheet with simple adjustments-Outstanding Expenses and Income, Prepaid Expenses, Pre received Income, Depreciation –Provision for bad debts.

UNIT IV (12 Hours)   Cost Account
Cost Account-Meaning Elements of Cost-Preparation of Cost Sheet with Simple Adjustments-Ratio Analysis- Material Cost: Stores Ledger-FIFO-LIFO-Weighted Average, Simple Average Method.

UNIT V (12 Hours)   **Management Account**

Management Account-Meaning –Objectives-Management Account with Financial Account,
Budget and Budgetary control-Preparation of Various Budgets -Flexible Budget-Production
Budget-Cash Budget –Sales Budget.

TEXT BOOK:
1. N.P.Srinivasan and M.Sakthivel Murugan, Accounting For Management, (Revised Edition),
   New Delhi, S.Chand & Company Ltd., 2012.

REFERENCE BOOKS:
1. T.S Grewal, Double Entry Book Keeping, Sultan Chand & Sons, New Delhi.
2. Sharma and Gupta, Management Accounting, Kalyani Publishers, New Delhi.
3. Anil Chowdhry, Fundamentals Of Accounting & Financial Analysis, (Pearson Education) .
4. Jane Reimers, Financial Accounting,(Pearson Education).
5. Rajesh Agarwal & R Srinivasan, Accounting Made Easy, (Tata McGraw –Hill) .
6. Amrish Gupta, Financial Accounting For Management, (Pearson Education) .
7. Dr. S. N. Maheshwari, Financial Accounting For Management, (Vikas Publishing House).

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE : II	17SEUCA2	PROGRAMMING IN PHP WITH SYMFONY - PRACTICAL	-	48	2

Subject Description: This course provides programming skills in PHP
Goal: To enable the students to develop web based application
Objectives: On successful completion of the course the students will understand the concepts of
PHP and connectivity with My SQL

Practical list

1. Create a simple HTML form and accept the user name and display the name through PHP echo statement

2. Write a PHP script, which changes the color of the first character of a word

3. Write a PHP script to redirect a user to a different page

4. Write a PHP program to swap two variables

5. Write a PHP program to remove duplicates from a sorted list

6. Create a script to construct the following pattern, using nested for loop

   ```
   *
   * *
   * * *
   * * * *
   * * * * *
   ```
7. Write a PHP script using nested for loop that creates a chess board

8. Create a web application takes a name as input and on submit it shows a hello<name> page where <name> is taken from the request and it shows a start time at the right top corner of the page and provides the logout button on clicking this button it should show a logout page with thank you<name> message with the duration of Usage

9. Write a PHP program to store a image in Database and to retrieve it

10. Write a PHP program to create personal blog

Career Enhancement (Online Examination):

This course in one of the compulsory courses stipulated under Part- IV. This course is offered to facilitate the students to know and get prepared for the public service commission related examinations and other similar examinations. A Question bank in the format of MCQs would be uploaded in the computer and the candidate would be given $1_{1/2}$ Hours with randomly selected 50 questions for a maximum of 50 marks. The passing minimum is 40% of 50 marks ie. 20 marks

Course	No. of Questions	Marks	Total Marks
Non-Major Elective II Career Enhancement (Online Exam)*	50	50 X 1 = 50	50

* Online Exams are conducted in the computer laboratory at the end of each semester

With one credits each.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVI	17CAU20	**RELATIONAL DATABASE MANAGEMENT SYSTEM**	72	-	4

Preamble

To enable the students to learn about the concepts of database system and manipulation of data.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of database system	K1,K2
CO2	Ability to implement the relational database concepts	K3,K5
CO3	Acquire the deep knowledge on normalization techniques	K2,K3,K4
CO4	Understand the detailed knowledge on PL/SQL	K3,K4,K5
CO5	Ability to work with PL/SQL statements	K5

SYLLABUS

UNIT I (12 HOURS)   **Introduction to Database System**

Purpose of Database Systems – View of Data – Database Languages – Transaction Management – Database Architecture – Database Users and Administrators. Relational Model: Structure of Relational Databases – Database Design – ER Model – Overview of the Design Process – The Entity-Relationship Model – Constraints – Entity Relationship Diagrams.

UNIT II (15 HOURS)   **Relational Algebra Operations – Relational Languages**

The Tuple Relational Calculus – The Domain Relational Calculus – SQL: Background – Data Definition – Basic Structure of SQL Queries – Set Operations – Aggregate Functions – Null Values – Nested Sub-Queries – Views – Modification of the Database.

UNIT III (15 HOURS)   **Data Normalization**

Pitfalls in Relational Database Design – Decomposition – Functional Dependencies – Normalization – First Normal Form – Second Normal Form – Third Normal Form – Boyce-Codd Normal Form – Fourth Normal Form – Fifth Normal Form – Denormalization – Database Security: Data Security Requirements – Protecting the Data within the Database – Granting and Revoking Privileges – Data Encryption.

UNIT IV (15 HOURS)   PL/SQL

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 – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes –FOR Loops – SELECT…FOR UPDATE – WHERE CURRENT OF Clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.

UNIT V (15 HOURS)   PL/SQL Composite Data Types

Records – Tables – Arrays. Named Blocks: Procedures – Functions – Packages –Triggers – Data Dictionary Views.

TEXT BOOKS:
1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, Database System Concepts, 5th Edition, TMH   (UNIT - I, II,)
2. Alexis Leon, Mathews Leon , Fundamentals of Database Management Systems, Vijay Nicole Imprints Private Limited. (UNIT – III)
3. Nilesh Shah, Database Systems Using Oracle‖, 2nd edition, PHI. UNIT -IV: Chapters 10 & 11 UNIT -V: Chapters 12, 13 & 14)

REFERENCE BOOK:
1. Majumdar & Bhattacharya, Database Management Systems, 4th Edition, TMH, 2007.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVII	17CAU21	VB.NET PROGRAMMING	72	-	4

Preamble

To enable the students to learn about the .NET Framework and VB.NET programming.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the .NET framework programming	K1,K2
CO2	Acquire the deep knowledge on data types, operators and control statements in VB.NET	K2,K3,K4
CO3	Implement the concept of arrays, procedures and structures using various VB.NET controls	K3,K5
CO4	Ability to work with menus and dialog boxes in VB.NET	K4,K5
CO5	Ability to handle exceptions and effectively work with database connectivity using ADO.NET	K3,K5

SYLLABUS

UNIT I (12 HOURS)   Introducing .NET
.NET Framework Overview – Namespace – Languages in .NET – Visual Studio .NET – Why VB.NET? – Objects and Properties – Constructors and Destructors – Interfaces – Free Threading – Delegates – Winforms - Console Applications – ADO.NET – VB.NET Program: The Solution Explorer Window – The Class View Window – Toolbox – Output Window – The Task List Window.

UNIT II (15 HOURS)   Data Types, Operators and Control Statements
Literals – Variables – Data Types – Declaration of Variables – Constant – Statements – Operators – Arithmetic Operators – Concatenation Operators – Relational Operators – Compound Assignment Operator – Logical Operators – Bitwise Operators – Control Statements: IF Statement – Block-If – Nested If – Looping – Select-Case Statement – Goto Statement – Early exit from control statements – Intrinsic Control List – Events – Label – Textbox – Group Box - Check Box – Radio Button – Scroll Bar – Timer – Picture Box – Working with Mouse Input – Date Time Picker – Month Calendar.

UNIT III (15 HOURS)   **Arrays, Procedures and Structures**
One-Dimensional Array – Array Initialisation – Printing Array Elements using For Each..Next Loop – Redim Statement – Multi-Dimensional Array – Initialization of Two-Dimensional Array – Arrays of Array – List Box Control – Checked List Box – Combo Box Controls – Procedures and Structures: Subroutine Procedures – Function Procedure – Property Procedure – Functions – Sub Procedure – Structures – Message Box Function – Input Box Function.

UNIT IV (15 HOURS)   **Creating Menus and Using Dialog Boxes**
Menu – MDI Forms – Context Menu – Rich TextBox – Color Dialog control – Font Dialog control – Object Oriented Concepts in VB.NET: Boxing and Unboxing – Read-Only and Write-Only Properties – Adding Methods to Classes – Classes with constructor – Assemblies – Namespaces – Inheritance – Overriding Properties and Methods – Shadows statement – Polymorphism.

UNIT V (15 HOURS)   **Events Delegates Exception Handling and ADO.NET**
Events in class – Delegates – Singlecast Delegate – Multicast Delegates – Exceptions – Try – Catch – Finally – End Try – Try-Catch – Multiple-Catch – Nested try statements – Try-finally – Data Access with ADO.NET: Database – Relational Database – Table Creation – Record Insertion – Displaying Data – Deleting Data – Modifying – Drop Table – Special Features of ADO.NET – Differences Between ADO and ADO.NET – Connection – Commands – Data Reader – Data Set – Using Data Grid – Using Data Adapter Configuration Wizard – XML and ADO.NET – Filtering Data using Data View – Complex Data Binding – Command Parameters Property and Using Stored Procedures with a Command.

TEXT BOOK:
1. P.Radhaganesan,"VB.NET" , 1st Edition, Scitech Publications(India) Pvt Ltd, 2014.

REFERENCE BOOKS:

1. Jefrey R.Shapiro, The Complete Reference – Visual Basic .NET, Tata McGraw-Hill, 2002.

2. Stevem Holzner, Visual Basic .Net Programming Black Book, Dreamtech Press, Reprint 2011.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVIII	17CAU22	PROGRAMMING IN VB.NET AND ORACLE - PRACTICAL	-	72	4

Subject Description: This course provides hands on experience on VB.NET Programming and Oracle

Goal: To enable the students to work effectively with VB.NET and Oracle

Objectives: On successful completion of the course the students will be able to build real world applications using VB.NET and Oracle

Practical list

VB.NET PROGRAMS

1. Write a simple VB.NET program to develop a calculator with basic operation.
2. Demonstrate the looping statements in VB.NET using a console application.
3. Develop an application for deploying various built-in functions in VB.NET.
4. Develop a windows application with Menus and Dialog Boxes
5. Develop a simple project for Student Database Management System using VB.NET as front end and Oracle as back end.
6. Develop a simple project for Employee Database Management System using VB.NET as front end and Oracle as back end.

ORACLE:

1. Create a table for Employee details with Employee Number as primary key and following fields: Name, Designation, Gender, Age, Date of Joining and Salary. Insert at least ten rows and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping operators.

2. Create tables for library management system which demonstrate the use of primary key and foreign key. Master table should have the following fields: Accno, Title, Author and Rate. Transaction table should have the following fields: User id, Accno, Date of Issue and Date of Return. Create a Report(Select verb) with fields Accno, Title, Date of Issue for the given Date of Return with column formats.

3. Write a PL/SQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.

4. Write a PL/SQL to split the student table into two tables based on result (One table for Pass and another for Fail). Use cursor for handling records of student table. Assume necessary fields and create a student details table.

5. Create a database trigger to implement on master and transaction tables which are based on inventory management system for checking data validity. Assume the necessary fields for both tables.

6. Write a PL/SQL to raise the following Exception in Bank Account Management table when deposit amount is zero.

Core Optional

A student shall take up one **CORE OPTIONAL** course offered by other departments under Part: III to complete the programme. The score obtained in this course will be accounted for CGPA calculation. The enrollment is based on first come first served basis depending upon the available strength. The following is the list of optional papers offered by each department.

UG PROGRAMME 2017-18 ONWARDS

S.No.	Course Code	Department	Course
1.	17TAUC01	Tamil	jd;dk;gpf;if ,yf;fpak; (ngz;Nz eP tho;f)
2.	17ENUC01	English	English for Effective Communication
3.	17MAUC01	Mathematics	Mathematics for Business
4.	17PHUC01	Physics	Physics in day to day life
5.	17CSUC01	Computer Science	Desktop Publishing Practicals
6.	17CGUC01 17CCUC01 17CPUC01 17CFUC01	Commerce :B.Com B.Com (CA) B.Com (PA) B.Com (A&F)	Basics of Accounting Elements of Costing Investment Portfolio Accounting for Managerial Decision Making
7.	17BAUC01	Management	Start up Business

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :XIX	******	**CORE OPTIONAL**	**-**	**36**	**3**

Subject description: This course provide complete knowledge in Adobe Pagemaker and Coreldraw

Goal: To enable the students to develop and design with creativity

Objectives: To learn how to create and design real-time applications

Practical List

DESKTOP PUBLISHING PRACTICAL

ADOBE PAGEMAKER:

1. Design a Visiting Card for your own business
2. Design a Pamphlet for a Textile Showroom
3. Design a Brochure for a seminar conducted by your department
4. Design a Newsletter for your department activities
5. Design a Student Identity card

ADOBE CORELDRAW:

1. Create a button with help of interactive blend tool
2. Create a lotus flower with help of transparency tool
3. Create a Birthday card
4. Create a logo of RADIO MIRCHI
5. Create a banner for a political function

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XX	17CAU23	**INSTITUTIONAL TRAINING**	-	-	1

Institutional / Industrial Training:

A student shall visit an institution / organisation and learn its operations according to the nature of her discipline of study after approval from the Department for a period of 15 days during her summer vacation between IV and V semesters. Work carried out during this period will have to be recorded in a work diary provided by the department. An institutional training report should be submitted by the student at the end of the fifth semester (ESE) to complete the programme.

Institutional Training reports are evaluated at the end of semester- V by the **Internal Examiners** only as appointed By COE. Following weightages shall be used to evaluate the institutional training report:

COMPONENTS*	MARKS	TOTAL MARKS
Understanding and articulation of concepts	30	
Clarity and comprehensiveness of presentation in the report	30	**100**
Structure and neatness of the report	40	

- Different metrics may be evaluated depending on the nature of the work carried out during the training period and is left to the discretion of the department.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : I	17CAU24A	INTRODUCTION TO COMPILER DESIGN	72	-	4

Preamble

To understand the principles of Compiler design

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand the basics of compilers and lexical analysis	K1,K2
CO2	Understand the concept of syntactic specification of programming languages and parsing techniques	K2,K3
CO3	Acquire knowledge on the syntax and symbol tables	K2,K3
CO4	Provide a insight on runtime storage and error recovery	K4,K5
CO5	General introduction on code optimization and generation	K2,K3,K4

SYLLABUS

UNIT I (12 HOURS)   Introduction to Compliers

Compliers and Translator – Need of Translator – The Structure of a Complier – Lexical Analysis – Syntax Analysis – Intermediate Code Generation – Optimization – Code Generation – Complier – Writing Tools. Finite Automata and Lexical Analysis: The Role of the Lexical Analysis – A Simple Approach to the Design of Lexical Analyzers- Regular Expressions to Finite Automata – Minimizing the Number of States of a DFA.

UNIT II (15 HOURS)   The Syntactic specification of programming languages

Context Free Grammars – Derivations and Parse Trees – Capabilities of Context Free Grammars. Basic Parsing Techniques: Parsers – Shift- Reduce Parsing – Top Down Parsing – Predictive Parsers.

UNIT III (15 HOURS)   Syntax – directed translation

Syntax-Directed Translation Schemes – Implementation of Syntax-Directed Translators – Intermediate Code – Postfix Notation – Parse Trees and Syntax Trees – 3 Address Code – Quadruples and Triples – Translation of Assignment Statements – Boolean Expressions – Statements that alter the Flow of Control. Symbol Tables: The Contents of a Symbol Table – Data Structures for Symbol Table – Representing Scope Information.

UNIT IV (15 HOURS)   Run time storage administration

Implementation of a Simple Stack Allocation Scheme – Implementation of Block-Structured Languages – Storage Allocation in Block Structured Languages**.** Error Deduction and Recovery: Errors – Lexical Phase Errors – Syntactic Phase Errors – Semantic Errors.

UNIT V (15 HOURS)   **Introduction of code optimization**

The Principle Sources of Optimization – Loop Optimization – The DAG Representation of Basic Blocks – Value Numbers and Algebraic Laws – Global Data Flow Analysis. Code Generation: Object Programs – Problems in Code Generation – A Machine Model – A Simple Code Generator – Register Allocation and Assignment – Code Generation from DAG's – Peepholes Optimization.

TEXT BOOK

1. V.Aho, Jeffrey D.Ullman: Principles of Complier Design by Alfred, Narosa Publishing House.

REFERENCE BOOKS

1. Alfred V. Aho, Ravi Sethi,Jeffry D. Ullman: Compliers, Principles. Techniques, and tools

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : I	17CAU24B	**COMPUTER NETWORKS**	72	-	4

Preamble

To understand the concepts and design of Computer Networks

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the overview of networks OSI model and Physical Layer	K1,K2
CO2	Obtain the knowledge about error deduction and correction in Data Link Layer	K2,K3
CO3	Obtain the knowledge about packet switching network and addressing in Network Layer	K2,K3
CO4	Acquire the knowledge about TCP in Transport Layer	K2,K3
CO5	Ability to understand client/Server programming, WWW and Email using Application Layer	K3,K4,K5

SYLLABUS

UNIT I (12 HOURS)   Overview and Physical Layer
Introduction: Data Communications - Networks - Network Types, Network Models: TCP/IP Protocol Suite - The OSI Model, Bandwidth Utilization: Multiplexing- Spread Spectrum, Transmission Media: Guided Media-Unguided Media, Switching: Circuit Switched Network-Packet Switching-Structure of a Switch.

UNITII (15 HOURS)   Data Link Layer
Error Deduction and Correction: Introduction- Cyclic Codes- Forward Error Correction, Data link Control: Data link layer Protocols- Media Access Control: Random Access- Controlled Access, Wireless Networks: EEE 802.11- Bluetooth-Cellular Telephone- Satellite Network-Connection Devices.

UNIT III (15 HOURS)   Network Layer Services
Packet Switching- Network Layer Performance- PV4 Addresses- Internet Protocol-Routing Algorithms - IPV6 Addressing.

UNIT IV (15 HOURS)   Transport Layer
Transport Layer Protocols- User Datagram Protocol - TCP: TCP Services TCP Features - Windows in TCP - Flow Control - Error Control- TCP Congestion Control - TCP Timers.

UNIT V (15 HOURS)   **Application Layer**

Client Server Programming - Word Wide Web & HTTP FTP - Email - DNS.

TEXT BOOK:

1. Behrouz A Forouzan, Data Communications and Networking, Tata McGraw Hill, Fifth Edison, 2013.

REFERENCE BOOK:

1. Data Communications and Networks, Achyut Godbole and Atul Kahate, McGraw Hill Education, 2011.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : I	17CAU24C	INTRODUCTION TO IMAGE PROCESSING	72	-	4

Preamble

To understand the trends and principles of Digital Image Processing

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to understand the basics of digital image fundamentals and transforms	K1,K2
CO2	Understand and apply the concept of Image enhancement and restoration	K2,K3
CO3	Acquire knowledge on image compression models	K2,K3
CO4	Implement the concepts of edge detection and image segmentation	K3,K4,K5
CO5	Familiarity with knowledge representation concepts	K3,K4

SYLLABUS

UNIT I (12 HOURS)   Digital Image Fundamentals
Digital Image, Applications of Digital Image Processing - Elements of Digital Image Processing - Digital Camera, Line Scan-CCD Sensor – Area Sensor - Image Transforms - Walsh, Hadamard, Discrete Cosine - Image Formation - File Formats.

UNIT II (15 HOURS)   Image enhancement and restoration
Contrast Stretching – Intensity Level Slicing – Histogram Equalization – Spatial Averaging – Smoothing – Median Filtering – Non Linear Filters – Maximum , Minimum, Geometric Mean,– Removal Of Blur –Wiener Filtering.

UNIT III (15 HOURS)   Image Compression
Compression Models - Elements of Information Theory - Error Free Compression - Huffman's Coding - Truncated Huffman's Coding.

UNIT IV (15 HOURS)   Edge Detection and Image Segmentation
Detection of Discontinuities - Edge Linking and Boundary Detection – Thresholding - Regions Oriented Segmentations - Morphology. Pixel Based Approach - Region Based Approach – Region Growing – Region Splitting – Region Merging

UNIT V (15 HOURS)   Knowledge Representation
Knowledge Representation and Use - Image Analysis using Knowledge about Scenes - Image Understanding using Two Dimensional Methods.

TEXT BOOKS:

1. Gonzalez &Woods, Digital Image Processing, 2nd Edition, Pearson Education, 2002. (Chapters: 1, 2, 3, 4, 5, 8, 9, 10, 11 and 12).
2. Anil Jain, Fundamentals of Digital Image Processing, PHI, 1989. (Chapters: 5, 7, 8 and 11).

REFERENCE BOOKS:

1. B. Chanda, D. Dutta Majumder, "Digital Image Processing and Analysis", PHI, 2003.
2. Nick Efford, "Digital Image Processing a practical introducing using Java", Pearson Education, 2004.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE: III	17SEUCA3	TALLY- PRACTICAL	-	36	2

Subject Description: To include the different accounting applications using Tally.

Goals: To impart knowledge on the different accounting applications using Tally

Objectives: On successful completion of the course the students will understand the accounting applications using Tally

Practical list

1. Creating a company

   Create a company with all relevant details including vat options

2. Creating ledger

   Create the ledgers under appropriate predefined groups

3. Create vouchers and view profit and loss a/c and balance sheet

4. Prepare trading profit and loss account and b/s, with inventory details

5. Create stock items, stock groups, sales categories, god owns, units of measure view the

   Stock summary

6. Maintain bill wise details

7. Consolidation of accounts

8. Calculate forex gains/loss

9. Memo voucher

10. Cheque printing

11. Ratio analysis

12. Create various vouchers including vat calculation for the following

    a) Purchase order b) Sales order

    c) Rejection out d) Rejection in

    e) Stock journal f) Delivery note

    g) Receipt note h) Physical stock

Proficiency Enhancement - Self Study: (Part: V)

No lecture hours are provided for self study courses and the students are expected to prepare the courses on the prescribed syllabi by their own. Students have to appear for the ESE that would be conducted as per the curriculum specification of each department and scoring a passing minimum is mandatory for completion of the programme. The score obtained in these courses will also be accounted for CGPA calculation.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
PROFICIENCY ENHANCEMENT	17PEUCA1	SOFTWARE PROJECT MANAGEMENT	-	-	2

Preamble

To inculcate the knowledge on how to manage a Software Project.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of software product life cycle	K1,K2
CO2	Obtaining the knowledge thoroughly on software requirements gathering	K2, K3,K4
CO3	Gain detailed understanding on estimation concepts	K3,K5
CO4	Acquire familiarity on design and development phases	K4,K5
CO5	Accumulate and apply the knowledge on project testing phase	K4,K5

SYLLABUS

UNIT I   Introduction to Software Product Life cycle
Product Life Cycle: Introduction –Idea Generation- Prototype Development Phase- Alpha Phase –Beta Phase- Protection Phase- Maintenance and Obsolescence Phase. Project Life Cycle Models: What is Project Life Cycle Model - A Frame Work for Studying Different Life Cycle Models - The Waterfall Model - The Prototype Model- The Rapid Application Development Model- The Spiral Model and its Variants.

UNIT II   Software Requirements Gathering
Inputs and Start Criteria for Requirements Gathering- Dimensions of Requirements Gathering- Steps to be Followed During Requirements Gathering Outputs and Quality Records from the Requirements Phase- Skill Sets Required During the Requirements Phase- Differences for a Shrink-Wrapped Software- Challenges During the Requirements Management Phase- Metrices for the Requirement Phase.

UNIT III   **Estimation**

What is Estimation - When & Why is Estimation Done – The Three Phases of Estimation - Estimation Methodology - Formal Models for Size Estimation –Translation Effort Estimated into Schedule Estimates – Common Challenges During Estimation – Metrices for the Estimation Processes.

UNIT IV   **Design and Development phases**

Some Difference in our Chosen Approach - Salient Features of Design- Evolving an Architecture Blueprint –Design for Reusability- Technology Choices/Constraints – Design to Standards – Design for Portability- User Interface Issues- Design for Testability - Design for Diagnosability- Design or Maintainability- Design for Installability – Inter-Operability Design - Challenges During Design and Development Phases - Skill Sets for Design and Project Management.

UNIT V   **Testing Phase**

Introduction- What is Testing- What are the Activities that make up Testing- Test Scheduling and Types of Tests-People Issues in Testing Management Structures for Testing in Global Teams –Metrics for Testing Phase.

TEXT BOOK:
1. Gopalaswamy Ramesh, Managing Global Software Projects, Tata McGraw Hill.

REFERENCE BOOKS:
1. S.A. Kelkar, Software Project Management –A concise study, PHI, 2003
2. Milk Cotterel, Bob Hughes, Software Project Management, Inclination / Thomas computer press, 1955.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XXII	17CAU26	RESEARCH METHODOLOGY	72	-	5

Preamble

To enhance the ethical conduct of research and to learn about its techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Research	K1,K2
CO2	Acquire the deep knowledge on Research problem and its design	K1,K2
CO3	Familiarize on sampling design	K2,K3
CO4	Give detailed understanding about data collection	K3,K4,K5
CO5	Ability to work with interpretation and writing reports	K5

SYLLABUS

UNIT I (12 Hours)   Introduction to Research Methodology
An Introduction-Meaning of Research-Objectives of Research-Motivation in Research-Types of Research-Research Approaches-Significance of Research-Research Methods versus Methodology-Research and Scientific Method-Importance of knowing How Research is Done-Research Process-Criteria of Good Research-Problems Encountered by Researchers in India.

UNIT II (18 Hours)   Research Problem and Research Design
What is a Research Problem?-Selecting the Problem-Necessity of Defining the Problem-Techniques involved in Defining a Problem-Research Design: Meaning of Research Design-Need for Research Design-Important Concepts Relating to Research Designs-Different Research Designs.

UNIT III (18 Hours)   Sampling Design
Census and Sample Survey-Implications of a Sample Design-Steps in Sampling Design-Criteria of Selecting a Sampling Procedure-Characteristics of a Good Sample Design-Different Types of Sample Designs-How to Select a Random Sample?- Random Sample from an Infinite Universe-Complex Random Sampling Designs.

UNIT IV (12 Hours)   Methods of Data Collection
Collection of Primary Data-Observation Method-Interview Method-Collection of Data through Questionnaires-Collection of Data through Schedules-Difference between Questionnaires and Schedules-Some other Methods of Data Collection-Collection of Secondary Data-Selection of Appropriate Method for Data Collection-Case Study Method.

UNIT V (12 Hours)   **Interpretation and Report Writing**

Meaning of Interpretation-Why Interpretation?-Technique of Interpretation-Significance of Report Writing –Difference Steps in Writing Report-Layout of the Research Report-Types of Reports-Oral Presentation-Mechanics of Writing a Research Report-Precautions for Writing Research Reports.

TEXT BOOK:

1. C.R.Kothari, Research Methodology Methods and Techniques, New Age International publishers.

REFERENCE BOOK:

1. John W.Creswell, Research Design: Qualitative, Qualtitative and Mixed Methods Approaches.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XXIII	17CAU27	**COMPUTER GRAPHICS AND MULTIMEDIA**	72	-	5

Preamble

To learn about reconstruction and visualization framework and to give introduction on basic algorithms and its techniques.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide a insight of computer graphics and algorithms	K1,K2
CO2	Ability to understand the Transformations and its types	K2,K3,K4
CO3	Acquire knowledge on window transformations	K3,K4
CO4	Learn about Multimedia basics	K1,K2
CO5	Obtain basic fundamentals of image, audio and video	K5

SYLLABUS

UNIT I (12 Hours)   Introduction to Computer Graphics
Introduction, Applications, Pixel, Frame Buffer, Raster and Random Scan display, Display devices -CRT, Color CRT Monitors, Scan Conversion of Line - DDA Algorithm of Line Drawing, Scan Conversion of Circle-Bresenham's Circle and Ellipse Generating Algorithms.

UNIT II (18 Hours)   2D and 3DTransformations
2-Dimensional Transformation, Translation, Rotation, Scaling, Homogeneous Coordinates, Reflection, Shear. 3-Dimensional Transformation, Translation, Rotation, Scaling, Reflection, Shear.

UNIT III (18 Hours)   Window Transformation
Window To View Port Transformation, Clipping, Line Clipping, Cohen –Sutherland Line Clipping, Polygon Clipping, Sutherland And Gary Hodgman Polygon Clipping Algorithm.

UNIT IV (12 Hours)   Introduction to Multimedia
Multimedia in Use: Introducing Multimedia for Today and Tomorrow – What is Multimedia – Using Multimedia: Applications, Benefits and Problems– Technology: System Components – Multimedia Platforms.

UNIT V (12 Hours)   **Multimedia Tools**

Development Tools – Image – Audio – Video.

TEXT BOOKS:

1. Donald Hearn and M.Pauline Baker, Computer Graphics C Version, Second Edition,Pearson

   Education, 2006.

2.Judith Jeffcoate, Multimedia in Practice : Technology and Practice, Pearson Education, 2007.

REFERENCE BOOKS:

1. William M. Neuman, Robert R. Sprout, Principles of interactive Computer Graphics, McGraw

    Hill International Edition.

2. Buford J. F Koegel, Multimedia Systems, Twelfth Indian Reprint, Pearson Education.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :XXIV	17CAU28	PROGRAMMING IN 3D MAX- PRACTICAL	-	72	4

Subject description: This course provides hands on experience on 3D Max Programming
Goal: To enable the students to equip them with graphics and multimedia skills
Objectives: On successful completion of the course the students will understand the concept of 3D Max and expertise in using graphics and multimedia

Practical list

1. Create a Flag animation with 3ds max

2. Create a realistic winter scene with motion blurred snow particles and a night render as well

3. Polygon :- Selection, Creation, combining, separating, Splitting and Editing

4. Working with Nurbs Modeling

5. Nurbs :- Creating curves, Creating Surfaces, Editing , Trimming, Stitching and Sculpting Surface meshes

6. Subdivision :-surface conversion, Editing surface, Editing Uvs

7. Create Various Basic 3D geometrical shapes

8. Create Basic Polygon inorganic objects (lamp, Mobile, computer, Bike, Car)

9. Create basic architectural polygon modeling

10. Create Interior with polygon and Subdivision

11. Create Cartoon and semi cartoon characters with polygon

12. Create environment modeling (tree, Mountain, road, Planet, forest)

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : II	17CAU29A	NETWORK SECURITY	60	-	4

Preamble

To provide grounding in basic and advanced methods in network security and its effective algorithms

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of network security	K1,K2
CO2	Acquire the knowledge on symmetric key algorithms	K2,K3
CO3	Learn about Asymmetric Key Algorithms and Digital Signatures	K2,K3,K4
CO4	Provide the insight on digital certificates	K2,K3
CO5	Understand about Network Security, Firewalls and Virtual Private Networks	K1,K2

SYLLABUS

UNIT I (12 Hours)   Introduction to Network Security

Introduction, Need for security, Principles of Security, Types of Attacks Cryptography :Plain Text and Cipher Text, Substitution techniques, Caesar Cipher, Mono-alphabetic Cipher, Polygram, Polyalphabetic Substitution, Polyfair, Hill Cipher, Transposition techniques, Encryption and Decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks.

UNIT II (12 Hours)   Symmetric Key Algorithms

Algorithms Types and Modes, Overview of Symmetric key Cryptography, Data Encryption Standard (DES), International Data Encryption Algorithm (IDEA), RC4, RC5, Blowfish.

UNIT III (12 Hours)   Asymmetric Key Algorithms and Digital Signatures

Brief history of Asymmetric Key Cryptography, Overview of Asymmetric Key Cryptography, RSA Algorithm, Symmetric and Asymmetric key Cryptography together, Digital Signatures, Knapsack Algorithm.

UNIT IV (12 Hours)   Digital Certificates

Digital Certificates, Private Key Management, Hash functions, Key Predistribution, Blom's Scheme, Diffie-Hellman Key Predistribution, Kerberos, Diffie-Hellman Key Exchange, The Station-to-station Protocol.

UNIT V (12 Hours)   Network Security, Firewalls and Virtual Private Networks

Brief Introduction to TCP/IP, Firewalls, IP Security, Virtual Private Networks (VPN), Intrusion.Internet Security Protocols: Basic concepts, Secure Socket Layer (SSL), Transport Layer Security (TLS), Secure Hyper Text Transfer Protocol (SHTTP), Time Stamping Protocol (TSP), Secure Electronic Transaction (SET), SSL vs SET, 3-D Secure Protocol, Electronic Money, E-mail Security.

TEXT BOOK:

1. Atul Kahate, Cryptography and Network Security, 2nd Edition, Tata McGrawHill. (Unit I: Chapter 1,2, Unit II: Chapter 3, Unit III: Chapter 4, Unit IV: Chapter 5, Unit V: Chapter 6)

REFERENCE BOOKS:

1. William Stallings, Cryptography and Network Security, Fifth Edition, Pearson Education.
2. Douglas Stinson, Cryptography: Theory and Practice, CRC Press, CRC Press LLC.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : II	17CAU29B	BIG DATA ANALYTICS	60	-	4

Preamble

To provide grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of big data analytics	K1,K2
CO2	Acquire the knowledge on Hadoop	K1,K2
CO3	Learn to build and maintain reliable, scalable, distributed systems with Hadoop	K2,K3
CO4	Able to apply Hadoop ecosystem components	K3,K4
CO5	Understand the basics of HIVE and its usage	K2,K3,K4

SYLLABUS

UNIT I (12 Hours)   Introduction to Big data

Introduction – Distributed File System – Big Data and its Importance, Four V's in Big Data, Drivers For Big Data, Big Data Analytics, Big Data Applications. Algorithms Using Map Reduce, Matrix-Vector Multiplication by Map Reduce.

UNIT II (12 Hours)   Introduction to Hadoop

Big Data – Apache Hadoop & Hadoop Ecosystem – Moving Data in and out of Hadoop – Understanding Inputs and Outputs of Mapreduce - Data Serialization.

UNIT III (12 Hours)   Hadoop- Architecture and Storage

Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell Commands , Anatomy of File Write and Read, NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Tasktrackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

UNIT IV (12 Hours)   Hadoop ecosystem and Yarn

Hadoop Ecosystem Components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features-NameNode High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN.

UNIT V (12 Hours)   HIVE and HIVEQL, HBASE

Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts-Advanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - How it Helps in Monitoring a Cluster, HBase uses Zookeeper and How to Build Applications with Zookeeper.

TEXT BOOKS:

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, Professional Hadoop Solutions, Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al. , Understanding Big data, McGraw Hill, 2012.
3. Tom White, HADOOP: The definitive Guide, O Reilly, 2012.
4. Vignesh Prajapati, Big Data Analytics with R and Haoop, Packet Publishing, 2013.

REFERENCE BOOKS:

1. Tom Plunkett, Brian Macdonald et al., Oracle Big Data Handbook, Oracle Press, 2014.
2. Jy Liebowitz ,Big Data and Business analytics ,CRC press, 2013.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : II	17CAU29C	FUNDAMENTALS OF DISTRIBUTED COMPUTING	60	-	4

Preamble

To enable the students to learn the concepts of distributed computing

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of distributed systems	K1,K2
CO2	Acquire the knowledge on distributed databases	K1,K2
CO3	Learn about the resource allocation and design considerations of databases	K2,K3
CO4	Provide the insight on client server network model	K2,K3,K4
CO5	Understand in detail about distributed databases	K2,K3

SYLLABUS

UNIT I (12 Hours)　　　　Introduction to Distributed Systems
Distributed Systems: Fully Distributed Processing Systems – Networks and Interconnection Structures – Designing a Distributed Processing System.

UNIT II (12 Hours)　　　　Overview of Distributed Database Systems
Pros And Cons Of Distributed Processing – Distributed Databases – The Challenges of Distributed Data – Loading, Factors – Managing the Distributed Resources Division of Responsibilities.

UNIT III (12 Hours)　　　　Resource allocation and Design considerations
Communication Line Loading – Line Loading Calculations, Partitioning And Allocation - Data Flow Systems – Dimensional Analysis- Network Database Design Considerations- Ration Analysis- Database Decision Trees- Synchronization of Network Databases.

UNIT IV (12 Hours)　　　　Client server network model
Client Server Network Model: Concept – File Server – Printer Server and E-Mail Server.

UNIT V (12 Hours)　　　　Distributed databases
An Overview, Distributed Databases- Principles of Distributed Databases – Levels of Transparency- Distributed Database Design- The R* Project Techniques Problem of Heterogeneous Distributed Databases.

TEXT BOOKS:

1. John A. Sharp, An introduction to distributed and parallel processing, Blackwell Scientific Publication(Unit I & III)
2. Uyless D. Black, Data communication and distributed networks(Unit II)
3. Joel M.Crichllow, Introduction to distributed & parallel computing (Unit IV)

REFERENCE BOOK:

1. Stefans Ceri, Ginseppe Pelagatti, Distributed database Principles and systems, Tata McGraw Hill.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CAU30A	E-COMMERCE	60	-	4

Preamble

To enable the students to learn the concepts of E-commerce and its usage

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the basics of E-commerce	K1,K2
CO2	Acquire the knowledge on the fundamentals of E-commerce	K2
CO3	Understand about Business of internet	K3,K4
CO4	Provide the insight on security on E-commerce	K3,K4,K5
CO5	Learn about the E-commerce opportunities in India	K4

SYLLABUS

UNIT I (12 Hours)   Introduction
Meaning, Concepts, Features, Functions, Categories of E-Commerce, Scope, Advantages and Limitation of E-Commerce, E-Commerce practices v/s Traditional Practices, E-Commerce and the Trade Cycle.

UNIT II (12 Hours)   Fundamental of E-Commerce
Types of E-Commerce- B2B, B2C, C2C, and P2P, B2B Service Provider, E-Distributor, Procurement, Importance of E-Commerce, Internet and its role in E-Commerce, Procedure of Registering Internet Domain, Tools and Services of Internet.

UNIT III (12 Hours)   E-Payment, Marketing and Finance
Transactions through Internet, Requirements of E-Payment Systems, Functioning of Debit and Credit Cards, Impact of E-Commerce on Market, Marketing Issues in E-Marketing, Direct Marketing, Areas of E-Financing, E-Banking, Traditional v/s E-Banking.

UNIT IV (12 Hours)   Security of E-Commerce
Setting up Internet Security, Maintaining Secure Information, Data Encryption, Digital Signature and other Security Measures. Laws Relating to Online Transactions- Salient Features.

UNIT V (12 Hours)   E-Commerce in India
State of E-Commerce in India, Problems and Opportunities in E-Commerce in India, Legal Issues, Future of E-Commerce, Applications in E-Commerce: E-Commerce Applications in Manufacturing, Wholesale, Retail and Service Sector.

TEXT BOOKS:

1. Daniel Amor, E Business R(Evolution), Pearson Education.

2. Krishnamurthy, E-Commerce Management, Vikas Publishing House.

REFERENCE BOOK:

1. David Whiteley, E-Commerce: Strategy, Technologies and Applications.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CAU30B	GREEN COMPUTING	60	-	4

Preamble

To acquire knowledge to adopt green computing practices to minimize negative impacts on the environment, skill in energy saving practices in their use of hardware, examine technology tools that can reduce paper waste and carbon footprint by user, and to understand how to minimize equipment disposal requirements.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the fundamentals of green computing and its IT strategies	K1,K2
CO2	Learn about green assets, modeling and information systems	K2,K3
CO3	Acquire knowledge on grid framework	K2,K3
CO4	Understand the concept of green compliance	K2,K3
CO5	Work with case studies	K5,K6

SYLLABUS

UNIT I (12 Hours)　　　　　　　**Fundamentals of Green Computing**
Green IT Fundamentals: Business, IT, and the Environment – Green computing: carbon foot print, scoop on power – Green IT Strategies: Drivers, Dimensions, and Goals – Environmentally Responsible Business: Policies, Practices, and Metrics

UNIT II (12 Hours)　　　　　　　**Green Assets and Modeling**
Green Assets: Buildings, Data Centers, Networks, and Devices – Green Business Process Management: Modeling, Optimization, and Collaboration – Green Enterprise Architecture – Environmental Intelligence – Green Supply Chains – Green Information Systems: Design and Development Models.

UNIT III (12 Hours)　　　　　　　**Grid Framework**
Virtualizing of IT systems – Role of Electric Utilities, Telecomputing, Teleconferencing and Teleporting – Materials Recycling – Best ways for Green PC – Green Data center – Green Grid Framework.

UNIT IV (12 Hours)　　　　　　　**Green Compliance**
Socio-cultural aspects of Green IT – Green Enterprise Transformation Roadmap – Green Compliance: Protocols, Standards, and Audits – Emergent Carbon Issues: Technologies and Future.

UNIT V(12 Hours)   **Case Studies**

The Environmentally Responsible Business Strategies (ERBS) – Case Study Scenarios for Trial Runs – Case Studies – Applying Green IT Strategies and Applications to a Home, Hospital, Packaging Industry and Telecom Sector.

TEXT BOOKS:

1. Bhuvan Unhelkar: Green IT Strategies and Applications-Using Environmental Intelligence, CRC Press, June 2011.
2. Woody Leonhard, Katherrine Murray, Green Home computing for dummies, August 2009.

REFERENCE BOOKS:

1. Alin Gales, Michael Schaefer, Mike Ebbers, Green Data Center: steps for the Journey, Shoff/IBM rebook, 2011.
2. John Lamb, The Greening of IT, Pearson Education, 2009.
3. Jason Harris, Green Computing and Green IT- Best Practices on regulations & industry, Lulu.com, 2008.
4. Carl speshocky, Empowering Green Initiatives with IT, John Wiley & Sons, 2010.
5. Wu Chun Feng (editor), Green computing: Large Scale energy efficiency, CRC Press, 2012.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	**17CAU30C**	**WEB SERVICES**	**60**	**-**	**4**

Preamble

To enable the students to learn the concepts of web services and its technologies

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Obtain the fundamentals of web services	K1,K2
CO2	Acquire the knowledge on the basic protocols	K2,K3
CO3	Understand about UDDI	K3,K4
CO4	Provide the insight on advanced web based technologies	K4
CO5	Learn about the basics of transactions	K5

SYLLABUS

UNIT I (12 Hours)   Introduction
Introduction to Web Services- SOAP –WSDL- UDDI -The Evolution of Web Application -Web Services & Enterprises -XML fundamentals.

UNIT II (12 Hours)   SOAP and WSDL

SOAP and WSDL-The SOAP model -SOAP messages- SOAP Encoding - SOAP RPC -SOAP Encoding- REST Architecture -WSDL -Using SOAP and WSDL.

UNIT III (12 Hours)   UDDI
UDDI- UDDI Business Registry -UDDI Specification- Accessing UDDI- UDDI and Lifecycle Management-UDDI and Dynamic Access Point Management.

UNIT IV (12 Hours)   Advanced Web Services Technologies and Standards
Overview Conversational requirements for B2B Interactions- Web Services Conversation Language -Relationship between WSCL and WSDL- WORKFLOW- business Process Management- Workflows and Workflow Management Systems- Business Process Execution Language for Web Services (BPEL).

UNIT V (12 Hours)   Transactions
ACID Transactions- Distributed Transactions and Two phase Commit Dealing with Heuristic outcomes- scaling transactions to Web Services- OASIS Business Transaction Protocol-SECURITY- Web Service Security issues.

TEXT BOOK:

1. Sandeep Chatteree & James Webber, Developing Enterprise Web Services An Architects
   Guide , Pearson Education

REFERENCE BOOK:

1. Sanjiva weerawarana, Francisco Curbera,Web Services platform architecture , Prentice Hall,
   2005.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE : IV	**17SEUCA4**	**CASE TOOLS-PRACTICAL**	**-**	**24**	**2**

Subject description: This course provides hands on experience on case tools techniques
Goal: To enable the students to equip them with designing UML diagram and to generate VB code
Objectives: On successful completion of the course the students will understand the concept of case tools and to generate models

Practical list

Use UML diagram and generate VB code for the following:

1. To design an ATM transfer system

2. To design a student mark analysis

3. To design an expert system for medicine field

4. To design a stock maintenance system

5. To design a quizzing system

6. To design a remote computer monitoring system

7. To design an online ticket reservation system

8. To design an E-mail client server system

9. To design a Library management system

10. To design a ERP system

The Comprehension in Computer Science examination will be conducted at the end of each semester III, IV, V, VI for a maximum of 50 marks which consists of

Comprehension (Multiple Choice Questions) (50x1=50)   50 marks

The students are examine on Core, Core Allied, Core Elective papers studied in III, IV, V & VI Semester. In the comprehension component, the students are tested on their grasping ability of the subjects of study.

Extension Activity:

Participation of a student in the extension activities conducted by the department between I and VI semesters evaluated under Part :V is mandatory for completion of the programme.