J.J.COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

DEPARTMENT OF INFORMATION TECHNOLOGY

B.Sc. Information Technology – SYLLABUS
(from 2019 – 2020)

J.J College of Arts and Science (Autonomous), Pudukkottai – 622 422

B.Sc – Information Technology (Course Structure under CBCS)

(For the Candidates admitted from academic year 2019 - 2020 onwards)

SEM	Part	PaperCode	Course Title	Hrs/ Week	Credit	Exam Hrs	Marks		Total Marks
							Int.	Ext	
I	I	U1R1TL1	Language Course – I	6	3	3	25	75	100
	II	U1R1EL1	English Language Course – I	6	3	3	25	75	100
	III	U1R1ITCC1	Core Course – 1 Principles of Information Technology	8	6	3	25	75	100
		U1R1ITCC2P	Core Course – 2 Digital Documentation Preparation Practical	3	2	3	40	60	100
		U1R1MITAC 1	Allied Course I Essentials of Mathematics	7	4	3	25	75	100
			TOTAL	**30**	**18**	**-**	**-**	**-**	**500**
II	I	U2R1TL2	Language Course – II	5	3	3	25	75	100
	II	U2R1EL2	English Language Course- II	5	3	3	25	75	100
	III	U2R1ITCC3	Core Course – 3 Programming in C	6	6	3	25	75	100
		U2R1ITCC4P	Core Course – 4 Programming in C Practical	3	2	3	40	60	100
		U2R1ITAC2	Allied Course II Computer Hardware and Troubleshooting.	4	4	3	25	75	100
		U2R1ITNMAC 3	Allied Course III Numerical Methods and Statistics	5	4	3	25	75	100
	IV	U2R1ES	Environmental Studies	2	2	3	25	75	100
			TOTAL	**30**	**24**	**-**	**-**	**-**	**700**

III	I	U3R1TL3	Language Course – III	5	3	3	25	75	100
	II	U3R1EL3	English Language Course- III	5	3	3	25	75	100
	III	U3R1ITCC5	Core Course – 5 Fundamentals of Data Structures	7	7	3	25	75	100
		U3R1ITCC6	Core Course – 6 Object Oriented Programming with C++	6	6	3	25	75	100
		U3R1ITCC7P	Core Course – 7 Data Structures using C++ Practical	3	2	3	40	60	100
		U3R1ITORAC 4	Allied Course IV Operations Research	4	4	3	25	75	100
	IV	U3R1VE	Value Education	2	2	3	25	75	100
			TOTAL	**30**	**27**	**-**	**-**	**-**	**700**
IV	I	U4R1TL4	Language Course – IV	5	3	3	25	75	100
	II	U4R1EL4	English Language – IV	5	3	3	25	75	100
	III	U4R1ITCC8	Core Course – 8 JAVA Programming	6	6	3	25	75	100
		U4R1ITCC9P	Core Course – 9 JAVA Programming Practical	3	2	3	40	60	100
		U4R1ITAC5	Allied Course V Digital Computer Fundamentals	5	4	3	25	75	100
		U4R1ITAC6	Allied Course VI LINUX and Shell Programming	4	4	3	25	75	100
	IV	U4R1ITSBE1	Skill Based Elective Course – I Any one from the list	2	2	3	25	75	100
			TOTAL	**30**	**24**	**-**	**-**	**-**	**700**
V	III	U5R1ITCC10	Core Course – 10 Operating System	7	6	3	25	75	100
		U5R1ITCC11	Core Course – 11 DBMS	7	6	3	25	75	100
		U5R1ITCC12P	Core Course – 12 DBMS Practical	3	2	3	40	60	100
		U5R1ITMBE1	Major Based Elective Course - 1 Any one from the list	6	5	3	25	75	100
	IV	U5R1ITSBE2	Skill Based Elective Course – II Any one from the list	5	2	3	25	75	100
		U5R1ITIDC1	Inter Disciplinary Course – I Any one from the list	2	2	3	25	75	100
			TOTAL	**30**	**23**	**-**	**-**	**-**	**600**

VI	III	U6R1ITCC13	Core Course – 13 PHP Programming	6	6	3	25	75	100
		U6R1ITCC14P	Core Course – 14 PHP Programming Practical	3	2	3	40	60	100
		U6R1ITMBE2	Major Based Elective Course – 2 Any one from the list	6	5	3	25	75	100
		U6R1ITMBE3	Major Based Elective Course – 3 Any one from the list	6	5	3	25	75	100
	IV	U6R1ITSBE3	Skill Based Elective Course – III Any one from the list	5	2	3	25	75	100
		U6R1ITIDC2	Inter Disciplinary Course – II Any one from the list	2	2	3	25	75	100
	V	U6R1GS	Gender studies	2	1	3	25	75	100
			Extension Activities	-	1	-	-	-	-
TOTAL				**30**	**24**	**-**	**-**	**-**	**700**
Grand Total					**140**				**3900**

Major Based Electives Courses (Any 03 out of 05)

- Dot Net Technology
- Computer Networks
- Software Engineering
- Cloud Computing
- Python Programming

Skill Based Electives Courses (Any 03 out of 05)

- Web Technology
- Human Resource Management
- Microprocessor and ALP
- Web Design
- Visual Programming

Inter Disciplinary Courses (Any 02 out of 04)

- Basics of Information Technology
- Management Information System
- Internet and Web Design

Programme Specific Outcomes – B.Sc. Information Technology

- **Learners would have acquired the fundamental knowledge about Computers.**
- **Students will be able to understand the programming languages and Database concepts.**
- **After completion of this program students will be able to acquire the skills to do project.**
- **They could become a Web Developer and Computer Programmer.**

Core Course-1 (Semester-I)

PRINCIPLES OF INFORMATION TECHNOLOGY - U1R1ITCC1

Hours/Week: 08 **Max. Marks : 100**

Total Hours : 96 **Credits : 6**

Objectives:

1. **To educate the beginners the fundamentals of computer hardware and software.**
2. **To make them understand how to create MS-Office applications.**
3. **To teach them the basic concepts of internet and programming concepts.**

UNIT I: Internet and World Wide Web (20 Hours)

Internet and World Wide Web- Home page, Website, Browser, Provider and Web Multimedia. Recent Trends in IT - Business, Industry, Education, Training and Entertainment. Anatomy of Computer, Types of computers-Super computers, Mainframes, personal computers and mini computers. Central Processing Unit-Memory-ROM, RAM, Virtual Memory and Cache Memory. **(ICT classes)**

UNIT II: Input and Output Devices (20 Hours)

Input and Output Devices-Keyboard, scanner, mouse, monitor and printer-Secondary Storage Media-Magnetic, optical and solid state devices –Needs of Backup-Introduction to Software-System software and Application software - Types of Operating Systems-Server, Mainframe, Handheld and Embedded operating systems.**(ICT classes)**

UNIT III: Office Automation Packages: (20 Hours)

Word Processing: Entering and Editing documents –Word wrap, Editing, Spelling checker, Grammer checker, Thesaurus, Find and Replace, Merge printing and Footnotes. Formatting Documents-Tables and styles - Spreadsheet Applications – Entering data, functions and chart type-Database Applications- Power point**.(ICT Classes)**

UNIT IV: Communications: (16 Hours)

Communications-The Electronic web: Network Applications-Fax, voice mail and Email –Types of Network - Local Area Network and Wide Area Network -Topologies of Network. Multimedia - Tools of Multimedia.**(Self study)**

UNIT V: Programming and System Development: (16 Hours)

Programming and System Development: Programming Languages-First Generation, Second Generation and Third Generation- Programming Techniques-Flowchart, Branching and Looping. Personal, Social and Ethical issues.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK

1. Dennis P.Curtin, Kim Foley, Kunal Sen, Cathleen Morin, "Information Technology the Breaking Wave", Tata McGraw Hill Publication, 2005. [**Unit-I:** Chapter 1,2,3 , **Unit-II:** Chapter 4,5,6, **Unit-III:** Chapter 7,8, **Unit-IV:** Chapter 9,10,11, **Unit-V:** chapter 12,13]

Reference Book

Gilbert Brands – Introduction to Computer Science, Create Sapce Independent Publications, 2018.

Course Outcomes:

- The Students would have understood the Parts of the Computer
- They should understand the System Languages and Operating System
- They would have acquired the knowledge of Internet and Networks

Note: ICT classes include and Self study

Core Course-2 (Semester-I)

DIGITAL DOCUMENT PREPARATIION PRACTICAL – U1R1ITCC2P

1. Create a simple word processing document like Bio-data and Letter by manipulating text.

2. Prepare a document in the Newspaper format in multicolumn using bullets, footer&header

3. Create a Calendar using tables in MS-word and also prepare a Greeting Card using Template.

4. Prepare a letter in MS word using Mail merge.

5. Create a mark list using formula and built-in function in MS-Excel

6. Draw a chart for a mark list in MS Excel.

7. Create a computer based presentation using multiple slides in Power Point

8. Give the animation effects to the slides and use the design templates in PowerPoint presentation

9. Create a Database Table and do data insertion/query/updating/deletion.

10. Create a Simple Web Page using HTML.

SEM: I **ALLIED COURSE:1**

Credit:3 **ESSENTIALS OF MATHEMATICS** **Int.Marks:25**

Hours/Week:7 **CODE:U1R1MITAC1** **Ext.Marks:75**

Total Hours:82 **Max.Marks:100**

Objectives:

- *To understand the basic skills of Logics and truth tables*
- *To Provide the knowledge of Theory of equations*
- *To solve Linear differential equations of second order.*
- *To introduce the basic concept of Matrices*
- *To provide working knowledge about combinatorial analysis.*

UNIT-I: Logic and Truth Tables (16 Hours)

Introduction – Conjunction – Disjunction – Negation – Propositions and Truth tables – Tautologies and Contradictions – Logical Equivalence – Conditional and Biconditional Statements.

UNIT-II: Theory of Equations (16 Hours)

Elements of Algebra – Functions – Linear equations – simultaneous Linear equations – quadratic functions and equations – Relation between roots and coefficients – solving the equations whose roots are in A.P, G.P and H.P.

UNIT-III: Differential Equations (16 Hours)

Linear equations – second order of types $(aD^2+bD+c)y = f(x)$ where a, b, c are constants and f(x) is one of the following types (i) e^{kx} (ii) sin(kx) , (iii) cos(kx). (iv) x^n, n being an integer.

UNIT- IV: Vectors and Matrices (16 Hours)

Introduction – Vectors – Matrices – Matrix addition and Scalar Multiplication – Matrix Multiplication – Square Matrix – Invertible Matrix – Determinants – Subscribed Variables – Linear equations in one and two unknowns – Gauss elimination method.

UNIT- V: Combinatorial Analysis (14 Hours)

Introduction – Factorial notation – Binomial coefficients – Permutations – Permutation with repetition; Partitions – combinations – Tree diagrams.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Books: [1] "Essential Computer Mathematics'' Seymour Lipschtz Schamu's outline 2004.
[2] " Algebra vol I'' T. K. Manickavasagam Pillai – S. Viswanathan Printers 2008.

Unit I: Chapter 4 Sec 4.1 to 4.8 [1] **Unit II**: Chapter 1 Sec 1, 2, 4, 5 and 6 [2]
Unit III: Chapter 9 Sec 1 to 4 [2] **Unit IV**: Chapter 9 full and Chapter 10 (10.1 to 10. 6) [1]
Unit V: Chapter 11 Sec 11.1 to 11.7[1]

Reference Books:

(1) 'Mathematical Foundation' P.R.Vittal – Margham Publications.
(2) 'Allied Mathematics', S.G.Venkatachalapathy, Margham Publications 2007.

Outcomes:

The Learners would have the ability to

- Analyze subject knowledge in order to classify logical equivalnces.
- Use computational techniques and algebraic skills essential for the study of systems of linear equations, differential equations, matrix Algebra & combinatorial analysis.
- Communicate & understand mathematical statements, ideas & results.

Core Course – 3 (Semester II) PROGRAMMING IN C – U2R1ITCC3

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 6**

OBJECTIVES

1. To teach the basic concepts of C.
2. Educating the students how to construct control statements and loops in C.
3. To teach them the usage of arrays and structures.
4. Making the students to build their own applications in c.

UNIT – 1: INTRODUTION (14 Hours)

Introduction to C- Tokens: identifiers, Keywords, Constants, Variables – Data types: Build –in Data type , User –defined Data type – Operators – Type of operators – Expressions.

UNIT – 2 : CONTROL STRUCTURES (14 Hours)

Managing Input and Output operations – Decision Making and Branching: Simple if, if-else, nested if-else, if – else ladder- switch-Go To- break-continue-Decision Making and Looping: while – do-while – for.

UNIT – 3: ARRAYS AND POINTERS (14 Hours)

Arrays : single dimensional array- Two dimensional array - multi dimensional array – String handling functions – User defined functions : Function with no arguments and no return values - Function with arguments and no return values- Function with arguments and one return value- Function with no arguments but return a value. **(14 Hours)**

UNIT – 4: STRUCTURES AND POINTERS Structures : Arrays of structures – Union – Pointers : Pointer to variable –pointer and array – Pointer and character string – Pointer and Structure.

UNIT -5: FILE MANAGEMENT IN C (12 Hours)

File management in c: Defining and opening a file- closing a file –Input /Output file operations –Random Access to files.

UNIT 6: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

1. Balagurusamy. E- Programming in ANSI C ,third edition, TATA MCGraw-Hill,2012 (Unit1-ch1,2,3,Unit 2-ch4,5,6,Unit3-ch 7,8,9,Unit4-ch 10,11,Unit5-ch12)

REFERENCE BOOK:

1. The Complete Reference C, 4th Edition, Herbert Schildt, 2018.

Course Outcomes:

- The Students would have understood the High Level Language and Compilation.
- They should have gathered the strong ideas using Pointers.
- They should have improved the Knowledge using Files.

Note: ICT classes include and Self study

Core Course – 4 (Semester – II)

PROGRAMMING IN C PRACTICAL – U2R1ITCC4P

1. Write and execute a C program to solve the quadratic equation.
2. Write and execute a C program for Sin series.
3. Write and execute a C program for sum of n numbers.
4. Write and execute a C program to sort the given numbers in ascending and descending order.
5. Write and execute a C program to arrange the given set of names in alphabetical order.
6. To print the following output :

   1

   1 2

   1 2 3

   1 2 3 4

   1 2 3 4 5

7. Write and execute a C program for Matrix Addition.
8. Write and execute a C program for

   i) Factorial.

   ii) Fibonacci numbers using recursive factions.

9. Write and execute a C program for String manipulations.
10. Write and execute a C program for creation and processing of sequential file for mark list preparation.

ALLIED COURSE-2 (SEMESTER-II)

COMPUTER HARDWARE AND TROUBLESHOOTING – U2R1ITAC2

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 4**

Objectives:

1. **To teach the students the basic concepts of Computer Hardware.**
2. **To impart inbound knowledge about Advanced Memory Techniques.**
3. **Learning basics optical Storage device**
4. **Learning basics Troubleshooting Techniques**

UNIT 1: Introduction to Computer Hardware (14 Hours)

Fundamentals of PC Technology: Building Blocks of PC – Principles of CPU Instructions- Multiprocessor: CPU Operation – Troubleshooting of CPU.

UNIT 2: Memory Techniques (14 Hours)

Memory: Memory works – Memory chips and modules – Module sizes and banks of memory- DRAM Timing and memory types – Advanced Memory techniques – Troubleshooting.

UNIT 3: Magnetic Storage Devices (14 Hours)

Magnetic Storage Devices: Magnetic Storage - Hard disk storage device – Floppy Disk storage device – Cartridge devices – Troubleshooting of Magnetic Storage devices.

UNIT 4: Optical Storage Devices (14 Hours)

Optical Storage Device: Optical storage media – CD ROM Devices – DVD Drives – Recordable Drives – Troubleshooting of Optical Storage Devices.

UNIT 5: I/O Devices (12 Hours)

Keyboards and Pointing Devices: Keyboards – Pointing Devices – Video sub Systems: Video Adapters – Monitors.

UNIT 6: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

PC Hardware – The Complete Reference by Craig Zacker and John Rourke, Tata McGrawHill, 2001 Edition.
Unit 1: Chapters 1 and 2, Unit 2: Chapter 3. Unit 3: Chapter 7. Unit 4: Chapter 8.
Unit 5: Chapter 10 and 11.

REFERENCE BOOK:

Computer Hardware Repair Guide and Hidden Design of Computer Hardware and Software , ISBN 171812449x, Independently published in 2018.

COURSE OUTCOME

- **The Students would have improved the Hardware Knowledge**
- **They should have gathered the Troubleshooting Knowledge**
- **They would have understood the Memory concept**

Note: ICT classes include and Self study

ALLIED COURSE:3

SEM: II
Credit:3 **NUMERICAL METHODS AND STATISTICS** **Int.Marks:25**
Hours/Week:5 **CODE: U2R1ITNMAC3** **Ext.Marks:75**
Total Hours:60 **Max.Marks:100**

Objectives:

- *To understand the concept of transcendental and polynomial equations*
- *To Know how to use numerical methods to solve Simultaneous Linear Equations*
- *To understand how to find Numerical interpolation with equal and unequal intervals*
- *To know the techniques of Numerical Differentiation and Numerical Integration*
- *To understand Mean, Median, Mode, Standard Deviation, Correlation and Regression*

UNIT I: Solution of Algebraic and Transcendental Equation: (12 Hours)

Bisection Method, Method of False Position, Iteration Method, Newton Raphson Method - Problems only.

UNIT II: Solution of Simultaneous Linear Equations: (12 Hours)

Gauss Elimination Method, Gauss Jacobi Method, Gauss Jordan Method, Gauss Seidel Method- (no proof needed).

UNIT III: Numerical Interpolation: (12 Hours)

Lagrange's Interpolation Formula – Divided differences – Newton's Formula **-** Newton's Forward and Backward Interpolation Formulae(Problems only).

UNIT IV: Numerical Differentiation and Integration (10 Hours)

Newton's Forward and Backward Differentiation Formula – Trapezoidal, Simpson's1/3rd and 3/8th Rule.

UNIT V: Statistics: (10 Hours)

Mean, Median, Mode, Standard Deviation, Correlation and Regression – Simple Numerical Problems Only.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text books:

[1] "**Introductory methods of numerical analysis**". S.S. Sastry, Prentical Hall India, 1994.
[2] "**Statistical methods",** S.P.Gupta ,S.Chand & Company, New Delhi.
[3] "**Numerical Methods**", N. Subramaniam, Scm Publishers, Erode.
Unit I: Chapter II sec 2.1to 2.5 [1] Unit II: Chapter I, Sec 1.2 fully [3]
Unit III: Chapter II sec2 {Page No. 87 – 92, 99 - 110 and 128 – 145} [3]
Unit IV: Chapter V 5.2, 5.4.1, 5.4.2, 5.4.3[1] Unit V: Chapter II, Sec 2.5, 2.6, 2.7 [2]

Reference Books:

1. P.Kandasamy "Numerical Methods" S.Chand& Co., New Delhi, .1998
2.R.S.N. Pillai and Bagavathi S, "**Statistics**" Chand & Co Ltd., New Delhi, 1999.

Outcomes:

- *Acquire the knowledge of transcendental and polynomial equations.*
- *Choose the suitable computational method among exisiting methods.*
- *Understand the nature and operations of Numerical analysis with theories & concepts.*
- *Know about numerical methods to solve Numerical differentiation and Integration.*

CORE COURSE-5 (SEMESTER-III)

FUNDAMENTALS OF DATA STRUCTURES – U3R1ITCC5

Hours/Week: 07 **Max. Marks : 100**
Total Hours: 84 **Credits : 7**

Objectives:

1. To create a clear idea about logical structures of data.
2. To teach the students how to do manipulation with the different data structures.
3. To make them learn applications of data structures.

UNIT 1 : **Introduction** **(20 Hours)**

Data structures: introduction to data structures-Ordered lists-Representation of Arrays-Stacks and Queues: Stacks – Queues –Circular Queues-Evaluation of expressions- Multiple Stacks and Queues.

UNIT 2 : Linked list **(20 Hours)**

Single Linked List-Linked Stacks and Queues-Polynomial Addition –Doubly Linked Lists.

UNIT 3: **Trees** **(20 Hours)**

Basic Terminology- Binary tree Representation- Binary tree Traversal- Threaded Binary tree – Binary tree Representation of Trees.

UNIT 4: **Graphs** **(12 Hours)**

Terminology and Representation – Traversal – Connected Components and Spanning trees – Shortest paths and – Activity Network, Topological Sort.

UNIT 5: Applying Data Structure for Problem Solving **(12 Hours)**

Insertion sort-quick sort- heap sort- Decision Trees – Game trees.

UNIT 6: Latest Learning (For CIA only)

Latest development related to the course during the semester concerned.

TextBook:

"Fundamentals of Data Structure s" , Ellis Horowitz , Sartaj Sahani

[**Unit-1** - (chapter 2,3), **Unit-2** - (Chapter- 4) **Unit-3** - (Chapter-5) **Unit-4-** (Chapter- 6) **Unit-5-** (Chapter-6,7)].

Reference Book:

"Data Structures and Algorithms made easy", Narasimha Karumanchi, Career Monk Publications, 2018.

Course Outcome:

- The Students would have gathered the practical knowledge about Stack and Queue.
- They would have understood the practical knowledge in Dijkstra's Algorithm.
- They would have understood the shortest path problems.

Note: ICT classes include and Self study

CORE COURSE-6 (SEMESTER-III)

OBJECT ORIENTED PROGRAMMING WITH C++ - U3R1ITCC6

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 6**

Objectives:

1. **To teach the basic concepts of OOP.**
2. **Educating the students the tokens of C++**
3. **To instruct the students to construct control statements, loops, functions in C++**
4. **To teach how to use the OOP details like class, constructor, overloading, overriding etc.**

UNIT-I : Introduction to OOP (14 Hours)

Principles of Object- Oriented Programming – Beginning with C++ - Tokens-variables, Identifiers, Constants, Strings - Expressions and Control Structures – Functions in C++

UNIT II : Class and Object: (14 Hours)

Classes and Objects – Constructors and Destructors – Type of Constructor-New Operator – Operator Overloading and Type Conversions

UNIT III: Inheritance (14 Hours)

Inheritance: Types of Inheritance- Extending Classes – Abstract Classes– Pointers.

UNIT IV: Polymorphism (14 Hours)

Virtual Functions and Polymorphism -Managing Console I/O Operations

UNIT V: Files (12 Hours)

Working with Files- Manipulating Strings.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Book

1. Balagurusamy. E - "Object Oriented Programming with C++", Tata McGraw Hill Publications, 2006 Third edition.,[Unit-1 (Chapters - 1, 2, 3, 4) ; Unit-2 (Chapters – 5, 6,7 ,16) Unit-3 (Chapters – 8.9)Unit-4 (Chapters – 10, 11, 12, 13); Unit-5 (Chapters – 14, 15, 16, 17)]

Reference Books

The Modern C++ Challenge – Marius Bancila, Packt Publications, 2018.

Course Outcomes:

- The Students would have created the depth knowledge in Virtual function
- They would have created the practical knowledge in Inheritance
- They would have gathered the depth knowledge in Polymorphism

Note: ICT classes include and Self study

Core Course – 7 (Semester – III)

DATA STRUCTURES USING C++ PRACTICAL – U3R1ITCC7P

1. Write and execute a C++ program to implement Banking operations such as Deposit and Withdraw using Class and Objects.
2. Write and execute a C++ program to sort the given numbers in ascending and descending order.
3. Write and execute a C++ program to read two matrices and print result matrix.
4. Write and execute a C++ program to find the sum of individual digits of given number using constructor and destructor.
5. Write and execute a C++ program to count the number of vowels in the given string.
6. Write and execute a C++ program to prepare inventory report using Inheritance concept.
7. Write and execute a C++ program to implement Stack operations.
8. Write and execute a C++ program to implement Queue Operations.
9. Write and execute a C++ program for Binary search operation.
10. Write and execute a C++ program to sort the given numbers using Bubble Sort.

ALLIED COURSE: 4

SEM:II&III
Credit:3 **OPERATIONS RESEARCH** **Int.Marks:25**
Hours/Week:5 **CODE: U3R1ITORAC4** **Ext.Marks:75**
Total Hours:70 **Max.Marks:100**

Objectives:

- *To understand Operation Research, Linear programming formation and role of Computer in OR*
- *To improve the skills of solving very common problems which we come across in various fields like transportation.*
- *To introduce concepts of Assignment Problems*

UNIT I: Introduction to OR (14 Hours)

Introduction - basics of OR - OR & decision making - Role of computers in OR - Linear programming formulations & graphical solution of two variables - canonical & standard forms of LPP -Introduction - concepts of slack & surplus variables - simplex method for $\leq$ constraints.

UNIT II: Transportation Problem (14 Hours)

Introduction - Transportation algorithm - concepts of feasibility basicness, methods used to find the solution to a TP - Unbalanced transportation problem.

UNIT III: Assignment Problem (14 Hours)

Introduction - - assignment algorithm - General model of the assignment problem - unbalanced assignment problem - solution to the assignment problem – maximization – Travelling Salesman.

UNIT IV: Sequencing Problems (14 Hours)

Problems of sequencing - Processing of n jobs through two machines - processing of n jobs through 3 machines.

UNIT V: Networks (12 Hours)

Introduction to Network - Fulkerson's rule - measures of activity - CPM - Finding the critical path - calculating TF, FF, IF, PERT computation.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Books:

[1] "**Problems in Operations Research",** Manmohan & P. .K Gupta, Sultan Chand Publishers, New Delhi, 1999.**Unit I**: Chapter 1 - 4 **Unit II**: Chapter 15 **Unit III**: Chapter 16 – Pg. No. 399 – 432. **Unit IV**: Chapter 17 **Unit V**: Chapter 27

Reference Books:[1] Prem Kumar Gupta and D.S. Hira, "An **Introduction of Operations Research**", S.Chand and co., Ltd. New Delhi, 1995.

[2] Humdy A. Taha, "**Operations Research** " (7^{th}Edn.), Mcmillan Publishing Company, New Delhi, 1982.

Outcomes:

The Learners would have the ability to,

- *Identify and develop OR models from the verbal description of the real system.*
- *Develop the solving technique and analyse the concepts of feasibility*

Core Course 8 (Semester – IV) JAVA PROGRAMMING – U4R1ITCC8

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 6**

Objectives:

1. **To teach the basic concepts of OOP.**
2. **Educating the students to tokens of JAVA**
3. **To instruct the students to construct control statements, loops, methods in JAVA**
4. **To teach how to use the OOP details like class, constructor, overloading, overriding**

UNIT-1: INTRODUCTION TO OOPS AND JAVA (14 Hours)

Introduction – Object Oriented Paradigm-Basic concepts of Object Oriented Programming – Benefits of OOP- Applications' of OOP – Java History – Java Features – Java Program structure- Java Tokens.

UNIT-2: JAVA BASICS (14 Hours)

Constants – Variables – Data Types – Declaration of variables – Giving Values to variables – Scope of Values- Symbolic constants – Type casting- Operators – Decision making and branching Statements – Looping Statements.

UNIT-3: CLASSES, OBJECTS AND INHERITANCE (14 Hours)

Defining a class – Method declaration – Creating objects – Constructors – Inheritance – Method Overloading – Static members – Method Overriding – Final variables and methods – Abstract Method and class-Visibility control. Arrays: one-Dimensional array, Two-Dimensional Array.

UNIT-4: INTERFACES AND PACKAGES (14 Hours)

Introduction-Defining and Extending Interfaces-Implementing Interfaces – Accessing Interfaces-Packages: Introduction-Java API packages- System Packages-Creating and accessing Packages-Using a package – Adding a class to a Package – Hiding a class – Static Import. Exception Handling: Introduction-Types of Errors – Exceptions.

UNIT-5: MULTITHREADING AND APPLETS (12 Hours)

Introduction – creating Threads –Stopping and Blocking a Thread- Life cycle. Applet: Introduction-Life cycle-Applet tag –Running the applet- Passing parameters to Applet-Displaying Numerical Values- Getting inputs from the users- The Graphic class- Drawing Arcs, Rectangles and polygons.

UNIT 6: Latest Learning (For CIA only) (4Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

"PROGRAMMING WITH JAVA", Fourth Edition, E.Balagurusamy, McGraw Hill Education.
[Unit 1: Chapters 1, 2 and 3, Unit 2: Chapters 5, 6 and 7, Unit 3: Chapters 8 and 9.
Unit 4: Chapters 10 and 11, Unit 5: Chapter 12, 13 and 14]

REFERENCE BOOK :

1. "Programming with JAVA",C.Muthu, Thoimson Publications 5th Edition.
2. Mastering JAVA11 – Dr. Edward Lavieri, Packt Publication, 2018.

Course Outcomes:

- The Students would have created the practical knowledge in JAVA.
- They would have created the depth knowledge in Applet.
- They would have gathered the practical knowledge in Threads.

- **Note: ICT classes include and Self study**

Core Course 9 (Semester – IV)

JAVA PROGRAMMING PRACTICAL- U4R1ITCC9P

1. Write and execute a JAVA Program to sort the given numbers using Arrays.

2. Write and execute a JAVA Program to implement the FIND and REPLACE operations in the given multiple text.

3. Write and execute a JAVA program to implement a calculator to perform basic arithmetic operations.

4. Write and execute a JAVA Program to find the students percentage and grade using command line arguments.

5. Write and execute a JAVA to Implement multiple inheritance concept in java using interface, you can choose your own example of a company or education institution or a general concept which require the use of interface to solve a particular.

6. Write and execute a JAVA Program to create threads and assign priorities to them.

7. Write and execute a JAVA program to create a window with the check boxes called red, green and blue the applet should change the color according to the selection.

8. Write and execute a JAVA Applet to use Combobox.

9. Write and execute a JAVA Applet to use Menu.

10. Write and execute a JAVA Applet to use TextField and Button.

Allied Course -5 (Semester IV)

DIGITAL COMPUTER FUNDAMENTALS – U4R1ITAC5

Hours/Week: 05 **Max. Marks : 100**

Total Hours: 70 **Credits : 4**

Objectives:

- **To teach the students about the basic number systems.**
- **To educate them logic gates and Boolean algebra.**
- **To make the students understand the Combinational circuits and sequential circuits**
- **To teach them the role of flip-flops**

UNIT-1: NUMBER SYSTEM (14 Hours)

The binary number system : Binary-to decimal, decimal to binary conversion-Binary Addition-Binary Subtraction : 1's ,2's,9's and 10's complements-Binary Multiplication-Octal number system- Hexadecimal number systems.

UNIT-2: LOGIC GATES AND BOOLEAN ALGEBRA (14 Hours)

Boolean Algebra and logic gates- AND, OR,NOT,NAND,NOR,EX-OR and EX-NOR-Boolean algebra : Definitions-Fundamentals of Boolean Algebra –Boolean Functions – Maxterms and Minterms-Laws and theorems of Boolean Algebra-De'Morgans theorem-UBB-NAND gate as UBB-NOR gate as UBB.

UNIT-3: K-MAP (12 Hours)

Fundamental products- Sum of products –product of sum – Karnaugh Map: Two, Three, Four and Five variable method-Don't care conditions: Overlapping groups – Rolling the map-Eliminating Redundant groups.

UNIT-4: COMBINATIONAL LOGIC CIRCUITS (14 Hours)

Introduction – Adders –Subtraction - Multiplexer - De-multiplexer- Decoders-Encoders.

UNIT-5: SEQUENTIAL LOGIC CIRCUITS (12 Hours)

Flip flops-RS Flip flop- Master slave Flip flop-Counters: Asynchronous (or) Ripple Counter – Ring counter- State diagrams and state tables-Shift Registers.

UNIT 6: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

"Principles of Digital Electronics", K.Meena PHI Learning Pvt.Ltd.New Delhi,2009.

[Unit 1: Chapter 1, Unit 2: Chapters 2 and 3, Unit 3: Chapter 3. Unit 4: Chapter 4, Unit 5: Chapter 12, 13 and 14]

REFERENCE BOOK:

1.Computer system Architecture- M.Morris Mano,Third Edition, PHI Learning PVT.,Ltd., 2007.
2. Computer Architecture and Logic Design, Thomas .C .Bartee.
3.Electronics Fundamentals and Applications – D. Chattopadhyay, PC. Rakshit, New Age International Publications, 2018.

Course Outcomes:

- The Students would have improved the knowledge in Number System
- They would have gathered the depth knowledge in K-Map
- They would have created the knowledge in Sequential and Combination circuits.

Allied Course 6 (Semester – IV) LINUX AND SHELL PROGRAMMING – U4R1ITAC6

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 4**

Objectives:

- Explain the concept of UNIX Utilities.
- Give the detailed Programming concept in Shell.
- Explain the role of Vi Editor.
- Analyze the features and operations of various Shell Programming Essentials commands and Filters.

UNIT I: UNIX ARCHITECTURE (14 Hours)

UNIX Architecture- Features of UNIX- General Purpose Utilities: Cal, date, echo, printf, bc, script- Mail Basics – Mailx, passwd, who, uname, tty, and stty.

UNIT II: The File System (14 Hours)

The File – What's in a File Name? –pwd, cd, mkdir, rmdir – ls Listing Directory – UNIX File System – The Vi editor.

UNIT III: Handling Ordinary File System (14 Hours)

Handling Ordinary Files: cat, cp, rm, mv, more, wc, od, cmp, comm., diff - Basic File Attributes: ls –l, -d option - File Permissions – chmod – Directory Permissions.

UNIT IV: The Shell (14 Hours)

The Shell's Interpretive Cycle – Shell Offering – Pattern Matching – Escaping and Quoting – Redirecting – Pipes – tee – Shell variable – Process basics – ps – system process – nice – Killing Processes with Signals – at and batch – cron – time.

UNIT V: Control Statement and Operator (12 Hours)

Essential shell programming: read, using command line argument – exit – if – test – case – expr – logical operators – while – for – trap.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text book:

1. UNIX Concepts and Applications Sumitabha Das, 4th edition, Mc Graw Hill Education.
   [Unit-1 :(Chapters 2,3); Unit-2 : (Chapters 4,7); Unit-3 (Chapters 5,6); Unit-4 (Chapters 8,9);Unit-5 (Chapters12,13,14]

Reference Book:

1. The LINUX Programming Interface: A LINUX and UNIX System Programming Handbook, ISBN-13:1593272203, 2018.

Course Outcome:

- Understand the security level of UNIX O.S.
- Gathered the depth knowledge of Shell Program
- Created the knowledge in UNIX Utilities

- **Note: ICT classes include and Self study**

Core Course -10 (Semester V)
OPERATING SYSTEMS – U5R1ITCC10

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 6**

Objectives:

1. **To teach the students about the history of Operating System.**
2. **To give them knowledge about Information Management and Process Management.**
3. **To make them understand deadlocks.**
4. **To create an in-depth knowledge about file system organization.**

UNIT – 1: OVERVIEW (15 Hours)

Importance Of Operating Systems – Basic Concepts and Terminology – An Operating System Resource Manager – An Operating System Process Viewpoint (where these resource Managers Are Activated) – Other Views of an Operating System – I/O Programming – interupt Structure and Processing.

UNIT – 2: MEMORY MANAGEMENT (14 Hours)

Single Contigupus Allocation – introduction to Multiprogramming – Paritioned Allocation – Relocatable Partitioned Memory Management – Paged Meomory Management – Demand-paged Memory Management – Segmented Memory Management – Segmented and Demand-paged Memory Management.

UNIT – 3: PROCESSOR MANAGEMENT (14 Hours)

State Model – Job Scheduling – Functions – Policies – Job Scheduling in Nonmultiprogrammed Environment – Process Scheduling – Function – Policies – Process State Diagrams for Scheduling – Evaluation of Round –Robin Multiprogramming – Performance – Multiprocessor Systems – Process Sychronization.

UNIT – 4: DEVICE MANAGEMENT (13 Hours)

Techniques for Device Management – Deivce Characteristics – Hardware Considerations – Channels and control Units – Device Allocation Considerations – I/O Traffic Controller, I/O Scheduler, I/O Device Handlers – Virtual Devices – Design Of A SPOOLing System.

UNIT – 5:F ILE MANAGEMENT (12 Hours)

Introduction – A Simple File System – General Model of a File System – Symbolic File System – Basic file System – Access Control Verification – Logical file System – Physical File System – Allocation Stategy Module – Device Strategy Module, I/O Initiator, Device Handler.

UNIT 6: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

"OPERATING SYSTEM" StuartE.Madnick John J.Donovan - by McGraw- Hill,Inc.
UNIT – 1 (CHAPTERS 1, 2) UNIT – 2 (CHAPTER 3) UNIT – 3 (CHAPTER 4)
UNIT – 4 (CHAPTER 5) UNIT – 5 (CHAPTER 6)

REFERENCE BOOK:

"Operating Systems" Remzi H. Arpaci-Dusseau, Andrea C. Arpaci – Dusseau, CreateSpace Independent Publishing Platform, 2018.

Course Outcomes:

- The Students would have created the Knowledge in Memory Management
- They should have gathered the depth knowledge in Device Management
- They would have created the Knowledge in Processor Management

Note: ICT classes include and Self study

Core Course 11 (Semester V) DBMS – U5R1ITCC11

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 6**

Objectives:

- Explain the main advantages of modern DBMS over file systems.
- Design, create, and query relational databases to satisfy user requirements.
- Design, build and deploy database-backed applications with dynamic website fron
- Implement data access control mechanisms for database and application security.
- Analyze the ethical issues and responsibilities related to records management and its impact on privacy, discrimination, etc. and its local and global impact on society.

UNIT 1: BASIC CONCEPTS (15 Hours)

Database system-Data independence – An architecture for a database system- Relational approach-Hierarchical approach - Network approach.

UNIT 2: RELATIONAL DATA STRUCTURE (14 Hours)

Relations – Domain and attributes – Keys - Extensions and Intensions, the architecture of system R: Background – Architecture- Query by Example: Retrieval operations - Retrieval operationsom Tree Structures Relations- Built- in Functions- Update Functions- The QBE Dictionary .

UNIT 3: RELATIONAL ALGEBRA AND RELATIONAL CALCULUS (14 Hours)

Relational algebra: Introduction – Traditional Set operations – Attribute Names for Derived Relations – Special Relational operations - – Relational Calculus: Introduction – Tuple-Oriented Relational calculus – Domain- Oriented Relational calculus – System R Data Structure: Introduction – Base Tables – Indexes - Discussions.

UNIT 4: DATA MANIPULATION (13 Hours)

System R Data Manipulation : Introduction – Retrieval Operations – Built- in Functions – Update Operations – The System R Dictionary – Discussion - Embedded SQL: Introduction – Operations Not involving Cursors - Operations involving Cursors – Dynamic Statements - Discussion.

UNIT 5: NORMALIZATION (12 Hours)

Normal Form – Functional Dependence – Fully Functional Dependence- First, second, Third Normal form, BCNF, Fourth and Fifth Normal Form.

UNIT 6: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOKS:

"An Introduction to Database Systems Vol 1 " C.J. DATE ,Narosa Publishing House, Third Edition.I(Chapter 1) Unit II (Chapter 2) Unit III (Chapter 3,4) Unit IV (Chapter 5,6) Unit V (Chapter 7)

Reference Book:

Fundamentals of Database System, 7th Edition, – Elmasri, Navathe, Pearson Publication, 2018

Course Outcomes

- The Students would have understood the SQL Queries
- Improved the PL/SQL Programming knowledge
- Understand the Normalizations form.

Note: ICT classes include and Self study

Core Course – 12 (Semester –V)
DBMS Practical – U5R1ITCC12P

1. Perform select, insert, delete and update operations using Data manipulation language.
2. Perform aggregate functions such as min, max, count, avg and sum using SQL
3. Perform set and join operations.
4. Execute DCL and TCL commands using SQL.
5. Execute Sub-queries and Nested sub-queries by using SQL.
6. Create a view table from the existing table using SQL.
7. Write a program to cursor, Triggers using PL/SQL.
8. Write a Program to function and procedure using PL/SQL.
9. Write and Execute the PL/SQL program to display the blood donor details.
10. Write and execute a PL/SQL program to display the employee salary statement.
11. Write and execute to create mark statement.

Core Course – 13 (Semester –VI) PHP PROGRAMMING – U6R1ITCC13

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 6**

Objective:

- **To teach the basics of PHP programming**
- **To make a crisp understanding about Arrays and Functions in PHP**
- **To give a detailed instruction about cookies and sessions**

UNIT I: Introduction (15 Hours)

Variables: Creating variables – creating constants – Data Types – Operators – if statement – else if statement – if else ladder statement – for loop – while loop – do while loop

UNIT II: Arrays and String Functions (14 Hours)

The php array Functions – Extracting data from arrays – Sorting arrays - string functions – Formatting text strings – Creating Functions in php – using default arguments – Passing functions some data

UNIT III: OOPS (14 Hours)

Class – Object – Constructors – Destructors – Inheritance – Interface.

UNIT IV: Reading data in web pages. (13 Hours)

Handling Text Fields – Handling Checkboxes – Handling Radio button – Handling List box – Reset Button – Submit button - Handling password controls – File Upload control.

UNIT V: Session and Cookies (12 Hours)

Setting a cookie – Reading a cookie – Setting cookies' expiration – Deleting cookies – Storing data in session – Hit counter using sessions.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

1. PHP COMPLETE REFERENCE by Steven Holzner ,Publication 2012, McGraw Hill Edcation private limited. [UNIT 1 – Chapter 1and 2 ; UNIT 2 – Chapter 3 and 4; UNIT III – Chapter 3; UNIT IV - Chapter 5; UNIT V – Chapter 11]

REFERENCE BOOK

PHP&MySQL: Server –side Web Development 1st Edition – Jon Duckett, Wiley Publications, 2019

Course Outcomes:

- The Students would have understood the PHP Programming.
- They would have created the knowledge of PHP Array and String functions.
- They would have developed the knowledge of Files and MYSQL.

- **Note: ICT classes include and Self study**

Core Course – 14 (Semester –VI)

PHP PROGRAMMING PRACTICAL – U6R1ITCC14P

1. Write and Execute a PHP Program to create a student mark sheet.
2. Write and Execute a PHP Program to create a EMP payroll
3. Write and Execute a PHP Program to change the background color
4. Write and Execute a PHP Program to format the text color, bold, underline, italic and change font style.
5. Write and Execute a PHP Program to perform String processing using functions.
6. Write and Execute a PHP Program to perform Array Processing using functions.
7. Write and Execute a PHP Program to create the Cookies.
8. Write and Execute a PHP Program to create Session.
9. Write and Execute a PHP Program to display student details from MYSQL.
10. Write and Execute a PHP Program to display employee particulars from MYSQL.

Major Based Elective Course I

DOT NET TECHNOLOGY

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 5**

Objectives:

1. **To impart knowledge in understanding .NET Framework.**
2. **Understanding the structure of ASP.NET Project.**
3. **Understanding main features of Integrated Development Environment (IDE).**
4. **Understanding controls in ASP.NET.**
5. **Create applications using Microsoft windows forms.**
6. **Create applications that use ADO.NET.**

UNIT-1: ASP DOT NET FRAMEWORK (15 Hours)

Over view of Dot Net Frame work –New features of ASP Dot Net- the VWD IDE –Introducing ASP Dot Net Pages.

UNIT-2: WEB FORM CONTROLS (15 Hours)

Label-Textbox- Button- Password control –Image control-Drop Down list-Checkbox-Radio Button- List box.

UNIT-3: VALIDATION CONTROLS (14 Hours)

Validation Control: Required field validator- Comparison validator –Range validator-Regular Expression validate - Custome validator-validation summary-calendar- AdRotator.

UNIT-4: ADVANCED ASP DOT NET CONCEPTS (12 Hours)

Tree view control- Menu control-sitemap path-Login control- Login view –Login status.

UNIT-5: WORKING WITH DATABASES (12 Hours)

Working with ADO Dot Net-Overview of ADO Dot net concepts : Connections, Data Adapter,Data sets- Accessing data with server explorer – Using with Grid view-Data binding with Grid view control`

UNIT 6: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

"ASP DOT NET 2.0" Block Book, DreamTec Press, 2006 Edition.[Unit 1: Chapter 1 ,2, Unit 2: Chapters 4 ,5, Unit 3: Chapter 7. Unit 4: Chapter 8, Unit 5: Chapter 11]

REFERENCE BOOK:

The Complete Reference ASP.NET, Mathew McDonold,McGraw Hill Education, 2018.

COURSE OUTCOMES

- The Students would have understood the ASP.NET website creation.
- They would have understood the ASP.NET control.
- They would have created the depth knowledge in ADO.NET.

Note: ICT classes include and Self study

Major Based Elective Course II

COMPUTER NETWORKS

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 5**

Objectives:

1. **To make a proper understanding about the fundamentals of Computer networks.**
2. **To teach the concepts of different media.**
3. **To give an inbound knowledge about the individual layers in detail.**

UNIT-I: Introduction (15 Hours)

Uses of Computer Networks- Network Hardware - Network Software-Reference Model: OSI Model-TCP/IP Model.

UNIT-II: Physical Layer (15 Hours)

Guided Transmission Media-Wireless Transmission-Communication Satellites-The public Switched telephone Network.

UNIT-III: The Data Link Layer (14 Hours)

Data Link Layer Design Issues-Error Detection and Correction-Simplex Stop and Wait Protocol-Sliding Window Protocols-HDLC-High Level Data Link Control.

UNIT-IV: The Network Layer (12 Hours)

Network Layer Design Issues-Routing Algorithms-Congestion Control Algorithms. Quality of Services: Requirements-Techniques of Achieving Good Quality of Service-Internetworking.

UNIT-V: The Transport Layer (13 Hours)

Services Provided To The Upper Layers-Transport Service Primitives-Berkeley Sockets. The Application Layer: Domain Name System-Electronic Mail-The World Wide Web.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

Andrew S. Tanenbaum, "Computer Networks", 5th Edition, Prentice hall India, 2013

[**Unit-I: Chapter1** (1.1, 1.2, 1.3, 1.4, 1.5), **Unit-II:** Chapter 2(2.2, 2.3, 2.4, 2.5), **Unit- III:** chapter 3(3.1, 3.2, 3.3.2, 3.4, 3.6.1), **Unit- IV:** Chapter 5(5.1, 5.2, 5.3, 5.4.1, 5.4.2, 5.5), **Unit-5** Chapter 6(6.1.1, 6.1.2, 6.1.3),Chapter7(7.1, 7.2, 7.3)].

REFERENCE BOOK:

1. Behruz A.Ferouzan,"Data Communication and Networking",4th Edition, Tata McGraw Hill Publication. **2010**

2. Computer Networking: a Top-Down Approach, 7th Edition, Jim Kurose and Keith W.Rose, 2018

COURSE OUTCOMES:

- The Students would have created the depth knowledge in Computer Networks.
- They would have gathered the knowledge in Routing and Congestion Algorithm.
- They would have understood the knowledge of Email and WWW.

- **Note: ICT classes include and Self study**

Major Based Elective Course III

SOFTWARE ENGINEERING

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 5**

Objectives:

1. **To teach the students the basic concepts of** software engineering
2. **To impart inbound knowledge about** software life cycle
3. **To give them proper guidelines to implementation ,verification and validation**

UNIT-I Software and Software Engineering (15 Hours)

Nature of S/W – Software Engineering – S/W Process – Generic process model- Process assessment and improvement – Perspective process model .

UNIT-II Process Model (15 Hours)

Specialized process model – unified process – personal and team process model. Requirements: Engineering – ground work – Eliciting requirements – developing use case.

UNIT-III Design Concept (13 Hours)

Design process – Design concept – Design model. Architectural Design**:** Software Architecture – Architectural style.

UNIT-IV Component level Design (13 Hours)

What is Component – Designing class based component – Conducting component level design – component level design for web app – designing traditional component.

UNIT-V Software Quality Assurance (12 Hours)

Elements of SQA – SQA Tasks, Goals and Metrics – Formal Approaches to SQA – S/W Reliability - ISO 9000 Quality standards – SQA plan.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Book

Software Engineering a Practitioners Approach, Roger S. Pressman, McGraw Hill Education Edition 7th, 2010. Chapters :Unit I-1, 2,Unit II-2,5,Unit III-8,9,Unit IV-10,Unit V-16

Reference Book

1. Software Engineering Concepts – Richard e. Fairley Tata Mcgraw-Hill, 2003
2.Handbook of Software Engineering, Cha, Sungdeok, Taylor, Richard N.Kang, Kyo. C, Springer Publications, 2019.

Outcomes:

- The Students would have understood the Software Development Concepts.
- They should have created the depth knowledge in Validation.
- They should have created the knowledge in Software testing.

- **Note: ICT classes include and Self study**

Major Based Elective Course IV

CLOUD COMPUTING

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 5**

Objectives:

- **To impart fundamental concepts in the area of cloud computing.**
- **To impart knowledge in applications of cloud computing.**
- **Understanding the systems, protocols and mechanisms to support cloud computing.**
- **Understanding the hardware necessary for cloud computing.**

UNIT-1: (15 Hours)
Cloud computing basics: Overview- Applications –Intranets and the cloud- your organization and cloud computing: Benefits – Limitations.

UNIT-2: (15 Hours)
Cloud computing with the titans: Google –Net app.- Microsoft – Amazon – sales force. com.

UNIT-3: (12 Hours)
The business case for going to the cloud: cloud computing services-How those applications help your business- deleting your data center – Thomson Reuters.

UNIT-4: (13 Hours)
Hardware and Infrastructure: Clients – Security- Network – Services-Accessing the cloud – Platforms – Web applications – Web APIS.

UNIT-5: (13 Hours)
Cloud storage: Overview – cloud storage Providers- Standards- :Application- Client.

UNIT 6: Latest Learning (For CIA only) (4 Hours)
Latest development related to the course during the semester concerned.

TEXT BOOK :
Anthony T.Velte,Toby J.Velte, Robert ElsenPeter-"Cloud computing a practical approach", Tata McGraw Hill Edition.[Unit 1: Chapters 1and 2, Unit 2: Chapter 3, Unit 3: Chapter 4.
Unit 4: Chapters 5 and 6, Unit 5: Chapter 7 and 8]

REFERENCE BOOK:

Rajkumar, James Brob erg, Andrzej Goscinski, "Cloud Computing Principle and Paradigms", 2018

Course Outcomes:

- The Students would have understood the Cloud Logic.
- They should have created the depth knowledge in Business cases in Cloud.
- They should have created the Web Applications through Cloud.

- **Note: ICT classes include and Self study**

Major Based Elective Course V

PYTHON PROGRAMMING

Hours/Week: 06 **Max. Marks : 100**
Total Hours: 72 **Credits : 5**

Objectives:

1. **To teach the basic concepts of Python**
2. **Educating the students the tokens of Python**
3. **To instruct the students to construct control statements, loops, methods in Python**
4. **To teach functions in Python**

Unit I : Operators (15 Hours)

Data, Expressions, statements; Introduction-basics of python programming using the REPL(Shell)-Running ython scripts- Identifiers, Keywords, indentation, variables-Input and output-Standard data types – operators.

Unit II Control Statements (15 Hours)

Functions-Function arguments-the anonymous functions- modules-related problems. Control flow : If statement-if …else statement-the elif statement-loops-while loop-the infinite loop-for loop-nested loops-loop control statement-break statement-continue statements – pass statement.

Unit-III Functions (13 Hours)

Fruitfull functions – scope of variables – composing two functions – Recursion – Strings – String slices – Mutable and immutability – String methods – python string functions – python string methods – the string module – Arrays – List as arrays.

Unit – IV Built-in function (12 Hours)

Python Lists – Basic list operations – Build – in list functions and methods –Tuples – Sets – Dictionaries – Build-in Dictionaries functions and methods.

Unit – V (13 Hours)

Reading and Writing to text files in Python – command line arguments – Error and Expression-Handling an Exception – Modules- Python packages.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

K.Nageswara rao, ShaikAkbar, Immadi Murali Krishna," PROBLEM SOLVING AND PYTHON PROGRAMMING", Scitech Publications(India) Pvt.Ltd.,2018.[Unit 1: Chapters 2, Unit 2: Chapters 2 and 3, Unit 3: Chapters 3. Unit 4: Chapters 4, Unit 5: Chapter 5]

REFERENCE BOOK:

Head First Python, 2nd Edition – Paul Barry, 2018

COURSE OUTCOMES:

- The Students would have understood the Python language fundamentals.
- They would have created depth programming knowledge in Python.
- They should have created the Project knowledge in Python.

Note: ICT classes include and Self study

Skill Based Elective Course I

WEB TECHNOLOGY

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

Objective:

1. **To teach the basic concepts of internet**
2. **To make a crisp understanding about Email and Search engines**
3. **To give a detailed instruction about HTML**

UNIT I: BASIC INTERNET CONCEPTS (5 Hours)

What is Internet – History – Host Machines and Host Names-Client / Server Model – Domain Names – Protocols- IPAddress.

UNIT II: ADVANCED INTERNET CONCEPTS (5 Hours)

Anatomy of an Email Message –Viewing - Sending – Replying - Search Engines – Meta Search Engine.

UNIT III: HTML INTRODUCTION (4 Hours)

History of HTML – HTML Document – Anchor Tags– Hyper Links-Sample HTML Documents

UNIT IV: HEAD AND BODY SECTIONS (4 Hours)

Header Section – Title – Prologue – Links –Comment – Heading – Horizontal Rule – Paragraph – Images and Pictures- Ordered and Unordered List.

UNIT V: TABLES (4 Hours)

Table Creation – ColSpan, RowSpan – Cell Spacing, Cell Padding– Nested Tables. FRAMES**:** Frameset Definition – Frame Definition – Nested Frames. FORMS**:** Action Attribute – Method Attribute – Drop Down List –Sample Forms.

UNIT VI: Latest Learning (For CIA only) (2 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK(S)

1. Wendy G. Lehnert, "Internet 101 - A Beginners Guide to Internet and the World Wide Web", Addison Wesley. UNITS I & II
2. C. Xavier,"World Wide Web design with HTML", Tata McGraw Hill Publishing Limited, New Delhi.UNITS III, IV & V

REFERENCE BOOK

Web Technologies, Black Book – Dreamtech Press, 2018

COURSE OUTCOMES:

- The Students would have understood the details of Internet.
- They should have developed knowledge in HTML Web program.
- They would have created the Web User Interaction.

- **Note: ICT classes include and Self study**

Skill Based Elective Course II

HUMAN RESOURCE MANAGEMENT

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

OBJECTIVE:

To provide through knowledge about principles and practice of Human Resource Management.

UNIT 1: INTRODUCTION TO HUMAN RESOURCE MANAGEMENT (5 Hours)

Nature, Significance, Scope and status, Steps in HR planning, Job analysis and job description, Recruitment and selection process and policies, Interviewing, induction and placement, Career planning and succession planning.

UNIT 2: HR PLANNING AND PROCUREMENT (5 Hours)

Performance appraisal – Nature – Objectives – methods- limitations- promotion, Demotion, Transfer and Separation –Job evaluation- techniques.

UNIT 3: TRAINING AND DEVELOPMENT (4 Hours)

Training – Need – objectives – benefits – Types of training- Evaluation of training and development.

UNIT 4: COMPENSATION MANAGEMENT (4 Hours)

Wages and salary administration – Meaning, objectives, Factors influencing wages and salary administration – Wage plans and policies – Wage differentials – Incentive and Fringe benefits- Motivation.

UNIT 5: HUMAN RELATIONS (4 Hours)

Grievance- Handling procedures – Discipline- Procedure for Disciplinary action – Counseling – welfare measures – significance – statutory provisions concerning employee welfare- case study practices.

UNIT 6: Latest Learning (For CIA only) (2 Hours)

Latest development related to the course during the semester concerned.

Text Books:

Human Resource Management – S.S. KHANKA
Human Resource Management - Gary Dessaer

Reference Book:

Human Resource Management – by David A. DeCenzo, Stephen P.Robbins, Susan L.Verhulst, Wiley Publications, 2018.

Course Outcomes:

- The Students would have created the knowledge of Resource Management.
- They should have improved the knowledge in Compensation Management.
- They should have improved the talent in Human relations.

Note: ICT classes include and Self study

Skill Based Elective Course III

MICROPROCESSOR AND ALP

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

Objectives:

- **To teach the 8085 Microprocessor**
- **To provide concept of Assembly Language Program**
- **To aware the knowledge of 8085 Instruction set and Addressing mode**

UNIT-1 : MICROPROCESSOR ARCHITECTURE (5 Hours)

Introduction –Intel 8085-ALU-Timing and control unit-Registers-Data and Address Bus –Pin Configuration.

UNIT -2 : INSTRUCTION SET OF INTEL 8085 (5 Hours)

Introduction – Instruction and Data formats – Addressing Modes : Direct Addressing-Register addressing – Register indirect addressing – Immediate Addressing- Implicit Addressing-Status flag.

UNIT – 3 : PROGRAMMING OF MICROPROCESSOR (2 Hours)

Introduction – Assembly Language- High-Level Language : Advantages of High- Level Languages –Disadvantages of High –Level Languages –Area of Applications of Various Languages : Machine Language –Assembly Language – High Level Language.

UNIT – 4 : EXAMPLES OF ASSEMBLY LANGUAGE PROGRAMS (2 Hours)

Addition of two 8-bit numbers – 8-bit subtraction-Find 1's complement of an 8-bit number-Find 1's complement of a 8-bit numbers- Find 2's complement of an 8-bit numbers- Find 2's complement of a 16-bit numbers –To find out the Largest number of two numbers.

UNIT – 5 : PERIPHERAL DEVICES AND THEIR INTERFACING (4 Hours)

Introduction – Memory and I/O interfacing: Memory interfacing – I/O interfacing – Data Transfer schemes : Synchronous data transfer – Asynchronous data transfer – interact driven data transfer.

UNIT 6: Latest Learning (For CIA only) (2 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK

Fundamentals of Microprocessor and Microcomputer, B.RAM, Dhanpatrai publication, Reprint 2006 edition.

REFERENCE BOOK

8085 Microprocessor and It's Applications, A. Nagoor Kani, McGraw Hill Education, 2018

COURSE OUTCOMES:

- The Students would have created the knowledge of ALP.
- They should have improved the knowledge in Intel 8085 Microprocessor.
- They should have gathered depth knowledge in Peripheral devices in Intel 8085.

Note: ICT classes include and Self study

Skill Based Elective Course IV

WEB DESIGN

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

Objectives:

- To Teach the Details of Scripting Languages
- To give details of String functions in JScripts
- To provide the ideas of Control Statements in JScripts

UNIT-1: JAVA SCRIPT BASICS (5 Hours)
Introduction- Identifiers –Literals – Keywords- Data Types- Variables – Operators.

UNIT-2: CONTROL AND LOOPING STATEMENTS (5 Hours)
If, if-else statements- Switch statement- While loop-Do-while loop – for loop-Arrays : single and multi Dimensional Arrays.

UNIT-3: STRINGS AND FUNCTIONS (4 Hours)
String specific properties and methods – Java script functions : Defining functions-Invoking functions – Functions scope.

UNIT-4: OBJECT ORIENTED JAVA SCRIPT (4 Hours)
Object properties and methods- Object constructors –Native objects : Boolean , Date, Documents, Event, Math, Number, Object, script and window object.

UNIT-5: VALIDATING FORMS (4 Hours)
Defining dynamic forms – Adding form Elements – changing selection -list-Reset events-Submit events-select events- form validation prior to submission-Enabling and disabling form fields.

UNIT 6: Latest Learning (For CIA only) (2 Hours)
Latest development related to the course during the semester concerned.

TEXT BOOK :
"JAVA script professional projects", Paul Hatcher with John Gosney, Thomson course technology,ISE.[Unit 1: Chapter 1, Unit 2: Chapters 2 Unit 3: Chapter 3,4 Unit 4: Chapter 5, Unit 5: Chapter 8.]

REFERENCE BOOK :
Web Technologies, Black Book – Dreamtech Press, 2018

COURSE OUTCOMES:

- The Students would have improved the knowledge in JAVA Script.
- They should have improved the programming knowledge in Java Script.
- They should have gathered the depth ideas in Object Oriented Java Script.

Note: ICT classes include and Self study

Skill Based Elective Course V

VISUAL Programming

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

Objectives:

- To Teach the Details of VB
- To give details of CONTROLS in VB
- To provide the ideas of Control Statements in VB

UNIT I: **(5 Hours)**

INTRODUCTION TO VISUAL BASIC: Integrated Development Environment (IDE) Features – Anatomy of a Form - Working with Form - Properties.

UNIT II: **(5 Hours)**

CONTROL STATEMENT: If … End if, if else end if, – For…..Next, While loop, Select case…..End select, Exit statement.

UNIT III: **(4 Hours)**

Procedure – Function – Subroutine – Variable - Declaration – Constant.

UNIT IV **(4 Hours)**

SELECTING AND USING CONTROLS – Introduction to Standard Controls – Command Buttons – Text Boxes – Labels – Image box – Picture box - Timer.

UNIT V **(4 Hours)**

Check Boxes– Option control - List boxes – Combo boxes – Scroll bars.

UNIT VI: Latest Learning (For CIA only) **(2 Hours)**

Latest development related to the course during the semester concerned.

TEXT BOOK

1. Mohammed Azam, "Programming with Visual Basic 6.0", Vikas Publishing House pvt Ltd,2002

REFERENCE BOOK

Visual Basic, 7th Edition, Tony Gaddis, Kip Irvine, Pearson Publication,2018.

Course Outcome:

- The Students would have understood VB Controls
- They should have created the programming knowledge in VB
- They should have improved knowledge in Form

Note: ICT classes include and Self study

Inter Disciplinary Course I

BASICS OF INFORMATION TECHNOLOGY

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

Objectives:

1. **To educate the beginners the fundamentals of computer hardware and software.**
2. **To make them understand how to create MS-Office applications**
3. **To teach them the basic concepts of internet and programming concepts.**

UNIT I: Internet and World Wide Web (5 Hours)

Internet and World Wide Web- Home page, Website, Browser, Provider and Web Multimedia. Recent Trends in IT - Business, Industry, Education, Training and Entertainment.

UNIT II: Introduction to Computer (5 Hours)

Anatomy of Computer, Types of computers-Super computers, Mainframes, personal computers and mini computers. Central Processing Unit-Memory-ROM, RAM, Virtual Memory and Cache Memory.

UNIT III: Input and Output Devices (4 Hours)

Input and Output Devices-Keyboard, Scanner, Mouse, Monitor and Printer – Storage Devices: Secondary Storage Media-Magnetic, optical and solid state devices

UNIT IV: Communications: (4 Hours)

Communications-The Electronic web: Network Applications-Fax, voice mail and Email –Types of Network - Local Area Network and Wide Area Network -Topologies of Network.

UNIT V: Programming and System Development: (4 Hours)

Programming and System Development: Programming Languages-First Generation, Second Generation and Third Generation- Programming Techniques-Flowchart, Branching and Looping.

UNIT VI: Latest Learning (For CIA only) (2 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK

1.Dennis P.Curtin, Kim Foley, Kunal Sen, Cathleen Morin, "Information Technology the Breaking Wave", Tata McGraw Hill Publication, 2005. [**Unit-I:** Chapter 1,2,3 , **Unit-II:** Chapter 4,5,6, **Unit-III:** Chapter 7,8, **Unit-IV:** Chapter 9,10,11, **Unit-V:** chapter 12,13]

Reference Book

Gilbert Brands – Introduction to Computer Science, Create Sapce Independent Publications, 2018.

Course Outcomes:

- The Students would have understood the Parts of the Computer.
- They should have understood the System Languages and Operating System.
- They should have created knowledge in Networks.

Note: ICT classes include and Self study

Inter Disciplinary Course II

MANAGEMENT INFORMATION SYSTEMS

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**

Objectives:

- To teach the concept of MIS
- To give the depth knowledge in Enterprise Systems
- To teach the Data Resource Management

UNIT 1: INFORMATION SYSTEMS IN BUSINESS (5 Hours)

The Real world of Information systems –Defining Information systems – The fundamental roles of IS in Business – Trends in Information systems – The role of E-Business in Business – Types of Information systems- Operations support systems – Management support systems –Managerial Challenges of Information Technology.

UNIT 2: THE COMPONENTS OF INFORMATION SYSTEMS (5 Hours)

System Concepts – Defining the system – Feedback and Control - Other system characteristics – Components of Information systems – Information system resources – people resources - Hardware resources – Software resources – Data resources – Network resources – Information system activities – Recognizing information systems.

UNIT 3: ENTERPRISE SYSTEMS (4 Hours)

Introduction – Enterprise Application architecture – Enterprise Application Integration – Transaction processing system – IT in Business – Marketing systems –Manufacturing systems – Human Resource systems –Accounting systems – Financial management systems.

UNIT 4: DATA RESOURCE MANAGEMENT (4 Hours)

Database Management – Fundamental Data concepts – Record – File – Database – Database structures - Database Development – Types of databases.

UNIT 5: E- COMMERCE SYSTEM (4 Hours)

Introduction – The scope of E-Commerce – Essential E-commerce process - Electronic payment processes – E-commerce Trends – Web store requirements - Business -to Business E-commerce – E-commerce marketplaces.

UNIT 6: Latest Learning (For CIA only) (2 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

Management Information Systems by James A o' Brien, George M maracas and Ramesh Behl. McGraw Hill Education, 10th Edition, 2016.

REFERENCE BOOKS:

1. Management Information Systems S. Sadagopan, PHI learning PVT Ltd., 2018.
2. Management of Information Systems By Waman S. Jawadekar Tata Mcgraw Hill,2018.

COURSE OUTCOMES:

- The Students would have created depth knowledge in MIS.
- They should have provided the knowledge about E-Commerce.
- They should have created the knowledge in Enterprise System.

Note: ICT classes include and Self study

Inter Disciplinary Course III

INTERNET AND WEB DESIGN

Hours/Week: 02 **Max. Marks : 100**
Total Hours: 24 **Credits : 2**
Objective:

1. **To teach the basic concepts of internet**
2. **To make a crisp understanding about Email and Search engines**
3. **To give a detailed instruction about HTML**

UNIT I: BASIC INTERNET CONCEPTS (5 Hours)

What is Internet – History – Host Machines and Host Names-Client / Server Model – Domain Names – Protocols- IPAddress.

UNIT II: ADVANCED INTERNET CONCEPTS (5 Hours)

Anatomy of an Email Message –Viewing - Sending – Replying - Search Engines – Meta Search Engine.

UNIT III: HTML INTRODUCTION (4 Hours)

History of HTML – HTML Document – Anchor Tags– Hyper Links-Sample HTML Documents

UNIT IV: HEAD AND BODY SECTIONS (4 Hours)

Header Section – Title – Prologue – Links –Comment – Heading – Horizontal Rule – Paragraph – Images and Pictures- Ordered and Unordered List.

UNIT V: TABLES (4 Hours)

Table Creation – ColSpan, RowSpan – Cell Spacing, Cell Padding– Nested Tables. FRAMES**:** Frameset Definition – Frame Definition – Nested Frames. FORMS**:** Action Attribute – Method Attribute – Drop Down List –Sample Forms.

UNIT VI: Latest Learning (For CIA only) (2 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK(S)

1. Wendy G. Lehnert, "Internet 101 - A Beginners Guide to Internet and the World Wide Web", Addison Wesley.UNIT: I & II
2. C. Xavier,"World Wide Web design with HTML", Tata McGraw Hill Publishing Limited, New Delhi.UNIT: III, IV & V

Reference Book

Learning Web Design, Jennifer Niederst Robbins - 2018.

COURSE OUTCOMES:

- The Students would have understood the details of Internet.
- They should have developed knowledge in HTML Web program.
- They should have created the Web User Interaction.

Note: ICT classes include and Self study