

# BACHELOR OF SCIENCE IN COMPUTER SCIENCE (2017)

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

**P.K.R ARTS COLLEGE FOR WOMEN**  
(Accredited with 'A' Grade by NAAC)  
An Autonomous Institution - Affiliated to Bharathiar University  
Gobichettipalayam - 638 476.

## BACHELOR OF SCIENCE - COMPUTER SCIENCE

### 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	
<b>SEMESTER - I</b>									
I	Language: I	17LTU01/ 17LHU01/ 17LFU01/ 17LKU01/ 17LMU01/ 17LSU01	Tamil- I/Hindi-I/French-I/ Kannada-I/ Malayalam-I / Sanskrit-I	6	3	25	75	100	4
II	English: I	17LEU01	English: I	6	3	25	75	100	4
III	Core: I	17CSU01	<b>Computing Fundamentals and C Programming</b>	4	3	25	75	100	4
III	Core :II	17CSU02	Digital Fundamentals and Computer Architecture	4	3	25	75	100	4
III	Core : III	17CSU03	Programming in C - Practical	3	3	40	60	100	4
III	Allied : I	17CSU04	Mathematical Structures for Computer Science	5	3	25	75	100	4
IV	Foundation Course: I	17FCU01	Environmental studies	2	3	-	50	50	2
<b>TOTAL</b>				<b>30</b>				<b>650</b>	<b>26</b>
<b>SEMESTER - II</b>									
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	17CSU05	<b>Programming in C++</b>	5	3	25	75	100	4
III	Core : V	17CSU06	<b>Programming in C++- Practical</b>	4	3	40	60	100	4
III	Core : VI	17CSU07	<b>Programming in HTML- Practical</b>	2	3	40	60	100	2

III	Allied : II	17CSU08	Discrete Mathematics	5	3	25	75	100	4
IV	Foundation Course : II	17FCU02	Yoga and Value Education	2	3	-	50	50	2
<b>TOTAL</b>				<b>30</b>				<b>650</b>	<b>24</b>

SEMESTER - III									
III	Core :VII	17CSU09	Data Structures	5	3	25	75	100	4
III	Core : VIII	17CSU10	Java Programming	5	3	25	75	100	4
III	Core : IX	17CSU11	Programming in Java - Practical	5	3	40	60	100	4
III	Core : X	17CSU12	Data Communication and Networks GSK	4	3	25	75	100	4
III	Allied : III	17CSU13	Operation Research	4	3	25	75	100	4
III	Core:XI	17CSU14	Comprehension in Computer Science-I (Online Exam / Self-Study)	-	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	-	-	-	-	-
<b>TOTAL</b>				<b>30</b>				<b>700</b>	<b>25</b>
SEMESTER - IV									
III	Core: XII	17CSU15	Operating System	6	3	25	75	100	5
III	Core : XIII	17CSU16	Linux Programming	6	3	25	75	100	5
III	Core : XIV	17CSU17	Programming in Linux - Practical	6	3	40	60	100	4
III	Allied : IV	17CSU18	Business Accounting	5	3	25	75	100	4
III	Core:XV	17CAU19	Comprehension in Computer Science-II (Online Exam / Self-	-	1/2	-	50	50	1
IV	Skill Enhancement Course : II	17SEUCS2	Tally - Practical	4	3	40	60	100	2
IV	Non - Major Elective :II	17NMU02A/ 17NMU02B	Career Enhancement(Online Exam)/ Consumer Rights	3	1/2	-	50	50	2
<b>TOTAL</b>				<b>30</b>				<b>600</b>	<b>23</b>

III	Allied : II	17CSU08	Discrete Mathematics	5	3	25	75	100	4
IV	Foundation Course : II	17FCU02	Yoga and Value Education	2	3	-	50	50	2
<b>TOTAL</b>				<b>30</b>				<b>650</b>	<b>24</b>

SEMESTER - III									
III	Core :VII	17CSU09	Data Structures	5	3	25	75	100	4
III	Core : VIII	17CSU10	Java Programming	5	3	25	75	100	4
III	Core : IX	17CSU11	Programming in Java - Practical	5	3	40	60	100	4
III	Core : X	17CSU12	Data Communication and Networks GSK	4	3	25	75	100	4
III	Allied : III	17CSU13	Operation Research	4	3	25	75	100	4
III	Core:XI	17CSU14	Comprehension in Computer Science-I (Online Exam / Self-Study)	-	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	-	-	-	-	-
<b>TOTAL</b>				<b>30</b>				<b>700</b>	<b>25</b>
SEMESTER - IV									
III	Core: XII	17CSU15	Operating System	6	3	25	75	100	5
III	Core : XIII	17CSU16	Linux Programming	6	3	25	75	100	5
III	Core : XIV	17CSU17	Programming in Linux - Practical	6	3	40	60	100	4
III	Allied : IV	17CSU18	Business Accounting	5	3	25	75	100	4
III	Core:XV	17CAU19	Comprehension in Computer Science-II (Online Exam / Self-	-	1/2	-	50	50	1
IV	Skill Enhancement Course : II	17SEUCS2	Tally - Practical	4	3	40	60	100	2
IV	Non - Major Elective :II	17NMU02A/ 17NMU02B	Career Enhancement(Online Exam)/ Consumer Rights	3	1/2	-	50	50	2
<b>TOTAL</b>				<b>30</b>				<b>600</b>	<b>23</b>

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: I	17CSU01	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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE: II	17CSU02	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 form 1 – 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. Computer Architecture -M. Carter, Schaum's outline series, TMH

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :III	17CSU03	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.



CATEGORY	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 analyze 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.



- 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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE :IV	17CSU05	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++”, 2<sup>nd</sup> Edition, TMH Publication, 2002.
2. Maria Litvin & Gary Litvin, “C++ for you”, Vikas Publication, 2002.
3. Yashavant Kanetkar, “Let us C++”, BPB Publication, 2<sup>nd</sup> Edition, 2010.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:V	17CSU06	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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : VI	17CSU07	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

CATEGORY	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
CO4	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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VII	17CSU09	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 of Algorithms, Analyzing 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).

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:VIII	17CSU10	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 –Application 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 , 3<sup>rd</sup> ed, TMH
2. John R. Hubbard , Programming With Java, 2nd Edition, TMH

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:IX	17CSU11	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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:X	17CSU12	DATA COMMUNICATION & NETWORKS	48	-	4

### Preamble

To introduces the details about basic concepts of data communication and networking.

### 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 Data Communication	K1,K2
CO2	Understand basic concepts Transmission Media, Switching and Routing Techniques	K1,K2
CO3	Acquire knowledge of Network types	K2,K5
CO4	Familiarize in internetworking	K3,K4
CO5	Analyze Communication protocols	K4,K5

## SYLLABUS

### UNIT I (8 Hours) Introduction to Data Communications and Networking

Introduction to Data Communications and Networking – Information Encoding – Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing – Transmission Errors: Detection and Correction.

### UNIT II (10 Hours) Transmission Media & Algorithms

Transmission Media : Guided Media, Unguided Media –Network Topologies: Mesh, Star, Tree, Ring, Bus – Switching: Circuit switching, Message switching, Packet switching – Routing Algorithms: Routers and Routing – Factors affecting Routing Algorithms – Routing Algorithms Types – Approaches to Routing – Network Protocols and OSI Model.

### UNIT III (10 Hours) Types of Networks

Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) – Integrated Services Digital Network (ISDN) – X.25 Protocol – Frame Relay – Asynchronous Transfer Mode(ATM)

### UNIT IV (10 Hours) Internetworking Concepts

Internetworking Concepts, Devices, Internet Basics, History and Architecture – Ways of Accessing the Internet – An Introduction to Transmission Control Protocol/ Internet Protocol (TCP/IP), Internet Protocol (IP), Address Resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP), Internet Control Message Protocol (ICMP).

### UNIT V (10 Hours) Protocols

TCP: Features of TCP, Relationship between TCP and IP, Ports and Sockets, TCP connections, What makes TCP Reliable? TCP Packet Format – User Datagram Protocol (UDP): UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – File Transfer Protocol (FTP) – Web Browser Architecture.

**TEXT BOOK:**

1.Achyut S.Godbole, “ Data Communications and Networks”, Tata McGraw-Hill Publishing Company Limited, Ninth reprint, 2007

**REFERENCE BOOKS:**

- 1.Behrouz A. Forouzan, “ Data Communications and Networking – Second Edition Update “ Tata McGraw-Hill Publishing Company Limited, Nineteenth reprint, 2007
- 2.Andrew S. Tanenbaum, “Computer Networks”, III Edition, Prentice Hall of India, 2000

CATEGORY	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) urla, Sambalpur, Odisha .

**REFERENCE BOOK:**

1. Andy Taylor (Editor) ,David Alexander, Amanda Finch & 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:**

<b>S.No</b>	<b>Authors</b>	<b>Title</b>	<b>Publishers</b>	<b>Year of Publication</b>
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

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
NON-MAJOR ELECTIVE:I	17NMU01B	BASIC TAMIL	24	-	2

**gFjp –IV: mbg;gilj; jkpo;j;jhs; -1**

**%d;whk; gUtk;**

**,sq;fiy 2017-18 fy;tpahz;L Kjy; Nru;Nthu;f;FupaJ**

**(12-Mk; tFg;G tiu jkpo; nkhopg;ghlk; gapyhjth;fSf;F)**

**mf kjpg;gPl;Lj; Njh;T kl;Lk;**

1. jkpo; nkhopad; mbg;gilf; \$Wfs;.  
vOj;Jfs; : KjnyOj;Jfs; (caph; vOj;J> nka; vOj;J> caph;nka; vOj;J)  
nrhw;fs; : ngah;r;nrhy;> tpidr;nrhy;> ,ilr;nrhy;> chpr;nrhy;  
njhlh; : njhluikg;G (vOtha;> nrag;gLnghUs;> gadpiy)
2. Fwpg;G vOJjy; : gj;Jg; gjpide;J njhlh;fspy; Fwpg;G tiujy;  
gpiopPf;fp vOJjy; : (xw;Wg;gpiop vOj;Jg;gpiop)

**2017 – 2018 fy;tpahz;L Kjy; gapy;gth;fSf;Fg; gpd;tUk; tpdhj;jhs; mikg;G  
gpd;gw;wg;gl Ntz;Lk;.**

	mf kjpg;gPl;Lj; Njh;T kjpg;ngz; toq;Fk; Kiw	kjpg;ngz;fs;
1.	tFg;Gj; Njh;T – 1	10
2.	tFg;Gj; Njh;T – 2	10
3.	khjphpj; Njh;T	10
4.	gapw;rpf; fl;Liu	10
5.	tha;nkhopj; Njh;T	10
	nkhj;j kjpg;ngz;fs;	50

**Fwpg;G : tha;nkhopj; Njh;tpy; jkpo; nkhop njhlh;ghd tpdhf;fs; kl;LNk Nfl;fg;gl  
Ntz;Lk;.**

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XII	17CSU15	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 (Sj 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,2<sup>nd</sup> Edition, Addison Wesley Publishing Company.

**REFERENCE BOOKS:**

- 1.William Stallings, Operating System: Internals and Design Principals, 6<sup>TH</sup> Edition, Pearson Publication.
- 2.Flynn, McHoes, Operating System, India Edition

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIII	17CSU16	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, Beginning Linux Programming, 4<sup>th</sup> Edition, Wiley India Pvt Ltd, 2007.

**REFERENCE BOOK:**

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

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XIV	17CSU17	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

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.



CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ALLIED:IV	17CSU18	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

### UNIT I (14 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 (15 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 (14 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 (15 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 (14 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)

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE: II	17SEUCS2	TALLY- PRACTICAL	-	48	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

**Career Enhancement (Online Examination):**

This course is 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 1½ Hours with randomly selected 50 questions for a maximum of 50 marks. The passing minimum is 40% of 50 marks ie. 20 marks

<b>Course</b>	<b>No. of Questions</b>	<b>Marks</b>	<b>Total Marks</b>
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 credit each.

CATERGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVI	17CSU20	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, 4<sup>th</sup> Edition, TMH, 2007.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVII	17CSU21	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", 1<sup>st</sup> Edition, Scitech Publications(India) Pvt Ltd, 2014

**REFERENCE BOOKS:**

1. Jeffrey 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



CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE : XVIII	17CSU22	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

<b>CATERGORY</b>	<b>COURSE CODE</b>	<b>TITLE</b>	<b>C</b>	<b>P</b>	<b>CREDIT</b>
<b>CORE : XX</b>	<b>17CSU23</b>	<b>INSTITUTIONAL TRAINING</b>	-	-	<b>1</b>

### **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:

<b>COMPONENTS*</b>	<b>MARKS</b>	<b>TOTAL MARKS</b>
Understanding and articulation of concepts	30	<b>100</b>
Clarity and comprehensiveness of presentation in the report	30	
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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17CSU24A	E-LEARNING	72	-	4

### Preamble

To understand the basic concepts of E-Learning and its tools.

### Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the evolution of E-Learning and its tools	K1,K2
CO2	Obtain the knowledge about Flash and its tools	K3,K4
CO3	Gain the deep knowledge on animation and its effects	K3,K4
CO4	Acquire the knowledge on sound and video effects in flash	K3,K4,K5
CO5	Ability to develop a video using adobe premiere	K5,K6

## SYLLABUS

### UNIT I (12 Hours)

#### E-Learning Evolution

Advantages and Disadvantages of E-Learning - Instructional Design Models for E-Learning - Applying User - Centered Design to E-Learning - E-Learning Tools – What is an E-Learning Tool?

### UNIT II (12 Hours)

#### Flash Tools

Geometric Shape Tools – Drawing Tools - Creating Precise Lines with the Pen Tool - Fill and Stroke Controls - Selection Tools - Designing and Aligning Elements.

### UNIT III (12 Hours)

#### Creating Animation and Effects

Animation Strategies – TimeLine Animation – Applying Layer Types - Character Animation Techniques.

### UNIT IV (12 Hours)

#### Sound and Video

Sound: Import and Export Formats – Importing Sound to Flash – Adding Sound to Timeline –Synchronizing Audio to Animations - Stopping Sounds. Video: Integrating and Importing Video.

### UNIT V (12 Hours)

#### Adobe Premiere

Starting Movie Projects: Starting New Projects -Reviewing and Changing Project Settings - Saving a Project. Adding Special Effects to Your Movies: Surveying Effects -Introducing the Effect Controls Window -Using Key Frames -Removing Effects -Working with Effect Presets.

1\

**TEXT BOOKS:**

1. Pamela Berman, E-Learning Concepts and Techniques, Institute for Interactive Technologies, Bloomsburg University of Pennsylvania, USA e-book, 2006.
2. Robert Reinhardt and Snow Dowd. Macromedia Flash 8 Bible, 1<sup>st</sup> Edition, New Delhi. Wiley India (P) Ltd, 2006,
3. Keith Underdahl, Adobe Premiere Elements for Dummies, Wiley Publishing Inc.

**REFERENCE BOOKS:**

1. Dinesh Maidasani, Flash 8, Firewall Media Publications, New Delhi. 2006.
2. Fred T.Hofstetter,MultiMedia Literacy, Tata McGraw Hill, New Delhi, 2001.
3. Tay Vaughan., Multimedia Making it Work, 7<sup>th</sup> Edition, Tata McGraw-Hill, New Delhi, 2008.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17CSU24B	CLIENT SERVER COMPUTING	72	-	4

### Preamble

To understand the basic concepts of Client/Server computing and explore the components of Client/Server communications.

### Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the Client/Server technology and its advantages	K1,K2
CO2	Understand the role of Client and Server	K2
CO3	Gain the deep knowledge on Client/Server communications	K2,K3
CO4	Acquire the knowledge on hardware and software for Client/Server technology	K3,K4
CO5	Obtaining the deep knowledge on Future of Client/Server computing	K4,K5

## SYLLABUS

### UNIT I (12 HOURS) Introduction to Client/Server Computing

Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.

### UNIT II (12 HOURS) Role of Client and Server

The Client: Role of a Client – Client Services – Request for Service. Components of Client/Server Applications – The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system.

### UNIT III (12 HOURS) Client/Server Communications

Connectivity: Open System Interconnect – Communications Interface Technology – Inter process communication – WAN Technologies.

\

### UNIT IV (12 HOURS) Software and Hardware

Software: Factors driving demand for application software development – Rising Technology Staff costs – Need to improve Technology – Need for Common Interface across Platforms –

Client/Server System Development Methodology. Components of Client/Server Applications–Hardware: Hardware/Network Acquisition – PC-Level Processing Units – Macintosh, notebooks, Pen – UNIX Workstation –X-terminals – Disk, Tape, Optical Disks, NIC and UPS.

**UNIT V (12 HOURS) Service and Support**

System Administration. The Future of Client/Server Computing: Enabling Technologies – Transformational Systems.

**TEXT BOOK:**

1.Patrick Smith, Steve Guenferich , Client/Server Computing, 2nd edition, Prentice Hall of India Private Limited, New Delhi

**REFERENCE BOOK:**

1.Dawna Travis Dewire, “ Client Computing”, Tata McGRAW Hill, 2003



CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:I	17CSU24C	MOBILE COMPUTING TECHNIQUES	72	-	4

### Preamble

To learn about the mobile computing basics and advanced techniques.

### Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the emergence of Mobile technology and its architecture	K1,K2
CO2	Acquire the knowledge on mobile computing through telephony	K2,K3
CO3	Learn about emerging technologies	K2,K3
CO4	Provide the insight on GPRS	K3,K4
CO5	Acquire the knowledge on CDMA and 3G	K4,K5

## SYLLABUS

### UNIT I (12 Hours) Introduction to Mobile Computing and its Architecture

Mobility of Bits and Bytes –Wireless The beginning –Mobile Computing –Dialogue Control –Networks –Middleware and Gateways –Application and Services-Developing Mobile Computer Applications –Security in Mobile Computing –Standards \_ Why is it Necessary – Standard Bodies. Mobile Computing Architecture: History of Computers and Internet – Architecture for Mobile Computing –Three-tier Architecture –Design Considerations for Mobile Computing –Mobile Computing through Internet –Making Existing Applications Mobile Enabled.

### UNIT II (12 Hours) Mobile Computing through Telephony

Evaluation of Telephony – Multiple Access Procedures – Mobile Computing through Telephone – IVR Application – Voice XML – TAPI.

### UNIT III (12 Hours) Emerging Technologies

Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 –Java Card. GSM : Global System for Mobile Communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency Allocations – Authentications and Security.

### UNIT IV (12 Hours) GPRS

GPRS – GPRS and Packet Data Network –GPRS Network Architecture –GPRS Network Operations –Data Services in GPRS –Application for GPRS-Limitations –Billing and Charging. WAP : MMS –GPRS Applications.

### UNIT V (12 Hours) CDMA and 3G

Spread Spectrum Technology –Is 95 –CDMA vs GSM –Wireless Data –Third Generation Networks –Applications on 3G.

**TEXT BOOK**

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

**REFERENCE BOOK**

1. Mobile Computing, KumkumGarg, Pearson Education, 2010.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE: III	17SEUCS3	PHOTOSHOP- PRACTICAL	-	36	2

**Subject Description:** This course provides hands on experience on designing in Photoshop

**Goal:** To enable the students to develop designing skills in Photoshop

**Objectives:** On successful completion of the course the students will understand the concepts of Photoshop

#### Practical list

1. Create your Visiting card.
2. Create Cover page for any text book.
3. Design a Banner with various characteristics.
4. Animate Plane Flying in the Clouds using Photoshop.
5. Create Brochure for your department.
6. Create Plastic Surgery for the Nose using Photoshop.
7. Create Stone Texture using Photoshop.
8. Create GIF / Animated file using Photoshop.
9. Create a web template for your college.
10. Convert Black and White to Color Photo using Photoshop.

### **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.

<b>CATEGORY</b>	<b>COURSE CODE</b>	<b>TITLE</b>	<b>C</b>	<b>P</b>	<b>CREDIT</b>
PROFICIENCY ENHANCEMENT	17PEUCS1	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

<b>CO Number</b>	<b>CO Statement</b>	<b>Knowledge Level</b>
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- Metrics 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 – Metrics 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.Gopaldaswamy 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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXII	17CSU26	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, Quantitative and Mixed Methods Approaches.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXIII	17CSU27	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 3D Transformations

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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
CORE:XXIV	17CSU28	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 poly
12. Create environment modeling (tree, Mountain, road, Planet, forest)

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17CSU29A	WEB TECHNOLOGY	60	-	4

### Preamble

To learn about Web technologies and its functionalities

### Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Provide a insight on the basics of Internet	K1,K2
CO2	Ability to understand the basics of web page creation	K1,K2
CO3	Acquire knowledge on creating cascading style sheets	K2,K3
CO4	Provide the insight on the introduction to servlets	K2,K3,K4
CO5	Ability to work with JSP sessions	K3,K4

## SYLLABUS

### UNIT I (12 Hours)

#### Introduction

History of the Internet –Services and Accessibility –Uses –Protocols –Internet Standards.

### UNIT II (12 Hours)

#### HTML

Introduction –HTML Document –Head Section –Body Section –HTML Forms –Java Script : Introduction –Language Elements –Objects of Java Script –Other Objects –Arrays.

### UNIT III (12 Hours)

#### Cascading Style Sheets

Cascading Style Sheets –Advantages of CSS –Properties of Tags –Property Values – Embedded Style Sheets –External Style Sheets –Grouping –Inheritance –Class as Selector – Pseudo Classes and Pseudo Elements –Positioning –Backgrounds –Element Dimensions.

### UNIT IV (12 Hours)

#### Servlets

Servlets –Introduction –Advantages of Servlets -Servlet Life Cycle -The Servlet API -A Simple Servlet –Handling HTTP GET Requests –Handling HTTP POST Requests –Cookies –Session Tracking.

### UNIT V (12 Hours)

#### JSP

Introduction –Advantages of JSP –Developing First JSP –Components of JSP –Reading request information –Retrieving the data posted from a HTML file to a JSP File –JSP Sessions –Cookies –Disabling Sessions.

### TEXT BOOK:

1. N P Gopalan, J Akilandeswari, Web Technology –A Developers Perspective, Prentice Hall of India Pvt. Ltd., New Delhi, 2008.

### REFERENCE BOOKS:

1. J Jaworkski ,Mastering Javascript, BPB Publications, 1999

2. Marty Halland Larry Brown ,Servlets and Java server pages Volume 1: Core technologies by Pearson, Pearson Education India

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17CSU29B	CLOUD COMPUTING TECHNIQUES	60	-	4

### Preamble

To learn about cloud computing technologies, functions and its uses

### Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Provide an insight on the basics of cloud computing technology	K1,K2
CO2	Ability to understand the concept of virtualization	K2,K3
CO3	Acquire knowledge on the cloud infrastructure and its resources	K2,K3
CO4	Gives detailed view on securities in the cloud	K4
CO5	Explain about other technologies outside the cloud	K4,K5

## SYLLABUS

### UNIT I (12 Hours) Understanding cloud computing

An Introduction to Cloud Computing –Cloud Models:-Characteristics –Cloud Services – Cloud models (IaaS, PaaS, SaaS) –Public vs Private Cloud –Cloud Solutions -Cloud ecosystem –Service management –Computing on demand.

### UNIT II (12 Hours) Virtualization

Basics of Virtualization -Types of Virtualization -Implementation Levels of Virtualization - Virtualization Structures -Tools and Mechanisms -Virtualization of CPU, Memory, I/O Devices -Virtual Clusters and Resource Management –Virtualization for Data-center Automation.

### UNIT III (12 Hours) Cloud infrastructure

Architectural Design of Compute and Storage Clouds –Layered Cloud Architecture Development –Design Challenges -Inter Cloud Resource Management –Resource Provisioning and Platform Deployment –Global Exchange of Cloud Resources.

### UNIT IV (12 Hours) Security in the cloud

Security Overview –Cloud Security Challenges and Risks –Software-as-a-Service Security – Security Governance –Risk management –Security Monitoring –Security Architecture Design –Data Security –Application Security –Virtual Machine Security -Identity Management and Access Control–Autonomic Security.

**UNIT V (12 Hours)****Outside the cloud**

Other ways to collaborate online: Collaborating via Web-Based Communication Tools - Collaborating via Social Networks and Groupware –Collaborating via Blogs and Wikis.

**TEXT BOOKS:**

1. George Reese, Cloud Application Architectures: Building Applications and Infrastructure in the Cloud, O'Reilly
2. RajkumarBuyya, Christian Vecchiola, S.ThamaraiSelvi, Mastering Cloud Computing, TMGH, 2013
3. Michael Miller, Cloud Computing, Pearson publication, 2013

**REFERENCE BOOKS:**

1. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, TMH, 2009.
2. Kumar Saurabh, Cloud Computing –Insights into New-Era Infrastructure ,Wiley India, 2011.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:II	17CSU29C	INTRODUCTION TO COMPILER DESIGN	60	-	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 Compilers

Compilers and Translator – Need of Translator – The structure of a Compiler – Lexical analysis – Syntax analysis – Intermediate code generation – optimization – code generation – Compiler – 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.

### UNITII (12 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 (12 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 (12 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 (12 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 Compiler Design by Alfred, Narosa Publishing House.

**REFERENCE BOOKS:**

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, Compilers, Principles. Techniques, and tools.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE : III	17CSU30A	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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17CSU30B	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 footprint, 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.

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
ELECTIVE:III	17CSU30C	GRID COMPUTING	60	-	4

### Preamble

To learn about the Grid environment, building software systems and components that scale to millions of users in modern internet, Grid concepts capabilities across the various Grid services.

### 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 grid computing	K1,K2
CO2	Classify the various grid computing technologies	K2,K3
CO3	Learn to build an architecture of Grid computing	K2,K3
CO4	Understand Grid computing standards	K2,K3,K4
CO5	Provide an insight about functionality requirements and services	K3,K4

## SYLLABUS

### UNIT I (12 Hours)

#### Introduction

Grid Computing & Key Issues – Applications – Other Approaches – Grid Computing Standards – Pragmatic Course of Investigation.

### UNIT II (12 Hours)

#### Grid Benefits & Status of Technology

Motivations –History of Computing, Communications and Grid Computing – Grid Computing Prime Time – Suppliers and Vendors – Economic Value – Challenges.

### UNIT III (12 Hours)

#### Grid Computing Systems Architecture

Basic Constituent Elements-A Functional View – A Physical View – Service View.

### UNIT IV (12 Hours)

#### Grid Computing Standards

Standardization – Architectural Constructs – Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed View.

### UNIT V(12 Hours)

#### OGSA Services

Functionality Requirements – OGSA Service Taxonomy – Service Relationships – OGSA Services – Security Considerations.

### TEXT BOOK:

1.Daniel Minoli ,A Networking Approach to Grid Computing, Wiley Publication

### REFERENCE BOOKS:

2.Ahmar Abbas, Grid Computing – A Practical Guide to Technology and Applications, Charles River Media Publication

CATEGORY	COURSE CODE	TITLE	C	P	CREDIT
SKILL ENHANCEMENT COURSE:IV	17SEUCS4	SOFTWARE TESTING - PRACTICAL	-	24	2

**Subject Description:** This course provides an opportunity to develop testing skills and to learn different kinds of testing.

**Goal:** To enable the students to equip them with testing the software after development phase.

**Objectives:** On successful completion of the course the students will understand the concept of software testing and expertise in using testing in software.

Write at least 10 TEST CASES for the following programs. Test cases can be for Input data, Conditional expressions, control transfer, output, etc. Run-Test-Debug-until all the test cases are in success status. Marks distribution as follows:

1. List of Test Descriptions (at least 10) for the Program. (20%)
2. Test Cases (40%)
3. Program with all test case results success (30%)
4. Record (10%)

**TEST CASE EXAMPLE:**

Test-Id	Test Description	Test Steps	Expected Output	Actual Output	Status
TC-01	Acceptance of 10 digit input data	Input 10 Digit Number	Accepting 10 digit number	Accepted 10 digit number	Success
TC-02	Non-acceptance of character data	Input a character data X	Character X should not be accepted	Accepting Character data	Failure

TC-02	Non-acceptance of character data	Input a character data X	Character X should not be accepted	Character data not accepted	Success
TC-03	Digit sum of 10 digit is in single digit	Output data	Single digit sum	Single digit Sum	Success

1. Test the C program: Finding the sum of individual digits of a 10-digit number until a single digit is produced.
2. Test the C Program: Accept the inputs student name, marks in five subjects and declare the result as PASS if the student gets minimum 40 in each subject; otherwise declare the result as FAIL.
3. Test the C program: Accept two numbers from the user find the biggest and smallest.
4. Test the C program: Sort and store the elements of two arrays of integers into the third list.
5. Test the C program: Experiment the operations of a stack using array implementation.
6. Test the C program: Menu-driven option for queue operations like add, remove and display.
7. Test the C++ program: Palindrome string checking program (using pointers).
8. Test the C++ program: Generate Fibonacci series and check it.

**Part III - COMPREHENSION IN COMPUTER SCIENCE (Courses III, IV,V & VI)**

**(For those admitted in June 2017-18 & onwards)**

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.