ST.MARY'S COLLEGE (AUTONOMOUS), THOOTHUKUDI

Bachelor of Science (Computer Science)

Preamble

B.Sc. Computer Science program helps students to master the basic skills needed to analyze a problem and design, implement, to find solution to meet the ever-changing demands of the industry and nurture their innovation and creativity.

Vision

Empower girls byte by byte.

Mission

To create computer professionals of immense quality and impeccable manners who can face and survive the computing and communication revolution that lies ahead with great confidence.

Program Outcomes

PO.No	Upon completion of B.Sc Degree programme , the graduates will be able to
PO 1	Apply the acquired knowledge of fundamental concepts in the field of science and to find solutions to various problems.
PO 2	Inculcate innovative skills and team – work among students to meet societal expectations.
PO 3	Perform analysis to assess, interpret, and create innovative ideas through practical experiments.
PO 4	Facilitate to enter multidisciplinary path to solve day-to-day scientific problems.
PO 5	Carry out fieldworks and projects, both independently and in collaboration with others, and to report in a constructive way.
PO 6	Improve communication ability and knowledge transfer through ICT aided learning integrated with library resources.
PO 7	Transfer the knowledge to the other stakeholders through extensive community development programme.
PO 8	Attain competency in job market / entrepreneurship.

Course Structure (w.e.f.2018- 2019)

Semester – I

Part	Component	Subject Code	Title Of The Paper	Contact Hours/ Week	Credits	Max.Marks		
						CIA	ESE	Total
I	Tamil /	18ULTA11	,f;fhy ,yf;fpak;: nra;As;> ,yf;fzk;> ciueil>rpWfij> ,yf;fpatuyhW Preliminary French Course	6	4	40	60	100
	French	18ULFA11						
II	English	18UGEN11	Prose, Poetry, Extensive Reading & Language Study -I	6	4	40	60	100
III	Core I	18UCSC11	C Programming	4	4	40	60	100
	Core Practical I	18UCSCR1	C Programming Lab	5	3	40	60	100
	Allied I	18UCSA11	Discrete Mathematics	4	3	40	60	100
	Allied Practical I	18UCSAR1	Discrete Mathematics Lab	3	2	40	60	100
IV	Ability Enhancement C	18UAVE11	Value education	2	2	20	30	50
Total				**30**	**22**	**220**	**330**	**650**

Semester II

Part	Component	Subject Code	Title Of The Paper	Contact Hours/ Week	Credits	Max.Marks		
						CIA	ESE	Total
I	Tamil / French	18ULTA21 18ULFA21	rka ,yf;fpaq;fSk;> ePjp ,yf;fpaq;fSk;: nra;As;> ,yf;fzk;>ciuei tho;f;iftuyhW> ,yf;fpatuyhW Basic French Course	6	4	40	60	100
II	General English	18UGEN21	Prose, Poetry, Extensive Reading & Language Study -II	6	4	40	60	100
III	Core II Core Practical II	18UCSC21 18UCSCR2	C ++ Programming C ++ Programming	4 5	4 3	40 40	60 60	100 100
	Allied II Allied Practical II	18UCSA21 18UCSAR2	Digital Principles Office Automation Lab	4 3	3 2	40 40	60 60	100 100
IV	Ability Enhancement Course	18UAEV21	Environmental Studies	2	2	20	30	50
Total				**30**	**22**	**260**	**390**	**650**

Semester III

Part	Component	Subject Code	Title Of The Paper	Contact Hours/ Week	Credits	Max.Marks		
						CIA	ESE	Total
III	Core III	18UCSC31	JAVA Programming	5	4	40	60	100
	Core IV	18UCSC32	Computer Architecture	6	4	40	60	100
	Core Practical III	18UCSCR3	JAVA Programming Lab	6	4	40	60	100
	Allied III	18UCSA31	Data Structures	4	3	40	60	100
	Allied Practical III	18UCSAR3	Data Structures Lab	3	2	40	60	100
IV	Skill Based Core (SBC)	18UCSS31	Microprocessors	4	4	40	60	100
	NME	18UCSN31	Introduction to Computers	2	2	20	30	100
	Ability Enhancement Course	18UAWS31	Women Studies		2	20	30	100
	Self Study Course/On-line Course/Internship (Optional)	18UCSSS1	Web Designing with HTML		+2		50	50
Total				**30**	**25+2**	**80**	**420+50**	**850+50**

Semester IV

Part	Component	Subject Code	Title of The Paper	Hrs/ Week	Credits	Max.Marks		
						CIA	ESE	Total
III	Core V	18UCSC41	Python Programming	5	4	40	60	100
	Core VI	18UCSC42	RDBMS	6	4	40	60	100
	Core Practical IV	18UCSCR4	Python Programming Lab	6	4	40	60	
	Allied IV	18UCSA41	Resource Management Techniques	4	3	40	60	100
	Allied Practical IV	18UCSAR4	Web designing Lab	3	2	40	60	100
	Skill Based Core	18UCSS41	Web Technology	4	4	40	60	100
	NME	18UCSN41	Introduction to Internet	2	2	20	30	50
IV	Ability Enhancement Course	18UAYM41	Yoga & Meditation		2	20	30	50
	Self Study Course/On-line Course/Internship (Optional)	18UCSSS2	Mathematical Reasoning		+2		50	50
V	NCC,NSS &Sports				1			
	Extension Activity and CDP				+1			
Total				**30**	**26+3**	**280**	**390+ 50**	**650+ 50**

Semester V

Part	Component	Subject Code	Title of The Paper	Contact Hours/ Week	Credits	Max.Marks		
						CIA	ESE	Total
III	Common core	18UCCC51	Computer Oriented Numerical Methods	6	4	40	60	100
	Core VII	18UCSC51	Operating Systems	4	4	40	60	100
	Core VIII	18UCSC52	Programming with PHP and MySQL	4	4	40	60	100
	Core integral I	18UCSI51	Data Mining	4	4	40	60	100
	Mini Project	18UCSM51	Mini Project	5	4	40	60	100
	Core Practical V	18UCSCR5	PHP & MySQL Lab	5	3	40	60	100
IV	Common Skill based	18UESS51	Computer for Digital Era And Soft Skills	2	2	20	30	50
	Self study or on-line course (compulsory)		Mathematical Reasoning		2		50	50
Total				30	27			

Semester VI

Part	Component	Subject Code	Title Of The Paper	Contact Hours/ Week	Credits	Max.Marks		
						CIA	ESE	Total
III	Core IX	18UCSC61	Android Programming	5	4	40	60	100
	Core X	18UCSC62	Software Engineering	4	4	40	60	100
	Core XI	18UCSC63	Computer Networks	5	4	40	60	100
	Core Integral II	18UCSE61	Cloud Computing	4	4	40	60	100
	Core practical VI	18UCSCR6	Android Programming Lab	5	3	40	60	100
	Core Integral III/ Project	18UCSP61	Project	7	4	40	60	100
Total				**30**	**23**	**240**	**410**	**650**
Grand Total				**180**	**145+5**			

Semester	Hours	Credits	Extra Credits
I	30	22	---
II	30	22	---
III	30	24	2
IV	30	27	3
V	30	27	--
VI	30	23	--
Total	**180**	**145**	**5**

Courses	**Number of Courses**	**Hours / week**	**Credits**	**Extra Credits**
Language	2	12	8	--
English	2	12	8	--
Core	12T+7P	56T+34P	48T+20P	--
Core Skill Based	2	8	8	--
Core Integral	2	8	8	--
Mini Project	1	5	4	
Group Project	1	7	4	--
Allied	4	16T+12P	12T+8P	--
NME	2	4	4	--
Ability Enhancement Course	4	4 (4 Extra Hours)	8	--
Common Skill Based	1	2	2	--
NCC, NSS & Sports		--	1	
Extension Activities		--		1
Self Study Papers (Optional)	2	--		4
Self Study Papers (Compulsory)	1	--	2	--
Total		**180**	**145**	**5**

ProgramSpecificOutcomes

PSO-1	Understand the basic operation of digital computers.
PSO-2	Acquire sufficient programming Skill through various concepts of computer languages
PSO-3	Apply mathematical concepts in solution of common computing applications
PSO-4	Discuss computing algorithm concepts in the solution of computing applications.
PSO-5	Understand the standard techniques for solving a problem on a computer, including programming techniques
PSO-6	Employ various techniques for the representation of informationin computers
PSO-7	Build skills to create web pages with various technologies
PSO-8	Describe nature of the software development process, testing and effective document preparation.
PSO-9	Understand the various techniques and operations of system software
PSO-10	Enhance students skills and embrace new computing technologies and encouraging self-learning activities

SEMESTER- I			
Core – I - C Programming			
Code: 18UCSC11	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

Understand the basic concepts of Structured programming language

Mission:

Able to design, code, test and debug an application

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Draw the flow chart for the given problem And algorithm	1	Un
CO-2	Describe the various operators and library functions and to define I/O functions	3	Un
CO-3	Compare and contrast loops	4	An
CO-4	Implement recursion	8	Ap
CO-5	Understand the concept of storage classes	9	Un
CO-6	Implement different operations on arrays	3	Ap
CO-7	Develop an application using pointer.	5	Cr
CO-8	Develop application using structure and pointers	10	Cr

Unit I:

Algorithms - Flow charts:

Developing algorithms and flowcharts forsolving simple problems

C Fundamentals: The C Character Set - Identifiers and Keywords - Data Types – Constants–Variables and Arrays - Declarations - Expressions - Statements - Symbolic Constants.

Unit II:

Operators and Expressions: Arithmetic Operators - Unary Operators - Relational and Logical Operators - Assignment Operators - The Conditional Operator - Library Functions.

Data Input and Output: Single Character Input-The getchar Function-Single Character Output-The putchar Function-Entering Input Data-More about the scanf function-Writing output data – The printf function- The scanf Function-More about the printf function -The gets and puts Functions.

Unit III:

Control Statements: Branching: The if-else Statement-Looping: The While Statement-More Looping: The do-while Statement-Still More Looping: The for Statement-Nested Control Structures-The switch Statement-The break Statement-The continue Statement-The comma Operator-The goto Statement.

Functions: Defining a Function-Accessing a Function-Function Prototypes- Passing Arguments to a Function- Recursion.

Unit IV:

Program Structure: Storage Classes- Automatic Variables- External (Global) Variables-Static Variables

Arrays: Defining an Array - Processing an Array - Passing Arrays to Functions - Multidimensional Arrays-Arrays and Strings.

Unit V:

Pointers: Fundamentals-Pointer Declarations- Passing Pointers to Functions- Pointers and One-Dimensional Arrays-Dynamic Memory Allocation- Operations on Pointers-
Pointers and Multidimensional Arrays -Arrays of pointers.

Structures and Unions: Defining a Structure - Processing a Structure - User Defined Data types (typedef) - Structures and Pointers - Passing Structures to Functions - Unions.

Text Book:

1. Byron Gottfried ,Programming with C ,, McGraw Hill Education (India) Private Limited, 3rd Edition .**Chapters: 2,3,4,6,7,8,9,10,11 and 12.**

Books for Reference:

1. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearsoneducation, 2006.
2. Gary.J.Bronson, A first Book of ANSI C 3rd Edition, Thomson learning 2001.
3. Kumar Agrawal, Programming in ANSI C., Tata McGraw Hill, 2006.
4. VenugopalPrasad, Programming with C, Tata McGraw Hill, 2006
5. E. Balagurusamy, Programming in ANSI C Sixth Edition,, McGraw Hill Education (India) Private Limited, 2012
6. S. Jaiswal, “Information Technology Today”, GalgotiaPublications,First Edition, 1999.

SEMESTER- I			
CorePractical I- C Programming Lab			
Code: 18CSCR1	**Hrs / week :5**	**Hrs / Semester:75**	**Credits :3**

List of Practicals :

1. Solve Quadratic Equation- control statements

2. Sum of Digits & reverse the number.

3. Prime number Checking

4. Sine Series evaluation

5. Binary search

6. Sorting an Array of numbers

7. Linear Searching using function

8. Sorting an array of names

9. Counting no. of vowels,consonants, words and white spaces in a line of text.

10.EB Bill using Structure

11.Exchanging values using pointers

12.Matrix multiplication using pointers

SEMESTER- I			
Allied – I Discrete Mathematics			
Code: 18UCSA11	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :3**

Vision:

To attain mathematical foundations which is very essential for the study of computer courses like data structures, computer algorithms, computer networks.

Mission:

Help students to think mathematically and logically. Comprehend and construct mathematical arguments.

Course Outcomes:

CO.No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Define basic principles of sets and operations in sets	**4**	**Re**
CO-2	Demonstrate relations	**4**	**Ap**
CO-3	Apply counting principles	**8**	**Ap**
CO-4	Compute the shortest path	**8**	**Cr**
CO-5	Create an argument using logical notation and evaluate if it is valid or not.	**1**	**Cr**
CO-6	Apply logical reasoning to solve a variety of problems.	8	**Ap**
CO-7	Model problems in computer science using graphs and trees and traverse them depending on the problem.	**8**	**Ap**
CO-8	Construct spanning tree and traverse trees and graphs.	**5**	**Cr**

Unit I:

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, partitions – mathematical induction.

Relations:

Introduction – product sets – relations – pictorial representations of relations – composition of relations – types of relations – closure properties – equivalence relations – partial ordering relations – n-ary relations.

Unit II:

Functions 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 III:

Logic 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 IV:

Counting:

Introduction, Basic counting principles – factorial Notation – Binomial coefficients – permutations – combinations – the pigeonhole principle – the inclusion – exclusion principle – ordered and unordered partitions.

Unit V:

Graph Theory:

Introduction, data structures – graphs and multigraphs – subgraphs, Isomorphic and homeomorphic graphs – paths, connectivity – the bridges of konigsberg, traversable multigraphs – labeled and weighted graphs – complete, regular, and bipartite graphs – tree graphs.

Directed Graphs :

Introduction- Directed Graphs- Basic Definitions- Rooted Trees.

Text Book:

1. Seymour Lipschutz, Marc Lipson Discrete Mathematics Third Edition, Tata McGraw Hill,2010.

Books for Reference:

1. B.S. Vatsa, “Discrete Mathematics”, WishwaPrakashan, Third Edition.
2. K.D. Joshi, “Foundation of Discrete Mathematics”, Wiley Eastern Ltd.
3. Kenneth H. Rosen “Discrete mathematics and its application”,McGraw-Hill Publishing Co.; 5th edition (November 1, 2002).

SEMESTER- I			
Allied Practical I-Discrete Mathematics Lab			
Code: 18UCSAR1	**Hrs / week :3**	**Hrs / Semester: 45**	**Credits :2**

List of Practicals :

1. Sum of series of squares of N numbers
2. Sum of series of odd numbers
3. Sum of series of even numbers
4. Polynomial Evaluation using Horner's methods.
5. Greatest Common divisor using Euclidian Algorithm.
6. Evaluate the function using Ackermann function.
7. Generate Pascal's Triangle.
8. Fibonacci series using recursive function.
9. Binomial co-efficient using recursive function.
10. Find out the frequency of numbers using function.
11. Computing Permutation P(n,r) and Permutation with repetitions.
12. R- Combination of a string

SEMESTER- II			
Core II- C++ Programming			
Code: 18UCSC21	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

Understand the basic concepts of object orient programming language

Mission:

Able to design,code,test and debug an application

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Know about object oriented features.	**8**	**Un**
CO-2	Understand the various operators and I/O functions	**3**	**Re**
CO-3	Write program using inline and friend function and to implement overloading constructor	**3**	**Cr, AP**
CO-4	Understand array of objects and to Demonstrate operator overloading	**8,9**	**Un, AP**
CO-5	Compare different inheritance methods	**3**	**An**
CO-6	Develop linked list	**5**	**Cr**
CO-7	Understand virtual function	**8**	**Un**
CO-8	Create an application using file operations	**10**	**Cr**

Unit I

The Big Picture: Why Do Need Object Oriented Programming- Characteristics of Object Oriented Languages -C++ and C-Laying the Groundwork.

C++ Programming Basics:Basic Program Construction - Output Using cout -Preprocessor Directives – Comments - Integer Variables- Character Variables - Input with cin- Type float- Manipulators-Variable type Summary-Type conversion-Arithmetic Operators-Library Functions.

Unit II

Function:

Simple Functions - Passing Arguments to Functions -Returning Values from Functions - Reference Arguments - Overloaded Functions - Inline Functions - Default Arguments- Variables and Storage Classes - Returning by Reference.

Objects and Classes:

A Simple Class - C++ Objects as Physical Objects - C++ Objects as Data Types- Constructors - Objects as Function Arguments -Returning Objects from unction- A Card Game Example-Structures and Classes-Classes, Object, and Memory-Static Class Data-What Does It All Mean?

Unit III

Arrays:

Array Fundamentals - Array as Class Member Data - Array of Objects - String.

Operator Overloading:

Overloading Unary Operators - Overloading Binary Operators-
Data Conversion- Pitfalls of Operator Overloading and Conversion.

Unit IV:

Inheritance:

Derived Class and Base Class - Derived Class Constructors - Overriding Member Functions-Inheritance in the English Distance Class - Class Hierarchies-Public and Private Inheritance-Levels of Inheritance-Multiple Inheritance-Ambiguity in Multiple Inheritance - Containership: Classes with Classes - inheritance and Program Development.

Pointers:

Addresses and Pointers - Pointer Variables - Pointers and Array - Pointers and Functions - Pointers and Strings - Memory Management: new and delete - Pointers to Objects - A Linked List Example - Pointers to Pointers - Debugging Pointers.

Unit V:

Virtual Functions:

Virtual Functions - Friend Functions - Static Functions -assignment and Copy Initialization -The *this* Pointer.

Files And Streams:

Streams -String I/O -Character I/O - Object I/O -I/O with Multiple Objects -File Pointers - Disk I/O with Member Functions - Error Handling - Redirection - Command Line Arguments - Printer Output - Overloading the Extraction And Insertion Operators.

Text Book:

1.Robert Lafore, Object-Oriented Programming in C++, 4thEdition,Pearson and Dorling Kindersley Publications.

Books for Reference:

1. E.Balagurusamy, Object Oriented Programming C++ 5thEdition., Tata McGraw-Hill, 2011.
2. D.Ravichandran, Programming with C++ 2ndEdition., Tata McGraw-Hill, 2010.
3. Y.VenugopalRajkumarRavishankar, Mastering C++, Tata McGraw –Hill, 2011.
4. Debasish Jana, C++ and object oriented programming paradigm 2nd Edition, PHI publications, 2005.
5. DeitelandDeitel ,C++ How to Program , Fourth Edition, Prentice Hall,2004

SEMESTER- II			
Core Practical II- C++ Programming Lab			
Code: 18UCSCR2	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

List of Practical's :

1.Write a program in C++ to perform Area calculation using Function overloading

(Minimum three functions).

2. Write a program to implement constructor overloading

3.Write a program to swap two values between two class objects using friend function.

4.Write a program in C++ to display the details of employees using array of objects.

5.Write a C++ program to overload Binary + operator which adds two complex numbers.

6.Write a C++ program to overload Relational operator = = to compare two strings.

7.Write a C++ program using class and objects to find row and column total of a matrix.

8.Using class and objects, find the sum of two matrices using pointers.

9.Write a program using multiple inheritances to process students mark list.

10.Write a program using multi level inheritance to process telephone billing.

11.Write a program in C++ using virtual function.

12.Write a program in C++ to process mark listing using binary file.

13.Write a program to open a file in output and input mode. Accept data and write to the file. Display the contents of the file.

SEMESTER- II			
Allied II Digital Principles			
Code: 18UCSA21	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :3**

Vision:

To Understand the basic concepts used in the design and analysis of digital systems .

Mission:

Acquire knowledge in Boolean functions and MSI and LSI logic circuits .

Course Outcome:

CO.No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Understand various Number Systems and Boolean functions.	9	Un
CO-2	Apply various methods to simplify Boolean function.	4	Cr
CO-3	Construct digital circuits for Boolean functions with logic gates.	6	Cr
CO-4	Design combinational circuits with logic gates.	6	Cr
CO-5	Apply classical techniques for the logical design of combinational and sequential circuits	6	Ap
CO-6	Define Sequential logic circuits.	6	Re
CO-7	Understand the basic operation of Flip-Flops.	2	Re
CO-8	Understand the various Registers-transfer methods .	2	Re

Unit I:

Binary Systems :

Digital Computers and Digital Systems **–** Binary numbers – Number base conversion – Octal and Hexadecimal numbers – Complements – Binary Codes –Basic theorems and properties of boolean algebra– Boolean functions – Canonical and Standard forms – Digital Logic Gates .

Unit II:

Simplification of Boolean Functions :

The Map method – Two and Three variable Maps – Four Variable Map – Five and Six Variable Maps – Product of Sums Simplification – NAND and NOR Implementation – Other two-level Implementations – Don't care conditions – The Tabulation method – Determination of Prime – Implicants – Selection of Prime – Implicants

Unit III:

Combinational Logic :

Introduction – Design Procedure – Adders – Subtractors – Code Conversion– Multilevel NAND Circuits – Multilevel NOR Circuits – Exclusive-OR and Equivalence Functions.

Unit IV:

Combinational Logic with MSI and LSI :

Introduction – Binary Parallel Adder – Decimal Adder – Magnitude Comparator – Decoders – Multiplexers

Unit V:

Registers and Counters:

Sequential logic -Introduction – Flip-Flops -Basic Flip-Flop Circuit-Clocked RS Flip-Flop-D-Flip-Flop-JK Flip-Flop- T-Flip-Flop- Registers – Shift Registers

Text Book :

1. M. Morris Mano, Digital Logic and Computer Design, , Fourth Edition Prentice Private Limited

Chapters : 1.2-1.6, 2.3-2.5,2.7,3.1-3.11,4.1-4.5,4.7-4.9,5.1-5.6,6.1,6.2,7.1-7.3

Books forReference :

1.CharlesH.Roth, Jr. "Fundamentals of Logic Design", 7th Edition, Jaico Publishing House, 1996.

2.DonaldD.Givone, "Digital Principles and Design", Tata McGraw-Hill, 2007.

3.DonaldP.Leach and Albert Paul Malvino, Digital Principles andApplications, Seventh ed., Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.

SEMESTER- II			
Allied-Practical I Office Automation Lab			
Code: 18UCSAR2	**Hrs / week :3**	**Hrs / Semester: 45**	**Credits :2**

List of Practical's :

1. Type a paragraph and use various formatting.
2. Usage of Numbering, Bullets, Indents and Headers in a Word Document
3. Prepare a Calendar in a Word Document
4. Design a wedding invitation in Word Document
5. Usage of Spell Check, Find and Replace
6. Picture Insertion and Alignment
7. Use mail merge in word.
8. Prepare class time table.
9. Prepare a semester wise mark statement for a computer class of 20 students using any spreadsheet' worksheet. Total, average and rank the student marks. Give proper headings. Make the column headings bold and italic.
10. Consider the sample employee worksheet and calculate their salary. Plot it using chart.
11. Use any spreadsheet to use mathematical, statistical and logical functions
12. Use any spreadsheet to plot a chart for marks obtained by the students.

SEMESTER- III			
Core – III – Java Programming			
Code: 18UCSC31	**Hrs / week :5**	**Hrs / Semester: 75**	**Credits :4**

Vision:

To attain the skill of developing applications, to solve problems.

Mission:

To create real world applications and applets using JAVA.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSOs Mapped	CL
CO-1	Know the various operators , Class and Methods of Java	1	Re
CO-2	Analyze the concept of Exception -Handling	2	An
CO-3	Describe multi threading	4	Un
CO-4	Discuss the Basics of Applet Concept	1	Re
CO-5	Apply Event Handling Mechanisms	4	Ap
CO-6	Implement AWT Controls	4	Ap
CO-7	Design JDBC Package	4	Cr
CO-8	Create an application using RMI	10	Cr

Unit I:

The History and Evolution of Java:

Creation of java - Operators – Control statements – Class , Methods , Inheritance

Packages and Interfaces:

Packages-Access Protection – Importing Packages- Interfaces.

Unit II:

Exception Handling:

Exception-Handling Fundamentals-Exception Types-Uncaught Exceptions-Using try and catch-Multiple catch clauses-Nested try Statements-throw-throws-finally-Java‘s Built-in Exceptions.

Multithreaded Programming:

Java Thread Model-Main Thread-Creating a Thread-Creating Multiple Threads- Using isAlive() and join ()-Thread Priorities-Synchronization - Interthread Communication-Suspending, Resuming, and Stopping Threads-Using Multithreading.

Unit III:

The Applet Class: Applet Basics -Applet Architecture - Applet Skeleton - Simple Applet Display Methods - Requesting Repainting - HTML APPLET tag - Passing Parameters toApplet.

Event Handling:

Event Handling Mechanisms - Delegation Event Model - Event Classes(The Action Event, Item Event, Key Event , Mouse Event) - Sources of Events - Event Listener Interfaces(Action Listener ,Item Listener, Key Listener, Mouse Listener) - Adapter Classes

Introducing the AWT:

AWT Classes-Window fundamentals -working with FrameWindows -Working with Graphics.

Unit IV:

Using AWT Controls:

Controls Fundamentals-Labels-Using Buttons-Applying Check Boxes-Check Box Group-Choice Controls-Using a Text Field-Using a Text Area-Understanding Layout Managers-[Flow Layout Only]-Menu Bars and Menus.

RMI:

Remote Method Invocation – Text Formatting

Unit V:

JDBC Package:

JDBC – JDBC versus ODBC – Types of JDBC drivers – Connection – Statement – PreparedStatement.

ResultSet:

Fields of ResultSet – Methods of ResultSet – Executing a query - ResultSetMetaData – DatabaseMetaData.

Database in JDBC:

Basicdatatypes in JDBC – Advanced datatypes in JDBC – fields of Statement – methods of Statement

Text Books:

1.Herbert Schildt, The Complete Reference Java™ ,8thEdition, TATAMcGRAW- HILL EDITION, 2011. Chapters: 1, 9, 10, 11,21,22,23,24,29,30,31 (Unit I,II,III,IV)

2. S..Horstmenn and Gary Cornell, Core Java2 Volume II Advanced Features, The Sun Microsystems press Java Series,2002. Chapter: 4.(Unit V)

Books for Reference:

1. Steven Holzner, Java 2 Programming Black Book ,DreamTech Press,2005.

2. Joseph O'Neil, JavaBeans Programming from the GroundUp, TMGH, New Delhi,1998

3.KathyWalrath, The J2EE Tutorial, Pearson Education Asia, 2003.

SEMESTER- III			
Core – IV– Computer Architecture			
Code:18UCSC32	**Hrs / week :6**	**Hrs / Semester: 90**	**Credits :4**

Vision:

To understand internal functioning of computer systems

Mission:

To use various algorithms for mathematical operations and different storage media efficiently.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSOs Addressed	CL
CO-1	Discuss the organization of basic computer	1	Un
CO-2	Explain various types of instructions.	2	Un
CO-3	Define Interrupts.	1	Un
CO-4	Explain general register organization and stack organization.	2	Un
CO-5	Discuss various addressing modes.	2	Ap
CO-6	Discuss various types of instructions depends on the operation performed and parallel processing.	2	Un
CO-7	Explain algorithms for arithmetic operations of various Number Systems , input /output organization and DMA	1	Un
CO-8	Discuss memory hierarchy with different types of memories.	1	Un

Unit I:

Basic computer organization and design :

Instruction codes –computer registers –computer instructions –timing and control – instruction cycle-memory reference instructions-input/output and interrupt

Unit II:

Central processing Unit :

General register organization –stack organization-instruction formats –addressing modes-data transfer and manipulation-program control-Reduced Instruction Set Computer.

Pipe and Vector Processing :

Parallel Processing – Pipelining.

Unit III:

Computer Arithmetic :

Addition and subtraction – multiplication algorithms-division algorithms-floating point arithmetic operations- Decimal Arithmetic unit- Decimal Arithmetic operations

Unit IV:

Input output organization:

Peripheral Devices –Input output interface – Asynchronous Data Transfer – modes of transfer – Priority Interrupt – direct memory access.

Unit V:

Memory organization :

Memory hierarchy –main memory –auxiliary memory-associative memory – cache memory – virtual memory

Text Book :

Morris Mano , Computer System Architecture , Third Edition PHI Private Limited .

Unit I: Chapter 5.1-5.7

Unit II: Chapter 8.1-8.8, 9.1,9.2

Unit III : Chapter 10,1-10.7

Unit IV : Chapter 11.1 -11.6

Unit V : Chapter 12.1 -12.6

Books for Reference:

1.P.V.S. Rao ,Computer system Architecture ,PHI William Stallings,Computer Organization and Architecture: Designing for Performance , Pearson

2.JhonP.Hayes ,Computer Organization and Architecture ,Third Edition , Tata McGRAW HILL.

3.P.Chakraborthy, Computer Organization and Architecture, Jaico Publishing House.

SEMESTER- III			
Core – Practical III – Java Programming Lab			
Code: 18UCSCR3	**Hrs / week :6**	**Hrs / Semester: 90**	**Credits :4**

List of Practicals :

1.Write a Java program to find the area of a square, rectangle by

i.Overloading Constructor

ii. Overloading Method

Define a class called Student with data members name, roll number and age.

2.Write a suitable constructor and a method output () to display the details. Derive another class Student from Student1 from Student with data members height and weight.Write a constructor and a method output () to display the details which overwrites the super class method Output () (Apply method Overriding concept).

3.Write a java program to create a package "Employee" which contains the classes Emp and Emppay.The data members of Emp are name, emp_id, category and Bpay.Write suitable constructors and methods to compute net pay of the employee. The class Emppay contains the main method.

4.Write a java program to create and implement an interface.

5.Write a java program to create a thread

i. Using Thread class ii.Using runnable interface

6.Write a java program to design a calculator to perform arithmetic operations.

7.Create an applet with four Checkboxes with labels and a Text area object. The program must display the details while clicking a particularCheckbox.

8.Write a java program, which creates a window with a checkbox group with boxes for the colors, Violet, Indigo, Yellow, Orange, Red, Blue and Green. When the button is selected the background color must change accordingly.

9.Write a java program to demonstrate the use of choice box.

10.Write a java program to throw the following exception,

i. Negative Array Size ii. Array Index out of Bounds

11.Write a java program to illustrate mouse event handling.

12.Write a java program to create a File menu with options new, save, and close,

edit menu with options cut, copy and paste.

13.Write a program to display your marksheet using JDBC.

SEMESTER- III			
Allied III– Data Structures			
Code: 18UCSA31	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :3**

Vision:

To develop different algorithms and data structure efficiently.

Mission:

To represent real world problems using different data structures and solve them using best algorithms

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Analyze efficiency of algorithms	1	An
CO-2	Compare various search methods	4	An
CO-3	Choose the appropriate data structure needed to solve the problem.	4	Ap
CO-4	Design stacks and queues	4	Cr
CO-5	Discuss applications of stack and queue	6	Un
CO-6	Create an expression tree for an expression and evaluate it.	3	Cr
CO-7	Implement graph traversals	3	Ap
CO-8	Compare and contrast sorting methods	4	An

Unit I:

Introduction: Pseudo code – The Abstract Data Type – A Model for an Abstract Data Type Algorithms Efficiency.

Searching : List Searches – Hashed List Searches – Collision Resolution

Unit II:

Linked Lists : Linear List Concepts – Linked List Concepts – Linked List Algorithms – Processing a Linked List – Complex Linked List Structures

Unit III:

Stacks And Queues: Basic Stack operations – Stack Liked List Implementation – Stack Applications – Queue operations – Queue Linked List Design

Unit IV:

Trees : Basic Tree Concepts – Binary Trees – Binary Tree Traversals – Expression Trees – General Trees – Binary search Trees – Heap Definition-Heap Structure – Basic Heap Algorithms. – Heap Data Structures – Heap Algorithms

Unit V:

Sorting and Graphs : General sort concepts – Quick sort – External sorts. Graphs– Terminology – Operations –Graph storage structure- Graph Algorithms – Insertion – Deletion – Traversal – BFS and DFS – Networks – Minimum Spanning Tree – Shortest Path Algorithm.

Text Book:

1. Richard F.Giolberg&Behrouz,A. forouzan,Data Structures - A Pseudo codeApproach with C++, 4th edition Thomson Brooks /Cole,2001

Chapters 11,2.1,2.3,2.4,3.1 – 3.4 ,3.6,4.1 -4.3 ,5.1 ,5.2,7.1 -7.5 ,8.1,9.1 -9.5,11.1,11.4(Quick sort only),11.5 , 12.1 -12.5

Books for Reference:

1. Ellis Horowitz &SartajSahani, Fundamentals of DATA STRUCTURES, GalGotia publications,2006.
2. Adam Drozdek, Data Structures & Algorithm in Java third edition, Ingram,2008.

SEMESTER- III			
Allied-Practical III–Data Structures Lab			
Code: 18UCSAR3	**Hrs / week :3**	**Hrs / Semester: 45**	**Credits :2**

List of Practicals :

1. Sequential search and Binary search
2. Implement linked list and perform the following operations

   i. Add a node as first nodeii. Add a node as last node

3.Implement Linked list and perform the following operations.

   i. Delete the first node ii. Delete the last node

4. Implement a stack using Linked List and perform the push and pop operations.
5. Implement a queue using Circular list and implement add and delete operations.
6. Implement binary tree using Linked and perform the following traversal.

   a. Inorder Traversal b. Preorder Traversal c. Post order Traversal

7. Implement Graph using Adjacency matrix and perform the DFS &BFS Traversal
8.Merge sort.
9.Quick sort.

SEMESTER- III			
Skill Based Core – Microprocessors			
Code: 18UCSS31	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

Acquire fundamental knowledge on hardware and software concepts of CPU architecture and design, facilitates fundamental assembly language programming concept and adapt to microcontroller environment.

Mission:

Emphasizing intel 8085 microprocessor Architecture, Instruction set , assembly language programming and interfacing . Overview on Intel family of microprocessors.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Explain basic components and structure of Microprocessor and Microcomputers	1	Un
CO-2	Describe 8085 Microprocessor and Memory Interfacing.	2	Un
CO-3	Explain 8085 Microprocessor Programming model.	3	Un
CO-4	Explain various categories of 8085 Microprocessor instruction set.	2	Un
CO-5	Execute simple Assembly language Programs.	3	Ap
CO-6	Explain various Assembly language programming techniques .	3	Un
CO-7	Develop Assembly language Programs.	4	Cr
CO-8	Explain interrupts in 8085 Microprocessor and high performance Processors.	1	Un

Unit I:

Microprocessor, Microcomputers and Assembly Language:

Microprocessors-Microprocessor Instruction Set and Computer Languages-From Large Computers to Single Chip Micro Controllers.

8085 Microprocessor Architecture And Memory Interfacing : The 8085 MPU- Memory Interfacing – Interfacing the 8155 memory section.

Unit II:

Introduction to 8085 Assembly Language Programming:

The 8085 Programming Model-Instruction Classification – Instruction Format -How to Write, Assemble and Execute a Simple Program-Overview of the 8085 Instruction Set.

Introduction to 8085 Instructions:

Data transfer operations-Arithmetic Operations-Logic Operation – Branch Operations – Writing Assembly Language Programs-Debugging a Program- I/O interfacing

Unit III:

Programming Techniques With Additional Instructions:

Programming Techniques: Looping ,Counting and Indexing- Additional Data Transfer and 16bit Arithmetic Instruction- Arithmetic Operations Related to Memory-Logic Operations: Rotate, Compare-Dynamic Debugging.

Counters And Time Delays:

Counters and Time Delays-Hexadecimal Counter-Modulo ten Counter-Generating Pulse Waveforms-Debugging Counter and Time Delay Programs.

Unit IV:

Stacks And Subroutines:

Stack-Subroutine-Restart, Conditional Call and Return Instruction-Advanced Subroutine Concepts.

Code Conversion, BCD Arithmetic And 16bit Data Operations:

BCD to Binary Conversion-Binary to BCD Conversion-BCD Addition and Subtraction-Multiplication-Subtraction with carry.

Unit V:

Interrupts: The 8085 Interrupts-Vectored Interrupts-Restart as Software Instruction.

Introduction to high performance processors: Intel 80386/80486, Intel Pentium , RISC.

Text Book:

1. Ramesh Goankar, "Microprocessor Architecture, Programming And Applications With The 8085", 5THedition,Penram International Publishing Private Limited. .(chapters 1.1-1.3, 2.1-2.5, 4.1,4.3, 4.4, 5.1 - 5.4, 6.1-6.6, 7.1-7.6, 8.1-8.5 , 9.1-9.4 ,10.1, 10.2 , 10.5, 10.6,10.8,10.9, 12.1 , 12.2, 12.3 ,18.4)

Books for Reference:

1. Yu – Cheng Liu, GlennA.Gibson , “Microcomputer Systems, The 8086/8088 family architecture , Programming and design”PHI,2000.
2. Introduction to microprocessors - Fourth edition , Aditya P MathurTata McGraw Hill.

SEMESTER-III			
Self Study Course I - Web Designing With HTML			
Code: 18UCSSS1	**Hrs/week**	**Hrs/sem:**	**Credits: 2**

Vision:

To create attractive web pages.

Mission:

Design web pages with images, audio and video. Create online forms.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Differentiate web browsers and search engines	2	An
CO-2	Create email id.	5	Ap
CO-3	Add absolute URLs, relative URLs, and named anchors to the Web pages.	7	Ap
CO-4	Create web pages with images and image map	7	Cr
CO-5	Apply styles to web pages with CSS	7	Ap
CO-6	Create websites with multimedia content	7	Cr
CO-7	Create websites with frames	7	Cr
CO-8	Create websites with inline frames	7	Cr

Unit I:

Introduction : What is HTML- HTML editors –web browsers – www- w3c- creating,saving and viewing HTML documents – Applying Structure Tags – Applying common tags and attributes- Including fancier formatting. Creating an email id , sending and receiving mails.

Unit II:

Linking Documents: URL anatomy-types of URL-Constructing link anchors – Linking to a specific location in a document – Inserting E-mail Links.

Including Images : Developing images –adding images – using image as links creating image maps – using background images.

Unit III:

Using Style sheets: How do stylesheets work – Implementing style sheets.

Developing Tables : Creating Basic Tables – Adding or removing rows and columns – spanning rows and columns – adding captions – formatting tables.

Unit IV:

Including Multimedia : Adding sound – adding video.

Developing HTML forms: Determining form content – creating forms –processing forms.

Unit V:

Creating Frames : Understanding Frames – deciding to use frames – creating frames-enabling effective navigation – creating inline frames.

Adding JavaScript: What is JavaScript – Adding JavaScript – Adding event handlers.

Scripting

Text Books:

1. Mastering HTML 4 premium edition Deborah S. Ray and Eric J.Ray BPB Publications

   Unit I : Chapter 1,2

   Unit II : Chapter 3,6

   Unit III: Chapter 4,8

   Unit IV: Chapter 9,10(pages 325-350)

2. Internet and web Design , Ramesh Bangia, Firewall Media.

   Unit I : Chapter 5 (working with e-mail).

Books for Reference:

1. HTML Black Book Steven Holzner
2. HTML 4 U RohitKhurana, APH Publishing Corporation
3. HTML the complete reference ,Thomas Powell
4. Sams Teach Yourself HTML 4 in 10 Minutes (2nd Edition)by Deidre Hayes, Tim Sams,Sams Publications
5. HTML,DHTML.JavaScript,Perl CGI ,Ivan Bayross , Third Edition, BPB Publications
6. Learn HTML 4 In A Weekend,SteveCallihan premier press
7.

NME Course Outcomes

Program Outcomes

o	**Upon completion of B.Sc Degree programme , the graduates will be able to**
	Apply the acquired knowledge of fundamental concepts in the field of science and t find solutions to various problems.
	Inculcate innovative skills and team – work among students to meet societal expectations.
	Perform analysis to assess, interpret, and create innovative ideas through practical experiments.
	Facilitate to enter multidisciplinary path to solve day-to-day scientific problems.
	Carry out fieldworks and projects, both independently and in collaboration with oth and to report in a constructive way.
	Improve communication ability and knowledge transfer through ICT aided learning integrated with library resources.
	Transfer the knowledge to the other stakeholders through extensive community development programme.
	Attain competency in job market / entrepreneurship.

ProgramSpecificOutcomes

PSO-1	Understand the basic operation of digital computers.
PSO-2	Acquire sufficient programming Skill through various concepts of computer languages
PSO-3	Apply mathematical concepts in solution of common computing applications
PSO-4	Discuss computing algorithm concepts in the solution of computing applications.
PSO-5	Understand the standard techniques for solving a problem on a computer, including programming techniques
PSO-6	Employ various techniques for the representation of informationin computers

PSO-7	Build skills to create web pages with various technologies
PSO-8	Describe nature of the software development process, testing and effective document preparation.
PSO-9	Understand the various techniques and operations of system software
PSO-10	Enhance students skills and embrace new computing technologies and encouraging self-learning activities

SEMESTER –III			
Part –IV Non Major Elective - Introduction To Computers			
Code: 18UCSN31	**Hrs/week: 2**	**Hrs/Sem. : 30**	**Credits: 2**

Vision

To be among the nation's premier small research and teaching Computer Science departments.

Mission

To create, share, and apply knowledge in Computer Science.To educate students to be successful, ethical, and effective problem-solvers and life-long learner

Course Outcomes:

CO No.	**Upon completion of this course, students will be able to**	**PSOs addressed**	
CO-1	Know about basic concept of Computer	**8**	
CO-2	Understand the various devices used in computer	**3**	
CO-3	Understand the Processing speed and memory storage of computer device	**3**	
CO-4	Understand the input and output devices and how it is helpful to the people	**8,9**	
CO-5	Compare different types of storage devices and the way of storing information	**3**	
CO-6	Understand various types of network	**5**	
CO-7	Understand devices that used to make communication among systems	**8**	
CO-8	Analyze different types of communication channel used	**10**	

Unit I:

An Overview of the Computer System :Page numbers 2 to 30

Looking Inside The Machine - The Processor - Memory - Input and Output Devices - Storage - Softwares - Operating Systems - Application Software - The Shapes of Computer - SuperComputers - Mainframe Computers - MiniComputers - Workstations - Personal Computers.

Unit II:

Processing Data: Page Numbers105 To 112

How Computers Represent Data ?- Bits and Bytes - Text Codes - The CPU - Memory.

Unit III:

Interacting With The Computer :Page Numbers40 To 56 , 73 To 84 , 88 To 95

The keyboard - The Mouse –variants of the mouse –Devices for the Hand - Monitor (CRT & Flat Panel) – other types of monitors – comparing monitors –PC Projectors - Sound Systems – Printers – other high quality printers -Plotters

Unit IV:

Storage and operating system:Page Numbers64-68,75-79

Floppy disk-Hard disk-Magnetic tape-optical storage devices-solid state devices-types of operating system-Batch processing-Multi processor-Multiprogramming and multitasking-Time sharing-Real-time/Online operating system-Distributed operating system-Network operating system

UNIT V

Networks And Data Communications:Page Numbers297 To 316 , 317 To 328

The Uses of a Network - Categories of Networks - Network Topologies For Lans - Network Media And Hardware - The network interface card , Network protocols

Text Book

1) Peter Norton's Introduction to computers Tata McGraw-Hill Edition.

Unit I (lesson 1 ,lesson 2 Page numbers 2 to 30)

Unit II (lesson 7 Page numbers 105 to 112)

Unit III (lesson 3 , lesson 4 , lesson 5 ,lesson 6 (Page numbers 40 to 56 , 73 to 84 , 88 to

95)

Unit IV (lesson 9 , lesson 10 Page numbers 147 to 167 ,170 to173)

Unit V (lesson 17 , lesson 18 Page numbers 297 to 316 , 317 to 328)

Books for Reference :

1) Computer Fundamentals , Architecture and Organization – B.Ram

2) Computers the user Perspective –Stalling Hutchinson Sawyer

3) Understanding Computers – Richard Stevens

4) Computers Today – Suresh . K Basandra

SEMESTER- IV			
Core V– Python Programming			
Code: 18UCSC41	**Hrs / week :5**	**Hrs / Semester: 75**	**Credits :4**

Vision:

To develop the skill of analysing a problem and solving it using computers.

Mission:

To design, debug and test a robust system using Python.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Explain what is python and why it is a powerful	2	Un
CO-2	Distinguish various python objects	1	An
CO-3	Apply decision and repetition structures in program design.	1	An
CO-4	Demonstrate the use of Python lists and dictionaries	1	Ap
CO-5	Demonstrate how to read and write files Programs in Python	2	Ap
CO-6	Develop Python programs using files.	5	Cr
CO-7	Identify the errors in csv files using and rectify.	6	Ap
CO-8	Write python programs to solve problems	10	Cr

Unit I:

Introduction and overview :

Introduction, What is Python, Origin, Comparison, Comments, Operators, Variables and Assignment, Numbers, Strings, Lists and Tuples, Dictionaries, if Statement, while Loop, for Loop and the range() Built-in Function, Files and the open() Built-in Function, Errors and Exceptions, Functions, Classes, Modules.

Syntax and Style:

Statements and Syntax, Variable Assignment, Identifiers, Basic Style Guidelines, Memory Management, Python Application Examples.

Unit II:

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 :

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: 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

Unit V:

Regular Expressions :

Introduction/Motivation, Special Symbols and Characters for REs, REs and Python.

Programming Exercise: Check for data error in CSV files: Numeric Check, Alphanumeric Check, Email Check, Date Check.

Text Book:

1. Chun, J Wesley, Core Python Programming, 2nd Edition, Pearson, 2007 Reprint 2010.

Books for Reference:

1. Barry, Paul, Head First Python, 2nd Edition, O Rielly, 2010.
2. Lutz, Mark, Learning Python, 4th Edition, O Rielly, 2009.

SEMESTER- IV			
Core – VI – RDBMS			
Code: 18UCSC42	**Hrs / week :6**	**Hrs / Semester: 90**	**Credits :4**

Vision:

To efficiently organize data and effectively retrieve data

Mission:

Apply E-R diagrams and normalization procedures to avoid redundancy in storing data

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Understand database concepts and database management system software	5	Un
CO-2	Apply Formal Relational Query Languages	5	Ap
CO-3	Demonstrate an application's data requirements using conceptual modeling tools like ER diagrams and Database Design	5	An
CO-4	Implement normalization techniques	6	Ap
CO-5	Compare the various storage media and Implement the file structures	6	Ap
CO-6	Apply transaction and concurrency control	6	Ap
CO-7	Implement Database System Architectures	10	Ap
CO-8	Design databases for different databases	10	Cr

Unit I:

Introduction:

Database System Applications-Purpose of Database Systems-View of Data-Database Languages-Relational Databases-Database Design-Data Storage and Querying-Transaction Management-Database Architecture-Data Mining and Information Retrieval-Specialty Databases-Database Users and Administrations-History of database Systems

Introduction to Relational Model:

Structure of Relational Databases-Database Schema-Keys-Schema Diagrams-Relational Query Language

Formal Relational Query Language-Relational Operations

Unit II:

Formal Relational Query Languages:

The Relational Algebra-The Tuple Relational Calculus-The Domain Relational Calculus

Database Design And The E-R Model:

Overview of the Design process-The entity Relationship Model-Constraits-Removing Redundant Attributes-Entity Sets-Entity Relationship Diagrams-Reduction to Relational Schemas-Entity Relationship Issues-Extended E-R Features-Alternative Notations for Modeling data-Other Aspects of Database Design

Unit III:

Relational Database Design:

Features of Good Relational-Designs-Atomic Domains and First Normal Form-Decomposition using Functional dependencies-Functional-Dependency Theory-Algorithms for Decomposition-Decomposition Using Multivalued Dependencies-More Normal Forms-Database Design Process-Modelling Temporal Data

Storage and File Structure:

Overview of Physical Storage Media-Magnetic Disk and Flash Storage-RAID-Tertiary Storage-File Organization-Organization of Records in Files-Data Dictionary Storage-Database Buffer

Unit IV:

Transactions:

Transaction Concept-A Simple Transaction Model-Storage Structure-Transaction Atomicity and Durability-Transaction Isolation-Serialzability

Concurrency Control:

Lock base Protocols-Deadlocks Handling-Multiple Granularity-Timestamp Based protocols-Validation Based Protocols-Multiversion Schemas-Shapshot Isolation

Unit-V:

Database System Architectures:

Centralized and Client-Server Architectures-Server System Architecture-Parallel Systems-Disturbuted Systems

Parallel Databases:

Introduction0I/O Parallelism-Interquery Parallelism- Intraquery Parallelism

Distributed Databases:

Homogeneous and Heterogeneous databases-Distributed Data Storage-Distributed Tranasctions

Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, ―Database System Concepts‖, Sixth Edition, Tata McGraw Hill, 2011.
2. RamezElmasri, Shamkant B. Navathe, ―Fundamentals of Database Systems‖, Sixth Edition, Pearson Education, 2011.

Books for References:

1. C.J.Date, A.Kannan, S.Swamynathan, ―An Introduction to Database Systems‖, Eighth Edition, Pearson Education, 2006.
2. Raghu Ramakrishnan, ―Database Management Systems‖, Fourth Edition, McGraw-Hill College Publications, 2015.
3. G.K.Gupta,"Database Management Systems‖, Tata McGraw Hill, 2011.

SEMESTER- IV			
Core – Practical IV – Python Programing Lab			
Code: 18UCSCR4	**Hrs / week :6**	**Hrs / Semester: 90**	**Credits :4**

List of Practicals :

1. Write a Python program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Write a Python Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
    a. Grade A: Percentage >=80
    b. Grade B: Percentage>=70 and <80
    c. Grade C: Percentage>=60 and <70
    d. Grade D: Percentage>=40 and <60
    e. Grade E: Percentage<40
3. Write a Python Program using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Write a Python Program to display the first n terms of Fibonacci series.
5. Write a Python Program to find factorial of the given number.
6. Write a Python Program to find sum of the following series for n terms: 1 – 2/2! + 3/3! - - - - - n/n!
7. Write a Python programs using String functions.
8. Write a Python program to count the number of strings where the string length is 2 or more and the first and last character are same from a given list of strings.
9. Write a Python program to get the largest number from a list.
10. Write a Python program to get a list, sorted in increasing order by the last element in each tuple from a given list of non-empty tuples.
11. Write a Python program to remove duplicates from a list.
12. Write a Python program to create a CSV File based on user input.
13. Write a Python program to read a CSV File already created and display the contents

SEMESTER- IV			
Allied – IV – Resource Management Techniques			
Code: 18UCSA41	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :3**

Vision:

To use various techniques for better decision making.

Mission:

To solve complex problems and optimize solutions

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Define operation research	1	Re
CO-2	Formulate optimization problems	1	Cr
CO-3	Identify the best technique to solve a game	3	An
CO-4	Estimate the replacement age of a machine	3	Ap
CO-5	Describe the functions and costs of an inventory	3	Un
CO-6	Draw the network diagram and estimate completion time for a project	3	Cr
CO-7	Describe project scheduling	3	Un
CO-8	Implement various disciplines of queue	3	Ap

Unit I:

Operation Research : Definition of operations research – Features of operations research – Phases of operations research – Models in operations research – Methods for solving operations Research models– Methodology of operations research – Advantages , Features and Applications of Operation Research

Linear Programming : General structure of an LP problem – General Mathematical model of LP Problem – Guidelines of LP model formulation – Graphical solution methods of LP problem – canonical and standard form of LP problem – simplex algorithm (Maximization case)

Unit II:

Game Theory : Definition – Two person zero sum games – Pure strategies (MInimax and Maxmin Principles) : Games with saddle point – Mixed Strategies : Game without saddle

point – Rules of dominance –Solution methods games without saddle point (Algebraic method , Arithmetic method , Matrix method , Graphical method)

Replacement Problem : Replacement of items that deteriorates with time : Model I Model II – Replacement of items that completely fail

Unit III:

Inventory models : Meaning of Inventory control – Reasons for carrying inventory – Factors involved in inventory problem analysis – Inventory cost components – classification of EOQ models – Single item inventory control models without shortages : EOQ model with constant rate of demand - Single item inventory control models with shortages : EOQ model with constant demand and variable order cycle time , EOQ model with constant demand and fixed reorder cycle time – Probabilistic Models: Single period EOQ model for uncertain demand(Newsboy problem)

Unit IV:

Project scheduling: What is PERT and CPM ? – Phases of project management – Network components and precedence relationships – Activity on node network – Rules for AOA network construction – Critical path analysis - Forward pass method – Backward pass method – Float(Slack) of an activity and event – Critical path – PERT calculations – Estimation of project completion time.

Unit V:

Queuing theory : Characteristics of queuing models – Queue Discipline – Service Process – Performance Measures of a queuing system – Probability distribution in queuing systems – classification of queuing models – solution of queuing Model I {(M/M/1) (∞ / FCFS)}

Text Books:

1. P.K.Gupta, Operation Research S.Chand& Company, 2010
2. J.K.Sharma, “Operations Research”, fourth Edition, Macmillan Publishers India,2009

Books for Reference:

1. S.D.Sharma, “Operations Research” ,KedarNath Ram Nath,2015
2. Hamdy A. Taha , “Operations Research” , 7th Edition , Prentice Hall (2002)

SEMESTER- IV			
Allied - Practical– IV – Web designing Lab			
Code: 18UCSAR4	**Hrs / week :3**	**Hrs / Semester: 45**	**Credits :2**

List of Practicals :

1. Create a web page of your College.
2. Create a web page to display your marks in the following table format.

Reg No.	Name	SEMESTER I							
		Language		English		C		HTML	
		Int	Ext	Int	Ext	Int	Ext	Int	Ext

3. Write an HTML code to display a list of five cars in a frame, Link each one to a brief description in second frame. The left frame should display the list and the right frame should display the paragraph about the frame.
4. Write HTML program to create E-Mail registration form.
1. Design a Web page using CSS which includes the following:
    i. Use Different fonts and styles
    ii. Set the background image
    iii. Define styles for links as A: link, A: visited , A: active and A: hover
2. Write a VB Script to prepare EB Bill.
3. Write a VB Script to prepare Pay Bill for an Organization.
4. Write a Java Script to design a simple calculator to perform sum, product, difference and quotient operations.
5. Write a JavaScript to validate the following fields:
    i. Name (should contain alphabet and the length should not be less than 6 characters)
    ii. Password (should not be less than 6 characters length)
    iii. Email id (must follow the pattern)
    iv. Mobile No (should contain 10 digits)

SEMESTER IV			
Skill Based Core – Web Technology			
Code: 18UCSS41	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

To design web sites.

Mission:

Using authoring and scripting languages to build websites

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Understand Internet standard and Internet protocols	5	Un
CO-2	Demonstrate sockets, RMI in JAVA networking	2	Ap
CO-3	Develop dynamic web pages using JavaScript (client side programming).	7	Cr
CO-4	Design dynamic web pages using VBScript	7	Cr
CO-5	Design interactive web pages using DHTM	7	Cr
CO-6	Discuss how XML DTDs differ from XML schemas	6	An
CO-7	Identify and correct problems related to concurrency in server-side programs	10	Un
CO-8	Create dynamic webpages using Server side scripting servlet and JSP	7	Cr

Unit I:

Introduction:

What is Internet? History of Internet, Internet Services and Accessibility, Uses of Internet, Protocols, Web Concepts, Internet Standards

Internet protocols:

Introduction, Internet Protocols, Host Names, Internet Applications and Application Protocols

Unit II:

Java network programming:

Introduction, UDP/IP and TCP/IP Communications, I/O Streams, Sockets, Multicast Sockets, Remote Method Invocation, Protocol Handler, Content Handlers

Javascript:

Introduction, Language Elements, Objects of Javascript, Other Objects, Arrays

Unit III:

Vbscript:

Introduction, Embedding VBScript Code in an HTML Document, Comments, Variables, Operators, Procedures, Conditional Statements, Looping Constructs, Objects and VB Script, Cookies.

Dynamic Html (DHTML):

Introduction, Cascading Style Sheets (CSS), DHTML Document Object Model and Collections, Event Handling, Filters and Transactions, Data Binding

Unit IV:

Extensible Mark-Up Language (XML):

Introduction, HTML vs XML, Syntax of the XML Document, XML Attributes, XML Validation, XML DTD, The Building Blocks of XML Documents, DTD Elements, DTD Attributes, DTD Entities, DTD Validation, XSL, XSL Transformation, XML Namespaces, XML Schema

Common Gateway Interface (CGI):

Introduction, Server – Browser Interaction, CGI Scripts Structure, The CGI.pm Module, Perl Variables, CGI Environment Variables, Processing Forms, Sending Mail, Validating the Form Data, Handling Checkboxes, Server Side Includes (SSI), CGI Server Side and Client Side Applets, CGI Security Issues

Unit V:

Servlets:

Introduction, Advantages of Servlets over CGI, Installing Servlets, The Servlet Life Cycle, Servlet API, A Simple Servlet, Handling HTTP GET Requests, Handling HTTP POST Requests, Cookies, Session Tracking, Multi – tier Application Using Database Connectivity, Servlet Chaining

Java Server Pages: (JSP)Introduction, Advantages of JSP, Developing First JSP, Components of JSP, Reading Request Information, Retrieving the Data Posted from a HTML File to a JSP File, JSP Sessions, Cookies, Disabling Sessions

Text Book:

1. N.P.Gopalan, J.Akilandeseswari, Web Technology – A Developer's Perspective, PHI,2007

Books for Reference :

1. Achyut S Godbole, AtulKahate, Web Technologies - TCP / IP To Internet Application Architectures, Tata McGraw - Hill Education,2008.

2. Vipin Kumar, Web Technologies, A.B. Publication publisher, 2008

3. Jeffry C. Jakson, Web Technologies by Computer Science Perspective,pearson publication, 2005

SEMESTER IV			
Foundation Course: Yoga And Meditation			
Code: 18UFYM41	**Hrs/Week:**	**Hrs/Semester:**	**Credits: 2**

Objectives:

- To enable students to have good health
- To impart value for mental hygiene and possess emotional stability
- To integrate moral values in order to live a purpose driven life.

Unit- I

Physical Character and Functions

Yoga – Brief introduction – importance of Yoga Life – Simple methods for adopting Yoga in Daily Life Nature Cure: Brief history and principles – Health and Disease – Techniques of Healthy Living Rules & Regulations – asanas, Pranayama, mudra, bandha

Unit - II

Exploring the traditions of Yoga

The Secret of Change-The Mind: Agent of Change - The Twelve steps of Spiritual Recovery -Raja yoga- Hatha Yoga- Jnana Yoga-Karma Yoga- Bhakthi Yoga - Mantra Yoga - Tantra Yoga - Surya Namaskar.

Unit- III Greatness of Life Force

Philosophy of kayakalpa-physical body- bio magnetism, mind-Kayakalpa practical - sex and spirituality-value of sexual vital fluid, married life-chastity- jeeva Samadhi -intensifying biomagnetism through exercise- lamp gazing-rules-benefits - mirror gazing-rules-benefits, passes for healing.

Unit - IV Self Discipline

Self-Discipline, Diet: You are what you eat - Yogic and Naturopathic treatment for Common Ailments: Common Cold, Cough, Headache, Constipation, Gastric touble, Menstrual Disorders – Obesity – And General Steps for being healthy.

Unit- V

Special Meditation

Pranayama - Physiological value of Pranayama- Practice of Pranayama- NatureMeditations

Books for Reference:

1. Mind – VethathiriMaharashi
2. Karma Yoga - VethathiriMaharashi

3. Sound health through Yoga – Dr. K. Chandrasekar
4. Yoga for Modern Age – Vethathiri Publication
5. Department .of AYUSH, Yogic and Naturopathic treatment for Common Ailments
6. Edi IV, Ministry of Health and Family Welfare, Gove. Of India, 2010
7. Georg Feuerstein &Benda Feuerstein,Yoga: A beginners Guide, Rashmi Graphics,#3, AmrutwelCHS.Ltd Mumbai, 2014

SEMESTER –IV			
Self Study Course II- Mathematical Reasoning			
Code: 18UCSSS2	**Hrs/week:**	**Hrs/Sem. :**	**Credits: 2**

Vision:

To attain critical thinking and strengthen decision making.

Mission:

To practice various mathematical concepts and speed up calculations to excel in quantitative exams.

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Simplify various expressions	3	Ev
CO-2	Determine Averages of various calculations	3	Ap
CO-3	Compare and Proportion	3	An
CO-4	Evaluate Partnership in enterprises	3	Ev
CO-5	Analyse Percentage computation	3	An
CO-6	Evaluate profit and loss.	3	Ev
CO-7	Apply Simple interest and Compound interest calculation	3	Ap
CO-8	Apply Time and work , Time and distance evaluation in real world problems	3	Ap

Unit I :

Simplification, Averages.

Unit II :

Ratio and Proportion, Partnership.

Unit III :

Percentage , profit and loss.

Unit IV :

Simple interest , Compound interest.

Unit V :

Time and work , Time and distance.

TextBook :

Objective Arithmetic – R.S.Agarwaal.

.(chapters 4,6,12,13,10,11,21,22,15,17)

SEMESTER-IV			
Part IV Non Major Elective Introduction To Internet			
Code: 18UCSN41	**Hrs/week:2**	**Hrs/sem:30**	**Credits: 2**

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Know about history of internet	**8**	**Un**
CO-2	Understand the www concept	**3**	**Re**
CO-3	Understand uniform resource locator and browser	**3**	**Cr, AP**
CO-4	Understand what is E-mail and how it works	**8,9**	**Un, AP**
CO-5	Compare different types of browser and its tools	**3**	**An**
CO-6	To know about how to host website in online	**5**	**Cr**
CO-7	Understand security features to protect our system from viruses	**8**	**Un**
CO-8	Analyze different types of virus and its vulnerability	**10**	**Cr**

Unit I:

Introduction to Internet – History – Internet Applications – Internet Protocols – Evolution of World Wide Web – basic features – WWW Browsers – Uniform Resource Locator (URL) – Search Engines

Unit II:

Introduction to E-mail-E-mail protocols – Structure of E-mail-Categories of Browsers Bookmarks – History list-Social Networking-Characteristics of social networking-Social networking websites-Advantages and risk of social networking-Protecting ourselves from social networking

Unit III:

Mobile computing-Evolution of Mobile communication-Mobile hardware-Mobile software-Applications of M-commerce

Unit IV:

Bigdata analytics and cloud computing-Characteristics-Applications–uses of Cloud computing-Types of cloud deployment

Unit V:

Web publishing - An overview – hosting a Website – Document management – Webpage design consideration and principles - Internet security – Firewalls.

Text Books

1. Vikas Gupta, Internet and Web design, Rematch Press I Edition, 2003.

2. Alexis Leon & Mathews Leon, Internet for Everyone

Books for Reference:

- Internet Millennium Edition ,Margaret Levine Young ,Tata McGRAW-HILL.
- Internet and web Design , Ramesh Bangia, Firewall Media.
- Using the internet, Jerry Honey Cutt, PHI
- Computer Literacy,Prof A.Charles,St.Joseph's college

Semester - V			
Common Core - Computer Oriented Numerical Methods			
Code: 18UCCC51	**Hrs/Week: 6**	**Hrs/Sem: 90**	**Credits : 4**

Vision:

To inspire the students with modern computational methods to carry out the problems.

Mission:

To equip students with the knowledge of algorithms of numerical analysis and execute it efficiently with MATLAB.

Course Outcomes:

CO. No.	Upon completion of this course, students will be able to	PSOs addressed	CL
CO-1	Find numerical solution of a problem in all aspects and apply these methods to practical implementation as reliable and efficient.	3	Re
CO-2	Recognize and apply appropriate principles and concept relevant to Numerical Analysis.	3	Ap
CO-3	Discover the most appropriate estimate for the missing data.	3	Cr
CO-4	Analyze the errors obtained in the numerical solutions of problems.	3	An
CO-5	Use appropriate numerical methods, determine the solutions to given problems.	3	Ap
CO-6	Demonstrate the method of interpolation and find the solution for the data.	**3**	Un
CO-7	Develop their calculation skills.	**3**	Cr
CO-8	Differentiate Gauss Jacobi iteration and Gauss Seidal Iteration method.	**3**	An

Unit I:

Difference operators-Other difference operators-Newton's interpolation formula-Lagrange's interpolation formulae-Divided difference-Divided difference formula-Inverse interpolation.

(Textbook: 1, Chapter 3, Sec 3.1, 3.2, Chapter 4, Sec 4.1,4.3,4.4,4.5,4.6, pages 3.1 – 3.45, 4.1- 4.16, 4.31- 4.54) (Problems only)

Unit II:

Derivatives using Newton's forward difference formula-Derivatives using Newton's backward difference formula-Derivatives using Newton's central difference formula-Maxima and minima of the interpolating Polynomial-Numerical Integration-Newton – Cote's quadrature formula-Trapezoidal Rule-Simpson's one third rule-Simpson's three eighth rule-Wedley's rule.

(Textbook: 1, Chapter 5, Sec 5.1 – 5.4, Chapter 6, Sec 6.1 – 6.4, pages 5.1 – 5. 24, 6.1 – 6.26) (Problems only)

Unit III:

Taylor series method-Picard's method- Runge-Kutta method.

(Textbook: 1, Chapter 7, Sec 7.1,7.2,7.4, pages 7.1-7.15, 7.25-7.40) (Problems only)

Unit IV :

Introduction to MATLAB: MATLAB environment – Types of files _ platform – search path – Constants, variables and expressions – Vectors and Matrices – Polynomials – Input Output statements – MATLAB Graphics.

(Textbook:2, Chapters:1,2,3,4,5,6)

Unit V:

Control Structures- writing programs and functions – ordinary differential equation and symbolic mathematics – MATLAB Applications. **(Textbook: 2, Chapters: 7,8,9,10)**

Text Books:

1.Arumugam S and Thangapandi Isaac A, Numerical Analysis With Programming in C, New Gamma Publishing House, Palayamkottai.

2.Raj Kumar Bansal, Ashok Kumar Goel, Manoj Kumar Sharma, MATLAB and its Applications in engineering, Pearsons Publications.

Books for Reference:

1.Stormy Attaway, MATLAB- A Practical Introduction to Programming and Problem Solving.

2.Stephen J. Chapman, Essentials of MATLAB Programming, Published November 1st 2007 by Thomson Learning.

SEMESTER- V			
Core – VII– Operating Systems			
Code: 18UCSC51	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

To study about the resource manager and how to use the resources efficiently

Mission:

Use various scheduling algorithms for process scheduling. How to avoid deadlock situation.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Define Operating System Structure and the various operations , process of operating system	1	Re
CO-2	Analyze the Various Scheduling Algorithms of Process Management	6	An
CO-3	Explain the concept of Deadlock.	6	Re
CO-4	Implement the various allocation methods of Memory Management	6	Ap
CO-5	Access Methods and File allocation Methods	6	Re
CO-6	Compare the scheduling algorithms of disk	6	An
CO-7	Discuss about open source software	9	Un
CO-8	Compare Linux with other operating system	6	An

Unit I:

Introduction and System Structures: Operating system definition, computer system organization, and architecture, structure and operations, process, memory and storage management.

Unit II:

Process Management: Process concepts, scheduling and operations on processes. Process Scheduling: Basic concepts, scheduling criteria, scheduling algorithms, Synchronization: Background, critical section problems, Peterson's Solution, Synchronization Hardware, Classic problem of synchronization.

Unit III:

Deadlock: Deadlock: System model, deadlock characterization, methods for handling deadlock, deadlock prevention, avoidance and detection, Recovery from deadlock.

Memory Management: Memory Management Strategies: Background, swapping, Memory allocation, Paging, Structure of the page table.

Unit IV:

File system: File system: File concept, Access methods, File system structure, allocation methods and free-space management. Disk structure, disk scheduling algorithms and management RAID structure.

Unit V:

Open Source

Introduction to Linux: What is Linux? – A Brief History of Linux – System features – Differences between Linux and other Operating Systems .

Some Basic Linux Commands:Directory oriented commands, file oriented commands, Process oriented commands, General Purpose Commands.

Text Books:

1. A. Silberschatz, P.B. Galvin and G. Gagne, Operating System Concepts, 8th Edition, Wiley India, 2011.

2**.** Linux complete - Grant Taylor , BPB Publications. 1998 (Chapter 1).

Books for Reference:

1. Stalling William, Operating Systems: Internals and Design Principles, 7th Edition, Prentice Hall, 2011.
2. Dietel, Operating Systems, 3rd Edition, Pearson Education,2004.
3. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Prentice Hall, 2007.

SEMESTER- V			
Core – VIII – Programming With PHP and MySQL			
Code: 18UCSC52	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

Create dynamic webpages

Mission:

Use open source software PHP and MYSQL to create dynamic web pages.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Explain the variable usage in PHP	1	Un
CO-2	Creating forms with conditional statements	1	Cr
CO-3	Describe about arrays, files, cookies and functions.	2	Un
CO-4	Create an application using file operation	4	Cr
CO-5	Implement the concept of oracle in Mysql query	7	Ap
CO-6	Explain the concept Grouping data, filtering, Aggregate function	7	Un
CO-7	Explain the concept of the sub queries, joining tables,set operator and full text searching	7	Ap
CO-8	Develop PHP program with database connectivity .	7	Cr

Unit I :

Introduction:

Introduction- Open source PHP – PHPhistory- features-variables- statementsoperators-conditional statements-if-switch-nesting conditions-merging forms withconditional statements-loops-while-do-for – loop iteration with break andcontinue.

Unit II:

Arrays and Functions:

Arrays- Creating an array- modifying array-processing array-groupingform with arrays- using array functions- creating user defined functions- usingfiles- sessions- cookies- executing external programs- Creating sampleapplications using PHP.

Unit III:

File Handling:

Opening files using fopen - looping over a files content with feof- reading text from a file using fgets - closing a file- reading character with fgetc- reading whole file with file_get_contents- reading a fle into into an array with file-checking if a file exists-fscanf-parse_ini_file- Getting file information with stat-fseek- copying files with copy- deleting files-writing to a file-reading and writing binary files –locking files

Unit IV:

MySQL:

Effectiveness of MySQL -MySQL Tools-Prerequisites for MySQL connection-Databases and tables- MySQL data types-Creating and manipulating tables-Insertion-updation and deletion of rows in tables -Retrieving data- Sorting andfiltering retrieved data -Advanced data filtering-Data manipulation functions-Aggregate functions -Grouping data- Sub queries-Joining Tables- Set operators-Full text searching.

Unit V:

PHP with MySQL:

Working MySQL with PHP-database connectivity- usage of MYSQLcommands in PHP-processing result sets of queries- handling errors-debuggingand diagnostic functions-validating user input through Database layer andApplication layer- formatting query output with Character- Numeric- Date andtime –sample database applications.

Text Books:

1. VIKRAM VASWANI- “PHP and MySQL”- Tata McGraw-Hill- 2005
2. BEN FORTA - ”MySQL Crash course “ SAMS- 2006.
3. Steven Holzner,The Complete reference PHP, Tata McGraw Hill,2008

Books for Reference:

1. Tim Converse- Joyce Park and Clark Morgan- ”PHP 5 and MySQL”-Wiley India reprint- 2008.
2. Robert Sheldon- Geoff Moes- ”Beginning MySQL”-Wrox- 2005.
3. Alexis Leon and Mathews Leon- “Database Management Systems”-Vikas- 2008.

SEMESTER- V			
Core – Integral I – Data Mining			
Code: 18UCSI51	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

To analyse the data for KDD

Mission:

Use market basket analysis, clustering techniques to identify the hidden pattern in the data.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Define data mining process and the various data mining techniques	1	Re
CO-2	Apply market basket analysis	7	Ap
CO-3	Compare different classification methods	7	An
CO-4	Implement cluster analysis	7	Ap
CO-5	Create an ODS	7	Cr
C0-6	Discuss about data warehousing	6	Re
CO-7	Compare and contrast OLAP AND OLTP	7	An
CO-8	Describe various search engines .	10	Un

Unit I:

Introduction: What is Data Mining?-Why Data Mining now!-The Data Mining Process-Data Mining Applications-Data Mining Techniques.

Association Rules: Introduction-basics-The Task and a Naïve Algorithm-The Apriori Algorithm-Improve the efficiency of the Apriori Algorithm.

Unit II:

Classification: Introduction-Decision tree-Building a Decision Tree-Overfittingand pruning-Decision Tree Rules- Naïve Bayes Method-Estimating Predictive Accuracy of Classification Methods-Improve Accuracy of classification methods-other evaluation criteria for classification methods.

Unit III:

Cluster Analysis: What is Cluster Analysis?- Desired features of Cluster Analysis-Types of Data –Computing Distance- Types of Cluster Analysis Methods-Partition Methods-

Hierarchical Methods-Density based methods- Quality and validity of cluster analysis methods.

Unit IV:

Web Data Mining: Introduction-Web Terminology and characteristics- Locality and Hierarchy in the web-Web Content mining- Web usage mining.

Search Engine: Introduction-Search Engine Functionality- Search Engine Architecture.

Unit V:

Data Warehousing: Introduction-Operational Data Stores-Data Warehouses-Data Warehouse Design-Guidelines for Data Warehouse Implementation-Data Warehouse Metadata.

Online Analytical Processing (OLAP): Introduction- OLAP- Characteristics of OLAP Systems-Multi Dimensional View and Data Cube-Data Cube Implementation- Data Cube Operations.

Text Book:

1. G.K.Gupta, Introduction to Data Mining with Case Studies, Prentice Hall of India, 2008. Chapters: 1.1-1.5, 2.1-2.5, 3.1-3.4, 3.6-3.12, 4.1- 4.8, 4.10,5.1-5.5, 6.1, 6.3-6.4, 7.1-7.2, 7.4-7.7, 8.1-8.3, 8.5-8.8.

Booksfor Reference:

1. Margaret H.Dunham; S.Sridhar, Data Mining Introductory and Advanced Topics, Pearson Education, 2007.

2. Alex Berson and Stephen J. Smith, Data Warehousing, Data Mining, OLAP, TMH Publication ,1997 .

SEMESTER V			
Core – Practical V – PHP& MySQL Lab			
Code: 18UCSCR5	**Hrs / week :5**	**Hrs / Semester: 75**	**Credits :3**

List of Practicals :

1. Creating simple webpage using PHP.
2. Write programs using conditional-looping statements in PHP.
3. Use of looping statements in PHP
4. Creating programs using arrays.
5. Creating user defined functions.
6. File manipulation using PHP.
7. Creating simple table with constraints.
8. Insertion-Updation and Deletion of rows in MYSQL tables.
9. Searching of data by different criteria.
10. Sorting of data.
11. Demonstration of joining tables.
12. Usage of subqueries.
13. Validating Input.

SEMESTER VI			
Core – IX– Android Programming			
Code: 18UCSC61	**Hrs / week :5**	**Hrs / Semester: 75**	**Credits :4**

Vision:

To create android apps

Mission:

To create apps using various layouts and views

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Distinguish different mobile techniques	2	Re
CO-2	Install Android SDK	5	Ap
CO-3	Design User Interface	5	Cr
CO-4	Modify app to include multimedia content	10	An
CO-5	Create app to access SD card	10	Cr
CO-6	Create app with Google Maps	10	Cr
CO-7	Design app with SQLite database	10	Cr
CO-8	Deploy Mobile app	10	Ap

Unit I:

Getting started with Android Programming: What is Android?- Android versions- Features and architecture of Android- Android Devices in the market- Obtaining the required tools- Android Studio- Android SDK- Creating Android Virtual Devices (Avds)- Android Developer Community- Launching Android Application.

Using Android Studio for Android development : Exploring IDE- Using Code Completion- Debugging Application -Setting Break points- Publishing Application- Generating a Signed APK

Unit II:

Activities, Fragments and Intents: Understanding activities - applying styles and themes to an activity- Hiding the activity title- Displaying a dialog Window and a Progress

dialog- Linking activities using intents- returning results from an Intent- Passing data using an Intent Object- Fragments - adding Fragments dynamically - life Cycle of a Fragment- interactions between Fragments- Understanding the Intent Object- Using Intent Filters- Displaying notifications

Getting to know the Android User Interface: Understanding The Components of a Screen- Views and View groups - Frame layout - Linear layout (Horizontal) and linear layout(Vertical)- Table layout- Relative layout - Frame layout- Scroll view- Adapting to Display Orientation- Anchoring Views - Managing Changes to Screen Orientation - Persisting State information during changes in configuration- detecting orientation changes- Controlling the orientation of activity- Utilizing the Action Bar- adding action Items to Action Bar- Creating the User Interface programmatically- listening for UI Notifications

Unit III:

Designing user Interface with views: Using basic views - Text view - Button, Image button, Edit text, Checkbox, Toggle button, Radio button, and Radio group Views- Progress bar View- Auto complete text view View- Using Picker Views- Time picker View- Date picker View- using List Views To Display Long Lists- List view View- Using The Spinner View- understanding Specialized Fragments- using List fragment- Dialog fragment- Preference fragment

Displaying Pictures and Menus With Views: Using Image Views to Display Pictures- Image view - Image switcher- Grid view- Using Menus With Views- Creating the helper Methods- Options Menu- Context, Web view

Unit IV:

Data persistence: Saving And Loading User Preferences- Accessing Preferences Using An Activity- Programmatically Retrieving And Modifying the Preferences Values- Persisting Data to Files- Saving To Internal Storage- Saving To External Storage (SD Card)- Choosing the Best Storage option- Creating and using Databases- Creating Dbadapter Helper Class- Using the Database Programmatically

Content Providers: Sharing Data In Android- Using a Content Provider- Predefined Query String Constants- Projections- Filtering- Sorting- Creating Your Own Content Providers- Using The Content Provider

Unit V:

Messaging: SMS Messaging- Sending SMS Messages Programmatically- Sending SMS Messages using Intent- Receiving SMS messages- Caveats and warnings- Sending Email

Location-Based Services: Displaying Maps- Creating the Project- obtaining the Maps API Key- Displaying Map- Zoom Control- Changing Views- navigating to a specific location- Getting the location that was touched- Geo coding and reverse Geo coding- Getting location data- Monitoring location

Text Books:

J. F.DiMarzio ,Beginning Android Programming with Android Studio, John Wiley &sons, Inc, Fourth Edition

Books for Reference:

1. Ed Burnette, Hello, Android: Introducing Google's Mobile Development Platform, Pragmatic.2009.
2. Jerome (J.F) DiMarzio , Android - A programmer's Guide, TataMcgraw Hill,2010.
3. JhonHarton, Android Programming for Beginners ,Packt Publishing, 2015

SEMESTER VI			
Core – X– Software Engineering			
Code: 18UCSC62	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

Be successful professionals in the field with solid fundamental knowledge of Software Engineering on creating more complex software systems.

Mission:

Prepare students with a thorough understanding of software engineering Techniques and important concepts such as software processes from software specification through system evolution with ethical values to solve real world problems.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Describe the concepts of Software Engineering.	1	Un
CO-2	Describe Software Life Cycle Model	1	Un
CO-3	Discuss Project Management	2	Ap
CO-4	Discuss software Requirement and specification	2	Ap
CO-5	Explain Software Design Process	3	Un
CO-6	Describe User Interface Designing	3	Un
CO-7	Explain software Testing and Software Reliability and	3	Un
CO-8	Discuss Software Quality Management System	3	Un

Unit I:

Introduction:- Evolution – From an Art form on Engineering Discipline: Evolution of an Art into an Engineering Discipline. – Software Development of Projects: Program versus Product – Emergence of Software Engineering: Early Computer Programming – High Level Language Programming – Control Flow-based Design – Data Structure Oriented Design – Object Oriented Design.

Software Life Cycle Models:- A few Basic Concepts – Waterfall Model and its Extension: Classical Waterfall Model – Iterative Waterfall Model – Prototyping Model – Evolutionary Model. – Rapid Application Development (RAD): Working of RAD. –Spiral Model. (12L)

Unit II :

Software Project Management:- Responsibilities of a Software Project Manager – Project Planning- Project Estimation Techniques-Risk Management. Requirements Analysis and Specification:- Requirements Gathering and Analysis – Software Requirements Specifications (SRS):Users of SRS Document – Characteristics of a Good SRS Document – Important Categories of Customer Requirements – Functional Requirements – How to Identify the Functional Requirements? – Organisation of the SRS Document. (12L)

Unit III:

Software Design:- Overview of the Design Process: Outcome of the Design Process – Classification of Design Activities. – How to Characterize a good Software Design?

Function-Oriented Software Design:- Overview of SA/SD Methodology – Structured Analysis – Developing the DFD Model of a System: Context Diagram – Structured Design – Detailed Design. (12L)

Unit IV:

User Interface Design:- Characteristics of a good User Interface - Basic Concepts – Types of User Interfaces – Fundamentals of Components based GUI Development: Window System.

Coding and Testing:- Coding – Software Documentation – Testing: Basic Concepts and Terminologies – Testing Activities. – Unit Testing – Black-box Testing: Equivalence Class Partitioning – Boundary Value Analysis. – White-box Testing. (12L)

Unit V:

Software Reliability and Quality Management:- Software Reliability: Hardware versus Software Reliability. – Software Quality – Software Quality Management System – ISO 9000: What is ISO 9000 Certification? – ISO 9000 for Software Industry – Shortcomings of ISO 9000 Certification. – SEI Capability Maturity Model: Level 1 to Level 5. Software Maintenance:- Characteristics of Software Maintenance: Characteristics of Software Evolution – Software Reverse Engineering. (12L)

Text Book:

1. RajibMall,Fundamentals of Software Engineering Fourth Edition ,PHI Learning Private Limited 2015.

Books for Reference:

1. Ian Sommerville , Software Engineering 9th Edition , Pearson Education Asia.

2.R.S.Pressman, Software Engineering: A Practitioner‘s Approach (7th Edition), McGraw-Hill, 2009.

3. K L James , Software Engineering 2nd Edition , PHI.

SEMESTER VI			
Core – XI– Computer Networks			
Code: 18UCSC63	**Hrs / week :5**	**Hrs / Semester:75**	**Credits :4**

Vision:

Gain fundamental knowledge about computers and devices communicate.

Mission:

Analyse different network models, various topologies and various protocols.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Define Network and the various types of Network	1	Re
CO-2	Demonstrate the model of Network	1	An
CO-3	Analyze the structure of Switch and the Protocols.	2	An
CO-4	Discuss Connection devices by using Wired LANs	2	Ap
CO-5	Discuss the Network layer and Transport Layer in routing and TELNET	6	Re
CO-6	Describe the various routing algorithms in network layer	8	Un
CO-7	Define Network Security and other aspects of Security	5	Re
CO-8	Acquire the basic knowledge of layers of OSI model	5	Re

Unit I :

Introduction: Data communications-Networks- Network Types- Internet History- Standards and Administration.

Network Models : Protocol Layering- TCP/IP Protocol suite- The OSI Model.

Transmission Media: Guided Media- Unguided Media: Wireless

Unit II:

Switching: Introduction- Packet switching – Structure of a switch.

Data Link control :DLC Services- Data Link Layer Protocols –HDLC.

Media Access Control : Random Access- Controlled Access.

Unit III:

Wired LANs: Ethernet -: Ethernet Protocol – Standard Ethernet - Fast Ethernet- Gigabit Ethernet - 10Gigabit Ethernet.

Wireless LANS: Bluetooth.

Connecting Devices and Virtual LANs: Connecting Devices – Virtual LANs.

Unit IV:

Network layer: Unicast Routing : Introduction – Routing Algorithms- Unicast Routing Protocols.

Next Generation IP : Ipv6 Addressing

Introduction to Transport Layer: - Introduction – Transport-Layer Protocols.

Application Layer : Standard Client – Server Protocols: FTP- Electronic mail-TELNET Secure Shell –Domain Name System.

Unit V:

Quality of Services : Data- flow characteristics Flow control to improve QOS-Integrated Services.

Cryptography and Network Security: Introduction – Confidentiality-Other aspects of Security .

Text Book:

1. BehrouzA.Foruzan,"Data Communications and Networking ", McGraw Hill Education Private Ltd., Fifth Edition 2013.

Unit I: Chapter 1.1-1.5, 2.1-2.3,7.1,7.3

Unit II: Chapter 8.1-8.4, 11.1-11.3, 12.1-12.2

Unit III: Chapter 13.1-13.5, 15.3, 17.1-17.2

Unit IV : Chapter 20.1-20.3, 22.1,23.1-23.2, 26.2-26.6

Unit V : Chapter 30.1-30.3, 31.1-31.3

Books forReference:

1. Andrew S.Tenanbaum,"Computer Networks", Fourth Edition, PHI,2002.
2. R.S.Rajesh, K.S.Easwarakumar&R.Balasubramanian, Computer Networks, Vikas Publishing House ,2012
3. James F. Kurose, Keith W.Ross, Computer Networking , Fifth Edition,Pearson,2010.

SEMESTER VI			
Core – Integral II– Cloud Computing			
Code: 18UCSI61	**Hrs / week :4**	**Hrs / Semester: 60**	**Credits :4**

Vision:

Attain knowledge about how to design and build cloud environments to enhance performance and cost reduction

Mission:

Learn about various service models PaaS, SaaS, IaaS and data centres. To analyse cloud storage systems.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Define cloud computing	1	Re
CO-2	Describe the characteristics of cloud	2	Un
CO-3	Identify the technical foundations of cloud system architecture	2	An
CO-4	Characterize the distinction between infrastructure , platform, software and service	7	An
CO-5	Illustrate the use of load balancing techniques	7	Ap
CO-6	Attempt to generate new ideas and innovations in cloud computing	7	Cr
CO-7	Compare and contrast the various web services	10	An
CO-8	Demonstrate the usage of mail services	10	An

Unit I:

Understanding cloud computing:

Cloud computing - cloud types- the cloud cube model- deployment models-service models-characteristics of cloud computing-assessing the role of open standards.

Assessing the value proposition:

Measuring the cloud's value – the laws of cloudonomics –cloud computing obstacles – measuring cloud cost – avoiding capital expenditures

Unit II:

Cloud Architecture:

The cloud computing stack – composability – infrastructure – platforms – virtual appliances – communication protocols – Connecting to the cloud: The Jolicloud net book OS – Chromium OS the browser as an operating system.

Developing Cloud Services:

Infrastructure as a service (IaaS) – IaaS workloads- Platform as a service (PaaS) – Software as a service (SaaS)– Identity as a service (IDaaS) – Compliance as a service(CaaS).

Unit III:

Virtualization and CloudApplications:

Virtualization technologies – load balancing and virtualization – advanced load balancing – the Google cloud

Cloud Security:

Securing the cloud –security service boundary –security mapping- securing data –brokered cloud storage access-encryption-auditing and compliance

Unit IV:

Google Web Services:

Google Analytics – Google translate- Google Toolkit –Google APIs

Amazon Web Services:

working with Amazon Elastic compute cloud(EC2)- Amazon simple storage system(S3) – Amazon Elastic block store(EBS)- cloud front.

Microsoft Web Services:

Windows azure platform – windows Azure App fabric.

Unit V:

Cloud Storage:

Cloud storage definition – unmanaged cloud storage – managed cloud storage – creating cloud storage systems – backup types - cloud backup features

Webmail Services:

Cloud mail services- Google Gmail- Mail2Web – Windows Live Hotmail- Yahoo Mail

Textbook:

1.Barrie Sosinsky, **Cloud Computing Bible**, Wiley India Pvt. Ltd, 2012. New Delhi.

Books for Reference:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the WayYou Work and Collaborate Online, Que Publishing, Second Edition, August 2008.

2.Aley Beard, Cloud Computing Best Practices for Managing and MeasuringProcesses for

On-demand Computing, Applications and Data Centers in the Cloud with SLAs, EmereoPvt. Limited, July 2008.

SEMESTER VI			
Core – Practical VI – Android Programming Lab			
Code: 18UCSCR6	**Hrs / week :5**	**Hrs / Semester: 75**	**Credits :3**

List of Practicals :

1. Creating “Hello world” Application.
2. Creating an Application that displays message based on the screen orientation.
3. Create an application that displays custom designed Opening Screen.
4. Create menu in Application.
5. Play an audio, based on the user event.
6. Read/ write the Local data.
7. Display Map based on the Current location.
8. Create / Read / Write data with database (SQLite).
9. Hello world – windows app.
10. Create a Tiles based app.
11. Design a Lock Screen in the existing app.
12. Learn to deploy both android and windows Applications.

SEMESTER- VI			
Self Study Course III– ASP.NET			
Code: 18UCSSS3	**Hrs / week :**	**Hrs / Semester:**	**Credits :2**

Vision:

To create dynamic webpages.

Mission:

Use DotNET technology to create server side web applications.

Course Outcomes:

CO No.	Upon completion of this course, students will be able to	PSO Mapped	CL
CO-1	Understand the Microsoft .NET Framework and ASP.NET page structure	2	Un
CO-2	Compare C# and VB programming Languages	5	An
CO-3	Build and debug well-formed Web Forms with ASP. NET Controls.	6	Cr
CO-4	Understand the Visual studio .NET environment	6	Un
CO-5	Create and Use Viewstate, Query String and cookies	7	Cr
CO-6	Implement appropriate data transfer between pages	7	Ev
CO-7	Use Microsoft ADO.NET to access data in web Application	10	Ap
CO-8	Develop dynamic Websites	10	Cr

Unit I:

The.Net Framework- The .NET Programming Framework-VB.NET, C#, and the .NET Language- The Common Language Runtime-The .NET Class Library-ASP.NET-Visual Studio.NET.

Learning The .Net Language-Data Types-Declaring Variables-Scope and Accessibility-Variable Operations-Object-Based Manipulation-Conditional Structures-Loop structures-Functions and Subroutines

Unit II:

Asp.Net Applications- ASP.NET Applications-Code-Behind-The Global.asax Application File-Understanding ASP.NET Classes-ASP,NET Configuration

Web Form Fundamentals- A Simple Page Applet-Improving the Currency converter-A deeper Look at HTML Control Classes-The Page Class-Assessing HTML Server Controls.

Unit III:

Web Controls-Stepping Up to Web Controls-Web Control Classes-Auto Post Back and Web Control Events-A Simple Web Page Applet-Assessing Web Controls.

Using Visual Studio .Net-The promise of Visual Studio. NET-Starting a Visual Studio .NET Project-The Web Form Designer-Writing Code-visual Studio .NET Debugging-Working Without Visual Studio .NET.

Unit IV:

State Management-The Problem of State-Viewstate-Transferring Information-Custom cookies-Session State-Session State Configuration-Application State.

Tracing And Logging-Logging Exceptions-Error Pages-Page Tracing

Unit V:

Database Connectivity: Overview of ADO.NET:9 Introducing ADO.NET and data Management− characteristics of ADO.NET –The ADO.NET Object Model. ADO.NET Data Access SQL Basics –The SQL Select Statement – The SQL Update Statement – The SQL Insert Statement − The SQL Delete Statement–Creating a connection –Defining a Select Command – Updating Data – Accessing Disconnected Data –Updating Disconnected Data – Data Binding –Introducing Data Binding –Single Value Data Binding –Repeated Value Data Binding –Data Binding with Databases−The DataLiIst, DataGrid and Repeater.

Text Book:

1. MATHEW MACDONALD, The Complete Reference ASP.NET, TMH 2002

Books for Reference:

1. G. Andrew Duthie,Microsoft ASP.NET Step by step, Microsoft Press, 2003
2. Kogent Learning Solutions Inc., ASP.NET 2.0 Black book, DreamTechPress, 2006.
3. NitinPandey ," Microsoft ASP.NET", PHI,2002
4. MridulaParihar, YeshSingal and NitinPandey, "Visual Studio .Net Programming",

PHI, 2002

5. C. Muthu,"ASP.NET", 2nd Ed., Vijay Nicole Imprints Pvt.Ltd., 2008.