ST. XAVIER'S COLLEGE**(AUTONOMOUS)**

Palayamkottai - 627 002

(Recognized as "College with Potential for Excellence" by UGC)

(Re-accredited with **"A"** Grade with a CGPA of 3.50)

SYLLABUS

Preserve this copy of the syllabus until you complete the course, as it is an important document of your presentcourse of study.

BACHALOR OF COMPUTER APPLICATIONS

Choice Based Credit System (CBCS)

(w.e.f. 2019 - 2020)

Course Pattern

Sem	Part	Status	Course.Code	Title of the Paper	Hrs	Cdts
I	I	Lang	18UGT11	General Tamil – I	6	3
	I	Lang	18UGH11	Hindi - I		
	I	Lang	18UGF11	French - I		
	II	Lang	18UGE11	General English - I	6	3
	III	Core-T1	18UCA11	Programming in C	4	4
	III	Core-P1	18UCA12	**Practical:** Programming in C	4	2
	III	Allied-T1	18UCAA11	Discrete Mathematics	4	4
	IV	NME1	18UNM11	MS-Word and Powerpoint	2	2
	IV	SBE1	18USB11	Life Skills	2	2
	IV	VE	18UVE11	Religion I / Ethics	2	2
					30	**22**
II	I	Lang	18UGT21	General Tamil – II	6	3
	I	Lang	18UGH21	Hindi - II		
	I	Lang	18UGF21	French - II		
	II	Lang	18UGE21	General English - II	6	3
	III	Core-T2	18UCA21	Object Oriented Programming with C++	4	4
	III	Core-P2	18UCA21	**Practical:** Programming with C++	4	2
	III	Allied-T2	18UCAA21	Computer Organization and Architecture	4	4
	IV	NME2	18UNM21	MS-Excel and Access	2	2
	IV	SBE2	18USB21	Religion II / Skills for Employability	2	2
	IV	SBE3	18USB22	Web Designing using HTML	2	2
					30	**22**
III	III	Core-T3	18UCA31	Programming in Java	4	3
	III	Core-T4	18UCA32	Visual Basic	4	3
	III	Core-P3	18UCA33	**Practical:** Programming in Java	4	2
	III	Core-P4	18UCA34	**Practical:** Visual Basic	4	2
	III	Allied-T3	18UCAA31	Numerical and Statistical Methods	4	4
	III	Allied-P1	18UCAA32	**Practical:**Numerical and Statistical Methods	4	2
	IV	SBE4	18USB31	Human Rights and Social Analysis	2	2
	IV	SBE5	18USB32	Macromedia Flash	2	2
	IV	ES	18UES31	Environmental Studies	2	2
					30	**22**
IV	III	Core-T5	18UCA41	Relational Database Concepts	4	3
	III	Core-T6	18UCA42	Data Structures and Algorithms	4	3
	III	Core-T7	18UCA43	Software Engineering	4	3
	III	Core-P5	18UCA44	**Practical:** Oracle	4	2
	III	Core-P6	18UCA45	**Practical:** Data Structures using C++	2	1
	III	Elective1	18UCAE41	Essentials of Financial Accounting / Data Mining / Software Testing	4	3

	III	Allied-T4	18UCAA41	Operations Research	4	4
	III	Allied-P2	18UCAA42	**Practical:**Operations Research	2	1
	IV	SBE6	18USB41	Web Designing Using XML	2	2
					30	**22**
V	III	Core-T8	18UCA51	.Net Programming using C#	4	4
	III	Core-T9	18UCA52	Operating Systems and UNIX	4	4
	III	Core-T10	18UCA53	J2EE	4	4
	III	Core-T11	18UCA54	Python Programming	4	4
	III	Core-P7	18UCA55	**Practical: .**Net Programming using C#	4	2
	III	Core-P8	18UCA56	**Practical:** UNIX	2	1
	III	Core-P9	18UCA57	**Practical:**J2EE	2	1
	III	Core-P10	18UCA58	**Practical:**Python Programming	2	1
	III	Elective2	18UCAE51	Fundamentals of Management / Management Information System / E-Commerce	4	4
					30	**25**
VI	III	Core-T12	18UCA61	Android Programming	5	5
	III	Core-T13	18UCA62	PHP Programming	5	5
	III	Core-T14	18UCA63	Computer Networks	5	5
	III	Core-P11	18UCA64	**Practical:** Android Programming	4	2
	III	Core-P12	18UCA65	**Practical:** PHP Programming	4	2
	III	Project	18UCAR61	Project Work & Viva Voce.	7	7
					30	**26**
				STAND		**1**
				TOTAL	**180**	**141**

Extra Credit Courses

Sem	Course Code	Title of the Course	Credits
I	18UEC11	Fundamentals of Computers	3
II	18UEC21	M-Commerce	3
III	18UEC31	Computer Graphics	3
IV	18UEC41	Wireless Technology	3
V	18UEC51	Internet of Things	3
VI	18UEC61	Social Networks	3

PROGRAMMING IN C

(Course Code: 18UCA11)

SEMESTER: I	CORE: T1	HOURS: 4	CREDITS: 4

COURSE OUTCOMES:

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

1. Students will be able to gainthe knowledge of structured programming.
2. To make them to work on control structures, functions.
3. Enabling them to process with various data structures like structures, unions and files.
4. Making the students well versed in pointers concept.
5. To throw lights on the concepts of files.

UNIT I INTRODUCTION TO C

Structure of C program – Keywords – Identifiers – Constants – Variables – Data types – Type Conversion – Types of Operators and Expressions – Input and Output Functions in C. Decision Statement – if – else Statement – break – continue – goto – switch() Case and Nested if statement.

UNIT II ARRAYS

Loop Control Statements – for Loop – while Loop – do..while Loop and Nested Loops. Arrays – Definition – Initialization – Characteristics – One,Two and Multidimensional Arrays – scanf() and printf() Functions – Working with Strings & Standard Functions.

UNIT IIIFUNCTIONS

Functions – Declaration – Prototype – Types of Functions – Call by Value and Reference, Function with Operators – Function with Decision Statements – Function with Loop Statements – Function with Arrays and Pointers – Types of Storage Classes.

UNIT IVPOINTERS

Pointers – Introduction – Features – Declaration – Arithmetic operations – Pointers and Arrays – Array of Pointers – Pointers to Pointers – Pointers and Strings – void Pointers.

UNIT V STRUCTURE, UNION AND FILES

Structure and Union – Declaration – Initialization – Structure within Structure – Array of Structure – Enumerated Data Types – Union of Structure – Files – Streams and File Types – File Operations – File I/O – Read – Write and Other File Functions.

TEXT BOOKS

1. E. Balaguruswamy, "Programming in ANSI C", TataMcGrawHill Publications, 4th Edition, 2012.
2. Ashok Kamthane, "Programming with ANSI & Turbo C", Pearson, 2011.

REFERENCE BOOKS

1. Gottfried, Schaums Outline Series, "Programming with C", TMH Publications.
2. Mahapatra, "Thinking in C", PHI Publications.

PRACTICAL: PROGRAMMING IN C

(Course Code: 18UCA12)

SEMESTER: I	CORE: P1	HOURS: 4	CREDITS: 2

1. Write a program to find the largest number and smaller number by using if statement.
2. Write a program to convert the decimal to binary conversion by using while statement.
3. Write a program to count the positive, negative & zero numbers.
4. Write a program to check whether a given number is a prime or not.
5. Write a program to display the Fibonacci Series.
6. Write a program to concatenate two strings without using String Library Function.
7. Write a program to count the number of Vowels, Consonants, and Digits in a Line of Text.
8. Write a program to reverse a String.
9. Write a program to design the Calculator Functions as (i) Addition (ii) Subtraction & (iii) Multiplication.
10. Write a program to find the Factorial of a number using Recursion.
11. Write a program for Ascending Order of given N Numbers.
12. Write a program to separate odd and even numbers using File.

DISCRETE MATHEMATICS

(Course Code: 18UCAA11)

SEMESTER: I	ALLIED: T1	HOURS: 4	CREDITS: 4

COURSE OUTCOMES:

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

1. Write an argument using logical notation and determine if the argument is valid or not valid.
2. Understand the basic principles of sets and operations in sets.
3. Prove basic set equalities.
4. Apply counting principles to determine probabilities.

UNIT lSET THEORY AND RELATION

SET THEORY: Introduction - Sets and Elements - Universal Set and Empty Set - Subsets - Venn Diagrams - Set Operations - Algebra of Sets and Duality - Finite Sets, Counting Principle - Class of Sets, Power Sets and Partitions. **RELATIONS**: Introduction - Product Sets - Relations - Pictorial Representations Of Relations - Composition of Relations - Types of Relations - Closure Properties - Equivalence Relations - Partial Ordering Relations - n-aryRelations.

UNIT II FUNCTION AND ALGORITHMS

Introduction - Functions - One - to - One - Onto and Inevitable Functions - Mathematical Functions, Exponential and Logarithmic Functions - Sequences, Indexed Classes of sets - Recursively Defined Functions - Cardinality - Algorithms and Functions - Complexity of Algorithms.

UNIT IIILOGIC AND PROPOSITIONAL CALCULUS

Introduction - Propositions and Compound Propositions - Basic Logical Operations - Propositions and Truth Tables - Tautologies and Contradictions - Logical Equivalences - Algebra of Propositions - Conditional and Biconditional Statements - Arguments - Logical Implication - Prepositional Functions, Quantifiers - Negation of Quantified Statements.

UNIT IVCOUNTING

Introduction, Basic Counting Principles - Factorial Notation - Binomial Coefficients - Permutations - Combinations - The Pigeonhole Principle - The Inclusion - Exclusion Principle - Ordered and Unordered Partitions.

UNIT VGRAPH THEORY

Introduction, Data Structures - Graphs and Multigraphs - Subgraphs, Isomarphicand Homeomorphic Graphs - Paths, Connectivity - The Bridges of Konigsberg, traversable Multigraphs - Labeled and Weighted Graphs - Complete, Regular and Bipartite Graphs - Tree Graphs - Planar Graphs - Graphs Colorings.

TEXT BOOKS

1. Seymour Lipschutz, Marc Lipson, "Discrete Mathematics", Second Edition, Tata McGraw Hill.

Chapters : 1,2,3,4,5,8.1-8.10

REFERENCE BOOKS

1. B.S. Vatsa, "Discrete Mathematics", WishwaPrakashan, Third Edition.

2. K.D. Joshi, "Foundation of Discrete Mathematics", Wiley Eastern Ltd.

MS-WORD AND POWER POINT

(Course Code: 18UNM11)

SEMESTER: I	NME: 1	HOURS:2	CREDITS: 2

COURSE OUTCOMES:

1. Ability to complete basic functions and explain the new formatting features in Word 2010.
2. Manage Header and Footer content and update page numbers and dates.
3. Able to create table and working with graphics and effects.
4. Learn how to create, manage, and collaborate on presentations.
5. How to enrich presentations with video, pictures, and animations.

UNIT IGETTING STARTED WITH WORD

Introducing the New Features in Word 2010 – Creating a New Blank Document – Saving in Different Formats – Beginning a New Word Project – Formatting Text in the Documents – Inserting the Symbols and Changing Date Styles – Adding Bullets and Numbered Lists – Searching and Replacing in the Document.

UNIT II PAGE NUMBERS, HEADER AND FOOTER

Adjusting the Structure of Document – Changing the Margins – Changing the Page Orientation – Inserting Page Numbers – Inserting Header and Footer – Adding Foot notes and End notes – Creating Columns in a Longer Document.

UNIT III WORKING IN TABLE

Creating Table – Adding and Deleting Rows/Columns – Merging Cells – Modifying Borders – Working with Graphics and Effects – Inserting a Picture – Adding a Clip Art Image – Cropping an Image – Applying Picture Style and Effects – Inserting a Smart Art Diagram – Using Screenshots or Screen Clippings.

UNIT IVGETTING STARTED WITH MS POWERPOINT

Getting started with PowerPoint 2010 – Adding and Editing Text – Adding Slides with Bullets – Moving Slides – Applying Theme from the Design Tab – Using Slide Masters.

UNIT VWORKING WITH TABLE, CHART, ANIMATION

Creating Table – Adding Chart – Inserting a Picture – Adding Slide Transitions – Adding Animations to Content – Using the Animation Painter Tool – Inserting and Trimming Video – Using Online Video.

TEXT BOOK

1. Tom Bunzel, “Easy Microsoft Office 2010”, Que Publishing, First Edition, 2010.

REFERENCE BOOKS

1. Gary B. Shelly, Misty E. Vermaat,“Microsoft office 2010: Introductory”,Cengage Learning, First Edition 2012.

2. Katherine Murray, "Microsoft Office 2010 Plain& Simple”, Microsoft Press,First Edition, 2010.

OBJECT ORIENTED PROGRAMMING WITH C++

(Course Code: 18UCA11)

SEMESTER: II	CORE: T2	HOURS: 4	CREDITS: 4

COURSE OUTCOMES:

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

1. Know basic concepts of Object Oriented Programming.
2. Interpret the Benefits of Object Oriented Programming.
3. Make use of constructors and destructors.
4. Interpret the Concepts of operator overloading.
5. Describe about Inheritance, Files and Templates.

UNIT I OOPS CONCEPT

Principles of Object Oriented Programming –Software Crisis – Software Evolution – Procedure Oriented Programming – Object Oriented Programming Paradigm – Basic Concepts and Benefits of OOP – Object Oriented Languages – Applications of OOP – Beginning with C++ – Structure of C++ – Applications of C++ – Tokens – Keywords – Basic Data types – Declaration of variables – Operators in C++ – Manipulators – Control Structures.

UNIT II FUNCTIONS, CLASSES AND OBJECTS

Function in C++ : Function Prototyping – Call by Value and Reference – Inline Functions – Default and const Arguments – Function Overloading – Classes and Objects – Member Functions – Nesting of Member Functions – Private Member Functions – Memory Allocation of Object – Array with in a Class – Static Data Members – Static Member Functions – Array of Objects – Objects as Function Arguments – Friend functions – Pointers to Members.

UNIT III CONSTRUCTORS, OPERATOR OVERLOADING

Constructors – Parameterized Constructors – Multiple Constructor – Constructor with Default Parameters – Copy and Dynamic Constructors – Destructors – Operator Overloading – Overloading Unary and Binary Operators – Operator Overloading using Friend Function – Rules for overloading operators.

UNIT IV INHERITANCE, VIRTUAL FUNCTIONS

Inheritance – Defining Derived Classes – Single Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes – Constructors in Derived Classes – Nesting of Classes – this Pointer – Virtual Functions – Pure Virtual Functions – C++ Stream Classes – Unformatted and Formatted I/O Operations.

UNIT V FILES AND TEMPLATES

Classes for File Stream Operations – Opening and Closing a File – File modes – Sequential Input and Output Operations – Random Access – Error Handling during File Operations – Command Line Arguments – Templates – Class Templates – Function Templates.

TEXT BOOK

E. Balagurusamy, “Object Oriented Programming with C++”, Seventh Edition, Tata McGraw Hill, 2018.

REFERENCE BOOKS

1. D. Ravichandran, “Programming with C++”, Third Edition, McGraw Hill Education, 2017.
2. Herbert Schildt, “The Complete Reference – C++”, Fourth Edition, McGraw Hill Education, 2017.

PRACTICAL: PROGRAMMING WITH C++

(Course Code: 18UCA22)

SEMESTER: II	CORE: P2	HOURS: 4	CREDITS: 2

1. Program using Control Structures.
2. Program using One Dimensional Array.
3. Program using Two Dimensional Arrays.
4. Program using Default Arguments.
5. Program using Function Overloading.
6. Program using Class and Objects.
7. Program using Static Data Member and Static Member Function.
8. Program using Array of Objects.
9. Program using Object as Function Arguments.
10. Program using Constructor and Destructor.
11. Program using Operator Overloading.
12. Program using Friend Function.
13. Program using Inheritance.
14. Program using Files.
15. Program using Templates.

COMPUTER ORGANIZATION AND ARCHITECTURE

(Course Code: 18UCAA21)

SEMESTER: II	ALLIED: T2	HOURS: 4	CREDITS: 4

COURSE OUTCOMES:

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

1. Identify the basic concepts of digital principles.
2. Describe the logic design and Arithmetic – Logic Unit.
3. Interpret the various memory elements.
4. Examine the input – output devices and control unit.
5. Describe the addressing techniques and RISC and CISC architecture.

UNIT I NUMBER SYSTEM, BOOLEAN ALGEBRA AND GATE NETWORKS

Computer Operation: Basic Components ofDigital Computer – Programming Overview – Assembly Languages – High level Languages. **Number Systems**: Binary Addition and Subtraction – Binary Multiplication and Division – Converting Decimal Numbers to Binary – Negative Numbers – Use of Complements to represent Negative Numbers – BCD Number Representation – Octal and Hexadecimal Number System **Boolean Algebra and Gate Networks**: Fundamental concepts of Boolean Algebra – AND and OR Gates – Complementation and Inverters – Evaluation of Logical Expressions – Basic Laws of Boolean Algebra.

UNIT II LOGIC DESIGN AND ARITHMETIC – LOGIC UNIT

De Morgan's Theorem – Derivation of a Boolean Expression – Interconnecting Gates – Sum of Products and Product of Sums – Derivation of a Three – Input – Variable Expression – NAND and NOR Gates. **Logic Design**: Flip flops – Clocks – Flip flop Designs – Shift Register – Binary Counter – BCD Counters – Integrated Circuits – Medium, Large and Very Large – Scale Integration. **The Arithmetic – Logic Unit**: Construction of the ALU – Integer Representation – Binary Half Adder – Full Adder – A Parallel Binary Adder – Multiplexers.

UNIT III RAM, ROM, VIRTUAL AND CACHE MEMORY

The Memory Element: Random Access Memories – Static and Dynamic RAMs – ROMs – Magnetic Disk Memories – Flexible Disk Storage System – The Floppy Disk –

Magnetic Tape – Optical Storage Devices – Computer Word Structures – Storage hierarchies – Virtual Memory – Cache memory.

UNIT IV INPUT – OUTPUT DEVICES AND CONTROL UNIT

Input Output devices: Terminals, Personal Computers and Workstations – Input Media – Character Recognition – Output Equipment – Error– Detecting and Error– Correcting codes – Buses for Personal Computers and Work stations. **Control Unit**: Construction of an Instruction Word – Instruction and Execution cycle Organization of Control Registers – Branch, Skip or Jump Instructions – Shift Instructions – Register Transfer Language.

UNIT V ADDRESSING TECHNIQUES, RISC AND CISC ARCHITECTURE

Computer Architecture: Instruction Word formats– Number of Addresses – Representation ofInstructions and Data – Addressing techniques – Direct Addressing – Immediate Addressing – Relative Addressing – Indirect Addressing – Indexed Addressing – BRANCH and JUMP Instructions – Flags, Condition Codes and Status Registers – Subroutine calls – Interrupts – Pipelined computers – RISC and CISC architecture – Security and protection.

TEXT BOOK

1. Thomas C Bartee, "Computer Architecture & Logic Design", Tata McGraw Hill, 2010.

   Chapters:UNIT I: **1.4 – 1.5** (Pg: 6-12), **1.7 – 1.8** (Pg: 16-19), **2.4 – 2.10** (Pg: 24-38), **3.1 – 3.5** (Pg: 55-65)
   UNIT II:**3.6 –3.11** (Pg: 65-78), **4.1 – 4.8** (Pg: 132-162), **5.1– 5.5**(Pg: 190-197), **5.13** (Pg: 227-229)
   UNIT III:**6.1** (Pg: 245-247), **6.6 – 6.11** (Pg: 263-286), **6.14 – 6.18** (Pg: 288-309)
   UNIT IV:**7.1 – 7.6** (Pg: 322-344), **9.1 – 9.2** (Pg: 417-424), **9.5 – 9.7** (Pg: 433-441)
   UNIT V: **10.1 – 10.15** (Pg: 452-483)

REFERENCE BOOKS

1. William Stallings, "Computer Organization and Architecture: Designing for Performance", Tenth Edition, Pearson Education, 2016.
2. M. Morris Manor, "Computer System Architecture", Revised Third Edition, Pearson Education, 2017.
3. SmutRanjan Sarangi, "Computer Organization and Architecture", First Edition, McGraw Hill Education, 2017.

MS-EXCEL AND ACCESS

(CourseCode: 18UNM21)

SEMESTER: II	NME: 2	HOURS: 2	CREDITS: 2

COURSE OUTCOMES:

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

1. Learn the basic concepts of MS Excel and Access
2. Learn to Format a worksheet in Excel
3. Learn to create a chart in Excel
4. Learn to build database tables in Access
5. Learn to create Report in Access

UNIT I GETTING STARTED WITH EXCEL 2010

The Excel Interface – Working and Worksheets – Cell and Range Selection – Entering data – Editing Data – Reorganizing a Worksheet – Filling Cells – Importing Data – Finding/Replacing Data – Sorting Data – Naming cells and Ranges – Password Protecting Workbooks.

UNIT II FORMATTING WORKSHEETS AND DATA

Setting Column Width and Row Height – About Data and Cell Formatting – Character and Paragraph Formatting – Fitting Text within a Cell – Number Formatting – Conditional Formatting – Adding Cell Backgrounds and Borders – Removing, Replacing and Reusing Formats – Worksheet Formatting.

UNIT III FORMULAS AND FUNCTIONS, CREATING CHARTS

Formulas and Functions: About Cell Reference – Formula Essential – Creating Formulas – Editing Formulas. **Creating Charts:** Chart Elements – Creating charts – Changing the Background – Adding and Formatting Text – Rows or Columns – Changing Layout Style – Displaying the Data Set – Working with Gridlines – Working with the Legend – Adding Trend Lines – Modifying the Axes – Creating Spark lines – Changing the Chart Data.

UNIT IV INTRODUCING ACCESS, BUILDING DATABASE TABLES

Introducing Access: What is a Database – Tables, Queries, Forms, and Other Objects – Creating a Database File – Finding Your Way around the Navigation Pane **Building Your Database Tables:** Creating a Database Table – Opening and Viewing Tables – Entering and Altering Table Fields – Field Properties for Making Sure that Data Entries are Accurate – Indexing for Faster Sorts, Searches, and Queries **Entering the Data:** The Two Ways to Enter Data – Finding and Replacing Data.

UNIT V SORTING DATA, PRESENTING DATA IN A REPORT

Sorting, Querying, and Filtering for Data: Sorting Records – Filtering to Find Information – Querying: The Basics – Six Kinds of Queries. **Presenting Data in a Report**: Creating a Report Opening and Viewing Reports.

TEXT BOOKS

1. Steve Schwartz, “Microsoft office 2010”, Dorling Kindersley (India) Pvt. Ltd, Pearson Education, 2012.
2. Peter Weverka, "office 2010 ALL – IN – ONE FOR DUMMIES", Wiley Publishing, Inc., Indianapolis, Indiana, 2010.

REFERENCE BOOKS

1. Prof. Satish Jain, M. Geetha, Kratika, "MS – OFFICE 2010 Training Guide", 2017.
2. Joyce Cox, Joan Lambert, Curtis Frye, "Microsoft office Professional 2010 Step by Step", Microsoft Publisher, 2011.

WEB DESIGNING USING HTML

(Course Code: 18USB22)

SEMESTER: II	SBE: 3	HOURS: 2	CREDITS: 2

COURSE OUTCOMES:

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

1. Design Web pages using HTML tags.
2. Work with links and tables.
3. Work with images and forms.
4. Embed audio and video files in web pages.
5. Format the web pages using CSS.

UNIT I INTRODUCTION TO HTML

Fundamentals of HTML: Understanding Elements – Understanding Line Breaks – Understanding a Paragraph – Formatting Text with HTML Elements – Arranging Text– Displaying Lists.

UNIT II WORKING WITH LINKS, TABLES AND IMAGES

Exploring the Hyperlinks–Understanding Tables – Describing the TABLE Elements – Inserting Images in a Webpage.

UNIT III WORKING WITH FORMS

Exploring the FORM Element – Exploring Types of the INPUT Element **–** Exploring the BUTTON Element – Exploring the Multiple–Choice Elements – Exploring the TEXT AREA and LABEL Elements – Submitting a Form.

UNIT IV WORKING WITH MULTIMEDIA

Describing a Multimedia File Using the EMBED Element – Defining a Multimedia File Using the OBJECT Element – Exploring the FIGURE and FIGCAPTION Elements.

UNIT V OVERVIEW OF CSS, FONT STYLES AND LIST STYLES

Understanding the Syntax of CSS – Inserting CSS in an HTML Document – Defining Inheritance in CSS –Exploring Font Properties in CSS – The list – style – type Property – The list – style – image Property – The list – style – position Property.

TEXT BOOK

Kogent Learning Solutions Inc., "HTML5 Black Book", Second Edition, Dreamtech Press, 2016.

REFERENCE BOOKS

3. Mike McGrath, "HTML5 in Easy Steps", Second Edition, BPB Publications, 2017.
4. Thomas A. Powell, "The Complete Reference – HTML& CSS", Fifth Edition, McGraw Hill Education, 2017.

PRACTICAL LIST

1. Designing a simple web page.
2. Designing web page using lists.
3. Designing web page using hyperlinks.
4. Designing web page using tables.
5. Designing web page using forms.
6. Designing web page using CSS.

PROGRAMMING IN JAVA
(Course.Code : 18UCA31)

SEMESTER - III	CORE – T3	HOURS - 4	CREDITS - 3

COURSE OUTCOMES:

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

1.Understand the concept and underlying principles of Object-Oriented Programming.

2. Understand how object-oriented concepts are incorporated into Java language.

3. Develop problem-solving and programming skills using OOP concepts.

4. Understand the benefits of a well structured program.

5. Develop efficient Java applets and applications using OOP concepts.

6. Become familiar with the fundamentals and acquire programming skills in Java.

UNIT I FUNDAMENTALS OF JAVA

FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING: Introduction – Object Oriented paradigm – Basic Concepts of OOP – Benefits of OOP – Applications of OOP – Java features: **OVERVIEW OF JAVA LANGUAGE**: Introduction – Simple Java program structure – Java tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command line arguments. **CONSTANTS, VARIABLES AND DATA TYPES:** Introduction – Constants – Variables – Data Types – Declaration of Variables – Giving Value to Variables – Scope of variables – Symbolic Constants – Type casting – Getting Value of Variables – Standard Default values. **OPERATORS AND EXPRESSIONS**.

UNIT II TYPES OF STATEMENTS , CLASSES AND OBJECTS

DECISION MAKING AND BRANCHING: Introduction – Decision making with if statement – Simple if statement – if. Else statement – Nesting of if.else statements – the else if ladder – the switch statement – the conditional operator. **LOOPING**: Introduction – The While statement – the do-while statement –the for statement – Jumps in loops.**CLASSES – OBJECTS AND METHODS**: Introduction – Defining a class – Adding variables – Adding methods – Creating objects – Accessing class members – Constructors – Method overloading – Static members – Nesting of methods.

UNIT III INHERITANCE, ARRAYS AND INTERFACES

INHERITANCE: Extending a class – Overloading methods – Final variables and methods – Final classes – Abstract methods and classes; **ARRAYS – STRINGS AND VECTORS:** Arrays – One-dimensional arrays – Creating an array – Two-dimensional arrays – Strings – Vectors – Wrapper classes; **INTERFACES:** MULTIPLE INHERITANCE: Introduction – Defining interfaces – Extending interfaces – Implementing interfaces – Assessing interface variables.

UNIT IVMULTITHREADED PROGRAMMING AND EXCEPTION HANDLING

MULTITHREADED PROGRAMMING: Introduction – Creating Threads – Extending the Threads – Stopping and Blocking a Thread – Lifecycle of a Thread – Using Thread Methods – ThreadExceptions – Thread Priority – Synchronization – Implementing the 'Runnable'. Interface. **MANAGING ERRORS AND EXCEPTIONS:** Types of errors: Compile-time errors – Runtimeerrors – Exceptions – Exception handling – Multiple Catch Statements – Using finally statement.

UNIT V PACKAGES, APPLETS AND INPUT/OUTPUT FILES

PACKAGES: Introduction – Java API Packages – Using System Packages – Naming conventions – Creating Packages – Accessing a Package – using a Package. **APPLET PROGRAMMING:** local and remote applets – Applets and Applications – Building Applet code – Applet Life cycle: Initialization state – Running state – Idle or stopped state – Dead state – Display state. **MANAGING INPUT/OUTPUT FILES:** Introduction – Concept of Streams – Stream classes – Byte Stream Classes – Input Stream Classes – Output Stream Classes – Character Stream classes: Reader stream classes – Writer Stream classes – Using Streams – Reading and writing files.

TEXT BOOK

E.Balaguruswamy,"Programming with JAVA-A Primer", Fifth Edition, McGraw Hill Education, 2014.

REFERENCE BOOKS

1. Herbert Schildt,"JAVA A Beginner's Guide", Seventh Edition, McGraw-Hill Education, 2017.
2. Herbert Schildt, "Java: The Complete Reference", Tenth Edition,McGraw-Hill Education, 2017.

VISUAL BASIC
(Course. Code – 18UCA32)

SEMESTER - III	CORE – T4	HOURS - 4	CREDITS - 3

COURSE OUTCOMES

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

1. Able to Design, create, build, and debug Visual Basic applications.
2. Able to Explore Visual Basic's Integrated Development Environment (IDE).
3. Able to Implement Procedure and Function in Visual Basic programs.
4. To create Custom Menu in Visual Basic.
5. To Establish Connection with Visual Basic and Database.

UNIT I VISUAL BASIC COMPONENTS AND CONTROLS

Working with Visual Basic Window Components: Menu Bar, Tool Bar, Project Explorer Window, Form Layout Window, properties Window, Toolbox, Code Editor Window Working with Forms: Properties, Events, Methods Working with Basic **Controls:**Label, CommandButton, TextBox, OptionButton, Frame, CheckBox, ListBox, ComboBox, Image, Scroll, Picture, Timer, DriveListBox, DirListBox, FileListBox and Shape Controls.

UNIT II PROGRAMMING FUNDAMENTALS

Basic Programming Fundamentals: Variables, Data types, Constant, Conversion Function. **Scope of Variable:** Public, Private Static. Operators: Logical, Arithmetic, Concatenation, Comparison. **Decision Structure:** If.. Then, If..Then..Else, Select Case.. End Case. **Loop Structure:** Do..While, While.. Wend, For.. Next, With..EndWith.DoEvents().

UNIT III ARRAYS, PROCEDURE AND FUNCTION

Arrays: Dynamic Array, Preserve and Control arrays. **Procedure:** General procedure, General Methods for Passing Arguments to a Procedure, **Functions:** User-Interaction, String, Math, Date, And Conversion Functions. Modules: Form, Standard.

UNIT IV MENUS AND DATABASE HANDLING

Menus: Creating, Adding Menu Items, Creating Shortcut, Adding Separators Bars, Submenus, Code for Menus. Creating Popup Menu: System, Custom**. Database Handling:** Database Concepts, Creating and Accessing Database, Using Data Control. Using DAO object library.

UNIT V ADO DATA CONTROLS

Using ADO Data Control, Data Link, ODBC Data Source name, Using Connection String, Creating Navigating buttons. Working with Advanced Data Controls :DataList Control, DataCombo Control, DataGrid Control and Msflexgrid Control. Handling Errors : Run Time, Trapping and Handling Error, ERR Object. Data Environment and Data Reports.

TEXT BOOK

Soma Dasgupta, "VISUAL BASIC – to Advance", BPB Publications, 2008.

REFERENCE BOOKS

1. Steven Holzner, "Visual Basic 6 Programming Black", Dreamtech Press, First edition, 2000.

2.Mohammed Azam**, "**Programming With Visual Basic 6.0", Vikas Publication House Pvt Ltd., First edition, 2001.

PRACTICAL:PROGRAMMING IN JAVA

(Course. Code: 18UCA33)

SEMESTER: III	CORE: P3	HOURS: 4	CREDITS: 2

1. Java program to demonstrate the use of Harmonic Series.
2. Java program to display a number of even, odd and sum of even, odd program.
3. Java program to find a sub string in the given string.
4. Java program to arrange the given strings in Alphabetic Order.
5. Java program to implements Addition and multiplication of two Matrices.
6. Java program to demonstrate the use of Constructor.
7. Java program to display a use of method overloading.
8. Java program to demonstrate the use of overriding Method.
9. Java program for single Inheritance.
10. Java program for implementing Interface.
11. Java program on Multiple Inheritance.
12. Java program for to implement Thread, Thread Priority.
13. Java program to demonstrate Exception handling.
14. Java program to demonstrate Applet program.

PRACTICAL:VISUAL BASIC
(Sub. Code – 18UCA34)

SEMESTER: III	CORE: P4	HOURS: 4	CREDITS: 2

1. Visual Basic program to work with controls.
2. Visual Basic program to Design a Calculator.
3. Visual Basic program using control structures.
4. Visual Basic program to take input of two matrices and perform their addition, subtraction and multiplication.
5. Visual Basic program to find factorial for a given number using function.
6. Visual Basic program to create a menu.
7. Database connectivity using DAO.
8. Database connectivity using ADO

NUMERICAL AND STATISTICAL METHODS

(Course. Code 18UCAA31)

SEMESTER: III	ALLIED: T3	HOURS: 4	CREDITS: 4

COURSE OUTCOMES

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

1. Concept cause & consequence of errors in the application of numerical computing
2. Numerical techniques for solving various problems
3. Applications of statistics &probability in real life domain

UNIT lAPPROXIMATION AND ERRORS IN COMPUTATION

Introduction - numbers - Errors - Error in the approximation of a function - Errors in a series approximation - order of approximation - propagation error.

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS

Introduction - Basic properties of equations - bisection method - Regula falsi method - Secant method - Iteration method - Newton Raphson method

UNIT II SOLUTION OF SIMULTANEOUS ALGEBRAIC EQUATIONS

Solution of linear simultaneous equations - Direct methods of solution - Gauss elimination method, Gauss - Jordan method, Crout'sTriangularination method - Iterative methods of solution - Jacobi, Gauss - Seidal.

Numerical integration - Quadrature formulae - Trapezoidal rule, Simpson's one - third rule - Simpson's three - eighth rule - Boole's rule - Weddle's rule.

UNIT III CURVE FITTING

Introduction - Principle of least squares - Fitting a straight line - Fitting a second degree parabola.Correlation and Regression: Introduction - Correlation - Rank correlation - Regression Correlation coefficient for a bipartite frequency distribution.Interpolation: Introduction - Finite Differences - Newton's formula - Lagrange's formula.

UNIT IV PROBABILITY

Introduction - Probability - Conditional probability some special Distributions - Introduction - Binomial distribution - Poisson distribution - Normal distribution - Some more continuous distribution.

UNIT V TEST

Test Based on chi-square Distribution - Introduction - chi-square Test - chi square test for test the goodness of fit - Test for independence of attributes.

Test of significance (small samples): Introduction - Test of significance based on t-distribution(t-test) - Test of significance based on f-test - Test for significance of an observed sample correlation.

TEXT BOOKS

1. B.S. Grewal, "Numerical methods in Engineering & Science", Khanna Publishers, Fifth Edition, April 1999.

2. S. Arumugam, A.Thangapandi Isaac, "Statistics", New Gamma Publishing House, 1999.

PRACTICAL: NUMERICAL AND STATISTICAL METHODS

(Course. Code 18UCAA32)

SEMESTER: III	ALLIED: P1	HOURS: 4	CREDITS: 2

1. Solution of Algebraic and Transcendental equations Bisection method Newton-Raphson method
2. Solution of Algebraic and Transcendental equations Regula falsi method Secant method
3. Solution of simultaneous equations Gauss elimination method Gauss-seidel iteration method
4. Solution of simultaneous equations Gauss-seidel iteration method
5. Solution of simultaneous equations Gauss Jordan method
6. Numerical integration Trapezoidal rule Simpson's one-third rule & three eighth rule
7. Numerical integration Boole's rule & Weddle's rule
8. Curve fitting, Fitting a straight line, Fitting a second degree parabola
9. Interpolation: Newton's formula - Lagrange's formula.
10. Correlation Computing correlation coefficient
11. Test of significance 't' - test Chi-square test.

MACROMEDIA FLASH

(Course. Code: 18USB32)

SEMESTER - III	**SBE-5**	**HOURS - 2**	**CREDITS - 2**

COURSE OUTCOMES:

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

1. Know about the basics of animation.
2. Work with the tools in Flash.
3. Work with symbols, gradients and frames.
4. Create animation with multiple layers.
5. Understand frame by frame and tweening animations.

UNIT I INTRODUCTION TO FLASH CS6

Exploring the Flash Professional CS6 User Interface: Menu Bar – Tools Panel– Properties Panel – Library Panel – Timeline Panel –The Motion Editor Panel – Exploring Drawing Tools

UNIT II WORKING WITH FLASH TOOLS AND GRADIENTS

Using Brush Tool – Using Paint Bucket Tool – Using Eyedropper Tool – Exploring Selection and Modification Tools – Using Gradient Transform Tool – Using Bone Tool – Creating Custom Gradients – Altering the Opacity of Gradients.

UNIT III WORKING WITH TEXT FIELDS AND FRAMES

Creating Text Fields – Editing a Text Field – Inserting Frames and Keyframes – Converting a Keyframe into a Frame – Copying and Pasting a Frame or Frame Sequence – Changing a Length of a Frame Sequence – Deleting a Frame or Frame Sequence.

UNIT IV WORKING WITH SYMBOLS AND LAYERS

Creating symbols in Flash – Creating symbols from an Existing Object – Creating New Symbols – Creating a Layer – Locking and Unlocking a Layer – Hiding a Layer – Creating a Layer Folder – Deleting a layer.

UNIT VWORKING WITH ANIMATION

Exploring the Onion Skinning Feature – Creating Frame by Frame Animation – Creating a Shape Tween – Creating a Motion Tween – Creating Classic Tween – Creating a Mask Layer – Using 3D Rotation Tool – Using 3D Translation Tool.

TEXT BOOK

Kogent Learning Solutions Inc., "Flash CS6 in Simple Steps", First Edition, Dreamtech Press, 2013.

REFERENCE BOOKS

Prof. Satish Jain,KratikaBhagia, "Flash Professional CS6 Training Guide", First Edition, BPB Publications, 2016.

PRACTICAL LIST

1. Designing a simple application using basic tools.
2. Designing an application to animate text.
3. Designing an application using symbols and multiple layers.
4. Designing an application using shape tweening and motion tweening.
5. Creating an animation using Frame by Frame animation.
6. Creating an application using mask layer.

RELATIONAL DATABASE CONCEPTS

(Course Code:18UCA41)

SEMESTER: IV	CORE: T5	HOURS:4	CREDITS: 3

COURSE OUTCOMES:

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

1. Have the knowledge about the fundamentals of RDBMS
2. Design database using ER diagram and normal forms
3. Create and manipulate relational database using Oracle
4. Use SQL queries in a procedural language, PL/SQL
5. Update knowledge to learn any future advanced version of language

UNIT I PURPOSE OF DATABASE SYSTEMS

View of Data – Database Languages –Relational Database – Database Architecture– Database Users and Administrators.

Structure of Relational Database– Database Schema–Keys –Schema Diagrams – Relational Query languages – Relational Operations.

UNIT II OVERVIEW OF DESIGN PROCESS

ER Model – E – R Diagrams– Extended E – R Features – Features ofGood Relational Design – Atomic Domains and First Normal Form – 2NF – 3NF – BCNF – Decomposition Using Functional Dependencies – Functional Dependency Theory

UNIT III NAMING RULES AND CONVENTIONS

Data Types – Constraints – Creating Table – Displaying Information – Altering Existing Table – Dropping, Renaming and Truncating a Table.

Adding New Records – Updating and Deleting Records – Retrieving Data from Table – Arithmetic Operations – Where Clause – Sorting – CASE.

UNIT IV BUILT – IN FUNCTIONS

Grouping Data – Join – Set Operators – Subquery – Top – N Analysis – Correlated Subquery – Views – Sequences – Synonyms – Index – Transactions – Locking Rows for Update – Controlling Access.

UNIT V FUNDAMENTALS OF PL/SQL

PL/SQL Block Structure – Comments– Data Types– Variable Declaration – Bind Variable – Control Structures – SQL in PL/SQL – Data Manipulation in PL/SQL – Cursors – Exception Handling – Procedure – Function – Packages – Trigger.

TEXT BOOKS

1. Abraham Silberschatz, Henry F. Korth and S. Sudarsan, ”Database system concepts”, Sixth edition, McGraw Hill, 2011. (For units I & II Chapters 1,2, 7 & 8)).
2. Nilesh Shah, ”Database Systems using Oracle A simplified guide to SQL and PL/SQL”, Prentice Hall ofIndia, 2009. (For units III, IV & V, Chapters 4 – 12 & 14).

REFERENCES BOOKS

1. Alexis Leon and Mathews Leon, Fundamentals of Database Management Systems, Vijay Nicole Imprints, 2010.
2. Scott Urman, ”Oracle 9i Pl/SQL programming”, Tata McGraw Hill, 2006.
3. Ivan Bayross, “SQL, PL/SQL, The programming language of Oracle”, BPB Publications, 2010.

DATA STRUCTURES AND ALGORITHMS

(Course Code:18UCA42)

SEMESTER: IV	CORE: T6	HOURS: 4	CREDITS: 3

COURSE OUTCOMES:

1. Students will be able to know and understand the concepts of all the data structures.
2. Providing them the knowledge of the applications of data structures.
3. To impart the ways of writing algorithms stepwise.
4. To enable them to choose appropriate data structures for the application problems.
5. Students will be able to perform all the operations on the data structures.

UNIT I ALGORITHMS AND DATA REPRESENTATION

Algorithms (Analysis And Design): Problem Solving – Procedure – Top– Down and Bottom– Up Approaches to Algorithm Design – Use of Algorithms in Problem Solving: Developing an Algorithm – Characteristics of Algorithmic Language – Design of Algorithms – Implementation of Algorithm – Verification of Algorithm – Efficiency Analysis of Algorithms: Space, Time Complexity, Frequency Count – Simple Algorithms. **Data Representation:**Abstract Data Type (ADT) – **Fundamental and Derived Data Types:**Declaration – Representation – Primitive Data Structures: Symbol Table – Recursion.

UNIT II ARRAYS

Arrays: Definition – Terminology – One dimensional array – Memory allocation, Operations, Application –**Multidimensional Arrays:** Two dimensional Arrays – Sparse matrices – Three dimensional and n – dimensional Arrays – Pointer Arrays.

UNIT III STACK AND LINKED LIST

Stacks: Introduction – Definition – Representation of stacks – Operations on stacks – Applications of stack. **Linked List:** Definition – Single Linked List: Representation, Operations – Circular Linked List – **Double Linked List:** Operations – Circular Double Linked List–

Operations**Application of Linked Lists:** Sparse Matrix Manipulation – Polynomial Representation – Dynamic Storage Management – **Memory Representation:** Fixed, Variable Block Storage – Boundary tag system – Deallocation Strategy – **Buddy System:** Binary Buddy system.

UNIT IV QUEUES, TREES AND GRAPH

Queues: Introduction – Definition – Representation of Queues – using Arrays, Linked list. – Various **Queue structures:** Circular Queue – De – queue – Priority Queue – Applications of Queues. **Trees:** Concepts – Representation of Binary tree – Operations on Binary Tree – Types of Binary Trees. **Graphs:**Introduction – Graph terminologies – Representation of Graphs – Operations on Graphs – Application of Graph Structures.

UNIT V SORTING AND SEARCHING

Searching and Sorting: Searching – Sequential and Binary Search – Indexed Search – Hashing Schemes – **Hashing functions:** Division/ Remainder methods – Mid Square method – Folding method – **Hash Collision:** linear probing – Chaining – Bucketing – **Sorting:** Selection sort – Bubble sort – Insertion sort – Quick sort – Merge sort – Radix sort – Shell sort – Heap sort – Comparison of time complexity.

TEXT BOOKS

1. D. Samanta "Classic Data Structures", PHI Learning, New Delhi 2011.
2. Sathish Jain, Shashi Singh, "Data Structures made simple", BPB Publications, New Delhi 2006.

REFERENCE BOOKS

1. Lipschutz ,"Data Structures (Schaume's Outlines)", TMH Publications.
2. Adam Drozdek Thomson (Vikas),"Data Structures and Algorithm in C++".
3. Aaron M. Tenenbaum, YedidyahLangsam"Data Structures using C & C++" PHI publications.

SOFTWARE ENGINEERING

(Course Code:18UCA43)

SEMESTER: IV	CORE : T7	HOURS :4	CREDITS : 3

COURSE OUTCOMES:

1. Ability to gather and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects.

UNIT I SOFTWARE ENGINEERING PROCESS

Software Engineering process paradigms – Project Management – Process and Project Metrics – Software Estimation – Empirical Estimation Models – Planning – Risk Analysis – Software Project Scheduling.

UNIT II REQUIREMENT ENGINEERING

Requirement Engineering Processes – Feasibility Study – Problem of Requirements – Software Requirement Analysis – Analysis Concepts and Principles – Analysis Process – Analysis Model

UNIT III SOFTWARE DESIGN

Software Design – Abstraction – Modularity – Software Architecture – Effective Modular Design – Cohesion and Coupling – Architectural Design and Procedural Design – Data Flow Oriented Design.

UNIT IV UI DESIGN

User Interface Design – Human Factors – Human Computer Interaction – Human – Computer Interface Design – Interface Design – Interface Standards.

UNIT V SOFTWARE QUALITY ASSURANCE

Software Quality Assurance – Quality Metrics – Software Reliability – Software Testing – Path Testing – Control Structures Testing – Black Box Testing – Integration, Validation and System Testing – Reverse Engineering and Re – Engineering.CASE Tools – Projects Management, Tools – Analysis and Design Tools – Programming Tools –Integration and Testing Tool – Case Studies.

TEXT BOOK

1. Roger Pressman S., "Software Engineering: A Practitioner's Approach", 7th Edition, McGraw Hill, 2010.

REFERENCE BOOKS

1. Rod Stephens, "BeginningSoftwareEngineering", First Edition, Wrox, 2015.
2. Ian Sommerville, "Software Engineering", 10th Edition, Pearson Education, 2016.

PRACTICAL: ORACLE

(Course Code: 18UCA44)

SEMESTER: IV	CORE : P5	HOURS: 4	CREDITS: 2

1. Creating, modifying and dropping Tables.
2. Creating tables with Referential and Check Constraints.
3. Inserting, Modifying, Deleting Rows.
4. Dropping, Disabling /Enabling Constraints
5. Retrieving rows with Operators in where Clause.
6. Retrieving rows with Character Functions.
7. Retrieving rows with Number and Date functions.
8. Retrieving rows with Group functions and Having.
9. Joining Tables. (Inner and Outer).
10. Retrieving rows with Sub Queries.
11. Simple PL/SQL programs.
12. PL/SQL programs with Control Structures.
13. PL/SQL programs with Cursors.
14. PL/SQL programs with Exception Handling.
15. Creating and Calling Procedures.
16. Creating and Calling Functions.

PRACTICAL: DATA STRUCTURES USING C++

(Course Code: 18UCA45)

SEMESTER : IV	CORE : P6	HOURS : 4	CREDITS : 2

1. Matrix operations.
2. Implementation of stack.
3. Implementation of Queue.
4. Program implementing graph structure.
5. Program implementing tree structure.
6. Program using Singly Linked List.
7. Program using Doubly Linked List.
8. Implementation of
9. Program using Merge sort.
10. Program using Quick sort.

ESSENTIALS OF FINANCIAL ACCOUNTING

(Course Code :18UCAE41)

SEMESTER : VI	ELECTIVE : I	HOURS : 4	CREDITS : 4

COURSE OUTCOMES:

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

1. Describe the Accounting Principles and Standards
2. Demonstrate Journal and Ledger
3. Interpret Trial Balance
4. Prepare Profit and Loss Account and Balance Sheet
5. Enunciate Company final accounts

UNIT I ACCOUNTING

The Language of Business – Accounting as an Information System – Generally accepted Accounting Principles –Accounting Equations –Accounting Standards.

UNIT II TYPES OF ACCOUNTS

Process of Recording Financial Information – Journal and Ledger – Manual Accounting System and Computerized Accounting System.

UNIT III SUB-DIVISION OF JOURNAL

Cash Book–Bank Reconciliation Statement –Capital and Revenue Items –Trial Balance and Errors.

UNIT IV PREPARATION OF FINAL ACCOUNT

Manufacturing Account –Trading Account –Profit and Loss Account and Balance Sheet – Adjustments in Final Account.

UNIT VCOMPANY ACCOUNTS

Share Capital and Loan Capital –Understanding Company Final Accounts –Annual Reports of the Company.

TEXT BOOKS

1. S N Maheshwari, Sharad K Maheshwari, Suneel K Maheshwari. “An Introduction to Accountancy”, 11th Edition.
2. T.S. Grewal, S.C. Gupta, S. Chand, “Introduction to Accountancy”.

REFERENCE BOOKS

1. “Meigs&Meigs: Accounting – The Basic for business decisions”, McGrawHill.
2. Bhattacharya &Dearden , “Accounting for management” , Test & cases, Vani.
3. Juneja&Sarena, Chawla , “ Accounting– Theory and Practice”,Kalyani.
4. Agarwal, “Financial Accounting”, Advance, Pitamber.
5. Prasanna Chandra, “ Managers Guide to Finance & Accounting”,TMH.

DATA MINING

(18UCAE41)

SEMESTER: IV	ELECTIVE: 1	HOURS:4	CREDITS: 3

COURSE OUTCOMES:

1. To get an understanding of the Data mining Techniques and preprocessing methods for any given raw data.
2. To get an overview of Data warehouse Design and Implementation.
3. How to discover useful patterns and associations in huge amount of data
4. Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems, make predictions of outcomes.
5. Evaluate and implement a wide range of emerging and newly – adopted methodologies and technologies to facilitate the knowledge discovery.

Unit I DATA MINING AND DATA PREPROCESSING

Introduction to Data Mining – Fundamentals of Data Mining – Data Mining Functionalities – Data andAttribute types – Statistical Description of Data – Data Preprocessing: Data Cleaning – Data Integration – Data Reduction – Data Transformation and Data Discretization.

Unit II DATA WAREHOUSING

Data Warehousing: Basic Concepts – Data Ware House Modelling Data Cube and OLAP – Data Warehouse Design and Implementation.

Unit III MINING FREQUENT PATTERN AND ASSOCIATIONS

Mining Frequent Patterns and Associations: Basic Methods – Frequent Item Set Mining Methods Any Two Algorithms – Pattern Evaluation Methods.

Unit IV CLASSIFICATION

Classification: Basic Concepts – Decision Tree Induction – Bayes Classification – Any Two Advanced Methods – Model Evaluation.

Unit V CLUSTER ANALYSIS

Cluster Analysis: Basic Concepts – Clustering Structures – Major Clustering Approaches – Partitioning Methods – Hierarchical Method – Density Based Methods – The Expectation Maximization Method – Cluster Based Outlier Detection Essential Reading.

TEXTBOOK

J. Han , M. Kamber and J. Pei , "Data Mining: Concepts and Techniques", 3rd Edition Morgan Kaufmann, 2011.

REFERENCE BOOKS

1. G.K. Gupta, "Introduction to Data mining with case studies", 3rd Edition, PHI Learning Private limited, New Delhi, 2014.
2. Arun K Pujari, "Data Mining Techniques", 10th impression, University Press, 2008.

SOFTWARE TESTING

(Course Code: 18UCAE41)

SEMESTER – VI	**ELECTIVE – 1**	**HOURS – 4 CREDITS – 3**

COURSE OUTCOMES:

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

1. Learn the concepts of Software testing process.
2. Develop the planning for testing.
3. Learn the various verification of testing.
4. Learn the different types of testing.
5. Get overall knowledge about the subject.

UNIT I OVERVIEW OF THE SOFTWARE TESTING PROCESS

Overview of the Software testing process: Advantages of Following a Process – The Cost of Computer Testing – The Seven Step Software Testing Process – Workbench Skills – Organizing for Testing**:**Objective – Workbench – Input – Do Procedures – Task 1 To 5 – Check Procedures – Output

UNIT IIDEVELOPING THE TEST PLAN

Developing the test plan: Overview – Objective – Concerns – Workbench –Input – Do procedures – Task 1 to 6 – Check Procedures – Output

UNIT IIIVERIFICATION TESTING

Verification testing: Overview – Objective – Concerns – Workbench – Input – Do Procedures – Task 1 to 3 – Check Procedures – Output

UNIT IVVALIDATION TESTING

Validation testing: Overview – Objective – Concerns – Workbench – Input – Do Procedures – Task 1 To 3 – Check Procedures – OutputAnalyzing and Reporting Test Results:

Overview – Objective – Concerns – Workbench – Input – Do Procedures – Task 1 To 3 – Check Procedures – Output.

UNIT VACCEPTANCE AND OPERATIONAL TESTING

Acceptance and operational testing: Overview – Objective – Concerns – Workbench – Input Procedures – Task 1 to 3 – Check Procedures – Output. Post – Implementation Analysis: Overview – Concerns – Workbench – Input – Do Procedures – Task 1 to 7 – Check Procedures – Output.

TEXT BOOK:

William E. Perry, "Effective Methods for Software Testing", Wiley India edition, Third Edition, 2006

REFERENCE BOOK:

Elfriede Dustin, "EffectiveSoftwareTesting", Addison Wesley, First Edition, 2002.

OPERATIONS RESEARCH

(Course Code : 18UCAA41)

SEMESTER - IV	ALLIED -T4	HOURS - 4	CREDITS - 4

COURSE OUTCOMES:

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

1. Use different Techniques used to solve the problems in operations research methodology.
2. Use the Optimization Techniques in Engineering And Business Problems.

UNIT l

INTRODUCTION: The Nature and Meaning of OR – Management Applications of OR – Modeling in OR – General methods for solving OR models – Scope of OR.

LINEAR PROGRAMMING PROBLEM : Formulation of LP problems – Graphical solution of LP problems – General formulation of LPP – Slack and Surplus variables – standard form of LPP – Some important form of LPP – Simplex Method.

UNIT II

ARTIFICIAL VARIABLE TECHNIQUES : Two phase method and some special cases.**INTEGER PROGRAMMING PROBLEM:**Importance – Definitions– Gromory's Pure Integer Programming Problem – Branch and Bound method.

UNIT III

ASSIGNMENT PROBLEM: Mathematical formulation – Hungarian method – Unbalanced assignment problem – various types.

TRANSPORTATION MODEL: Mathematical formulation – Matrix form – Methods for finding Initial Basic Feasible Solution and optimal solution – Degeneracy in Transportation problems – Unbalanced Transportation problem.

UNIT IV

SEQUENCING PROBLEM: Assumptions – Solutions to sequencing problems: Processing on jobs through 2 machines , Processing n jobs through 3 machines – Processing n jobs on m machines**.**

QUEUING MODELS: Queuing System – Transient and Steady States – Kendal's Notation for representing Queuing models – various models in Queuing system – Birth and Death model.

UNIT V

PERT AND CPM TECHNIQUES: Basic Steps – Network diagram representation – Rutes for Drawing Network diagram – Labeling Fulkerson's I-J Rule – Time Estimates and Critical Path in Network analysis – Examples on optimum duration and minimum duration cost – PERT.

TEXT BOOKS

S.D. Sharma, “Operations Research”, KedamathRamnath& Co. Meerut.

REFERENCE BOOKS

1. HamdyTaha, "Operations Research", Prentice Hall, 2010.

2. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan, “Resource Management Techniques”, A.R. Publications, 2004.

PRACTICAL : OPERATIONS RESEARCH

(Course Code : 18UCAA42)

SEMESTER : IV	ALLIED : P2	HOURS : 2	CREDITS : 1

1. Exercise on definition, formulation of linear programing problems.
2. Exercise on Graphical solution of linear programing problems
3. Exercise and case problems on Simplex Method
4. Exercise and case problems on Transportation Problems.
5. Exercise and case problems on Assignment and Travelling sales man Problems
6. Exercise and case problems on Travelling sales man Problems
7. Exercise and case problems on Game theory
8. Exercise and case problems on PERT/CPM

WEB DESIGNING USING XML

(Course Code: 18USB41)

SEMESTER: IV	**SBE: 6**	**HOURS: 2**	**CREDITS: 2**

COURSE OUTCOMES:

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

1. Describe the basics of XML and its components.
2. Design Web pages using DTD.
3. Work with XSLT.
4. Work with Schema elements.
5. Design web pages using XLINK and XPOINTER.

UNIT I INTRODUCTION TO XML

XML Basics: Creating Well – Formed XML – Adding Attirbutes – When to use attributes – Metadata – Using attributes to enhance elements – Attributes rules.

UNIT II WORKING WITH DTD

Working with DTD: Validating your XML Documents–Defining DTD Entities– Working with Attributes.

UNIT III WORKING WITH XSL TRANSFORMATION

XSL Basics: XSL Transformation – XSLT Concepts **–** The XPath Standard – Transforming XML with XSLT – Style Sheet Structure.

UNIT IV WORKING WITH SCHEMA

Using Schema:Introducing Schemas –Schema Elements, Types and Groups – Defining Schema Attributes – Advance Concepts with Schemas – Target Namespaces and Schemas – Undeclared Target Namespaces.

UNIT V WORKING WITH XML QUERY

Using XML Query: Introducing XML Query– XLinks –Understanding XLink – XLink Syntax – A Glance at XBase –Using XPointer–Understanding XPointer – Xpointer Schemas – Xpointer Syntax – Xpointer Escaping – XPointer Functions.

TEXT BOOK

Heather Williamson, "The Complete Reference – XML", Tata McGraw Hill Edition, 2011.

REFERENCE BOOKS

1. Anders Moller Michael Schwartzbach, "An Introduction to XML and Web Technologies", Pearson Education, 2015.
2. Joe Fawcett, Liam R.E.Quin, Danny Ayers, "Beginning XML", Fifth Edition, Wiley Publications, 2015.

PRACTICAL LIST

1. Designing a simple XML Document.
2. Designing XML document with DTD.
3. Designing web page using attributes and entities.
4. Creating XSLT program to extract from XML document.
5. Creating XML document with Schemas.
6. Designing web page using XLink and XPointer.

.NET PROGRAMMING IN C#

(Course Code: 18UCA51)

SEMESTER: V	CORE: T8	HOURS : 4	CREDITS : 4

COURSE OUTCOMES:

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

1. Describe .NET Framework and Common Language Runtime.
2. Apply the usage of methods, arrays and strings.
3. Interpret the concepts of constructors, inheritance and interfaces.
4. Analyze operator overloading, delegates, events and exceptions.
5. Create Windows Applications and Web – based Applications.

UNIT I INTRODUCTION TO C#, UNDERSTANDING .NET

Introduction – Evolution of C# – Characteristics of C# – Applications of C# – Origins of .NET Technology – .NET Framework – Common Language Runtime – User and Program Interfaces – .NET Languages – Benefits of the .NET Approach – Simple C# Program – Namespaces – Providing Interactive Input – Literals, Variables and Data Types – Decision Making and Branching Statements.

UNIT II METHODS, HANDLING ARRAYS AND STRINGS

Decision Making and Looping Statements – Methods in C# – Declaring Methods – Invoking Methods – Nesting of Methods – Method Parameters – Pass by Value – Pass by Reference – Output Parameters – Method Overloading – One – Dimensional Arrays – Creating an Array – Two – Dimensional Arrays – Array List Class – Manipulating Strings – Creating Strings – String Methods – Inserting strings – Comparing Strings – Finding Substrings – Array of Strings.

UNIT III CLASSES AND OBJECTS, INHERITANCE AND INTERFACE

Classes and Objects – Defining a Class – Adding variables and methods – Creating objects – Constructors – Member Initialization – this Reference – Nesting of Classes – Indexers – Classical Inheritance – Containment Inheritance – Defining a subclass – Defining Subclass Constructors – Multilevel Inheritance – Hierarchical Inheritance – Overriding Methods – Defining an interface – Implementing interfaces – Interfaces and Inheritance – Explicit interface implementation.

UNIT IV OPERATOR OVERLOADING, DELEGATES AND EVENTS

Need for Operator overloading – Defining Operator Overloading – Overloading Binary Operators – Overloading Comparison Operators – Delegate Declaration – Delegate Methods – Delegate Instantiation – Delegate Invocation – Using Delegate – Events – Exceptions – Types of errors – Multiple Catch Statements – Exception Hierarchy – General Catch Handler – Using Finally Statement.

UNIT V EXCEPTIONS AND WEB – BASED APPLICATIONS

Creating Window Forms – Customizing a Form – Creating and Running a Windows Application – Creating Web – based Application on .NET – Creating a .NET application to send SMS to mobile phones.

TEXT BOOK

E. Balagurusamy, “Programming in C#”, Fourth Edition, Tata McGraw Hill Education, 2017.

REFERENCE BOOKS

1. John Sharp, “Microsoft Visual C# Step by Step”, Eighth Edition, PHI Publications, 2016.
2. Harsh Bhasin, “Programming in C#”, First Edition, Oxford University Press, 2014.

OPERATING SYSTEMS AND UNIX

(Course Code: 18UCA52)

SEMESTER: V	CORE: T9	HOURS: 4	CREDITS: 4

COURSE OUTCOMES:

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

1. Learn the basic concepts of the operating system.
2. Learn about the process concepts and scheduling.
3. Learn about deadlocks in operating system
4. Learn about file systems.
5. Gain the knowledge of UNIX operating system.

UNIT I

Introduction: Operating System – Computer System Organization – Operating System Structure – Operations – Process Management – Memory Management – Storage Management – Protection and Security **System structures**: Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Structure

UNIT II

Process Concept: Process Scheduling – Operations on Processes – Inter Process Communication **Process Scheduling:** Basic concepts – Scheduling Criteria – Scheduling Algorithms **Synchronization:** Background – Critical Section Problem – Mutex locks – Semaphores – Classic problems of synchronization

UNIT III

Deadlocks: System Model – Deadlock Characterization – Methods of Handling Deadlocks – Deadlock prevention – Deadlock Avoidance **Memory Management Strategies**:

Background – Swapping – Contiguous Memory allocation – Segmentation – Paging Virtual Memory Management: Background – Demand Paging – Page replacement

UNIT IV

Introduction to Unix: – Architectureof Unix, Features of Unix , Unix Commands. Unix Utilities: – Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, Text processing utilities and backup utilities

UNIT V

Introduction to Shell Programming: – Shell scripts – Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, CommandLine Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization. **Filters:** Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

TEXT BOOKS

1. Abraham SilberSchatz, Peter Baer Galvin, Greg Gagne, "Operating System Concepts",John Willy & Sons (Asia), NINTH Edition, 2014.
2. Sumitabha Das, "Unix Concepts and Applications", Tata McGraw Hill Publications, Fourth Edition, 2017.

REFERENCE BOOKS

1. Gary J.Nutt,"Operating Systems", Pearson Education Asia, 2nd Edition, 2013.
2. H.M.Deital, "Operating Systems", Addison-Wesley Publishing Company, Second Edition, 2011.
3. Graham Glass, King Ables, "Unix for programmers and users", Third edition, Pearson Education.
4. Kernighan and Pike, PHI, "Unix programming environment", Pearson Education, 2013.

J2EE

(Course Code: 18UCA53)

SEMESTER: V	CORE: T10	HOURS : 4	CREDITS : 4

COURSE OUTCOMES:

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

1. Describe J2EE Multi – Tier Architecture
2. Develop servlet programs.
3. Develop JSP applications.
4. Examine Remote Method Invocation.
5. Describe the contents of an Enterprise Bean.

UNIT I J2EE MULTI – TIER ARCHITECTURE

J2EE Multi – Tier Architecture – Client TierImplementation – Web TierImplementation – Enterprise JavaBeans TierImplementation – Enterprise Information SystemsTierImplémentation – JDBC.

UNIT II SERVLETS

Java Servlets: Benefits of using a Servlet – A simple Java Servlet. Reading Data from a Client – Sending data to a Client – Working with Cookies – Tracking Sessions.

UNIT IIIJSP

JSP: JSP Tags – Variables and Objects – Methods – Control Statements –Loops – Cookies – Session Objects.

UNIT IVRMI

RMI: Remote Method Invocation Concept – Remote Interface – Passing Objects – The RMI Process – Server Side – Client Side.

UNIT V EJB FUNDAMENTALS

EJB Fundamentals – Types of Beans – Distributed Objects and Middleware – Contents of an Enterprise Bean – Developing an EJB Component – Deploying the Bean – Looking up a Home Object – Running the system.

TEXT BOOKS

1. Jim Keogh, “The Complete Reference J2EE”, Tata McGraw Hill Edition, 2017.
2. Ed Roman, Scott Ambler, Tyler Jewell, “Mastering Enterprise JavaBeans”, Third Edition, Wiley Publications, 2004.

REFERENCE BOOKS

1. RashmiKanta Das, “J2EE Made Easy”, First Edition, Vikas Publishing House, 2014.
2. Virender Singh, “Learn EJB in the simple way”, Amazon Kindle Edition, 2016.

PYTHON PROGRAMMING

(Course Code: 18UCA54)

SEMESTER: V	CORE: T11	HOURS : 4	CREDITS : 4

COURSE OUTCOMES:

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

1. Develop proficiency in creating applications using the Python Programming Language.
2. Learn the various data structures available in Python programming language and apply them in solving computational problems
3. Use Object Oriented Programming Paradigms through Python Programming
4. Use a systematic approach to design, organize, write and debug programs
5. Update knowledge to learn any future advanced version of language

UNIT I INTRODUCTION AND OVERVIEW

Introduction and overview: Introduction to Python, Origin, Features, Comparison, Comments, Operators, Variables and Assignment, Numbers, Strings, Lists and Tuples, Dictionaries. **Syntax and Style:**Statements and Syntax, Variable Assignment, Identifiers, Basic Style Guidelines, Memory Management, Python Application Examples.

UNIT II PYTHON OBJECTS, NUMBERS AND STRINGS

Python Objects: Python Objects, Standard Types, Other Built – in Types, Internal Types, Standard Type Operators, Standard Type Built – in Functions, Categorizing the Standard Types, Unsupported Types. **Numbers and Strings:** Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built – in Functions. Sequences: Strings, Lists, and Tuples, Sequences, Strings, Strings and Operators, String – only Operators, Built – in Functions, String Built – in Methods, Special Features of Strings.

UNIT III LISTS, CONDITIONALS AND LOOPS

Lists: Operators, Built – in Functions, List Type Built – in Methods, Special Features of Lists, Tuples, Tuple Operators and Built – in Functions, Special Features of Tuples.

Conditionals and Loops: if statement, else Statement, else if Statement, while Statement, for Statement, break Statement, continue Statement, pass Statement, else Statement.

UNIT IV FILES AND INPUT/OUTPUT

Files and Input/output: File Objects, File Built – in Function, File Built – in Methods, File Built – in Attributes, Standard Files, Command – line Arguments, File System, File Execution, Persistent Storage Modules. **Errors and Exceptions:** Exceptions in Python – Detecting and Handling Exceptions – Context Management – Exceptions as Strings – Raising Exceptions – Assertions –Standard Exceptions – Creating Exceptions

UNIT V FUNCTIONS, OBJECT ORIENTED PROGRAMMING

Functions and Functional Programming: Functions – Calling Functions – Creating Functions – Passing Functions – Formal Arguments –Variable Length Arguments – Functional Programming – Variable Scope – Recursion – Generators. **Object Oriented Programming:** Classes – Class Attributes – Instances – Instance Attributes – Binding and Method Invocation – Static Methods and Class Methods – Composition – Sub classing and Derivation – Inheritance – Built – in – functions for Classes – Delegation

TEXT BOOK

Chun, J Wesley, “Core Python Programming”, Second Edition, Pearson, 2010.

REFERENCE BOOKS

1. Barry, Paul, “Head First Python”, Second Edition, O Rielly, 2010.
2. Lutz, Mark,” Learning Python”, Fourth Edition, O Rielly, 2009.
3. John V. Guttag, “Introduction to Computation and Programming Using Python”, Revised and Expanded Edition, The MIT Press, 2013.
4. Mark Summerfield, “Programming in Python 3: a complete introduction to the Python language”, Second Edition, Pearson Education, 2010.

PRACTICAL: .NET PROGRAMMING IN C#

(Course Code: 18UCA55)

SEMESTER: V	CORE: P7	HOURS: 4	CREDITS: 2

1. Program using decision statements.
2. Program using iteration statements.
3. Program using methods.
4. Program using method overloading.
5. Program using One Dimensional and Two Dimensional Arrays.
6. Program using Strings.
7. Program using classes and objects.
8. Program using constructors.
9. Program using inheritance.
10. Program using interface.
11. Program using binary operator overloading.
12. Program using exception handling with multiple catch statements.
13. Designing a Windows Application using Window Forms.
14. Designing a Web – based Application.
15. Creating a .NET application to send SMS to mobile phones using web.

PRACTICAL: UNIX

(Course Code: 18UCA56)

SEMESTER: V	CORE: P8	HOURS: 2	CREDITS : 1

1. Execution of various file/directory handling commands.
2. Simple shell script for basic arithmetic and logical calculations.
3. Shell scripts to check various attributes of files and directories.
4. Shell scripts to perform various operations on given strings.
5. Shell scripts to explore system variables such as PATH, HOME etc.
6. Shell scripts to check and list attributes of processes.
7. Execution of various system administrative commands.
8. Write awk script that uses all of its features.
9. Use seed instruction to process /etc/password file.
10. Write a shell script to display list of users currently logged in.

PRACTICAL: J2EE

(Course Code: 18UCA57)

SEMESTER: V	CORE: P9	HOURS: 2	CREDITS : 1

1. Simple Servlet Program
2. Session Tracking using HTTPSession Object.
3. Implementing Cookies using Servlet
4. Accessing Database with Servlet using JDBC
5. Simple JSP Program
6. Accessing Database with JSP using JDBC
7. Program using implicit JSP objects

PRACTICAL: PYTHON PROGRAMMING

(Course Code: 18UCA58)

SEMESTER: V	CORE : P10	HOURS : 2	CREDITS : 1

1. Simple Programs
2. Program to check whether the given number is prime or not
3. Program to find first n Fibonacci series
4. Program to find the factorial of a given number
5. Programs using Control Structures
6. Programs using Sequences
7. Programs using Strings
8. Programs using Lists
9. Programs using Tuples
10. Programs using Files
11. Programs for Exception Handling
12. Programs using Functions

FUNDAMENTALS OF MANAGEMENT

(CourseCode: 18UCAE51)

SEMESTER : V	ELECTIVE :II	HOURS : 4	CREDITS:4

COURSE OUTCOMES:

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

1. Describe the functions and responsibilities of management
2. Enunciate the principles and types of planning
3. Describe the types and importance of objectives
4. Elaborate the methods of decentralization
5. Describe the Control Techniques

UNIT I CONCEPT OF MANAGEMENT

Concept of Management: Introduction to Management & Organizations – Functions and Responsibilities of Managers – Fayol's Principles of Management – Management thought – The Classical School – The Human Relations School – Systems Theory – Contingency Management Developing Excellent Managers.

UNIT II PLANNING, OBJECTIVES

Planning: Nature and Purpose of Planning Process – Principles of Planning – Types of Planning – Advantages and Limitation of Planning.

UNIT III CONCEPT AND NATURE OF OBJECTIVES

Concept and Nature of Objectives: Types ofObjectives – Importance of Objectives – Setting Objectives – Management by Objective (MBO) benefits and weaknesses of MBO.

UNIT IV ORGANIZING

Organizing: Nature and Purpose of Organizing – Bases ofDepartmentation, Span Relationship – Line Staff Conflict – Bases of Delegation – Kindsof Delegation and Decentralization – Methods of Decentralization.

UNIT V: CONTROLLING

Controlling: Concept and Process of Control, Control Techniques – Human Aspects of Control – Control as a Feedback System – Feed Forward Control – Preventive Control – Profit and Loss Control – Control through Return on Investment – The use of Computer of Controlling & Decision Making – The challenges created by IT a Control Tool.

TEXT BOOKS

1. Harold Koontz, O'Donnell and Heinz Weihrich, "Essentials of Management', New Delhi, Tata McGraw Hill.
2. R.D. Agrawal, "Organization and Management", New Delhi, Tata McGraw Hill.
3. Stephen Robbins, "Management" 8th Edition, New Delhi Pearson

REFERENCE BOOKS

1. Harold Koontz, Heinz Weihrich, "Management: A Global Perspective", New Delhi Tata mcGrow hill.
2. Robert Krietner, "Management", Houghton Miffin CO.
3. Stephen Robbins "Management" 8th Ed. New Delhi Pearson.

MANAGEMENT INFORMATION SYSTEMS

(Course Code: 18UCAE51)

SEMESTER: V	ELECTIVE: II	HOURS: 4	CREDITS : 4

COURSE OUTCOMES:

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

1. List the strategic views of management information system.
2. Interpret the information security threats and management.
3. Relate the object oriented technology and system analysis and design.
4. Understand the development process and strategic design of MIS.
5. Interpret the applications of MIS in Manufacturing and Service sectors.

UNIT I STRATEGIC VIEW OF MIS

Management Information Systems(MIS): Concept – MIS: Definition – Role of the Management Information System– Impact of the Management Information System – MIS and the user – Management as a Control System – MIS : A Support to the Management – Management Effectiveness and MIS – Strategic Management of Business Performance: The Concept of Corporate Planning – Essentiality of Strategic Planning – Development of the Business Strategies– Types of Strategies – Short – Range Planning – Tools of Planning– Strategic Analysis of Business – MIS: Strategic Business Planning.

UNIT II INFORMATION SECURITY, IMPACT ON SOCIETY AND DECISION MAKING

Security Threats and Vulnerability – Controlling Security Threat and Vulnerability – Managing Security Threat in E – business – Disaster Management – Information Security– Impact of IT on Privacy – Ethics – Technical Solutions for Privacy Protection – Intellectual Property, Copyright and Patents – Impact ofInformation Technology on the Workplace – Information System Quality and Impact – Impact on Quality of Life –Decision – Making Concepts – Decision – Making Process – Decision Analysis by Analytical Modelling –

Behavioural Concepts in Decision – Making – Organisational Decision – Making – MIS and Decision – Making.

UNIT III BUSINESSINTELLIGENCE AND SYSTEM ANALYSIS AND DESIGN

Information Concepts – Information: A Quality Product – Classification of the Information – Methods of Data and Information Collection – Value of the Information – Summary ofInformation Concepts and their Implications – Knowledge and Knowledge Management Systems – Business Intelligence – MIS, and the Information and Knowledge – System Concepts – Types of System – Classes of Systems – General Model of MIS – The Need for System Analysis – System Development Model – Structured System Analysis and Design (SSAD) – Object Oriented Analysis (OOA) – System Development through OOT: A Use Case Model– OOSAD Development Life Cycle.

UNIT IV DEVELOPMENT PROCESS AND STRATEGIC DESIGN OF MIS

Development of Long Range Plans of the MIS – Ascertaining the Class ofInformation – Determining the Information Requirement – Development and Implementation of the MIS – Management ofInformation Quality in the MIS – Organisation for Development of MIS – MIS: Development Process Model – Strategic Management of the Business – Strategic Design of MIS – Development Process Steps for Strategic Design (SD) of MIS – Illustrating SD of MIS for Big Bazaar – Strategic Management of Business and SD of MIS – Business Strategy Determination – Business Strategy Implementation.

.UNIT V

Applications in Manufacturing Sector: Introduction – Personnel Management (PM) – Financial Management (FM) – Production Management (PM) – Raw Materials Management (RMM) – Marketing Management –Applications in Service Sector: Introduction to Service Sector – Creating a Distinctive Service – Service Concept – Service Process Cycle and Analysis – Customer Service Design – Service Management System – MIS Applications in Service Industry – MIS: Service Industry.

TEXT BOOK

1. Waman S. Jawadekar, "Management Information Systems", Fifth Edition, McGraw Hill Education, 2017.

REFERENCE BOOKS

1. Kenneth C. Laudon, Jane Price Laudon, "Management Information Systems: Managing the Digital Firm", Fifteenth Edition, Pearson Education, 2017.
2. James A O'Brien, George M. Marakas, Ramesh Behl, "Management Information Systems", Tenth Edition, McGraw Hill Education, 2017.

E -COMMERCE

(Course Code: 18UCAE51)

SEMESTER: V	ELECTIVE : II	HOURS : 4	CREDITS :4

COURSE OUTCOMES:

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

1. Understand the scope of E – Commerce.
2. Analyze the concept of electronic market and market place.
3. Understand the business models.
4. Understand the business standards.
5. Understand the legal and security issues.

UNIT I

Main Activities of E – Commerce – Broad Goals of E – Commerce–E – Commerce technical Components – Functions of E – Commerce – Prospectus of E – Commerce – Lessons from E – Commerce Evolution– Scope of E – Commerce.

UNIT II

E – Commerce Technical Architecture– E – Commerce Strategies–E – Commerce Essentials– E – Commerce applications– Foundation of E – Commerce – Growth of E – Commerce – Advantages of E – Commerce – Disadvantages of E – Commerce – Progress of E – Commerce inIndia.

UNIT III

Driving the E – Commerce Revolution –E – Commerce Activities– Matrix of E – Commerce models– B2C – B2B – B2B Boom–E – Commerce opportunity Frame work– Developing an E – Commerce Strategy– International E – Commerce – International Strategy Development– Dotcom Companies.

UNIT IV

Electronic Market:Online Shopping– Online Purchasing– Electronic Market– Three models of Electronic Market– Markets category– International Marketing– One – to – one Marketing– Permission Marketing– Pull and push technologies– B2B Hubs– B2B market places– B2B exchange.

UNIT V

Electronic Business applications Emerging applications– Electronic Business Architecture– AMR Model for Electronic Business– Evolution of Electronic Business Application– Dotcom companies– The Indian scenario for E – Business–Electronic business implementations– B2B E – Commerce – B2C E – Commerce – B2B Market Place.

TEXT BOOK

1. C.S.V Murthy, “E-Commerce Concepts. Models, Strategies”, First Edition, Himalaya Publishing House, 2017.

REFERENCEBOOKS

1. David Whiteley, “E-Commerce: Strategy, Technologies and Applications”, McGraw Hill Education, 2017.
2. Chaffey, “E-Business and E-Commerce Management: Strategy, Implementation and Practice”, Fifth Edition,Pearson Education India.

ANDROID PROGRAMMING

(Course Code: 18UCA61)

SEMESTER : VI	CORE : T12	HOURS : 5	CREDITS : 5

COURSE OUTCOMES:

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

1. Create and debug and run own Android applications
2. Apply Android Components to create applications
3. Implement various features to create innovative applications
4. Create application using various UI components
5. Update knowledge to learn any future advanced version of language

UNIT I TOOLS, BUIDING BLOCKS

Quick Start: Installing the Tools – Creating and Running on the Emulator – Running on Phone – **Key Concepts:** The Big Picture – It's Alive – Building Blocks – Using Resources – safe and secure.

UNIT II USER INTERFACE, WIDGET, WALLPAPER

Designing the user Interface: Design by Declaration – creating the opening screen – using alternate resources – About Box – Applying Theme – Adding Menu – Adding settings – Debugging. **Widget:** Creating First Widget – Calling all widget- Running the widget – Keep Up to Date – **Wallpaper:** Creating wall paper – Building a Drawing Engine – Managing the Surface – Making the wallpaper visible.

UNIT III MULTIMEDIA, STORING LOCAL DATA, BEYOND THE BASICS

Multimedia : Playing Audio – Playing Video – Adding sounds – **Storing local Data :** Adding options – using preferences API – Saving Instance state – Accessing the internal file system – Accessing SD cards. **The Connected World:** Browsing the Internet – Web with a view – Java script to java.

UNIT IV 2D GRAPHICS, 3D GRAPHICS

Exploring 2D Graphics: Learning the Basic – Adding Graphics – Handling Input – Creating Keypad – Making Improvements. **3D Graphics in Open GL:** Understanding 3D Graphics – OpenGL Introduction – OpenGL program – Rendering and Building a model.

UNIT V SQL DATA, PUBLISHING

Putting SQL to work: SQL lite – SQL 101 – Database Program – Data Binding – using & Implementing Content Provider.**Publishing to the Android Market** - Preparing - Signing - Publishing - Updating.

TEXTBOOK

Ed Burnette,"Hello Android: Introducing Google's Mobile Development Platform", Fourth Edition, The Pragmatic Programmers, New Delhi, 2015

REFERENCE BOOKS

1. Wallace Jackson, "Android Apps for Absolute Beginners ", APress, Second Edition,201
2. Wei-Meng Lee, "Beginning Android 4 Application Development", Wiley India Pvt. Ltd., 2011.
3. James C. Sheusi, "Android Application Development for Java Programmers", Cengage Learning India Private Limited, New Delhi, 2013.
4. Jeff Friesen, "Learn Java for Android Development", Apress, 2010.

PHP PROGRAMMING

(Sub. Code 18UCA62)

SEMESTER : VI	CORE : T13	HOURS : 5	CREDITS : 5

COURSE OUTCOMES:

Upon successful completion of this course, a student should be able to:

1. To give detailed knowledge about PHP programming
2. Use a PHP editing program.
3. Develop a MySQL database.
4. Understand the use of PHP with HTML.
5. Develop Database connectivity using MySQL.
6. Develop Web Applications.

UNIT IINTRODUCTION TO PHP

PHP History– Unique feature– Writing and running the script– Mixing PHP with HTML– Variables and Operators – Assigning Values to Variable– Destroying and inspecting Variable Content– PHP Data Types– Manipulating Variable with Operators.

LEARNING PHP LANGUAGE: Basic Building Blocks: Variable, Data Type,Operators& Expression, Constant.Control Structures: if, if else,ifelseif..else, for,foreach, do– while, while,break, continue, switch.

UNIT II ARRAY, FUNCTIONS, DATE– TIME

ARRAYS: Anatomy of an Array:indexed and Associative Array – Creating Arrays – Accessing Array Elements – Looping through Array – Multidimensional Array – and Manipulating Array using array functions.

FUNCTIONS: What and why function – User– Defined Function – FunctionArguments– Returning values – Calling Function – Variable Function, and Recursive Function – String – Creating & Accessing String – String Manipulationusing string functions

DATE–TIME: Understanding Timestamp – Getting current date & time – Extracting date time values – format character for date – Formatting Date String.

UNIT IIICLASSES AND OBJECTS

Introduction to OOPS Concepts – Visibility Controls– Creating Class and Object – Create and using properties &methods – Overloading – Constructor – Destructor – Object Inheritance.

UNIT IVWEB FORMHANDLING FORM WITH PHP, COOKIES & SESSION

Capturing form Data with PHP – Dealing with Multi - value Fields – Validating Form Input – Generating Web Forms – Storing Variable in Forms – Working with Multipage Forms – Creating File – Upload Forms – Redirecting form submission

PRESERVING STATE IN PHP: Understanding cookies – Session & Query String –Saving State with Query String – Working with cookies –PHP Session to store data.

UNIT VDATABASE CONNECTIVITY & SQL:

Database – records –Primary and foreign Key – SQL statements – Creating Database – Adding Tables – Adding Records – Executing Queries – modifying and removing Records – Retrieving Data – Returning data as array and Object.

TEXT BOOK

VikramVaswani , "PHP A beginner's Guide" Tata McGraw Hill.

REFERENCE BOOKS

1. W. Jason Gilmore,"Beginning PHP and MySQL 5": From Novice to Professional", Second Edition, Apress publication.
2. Paul Hudson, "PHP in a Nutshell", O'Reilly Media, 2005.

COMPUTER NETWORKS

(CourseCode : 18UCA63)

SEMESTER : VI	CORE : T14	HOURS: 5	CREDITS : 5

COURSE OUTCOMES:

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

1. Trace the flow of information from one node to another node in the network.
2. Learn the functionalities at each layer for different applications.
3. Evaluate the protocols in network layer with noisy and noiseless channels.
4. Identify the functions of key management
5. Gain overall knowledge about the subject

UNIT I NETWORK MODELS, TRANSMISSION MEDIA

Introduction: Data Communications – Networks-Internet Protocols and standards. **Network Models:** Layered Tasks - The OSI Model - Layers in the OSI Model - TCP/IP Protocol Suite - Addressing. **Transmission media:** Guided Media - Unguided media.

UNIT II DIGITAL AND ANALOG TRANSMISSION, BANDWIDTH UTILIZATION

Digital Transmission: Digital-To-Digital conversion - Analog–To-Digital conversion - Transmission modes. **Analog Transmission:** Digital-To-Analog conversion - Analog-To-Analog conversion. **Bandwidth Utilization:** Multiplexing – spread spectrum.

UNIT III SWITCHING, ERROR DETECTION AND CORRECTION , DATA LINK CONTROL

Switching: Circuit Switched Networks - Datagram Networks - Virtual-circuit Networks - Structure of Switch.**Error Detection and Correction:** Introduction - Block Coding - LinearBlock Codes – Cyclic Codes - Checksum. **Data Link control:** Framing - Flow and Error Control - Noiseless Channel - Noisy Channel.

UNIT IV MULTIPLE ACCESS, WIRELESSLAN

Multiple Access: Random Access - ALOHA – CSMA – CSMAlCD - CSMAlCA - Controlled Access – Reservation - Polling - Token Passing – Channelization – FDMA - TDMA - CDMA.

WirelessLAN: Bluetooth - Architecture - Bluetooth Layers - Radio Layer - Baseband Layer - L2CAP - Other Upper Layers.

UNIT V NETWORK LAYER, CONGESTION CONTROL AND DNS

Network Layer: Delivery – Forwarding - Unicast Routing and Multicast routing.**Congestion Control:** Open Loop congestion control and Closed Loop congestion control. **Domain Name System:** Name Space - Domain Name space.

TEXT BOOK

Behrouz A Forouzan, "Data Communications and Networking", Fifth Edition, McGrawHill Higher Education, 2013.

REFERENCE BOOKS

1. Andrew S Tanenbaum, "Computer Networks", Pearson Publications, Fifth Edition, 2011.
2. Achyut and Godbole, "Data Communications and Computer Networks", Tata McGraw Hill Edition,2006.

PRACTICAL: ANDROID PROGRAMMING

(Course Code: 18UCA64)

SEMESTER - VI	CORE - P11	HOURS - 4	CREDITS - 2

1. Basic Android Aplication to display a message
2. Program using Control Structures
3. Program using classes and objects
4. Android application to display toast message on button click
5. Android applications using basic user interface controls
6. Android applications to use android specific user inteface controls
7. Android application for login operation
8. Android application to make use of database
9. Android applications to make use of different layouts
10. Android application to implement various Event listeners
11. Android application to display dialog box and alert messages
12. Android application to create animation

PRACTICAL: PHP PROGRAMMING

(Course Code : 18UCA65)

SEMESTER - VI	CORE - P12	HOURS - 4	CREDITS - 2

1. Write a PHP program to display “Hello World “ on the screen
2. Write a PHP program to display the Fibonacci series
3. Write a PHP program to display the sum of the given number using function.
4. Write a PHP program for demonstration of string functions.
5. Write a PHP program that will use the concept form.
6. Write a PHP program to read the employee details using form component.
7. Write a PHP program for demonstrating an Array.
8. Write a PHP program to prepare student Mark sheet using switch statement.
9. Write a PHP program for create and write the contents into the file.
10. Write a PHP program to open and read the contents of the file.
11. Write a PHP program for uploading the file.
12. Write a PHP program to send Mail from PHP Script.
13. Write a PHP program to count the no of visitors using session.
14. Write a PHP program to connect to database.
15. Write a PHP program to insert and retrieve data using database.

EXTRA CREDIT COURSES

FUNDAMENTALS OF COMPUTERS

(CourseCode : 18UEC11)

SEMESTER : I	ECC	CREDITS : 3

COURSE OUTCOMES:

At the end of the course the students will be able to

1. Learn all the basic concepts of Computer.
2. Learnabout various units and devices.
3. Gain knowledge about computer memory.
4. Learn about the basics of software.
5. Understand about the basics of Internet.

UNIT I EVOLUTION OF COMPUTERS

Evolution of Computers : Generations - Types of computers -Computer system characteristics - Basic components of a Digital Computer - Control unit – ALU - Input / Output functions and memory - Memory addressing capability of a CPU - Word length of a computer - processing speed of a computer - Computer Classification.

UNIT II INPUT AND OUTPUT UNITS

Input/Output Units : Keyboard – Mouse – Trackball – Joystick - Digitizing tablet – Scanners - Digital Camera – MICR – OCR – OMR - Bar-code Reader - Voice Recognition - Light pen - Touch Screen - Monitors and types of monitor – Digital – Analog – Size – Resolution - Refresh Rate - Dot Pitch - Video Standard – VGA – SVGA - XGA etc - Printers& types - Daisy wheel - Dot Matrix – Inkjet – Laser - Line Printer – Plotter - Sound Card and Speakers.

UNIT III MEMORY

Memory :- RAM – ROM – EPROM - PROM and other types of memory - Storage fundamentals - Primary Vs Secondary Data Storage - Various Storage Devices - Magnetic Tape - Magnetic Disks - Cartridge Tape - Hard Disk Drives - Floppy Disks (Winchester Disk) - Optical Disks – CD – VCD - CD-R - CD-RW - Zip Drive - Flash drives Video Disk - Blue Ray Disc - SD/MMC Memory cards - Physical structure of floppy & hard disk - Drive Naming Conventions in PC. DVD, DVD-RW, USB Pen drive.

UNIT IV SOFTWARE AND TYPES

Software and its Need: Types of Software - System software - Application software - System Software - Operating System - Utility Program - Algorithms - Flow Charts – Symbols - Rules for making Flow chart - Programming languages – Assemblers - Compilers and Interpreter - Computer Applications in various fields.

UNIT V INTERNET CONCEPTS

Internet Concepts:- Introduction to Internet - Connecting to the Internet Hardware - Software & ISPs - Search Engines - Web Portals - Online Shopping - Email – Types of email - Compose and send a message - Reply to a message - Working with emails - Surfing in the Internet.

TEXT BOOK

P.K. Sinha, “Computer Fundamentals”, New Age International Publishers, 2014.

https://www.edutechlearners.com/computer-fundamentals-p-k-sinha-free-pdf

REFERENCE BOOKS

1. S.K.Basandra, “Computers Today “, Galgotia Publications.
2. Shree SaiPrakashan, “PC Software”, Meerut.

M - COMMERCE

(18UEC21)

SEMESTER : II	ECC	CREDITS : 3

COURSE OUTCOMES

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

1. Analyze the concept of Mobile Commerce.
2. Understanding the Mobile Commerce Technology.
3. Understanding the Cellular Communication and Cellular Network.
4. To develop an understanding of Mobile Service Providers and Mobile Network.
5. Understanding the Legal Issues and Future of Mobile Commerce.

UNIT 1 MOBILE COMMERCE

Introduction to Mobile Commerce - Scope of Mobile Commerce - Mobile Commerce Framework - Mobile Commerce Business Models - Mobile Commerce Applications - Mobile Commerce Services.

UNIT II APPLICATIONS

Mobile Commerce Applications - Mobile Application Development – Software Platforms – Software Tools - Mobile Commerce Technology – Wireless and Mobile Communication – Communication Systems – Wireless Communication – Satellite Communication – Mobile Communication Systems.

UNIT III DIGITAL CELLULAR TECHNOLOGY, 2G AND 3G

Digital Cellular Technology – Cellular Communication – Cellular Networks – Mobile Phone Cellular Network – Mobile Access Technology – Evolution of Mobile Communication Systems – 2 G Systems – 3G Systems.

UNIT IV 4G AND 5G

4G Systems – 4G Features - 4G Technologies – 4G Objectives and Goals – 4G Deployment Plans – 5 Systems – Mobile Devices – Mobile Service Providers – Mobile Network Operators.

UNIT V MOBILE BANKING

Mobile Products - Mobile Banking – Tickets On Mobile – Mobile Payment – Security and Legal Aspects – Future of Mobile Commerce.

TEXT BOOK

KarabiBandyoPadhyay, "Mobile - Commerce", PHI Learning Press, 2013.

REFERENCES BOOK

1. Jeanne Hopkins, Jamie Turner, "Go Mobile: Location Based Marketing, Apps, Mobile Optimized Ad Campaigns, 2D codes and other Mobile Strategies to Grow your Business", John Wiley&Sons Inc., 2012.
2. Paul Skeldon, "M- Commerce", Crimson Publishing, 2012.

COMPUTER GRAPHICS

(18UEC31)

SEMESTER: III	ECC	CREDITS : 3

COURSE OUTCOMES:

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

1. To learn the principles of commonly used paradigms and techniques of graphics design.
2. To let the students knowing about various algorithms.
3. To enable them to do various transformations.
4. To understand the 3D-concepts and illumination models, which paves way for more exploration.

UNIT I OUTPUT PRIMITIVES

Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms. Attributes of Output Primitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Areafill attributes – Character Attributes.

UNIT II 2D CONCEPTS

2D Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations. 2D Viewing: The Viewing Pipeline – Viewing Co-ordinate Reference Frame – Window-to-Viewport Co-ordinate Transformation - 2D Viewing Functions – Clipping Operations – Point, Line, Polygon, Curve, Text and Exterior clippings.

UNIT III 3D CONCEPTS

3D Concepts: 3D Display Methods – 3D Graphics Packages. 3D Object Representations: Polygon Surfaces – Curved lines and Surfaces – Quadric Surfaces – Super quadrics – Blobby Objects – Spline representations. 3D Geometric Modeling and Transformations: Translation –

Rotation – Scaling – Other Transformations – Composite Transformations – 3D Transformation functions.

UNIT IV VISIBLE SURFACE DETECTION METHODS

Visible-Surface Detection Methods: Classification of Visible-Surface algorithms – BackFace Detection – Depth-Buffer Method – A-Buffer method- Scan- Line Method – DepthSorting Method – BSP-Tree Method – Area-Subdivision Method – Octree Methods – Raycasting Methods – Curved surfaces – Wire frame Methods – Visibility-Detection functions.

UNIT V ILLUMINATION MODELS

Illumination Models: Properties of Light – Standard Primaries and the Chromaticity Diagram – Intuitive color Concepts – RGB Color Model – YIQ Color Model – CMY Color Model – HSV Color Model – Conversion between HSV and RGB models – Color selection ad Applications.

TEXT BOOKS

Donald Hearn, M. Pauline Baker, "COMPUTER GRAPHICS", 4th edition(2012), PHI.

REFERENCE BOOKS

1. Foley Van Dam, Feigner Hughes, "Computer Graphics Principles and Practices", 2nd edition.
2. "Computer Graphics", ISRD Group, Tata MCGraw Hill, 2012.

WIRELESS TECHNOLOGY

(18UEC41)

SEMESTER: IV	ECC	CREDITS : 3

COURSE OUTCOMES:

At the end of the course the students will be able to

1. Learn the basics of Wireless Transmission.
2. Learnabout Spread Spectrum and Modulation.
3. Get the inputs about GSM.
4. Knowing a lot about UMTS.
5. Learn about Satellite communication.

UNIT I

Wireless Transmission–I : Frequencies for communication- Frequencies for mobile communication - Frequencies and regulations - Signals (physical representation of data, function of time and location) - Fourier representation of periodic signals - Different representations of signals (w.r.t. freq and amp) - Antennas (isotropic radiator, simple dipoles, directed and sectorized) – MIMO - Signal propagation ranges - Signal propagation – shadowing, reflection, refraction, scattering, diffraction) - Multipath propagation - Effects of mobility.

UNIT II

Wireless Transmission –II: Modulation (Digital, analog), spread spectrum technology – DSS, FHSS, Cell structure – frequency planning, cell breathing.

UNIT III

Wireless Telecommunication Systems: GSM: Overview - Performance characteristics of GSM (wrt. analog sys.) - GSM: Mobile Services, Architecture of the GSM system, system architecture - GSM - TDMA/FDMA - GSM hierarchy of frames - GSM protocol layers for signaling - Mobile Originated Call - Mobile Originated Call - 4 types of

handover - Handover decision - Handover procedure - Data services in GSM - GPRS quality of service - GPRS architecture and interfaces - GPRS protocol architecture,

UNIT IV

3G – The Universal Mobile Telecommunication System (UMTS): -UMTS Network Architecture –Release 99, UMTS Interfaces, UMTS Network Evolution - UMTS Release 5 - UMTS FDD and TDD - UMTS Channels - Logical Channels - UMTS downlink transport and physical channels - UMTS uplink transport and physical channels - UMTS Time Slots - UMTS Network Protocol – Architecture - Mobility Management for UMTS Network

UNI T V

Medium Access Control: Motivation for a specialized MAC – SDMA – FDMA – TDMA – CDMA - Wireless LANs - Characteristics of wireless LANs - Comparison: infrared vs. radio transmission – Comparison - infrastructure vs. ad-hoc networks - 802.11 - Architecture of an infrastructure network - 802.11 - Architecture of an ad-hoc network - Basics of Satellite communication.

TEXT BOOKS

1. William Stallings, “Wireless Communications and Networks”, Pearson / Prentice Hall of India, 2009.
2. Maral G and Bosquet. M, “Satellite communications systems Techniques and Technologies”, John Wiley & sons, 2009.

REFERENCES BOOKS

1. Vijay K Garg, “Wireless Communication and Networking”, Morgan Kaufmann Publishers, 2010.
2. Dharma PrakashAgrawal and Qing-An Zeng, "Introduction to wireless mobile systems" Thomson India, 2007.
3. Siva Ram Murthy C and Manoj B S, “Ad Hoc Wireless Networks: Architectures and Protocols”, Prentice Hall, 2004.

INTERNET OF THINGS

(Course Code : 18UEC51)

SEMESTER :VI	**ECC**	**CREDITS : 3**

COURSE OUTCOMES:

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

1. Vision and Introduction to IoT.
2. Data and Knowledge Management and use of Devices in IoT Technology.
3. Setting up IoT workflow.
4. Programming with Advanced C.
5. Programming with Python.
6. Building IoT Applications using Raspberry Pi.

UNIT IM2M TO IOT

M2M to IOT: The Vision-Introduction – From M2M to IoT–M2M towards IoT–the Global context –A use case example –Differing Characteristics.

UNIT IIA MARKET PERSPECTIVE

Introduction –Some Definitions –M2M Value Chains –IoT Value Chains –An emerging industrial structure for IoT–The international driven global value chain and global information monopolies.**M2M to IOT-an Architectural Overview:**Building an architecture – Main design principles and needed capabilities – An IoT architecture outline – standards considerations.

UNIT IIITECHNOLOGY FUNDAMENTALS

Devices and gateways –Local and wide area networking – Data management – Business processes in IoT– Everything as a Service(XaaS) – M2M and IoT Analytics – Knowledge Management.

UNIT IVARCHITECTURE MODEL

IOT Architecture-State of the Art : Introduction– State of the Art

Architecture Reference Model: Introduction– Reference Model and architecture –IoT reference Model.

UNIT VIOT REFERENCE ARCHITECTURE AND REAL-WORLD DESIGN CONSTRAINTS

IOT Reference Architecture: Introduction – Functional View – Information View – Deployment and Operational View – Other Relevant architectural views.**Real-World Design Constraints:**Introduction – Technical Design constraints–Hardware is Popular again – Data representation and visualization – Interaction and remote control. **industrial Automation:** Service-oriented architecture-based device integration – SOCRADES: realizing the enterprise integrated Web of Things – IMC-AESOP: from the Web of Things to the Cloud of Things.

TEXT BOOK

Jan Holler, VlasiosTsiatsis, **"**From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence**"** Academic Press, First Edition, 2014.

REFERENCE BOOKS

1. Vijay Madisett, ArshdeepBahga, **"**Internet of Things - Hands-on-Approach", FirstEdition, VPT, 2014.
2. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013.

SOCIAL NETWORKS

(CourseCode : 18UEC61)

SEMESTER: VI	ECC	CREDITS - 3

COURSE OUTCOMES:

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

1. Explain the basic concepts of Graph Theory and Python.
2. Interpret the Power Law and Emergent Properties.
3. Describe Homophily and Structural balance.
4. Interpret the Concepts of Link Analysis and Link Prediction.
5. Describe about diffusion behavior in Networks.

UNIT I

Introduction to Graph Theory and Python – Analyzing Online Social Network Datasets.

UNIT II

Power Law and Emergent Properties – Strength of Weak Ties.

UNIT III

Homophily and Social Influence – Structural Balance.

UNIT IV

The Structure of the web – Link analysis and Web Search – Link Prediction.

UNIT V

Information Cascades – Diffusion Behavior in Networks – The Small World Phenomenon.

REFERENCE

NPTEL Online Course videos by Dr. S. R. SudharshanIyengar, IIT, Ropar.