MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.C.A

[Bachelor of Computer Applications]

(Choice Based Credit System)

(with effect from the academic year 2022-23 onwards)

1. Vision of the University

To provide quality education to reach the un-reached

2. Mission of the University

- To conduct research, teaching and outreach programmes to improve conditions of human living.
- To create an academic environment that honours women and men of all races, caste, creed, cultures and an atmosphere that values intellectual curiosity, pursuit of knowledge, academic freedom and integrity.
- To offer a wide variety of off-campus educational and training programs, including the use of information technology, to individuals and groups.
- To develop partnership with industries and government so as to improve the quality of the workplace and to serve as catalyst for economic and cultural development.
- To provide quality/inclusive education, especially for the rural and un-reached segments of economically downtrodden students including women, socially oppressed and differently abled.

3. Vision of the Programme

- To provide quality education to the students community and develop them with skills attitude and leadership quality
- To bridge the gap between industry and institution by upgrading curricula and syllabi based on industrial and societal needs(Establish Industry Institute Interaction \ program to enhance corporate expectations)
- Encourage research based projects in the emerging areas of technology convergence.
- To provide suitable environments to develop pioneering talents, practice ethical values and train as permanent learners.

4. Mission of the Programme

- To educate students at under graduate level (BCA) in the fundamental and advanced concepts of computing discipline.

- To foster practical skills in our students with an emphasis on ethics, interpersonal development and professional competency.
- To prepare them to pursue exemplary careers in industries, academia and research.
- To impart the ability to use the expertise in computing to meet the ever growing demands of the society.

5. Preamble

Bachelor of Computer Applications (BCA) is a 3 – Year Under Graduate Programme Spread over Six semesters. This Programme is designed to bridge the gap between IT industries and Academic institutes by incorporating the latest development, into the Curriculum and to give students a complete understanding within a structured framework. This Programme helps the students to build-up a successful Career in Computer Science and for pursuing Higher Studies in Computer Science.

6. Programme Educational Objectives (PEOs)

PEO1: To enhance knowledge in critical areas of Computer Applications and Industrial Computing.

PEO2: To enrich analytical skills of students besides synthesis involved in the field of Computer Applications.

PEO3: To strengthen student's aptitude and ability to cope up with academic demands.

7. Programme Outcomes (POs)

PO1: Computational information: Appreciate and apply mathematical organization, computing and domain information for the conceptualization of computing models from clear harms.

PO2: Difficulty Analysis: Talent to classify, significantly evaluate and prepare complex computing problems using fundamentals of computer knowledge and request domains.

PO3: Accomplish Investigations of Compound Computing Troubles: Ability to invent and ways experiments interpret data and present well up to date conclusions.

PO4: Current Implement Procedure: Skill to select recent computing tools, skills and techniques compulsory for original software solutions

PO5: Proficient Principles: Facility to apply and give expert principles and cyber systems in a universal monetary situation.

PO6: Modernization and Private Enterprise: Classify opportunities, private enterprise dream and use of original thoughts to build worth and means for the betterment of the human being and the world.

8. Programme Specific Outcomes (PSO)

PSO1: An ability to enhance the application of knowledge of theory subjects in diverse fields.

PSO2: Develop language proficiency to handle corporate communication demands.

PSO3: In order to enhance programming skills of the young IT professionals, the concept of project development in using the technologies learnt during the semester has been introduced.

PSO4: To enhance knowledge in robotics, provide experimental hardware equipment for teaching the basics of robotics, robot dynamics and control, and robot system design and application.

PSO5: To enhance logical ability and programming concepts by implementing programming lab.

PSO6: Ability to understand the changes or future trends in the field of computer application.

PSO7: Ability to identify, formulate, analyze and solve problems of programming using different languages.

9. Eligibility for admission to the course and examination

Candidates shall be admitted to the course provided he/she has passed plus two examinations of the State or Central Board with Computer Science/Mathematics/Physics/Chemistry/Biology as one of the subjects or any other Science subject that may be considered as equivalent by the M.S. University.

10. Duration of the Course

The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). Each semester contains 90 working days.

11. Medium of instruction and examination

The medium of instruction as well as examination will be in English.

12. Theory examination

The external evaluation will be based on the examination to be conducted by the university at the end of each semester.

13. Practical examination

Practical examinations will be conducted at the end of each semester.

14. Evaluation

A. Each paper carries an internal component

B. There is a pass minimum of 40% for external and overall components

Theory External: Internal Assessment = 75:25

Practical External: Internal Assessment = 50:50

C. Internal Assessment

Internal marks for Theory shall be allocated in the following manner:

The average of the best two tests from three compulsory tests	20 Marks
Assignment	05 Marks
Total	**25 Marks**

Note: Each test will be of one hour duration.

D. Practical

Internal marks for Practical shall be allotted in the following manner.

Experimental work	20 Marks
Record	10 Marks
Model Test	20 Marks
Total	**50 Marks**

E. Project Work

Components	Marks
Project Report	75 Marks
Viva -Voce	25 Marks
Total	**100 Marks**

Note:

   i) Students should carry out group project in major subject.

   ii) Project report will be evaluated by Central valuation and Viva-Voce will be conducted by both the External examiner and the Guide at the end of the 6th semester.

15. Grading System

The performance of the student is indicated by the Seven Points Scale Grading System as per the UGC norms given below

Grade	Grade point	Percentage of marks	Performance
O	9.5 and above	95-100	Outstanding
E	8.5 and above	85-94	Excellent
D	7.5 and above	75-84	Distinction
A	7 and above	70-74	Very Good
B	6and above	60-69	Good
C	5 and above	50-59	Average
RA	0	Up to 49	Re-Appear

F. The overall performance level of the candidates will be assessed by the following formulae:

Cumulative weighted average of marks $= \dfrac{\sum(\text{marks} + \text{credits})}{\sum \text{credits}}$

Cumulative weighted average grade points $= \dfrac{\sum(\text{Grade points} \times \text{credits})}{\sum \text{credits}}$

16. The question paper pattern for all theory papers shall be as follows.

Duration of Exam: 3Hours

Section	Type of questions	Mark
Part-A	Multiple choice question	1×10=10 Marks

	(Two question from each unit compulsory)	
Part-B	Internal Choice questions (One question from each unit: either/or)	5×5=25 marks
Part-C	Internal Choice questions (One question from each unit: either/or)	8×5=40 marks
	Total	**75 Marks**

17. The question paper pattern for all practical papers shall be as follows.

Duration of Practical Exam: 3 hours

1	Major Experiment	25
2	Minor Experiment	15
3	Spotters	05
4	Record	05
	Total	**50 Marks**

B.C.A
[Bachelor of Computer Applications]

(Choice Based Credit System)
(with effect from the academic year 2022-23 onwards)

Sem. (1)	Pt. I/II/ III/ IV/ V (2)	Sub No. (3)	Course Status (4)	Course Title (5)	Contact Hrs / Week (6)	L Hrs. / Week (7)	T Hrs. / Week (8)	P Hrs. / Week (9)	C Credits (10)
I	I	1	Language	Tamil / Other Language	6	6	0	0	4
	II	2	Language	Communicative English-I	6	6	0	0	4
	III	3	Core-I	Programming in C	4	4	0	0	4
	III	4	Major Practical - I	C Programming Lab	4	0	0	4	2
	III	5	Add on Major (Mandatory)	Professional English for Physical Sciences - I	4				4
	III	6	Allied - I	Digital Design	4	4	0	0	3
	IV	7	Common	Environmental Studies	2	2	0	0	2
			Subtotal		**30**				**23**
II	I	8	Language	Tamil/Other Language	6	6	0	0	4
	II	9	Language	Communicative English-II	4	6	0	0	2
		10	Naan Mudhalvan	Language Proficiency for Employability – Effective English	2				2
	III	11	Core-II	Object Oriented Programming with C++	4	5	0	0	4
	III	12	Major Practical - II	Object Oriented Programming with C++ Lab	4	0	0	4	2
	III	13	Add on Major (Mandatory)	Professional English for Physical Sciences - II	4				4
	III	14	Allied - II	Mathematical Foundation for Computer Science	4	3	0	0	3
	IV	15	Common	Value Based Education / சமூகஒழுக்கங்களும் பண்பாட்டு விழுமியங்களும் / Social Harmony	2	2	0	0	2
			Subtotal		**30**				**23**

Se m	PartI /II/III /IV/ V/VI	Sub. No.	Subject Status	Subject Title	Contact Hrs/ week	L Hrs/ Week	T Hrs/ Week	P Hrs/ Week	Credits
	I	16	Language	Tamil	6	6	0	0	4
	II	17	Language	English	6	6	0	0	4
	III	18	Core	Java Programming	4	4	0	0	4
	III	19	Core	Financial Accounting	3	3	0	0	4
	III	20	Major Practical III	Java Programming Lab	2	0	0	2	2
III	III	21	Allied - III	Data Structure	2	2	0	0	3
	III	22	Allied Practical III	Data Structure LAB	2	0	0	2	2
	III	23	Skill based Core Theory I	Programming with PHP and MySQL	3	3	0	0	4
	IV	24	Non Major Elective	Introduction to IT/Introduction to Computers	2	2	0	0	2
	IV	25	Common	Yoga(* Excluding Contact Hours & Credit)	2*	2	0	0	2*
			Sub Total		**30**				**29**
	I	26	Language	Tamil	6	6	0	0	4
	II	27	Language	English	6	6	0	0	4
	III	28	Core	Python Programming	4	4	0	0	4
	III	29	Core	Software Engineering	3	3	0	0	4
	III	30	Major Practical IV	Python Programming Lab	2	0	0	2	2
		31	Allied - IV	Accounting Software- Tally	2	2	0	0	3
IV	III	32	Allied Practical IV	Tally Lab	2	0	0	2	2
	III	33	Skill Based Core Theory II	Micro Processor	3	3	0	0	4
	IV	34	Non Major Elective	Introduction to Internet with HTML/ Office Automation	2	2	0	0	2
	IV	35	Naan Mudhalvan	Digital Skills for Employability – Office Fundamentals	2*				2*
	V	36	Extension activity	NCC,NSS,YRC,YWF	-	0	0	-	1
			Sub Total		**30**				**30**

* Extra Credit / hrs

					L	T	P	
V	III	37	Core	Machine Learning Using Python	4	4	0	0	4
	III	38	Core	Web Technology	5	5	0	0	4
	III	39	Core	Relational Database Management System	6	6	0	0	4
	III	40	Major Practical V	RDBMS Lab	4	0	0	4	2
	III	41	Major Elective I	E-Commerce/Design and Analysis of Algorithms/Cyber Security/Multimedia	4	4	0	0	4
	III	42	Project	Mini Project	5	0	0	5	4
	IV	43	Common	Personality Development	2	2	0	0	2
			Sub Total		**30**				**24**
VI	III	44	Core	Cloud Computing	4	4	0	0	4
	III	45	Core	Data Communications and Networking	5	5	0	0	4
	III	46	Core	VB.Net	6	6	0	0	4
	III	47	Major Practical VI	VB.Net Lab	4	0	0	4	2
	III	48	Major elective II	Computer Graphics/Web Services/Software Project Management/ Artificial Intelligence	4	4	0	0	4
	III	49	Project	Major Project -(group)	5	0	0	0	5
		50	Naan Mudhalvan	PBL Android App Development	2				2
			Sub Total		**30**				**25**

Total Credit = 23+23+29+32+24+25 >= 156 (Excluding Yoga)

L-Lecture **T**-Tutorial **P**- Practical

Distribution of marks between External and Internal Assessment is

For Theory 75 : 25   **For Practical 50 : 50**

Programming in C

Course Objective:

- Aims to provide exposure to basic concepts of C programming.
- It familiarizes basic syntax, compilation and execution of C programming.
- It explores Arrays, Functions, structures and file concepts.
- It also provides design, code test and debug in C programming.

Course outcome:

- To understand basic understanding of computers and programming syntax.
- To explore basic understanding of computers and programming syntax.
- To implement standard libraries, operators, functions and arrays.
- To create C programming with features like pointers and structures.
- To implement various file handling techniques.

Unit I   **(12 Hours)**

Overview of C:

Introduction- Importance of C - Sample C Programs - Basic structure of C - Executing C program

Constant, variables and data types:

Introduction- Character set - tokens – keywords and identifiers – constants – variables- data types – declaration of variables – assigning values of variables.

Operators and expressions:

Introduction – arithmetic of operations- relational operator – assignment operator – increment and decrement operator – conditional operator – bitwise operator – special operator – evaluation of expressions – precedence of arithmetic operators – type conversion in expression- operator precedence and associatively- mathematical functions

Unit II   **(12 Hours)**

Managing input and output operators:

Introduction: Reading a character- writing a character – formatted input – formatted output

Decision making and branching:

Introduction – decision making with IF statement- simple IF statement – The IF ELSE statement- nesting of IF – ELSE statement –ELSE IF ladders- The switch statement – The ?: operators – The GOTO statement

Decision making and looping:

The **while** statement – The **do** statement – The **for** statement- Jump in loops

Unit III   **(12 Hours)**

Arrays:

One dimensional arrays –Two dimensional arrays -Initializing two dimensional arrays – multi dimensional arrays

Handling of character strings:

Introduction: declaring and Initializing string variables- Reading string from terminal- writing string to screen – arithmetic operation on characters – putting strings together – comparison of two strings together – string handling functions

Unit IV   (12 Hours)

User defined functions:

Introduction – need for user- define functions- A multi- function program – The form of C functions- return values and their types – calling a function- category of function – no argument and no return values – argument with no return values -argument with return values – handling of non integer functions – nesting of functions – recursion – function with arrays – the scope and life time of variables in functions.

Unit V Pointers   (12 Hours)

Introduction: understanding pointers – accessing the address of variables – declaring and initializing pointers – accessing a variable through its pointer – pointer expressions – pointer increments and scale factor – pointers and character strings – pointers and functions – points on pointer.

TOTAL: 60 HOURS

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4	H	K4
CO5	PO3, PO4	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

Text Book:

Programming in ANSI C – E.Balagurusamy, Tata McGraw-Hill Publishing Company, 2008.

Reference Book:

Programming with ANSI and Turbo C – Ashok N. Kamthane, Pearson Education, 2008.

C Programming Lab

Practical List

1. Find the area of a Triangle
2. To Solve the possible roots of the Quadratic Equation
3. To arrange a List of numbers in Descending Order
4. To Find Ncr Value using Functions
5. To check a given String is Palindrome or not
6. To find Transpose of a Matrix
7. To Multiply two matrices
8. To Prepare Marklist for students
9. To Sort a List of names in Alphabetical Order

DIGITAL DESIGN

Course Objective:

- To familiarize the student with basic principles and fundamentals in digital logics and design.
- To develop basic skills using tools and theory used in design process.
- To understand the creative process, develop techniques and methods of creative problem solving.

Course outcome:

Upon completion of the course, the students will be able to

- Definition of digital logics and Circuits(K1)

- Understand about the digital devices (K2)

- Understand about digital arithmetic circuits(K2)

- Acquire Knowledge on basics of Gates and its Applications(K4)

- Have the necessary understanding on Registers for Counting Applications (K4)

Unit I : (15 Hours)

Digital System and binary numbers:

Digital systems – binary numbers – number base conversion – Octal and hexa decimal numbers – complements – signed binary numbers – binary codes – binary storage and registers – binary logic.

Boolean algebra:
Introduction – basic definition – axiomatic definition of Boolean algebra – basic theorem and properties and of Boolean algebra – Boolean functions.

Unit II : (15 Hours)

Logic gates:
Canonical and standard forms – other logic operations – digital logic gates and integrated circuits.
Gate-Level minimization:
Introduction : The Map method – Four- variable Maps –Five-variable Map – Product –of-sums simplifications- Don't conditions.

Unit III : (15 Hours)

NAND and NOR implementation- other two level implementations – Exclusive OR Functions.

Combinational Logic: Introduction – Combinational circuits – Analysis Procedure - Design Procedure

– Binary Adder – Subtractor – Decimal Adder - Binary Multiplier - Magnitude Comparator.

Unit IV :   **(15 Hours)**

Combinational Logic: Decoders - Encoders – Multiplexers.

Synchronous Sequential Logic:

Introduction –Sequential Circuits – Storage Element Latches - Storage Element Flip- Flops - Analysis of Clocked Sequential Circuits.

Unit V :   **(15 Hours)**

Registers and Counters: Registers – Shift Registers – Ripple Counters – Synchronous Counters – Other Counters.

Memory : Introduction – Random access memory – Memory Decoding – Error Detection and Correction – Read Only Memory.

TOTAL: 45 HOURS

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4,PSO5	H/M	K4
CO5	PO3, PO4	H/M	PSO4	H	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

Text Book:

Digital Design - Fourth Edition – M.Morris Mano, Michael D Ciletti,- Prentice Hall of India Pvt Ltd., 2007.

Reference Books:

1.Digital Principles and Applications – Albert Paul Malvino, Donald P Leach, Tata McGraw-Hill Publishing Company Ltd.

2.Digital Principles and Design – Donald D.Givone, Tata McGraw-Hill Publishing Company Limited

OBJECT ORIENTED PROGRAMMING WITH C++

Course Code: ---------

Course Objectives:

L	T	P	C
5	0	0	4

- Impart knowledge of object oriented programming concepts and implement them in C++
- Enable to differentiate procedure oriented and object-oriented concepts.
- Equip with the knowledge of concept of Inheritance so that learner understands the need of inheritance.
- Explain the importance of data hiding in object oriented programming

Course Outcomes:

- Define complete overview of Data types, functions, control statements and pointers.
- Apply Object Oriented Programming Concepts.
- Demonstrate the use of virtual functions to implement polymorphism.
- Demonstrate Function Overloading and Operator Overloading concepts
- Illustrate Templates, Files and Exception Handling.

UNIT I (12 Hours)

Principles of Object-oriented Programming: Software Evolution – A look at Procedure-Oriented Programming – Object-Oriented Programming Paradigm – Basic concepts of object-Oriented Programming – Benefits of OOP – Object-Oriented Languages- Applications of OOP
Beginning with C++ : What is C++? – Applications of C++ - A simple C++ Program – More C++ statements – An example with Class- Structure of C++ Program – Reference Variables – Operators in C++ - Scope Resolution Operator – Member De referencing Operators – Memory Management Operators – Manipulators – Type Cast Operators

UNIT II (12 Hours)
Functions in C++: Introduction – The Main Function – Function prototyping – Call by Reference – Return by reference – Inline Functions - Default Arguments – const Arguments – Function Overloading – Math Library Functions
Classes and Objects: Introduction - C Structure Revisited – Specifying a Class – Defining Member Function-A C++ Program with Class -Making an outside Function Inline –Nesting of Member Function – Private member functions- Arrays with in a class – Memory allocation for objects – Static Data Members – Static Member Functions, Arrays of objects – Objects as Function arguments – Friendly Functions – Returning Objects - Pointers to Members – Local Classes

UNIT III (12 Hours)
Constructors and Destructors : Introduction – Constructors – Parameterized constructors – multiple constructors in a class – Constructors with Default arguments – Dynamic Initialization of Objects- Copy Constructors – Dynamic Constructors – Constructing two dimensional Arrays – Destructors **Operator Overloading and Type Conversion:**

Introduction – Defining Operator Overloading – Overloading unary operators – Overloading Binary Operators – Overloading binary operators using Friends – Manipulation of strings using operators – Rules for overloading operators – Type conversions

UNIT IV   (12 Hours)

Inheritance : Extending Classes : Introduction – Defining Derived Classes – Single inheritance – Making a Private Member Inheritable – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes -Abstract Classes – Constructors in Derived Classes – Member Classes –Nesting of Classes

Unit V   (12 Hours)

Managing Console I/O Operations: Introduction - C++ Streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operation – Managing output with Manipulators.

Working with Files: Introduction – Classes for File Stream Operators – Opening and closing a File – Detecting end-of-file _ File Pointers and their Manipulators – Sequential Input and Output Operations – Error Handling during File Operations – Command –Line Arguments.

                                                                  (Total: 60 Hours)

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS01, PSO5	M/M	K1
CO2	PO2, PO4	H/M	PS02, PSO3	H/M	K2
CO3	PO3	H	PSO4,PS06	H/M	K5
CO4	PO5,PO6	M/H	PSO5	M	K6
CO5	PO7	H	PSO4,PSO7	H/H	K4

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

Text Book:

Object Oriented Programming C++ -Third Edition – E Balagurusamy, Tata McGraw-Hill Publishing Company Limited, 2008.

Reference Book:

1. Complete Reference C++ - Herbert Schildt, Fourth Edition, Tata McGraw-Hill Publishing Company Limited, 2003.
2. Object Oriented Programming with ANSI and Turbo C++ - Ashok N. Kamthane, Pearson Education, 2003.
3. C++ How to Program – Deitel, Fifth Edition Prentice Hall of India, 2004.
4. Programming with C++ - D.Ravichandran, Second Edition , Tata McGraw-Hill Publishing Company Limited,2003.

OBJECT ORIENTED PROGRAMMING WITH C++ LAB

Course Code: ---------

L	T	P	C
4	0	0	2

List of Practical

1. Finding the Volume of any three geometric figures using Function Overloading
2. Exchange values between two class objects using Friend functions
3. Define a class to represent a Bank Account
   Data Members:
   1.Name of the Depositor   2. Account Name

   3.Type of Account   4. Balance amount in the Bank

   Member Functions

   1.To Assign initial values   3. To Deposit an amount
   2.To withdraw amount   4 .To display name and balance
   Write a main Program to test the program

4. Find the minimum of two objects using friend function
5. Using Dynamic Constructors , concatenate two strings
6. Overload unary minus operator to change the sign of given vectors (3elements)
7. Overload Binary + Operator to add two complex numbers
8. Add two vector objects . Use >> and << overloading
9. Process student Mark List using multilevel inheritance
10. Using Hierarchical Inheritance, process employee details

MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE

Course Code: ---------

L	T	P	C
3	0	0	3

Course Objectives:

- To introduce the concepts of mathematical logic
- To introduce the concepts of sets, relations, and functions.
- To perform the operations associated with sets, functions, and relations.
- To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- To introduce generating functions and recurrence relations.
- To use Graph Theory for solving problems.

Course Outcomes:

- Ability to apply mathematical logic to solve problems.
- Understand sets, relations, functions, and discrete structures.
- Able to use logical notation to define and reason about fundamental mathematical concepts such as sets, relations, and functions.
- Able to model and solve real-world problems using graphs and trees.

UNIT I (15 Hours)

Set Theory : Basic Concepts of Set Theory - Inclusion and Equality of Sets – Power Set – Operations on Sets – Cartesian Products – Relations – Equivalence Relations

UNIT II (15 Hours)

Functions: Definition – Examples – One and Onto Functions – Bijective Functions – Identify Functions - Composition of Functions – Inverse Functions

Unit III (15 Hours)

Mathematical Logic : Statements and Notation – Connectives – Negation, Conjunction, Disjunction – Statement Formulas and Truth Tables – Conditional and Bi conditional – well formed Formulas – Tautology – Equivalence of Formulas – Duality Law – Principle Disjunctive Normal Forms – Principal conjunctive Normal Forms

Unit IV (15 Hours)

Graph: Definition – Examples – Sub graphs – Finite and Infinite Graph – Degree of a Vertex – Isolated and Pendent Vertices – Types of Graphs –Examples

Unit V (15 Hours)

Paths and Circuits: Walk, Path and Circuits – Connected and Disconnected Graphs – Euler Graphs – Operations on Graphs – Trees – Properties of Trees – Rooted and Binary Trees.

(Total: 45 Hours)

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS01, PSO3	M/H	K1
CO2	PO3	H/M	PS02, PSO5	H/H	K3
CO3	PO2,PO4	M/H	PSO5,PS06	H/M	K6
CO4	PO5	H	PSO4	M	K4

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate, K6 – Create)

Text Book:

Mathematical Foundations for Computer Science – Part I - D Glory Ratna Mary, Y.S.Irine Viola, Veda Publications

Reference Books:

1. Modern Algebra – Arumugam and Isaac, SciTech Publications.
2. Graph Theory - Arumugam and Isaac, SciTech Publications.
3. Discrete Mathematics for Computer Science – Hary Haggard, John Schlipf and SueWhitesides, Thomson Publications.

JAVA PROGRAMMING

L T P C

4 0 0 4

COURSE OBJECTIVES:

- ✓ To learn Object Oriented Programming language.
- ✓ To learn about Networking and event handling concepts.
- ✓ To handle abnormal termination of a program using exception handling.
- ✓ To design user Interface using AWT.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To get knowledge of the structure and model of the Java programming language.

CO2: To understand how to design applications with threads in Java.

CO3: To get Knowledge for developing software in the Java programming language.

CO4: To learn how to use exception handling in Java applications.

CO5: To use the Java programming language for various programming technologies.

COURSE OUTLINE:

UNIT – 1 HISTORY, DATA TYPES AND OPERATORS

History & Evolution of Java: Creation of Java – The java Buzz words – An overview of Java Object Oriented Programming. **Data types**: A closer Look at Literals – Variables – Type conversion and casting – Automatic type promotion in Expressions. **Arrays:** One Dimensional Array – Multi Dimensional Arrays. **Operators**: Arithmetic Operators – Bitwise operators – Relational operators – Boolean Logical operators – Assignment operators – Conditional operators–Operator Precedence—Control statements. **(12 L)**

UNIT - 2 CLASSES, METHODS AND INHERITANCE AND ABSTRACT CLASS

Class Fundamentals – Declaring objects – Assigning object Reference variables – Introducing Methods – Constructors – This Keyword - Garbage collection. **A Closer Look at Methods and Classes**: Overloading Methods – Overloading Constructors –Using object as parameters – Returning objects – Recursion – Introducing Access control – understanding static – Introducing final – Nested and Inner classes – String class –String Buffer Class – Using command line arguments. **Inheritance**: Basics – Using super – creating Multilevel Hierarchy – Method overriding – Dynamic Method Dispatch – Using Abstract class – Using final with inheritance.**(12 L)**

UNIT - 3 PACKAGES, INTERFACES, EXCEPTION HANDLING AND MULTITHREADING

Packages –Access Protection -Importing packages – Interfaces. **Exception Handling**: Fundamentals – Exception Types – Uncaught Exceptions – Using try and catch – Multiple catch clauses – Nested try statements – throw- throws- finally – Java's Built – in Exception – creating your own Exception subclasses. **Multithreaded Programming**: Java Thread Model – Main Thread – Creating a Thread - Creating Multiple Threads–Using is Alive () and join () – Thread priorities – Synchronization – Interthread Communication – Suspending Resuming: and stopping Threads. **(12 L)**

UNIT – 4 NETWORKING, APPLETS AND EVENT HANDLING

Networking Basics – Networking Classes and Interfaces – Inet Address – Inet4 Address and Inet6 Address – TCP/IP client Sockets – URL – URL Connection – HTTP URL Connection – Cookies. **The Applet Class**: An Applet skeleton – Simple Applet Display Methods – Example programs. **Event Handling**: Two Event handling Mechanisms – Delegation Event Model – Event classes – Sources of Events – Event Listener Interfaces Handling Mouse events – Handling Keyboard events. **(12 L)**

UNIT - 5 AWT AND AWT CONTROLS

AWT Classes – Window fundamentals – working with Frame Windows - working with Graphic and color.**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. **(12 L)**

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4	H	K4
CO5	PO3, PO4	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

JAVA - The Complete Reference -Herbert Schildt, Eleventh Edition, Oracle Press, 2019.

REFERENCE BOOKS:

1. Core and Advanced Java Programming – Black Book, Dreamtech Press, 2018

2. Programming with Java - A Primer, E. Balaguruswamy, Sixth Edition, 2016.

CORE SUBJECT – II

FINANCIAL ACCOUNTING

L T P C

3 0 0 4

COURSE OBJECTIVES:

✓   To impart basic accounting knowledge.

✓   To provide knowledge on the fundamental of financial accounting.

✓   To expose the student to various financial transaction and its current applications.

COURSE OUTLINE:

UNIT -1 BASIC CONCEPTS OF ACCOUNTING

Introduction to Accounting : Need for Accounting –Accounting as the language of business – Attributes and steps of Accounting –Book keeping Vs Accounting – Branches of Accounting – Methods of Accounting – Types of Accounting – Accounting Rules - Bases of Accounting – Accounting terminology. Basic Accounting Concepts: Meaning and classification of Accounting- Accounting Concepts – Accounting Conversion – Accounting equations. **(10 L)**

UNIT – 2 JOURNAL AND LEDGER

Recording a Financial Data: Memorandum Book, business transaction, Journal, Rules for Debit and Credit, Compound Journal entry, Advantages of Journal, Ledger, Ledger Account, Ledger Posting, Process of Posting, Balancing of An Account, Significance of Balances, Relation between Journal and Ledger-Subsidiary Books. **(15 L)**

UNIT – 3 PREPARING TRIAL BALANCE

Trial Balance: Objects, Methods of Preparing Trial balance, how to locate errors, hints for the preparation of trial balance & problems. **(11 L)**

UNIT -4 FINAL ACCOUNTS

Trading account – individual items posted to the debit of trading account – individual items credited to trading account – advantages of trading account – profit & loss account - advantages of profit & loss account- manufacturing account- balance sheet- classification of assets & liabilities. **(12 L)**

UNIT – 5 ACCOUNTS FOR NON PROFIT ORGANISATION

Introduction – Final accounts of no trading concern- receipts and payments account – features- income & expenditure account – feature- distinction between the two – treatment of special items – some important adjustments – types of problems – Distinction between income and expenditure account and profit and loss account – accounts of professional men. **(12 L)**

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

- To acquire knowledge about general aspects of business operations.
- To explain the concepts and procedures of financial reporting, including income and expenditure statement, balance sheet etc.
- To locate and analyze financial data from annual reports of corporations.

TEXT BOOKS:

1. Financial Accounting - T.S.Reddy, A.Murthy – Margham Publications, 2012.
2. Fundamentals of Advanced Accounting - R.S.N.Pillai, Bagavathi, S.Uma, 5th Edition, S.Chand Publication, 2012.

REFERENCE BOOKS:

1. Essentials of Financial Accounting – Asish K.Bhattacharayya, PHI, 2020
2. Advanced Accountancy - S.P.Jain and Narang – Kalyani Publications, 2017.

DATA STRUCTURES

L T P C
2 0 0 3

COURSE OBJECTIVES:

✓ To understand different methods of organizing large amounts of data.
✓ To efficiently implement different data structure.
✓ To efficiently implement solution for different problems.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: An understanding of the basic data structures.

CO2: To describe Data structures like stack, queue, tree and graph.

CO3: An understanding of the basic search and sort algorithms.

CO4: The appropriate use of a particular data structure and algorithm to solve a problem.

COURSE OUTLINE:

UNIT – 1 DATATYPES INTRODUCTION

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

Searching: List Searches – Hashed List Searches – Collision Resolution. (10 L)

UNIT – 2 LINKED LISTS

Linear List: Linked List Concepts – Linked List Algorithms – Processing a Linked List – Complex Linked List Structures. (10 L)

UNIT – 3 STACKS AND QUEUES

Basic Stacks Operations – Stack Linked List Implementation – Stack Applications – Queue operations – Queue Linked List Design. (10 L)

UNIT – 4 TREES

Basic Tree Concepts – Binary Tree - Binary Tree Traversals – Expression Trees- General Trees – Binary Search Trees – Heap definition – Heap Structure – Basic Heap Algorithm. (8 L)

UNIT - 5 INTRODUCTION TO GRAPHS

Sorting And Graphs: General Sort Concepts – Quick sort – External sorts. Graphs: Terminology – Operations–Graph storage Structure–Networks. (7 L)

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO4	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

1.Data Structures a Pseudo Code Approach with C++, Richard F. Gilberg & Behrouz A Forouzan, Brooks/Cole (Thomson Learning) 2001. Chapters: 1,2.1,2.3,2.4,3.1-3.4,3.6,4.1-4.3,5.1,5.2,7.1-7.5,8.1,9.1-9.5,11.1,11.4 (Quick Sort only) 11.6, 12.1-12.5.

REFERENCE BOOKS:

1. Fundamentals of Data Structures - Eilis Horowitz & Sartaj, Galgotia Publications 2008

2. Data Structures - Seymour Lipschutz, Tata McGrawHill, 2014

PROGRAMMING WITH PHP & MYSQL

L T P C

3 0 0 4

COURSE OBJECTIVES:

- ✓ To understand the concepts of open sources.
- ✓ To learn and use open-source database management system MySQL
- ✓ To create dynamic web pages and websites.
- ✓ To connect webpages with database.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To observe and understand the role, structure, control flow, classes and concepts in PHP and tables in MySQL

CO2: To implement the concepts in PHP and queries in MySQL.

CO3: To analyze functions for data and file handling in PHP and data management in MySQL

CO4: To evaluate the programming concepts in PHP to develop interfaces and manipulate data using MySQL.

CO5: To create applications using PHP and MySQL.

COURSE OUTLINE:

UNIT-1

Introduction: Introduction- Open-source PHP – PHP history- features-variables- statements operators' conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break   and continue.   **(12 L)**

UNIT – 2

Arrays and Functions: Arrays: Creating an array- modifying array-processing array-grouping form with arrays-using array functions- creating user defined functions- using files- sessions cookies- executing external programs – Creating sample applications using PHP.   **(12 L)**

UNIT – 3

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 file into an array with file-checking if a file exists- fscan fparse_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.   **(12 L)**

UNIT - 4 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 and filtering retrieved data -Advanced data filtering Data manipulation functions-Aggregate functions -Grouping Data-Subqueries Joining Tables- Set Operators-Full text searching.   **(12 L)**

UNIT- 5 PHP with MySQL:

Working MySQL with PHP-database connectivity- usage of MYSQL commands in PHP processing result sets of queries- handling errors-debugging and diagnostic functions validating user input through Database layer and Application layer formatting query output with Character- Numeric- Date and time – sample database applications.
(12 L)

Mapping of COs to POs and PSOs :

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO4	H	K4
CO5	PO3, PO4	H/M	PSO4, PSO5	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

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

REFERENCE BOOKS:

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.

NON-MAJOR ELECTIVE PAPER

[CHOOSE ANY ONE]

INTRODUCTION TO INFORMATION TECHNOLOGY /

INTRODUCTION TO COMPUTERS

L T P C

2 0 0 2

INTRODUCTION TO INFORMATION TECHNOLOGY

COURSE OBJECTIVES:

- ✓ To understand the principles of digital devices, computer hardware, software, telecommunications, networking and multimedia.
- ✓ This course provides a sound foundation on the basic theoretical and practical principles behind the technologies.
- ✓ To discuss up to date issues surrounding them including social aspects and how they impact everyday life.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To understand the architecture of the computer.

CO2: To know about internet & its applications.

CO3: To understand and define about the current trends in IT.

COURSE OUTLINE:

UNIT - 1 INFORMATION TECHNOLOGY BASICS

Introduction, Information, Technology, Information Technology, Present Scenario, Role of Information Technology, Information Technology and internet, Careers in IT Industry. Computer Organization and Architecture: Central Processing Unit, inside a computer, Data representation in Computer, Coding Schemes.

(6 L)

UNIT – 2 COMPUTER STORAGE AND MEMORY

Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.
(6 L)

UNIT – 3 INPUT & OUTPUT DEVICES

Input, Output Media: Introduction, types of input devices, types of output devices, **Multimedia Essentials**: Introduction, Multimedia definition, Building blocks of Multimedia, Multimedia system, Multimedia applications, Virtual reality.
(6 L)

UNIT – 4 ABOUT INTERNET

The Internet: Introduction, Evolution of Internet – Basic Internet terms – Getting Connected to Internet – Internet Applications – Data over Internet. **Internet tools**: Introduction – Web Browser – Browsing Internet using Internet Explorer – E-Mail – Search engines – Instant messaging.
(6 L)

UNIT V CURRENT TRENDS IN IT

Emerging trends in IT: Introduction, E-Commerce – Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies.

(6 L)

Mapping of COs to POs and PSOs :

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2	H	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4, PSO6	H /M	K4

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

- Introduction to Computer and Information Technology - D.GloryRatha Mary, S.Selvanayahi, Shekina Publications.

REFERENCE BOOKS:

- A book of Fundamentals of Information Technology - Anshuman Sharma, Vishal Sharma, Hardeep Singh & S.K.Kakkar, 5th Edition, Panjab University, 2020
- Fundamentals of Information Technology - Anoop Mathew, S.Kavitha Murugeshan, Narosa , 2013
- Introduction to Information Technology - V.Rajaraman, PHI, 2018.

INTRODUCTION TO COMPUTERS

L T P C

2 0 0 2

COURSE OBJECTIVES:

- ✓ To learn about basic components of the computer.
- ✓ To study functions and types of operating system.
- ✓ To study about software Installation.

COURSE OUTCOMES:

Upon completion of the course, the students should be able:

CO1: To understand the meaning and basic components of a computer system.

CO2: To define and distinguish Hardware and Software components of computer system.

CO3: To understand the memory and storage devices and types of Operating system.

COURSE OUTLINE:

UNIT – 1 COMPUTER BASICS

Introduction, Characteristics of Computers – Evolution of Computers, Generation of Computers, Classification of Computers, the Computer System, Application of Computers.
(6 L)

UNIT – 2 COMPUTER ORGANIZATION AND ARCHITECTURE

Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes.
(6 L)

UNIT - 3 INPUT & OUTPUT UNITS

Computer input units, Computer output units.
(6 L)

UNIT – 4 MEMORY & STORAGE DEVICES

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks.
(6 L)

UNIT – 5 OPERATING SYSTEM

Introduction, Operating System, Definition, Evolution of Operating System, Types of Operating System, Functions of Operating System. Computer Software: Introduction, Computer Software, Definition, Categories of Software, Installing and Uninstalling software, Software piracy, Software terminologies. **(6 L)**

Mapping of COs to POs and PSOs :

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4, PSO5	M/H	K4

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

- Introduction to Computer and Information Technology - D.GloryRatha Mary, S.Selvanayahi, Shekina Publications.

REFERENCE BOOKS:

- Introduction to Computer - Peter Norton, Tata McGraw Hill, 2002
- Fundamental of Information Technology - Alex Leon& Mathews Leon Vikas Publication – New Delhi, 2009

MAJOR PRACTICAL – III

JAVA PROGRAMMING LAB

L T P C

0 0 2 2

PRACTICAL LIST

1. Design a class called student with data members name, Roll Number and three subject marks. include methods to assign initial values, find total and average and to display total and average marks .
2. Write a java program to find the area of Square, Rectangle, and Triangle by (a) Overloading Constructor Method (b) Overloading Method
3. Write a java program using Multilevel Inheritance.
4. Write a java program using Overriding Methods
5. Write a java program to create and Implement an Interface.
6. Write a java program to Create and Import Package (Minimum Three Classes)
7. Write a java program to throw the following Exception: (a)Negative Array Size (b) Array Index out of Bounds
8. Write a java program to Create your Own Exception
9. Write a java program to create a thread Using Thread Class.
10. Write a java program Display a Simple Banner Applet.
11. Write a java program using Applet to Design a Web Page
12. Write a java program to illustrate Mouse and keyboard Event Handling.
13. Write a java program to Design a calculator to perform arithmetic operations.
14. 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.
15. Write a java program to create a File menu with New, Save and Close options, Edit menu with cut, copy, and paste options.

DATA STRUCTURES LAB

L T P C

0 0 2 2

PRACTICAL LAB

1. Write a C++ program to implement sequential search and Binary search inarray.

2. Write a C++ program to implement linked list and perform the following operations

(a) Add a node as first node.   (b) Add a node as last node.

3. Write a C++ program to implement linked list and implement the following Objects.

(a) Delete the first node.   (b) Delete the last node.

4. Write a C++ program to implement a stack linear list perform the push and pop Operations.

5. Write a C++ program to implement binary tree using Linked and
Perform the following traversal:

(a) Inorder traversal.   (b) Preorder traversal. (c) Postorder traversal.

6. Write a C++ program to implement merge sort.

7. Write a C++ program to implement quick sort.

PYTHON Programming

L	T	P	C
4	0	0	4

Course Code: ---------

Course Objectives:

The main objectives of this course are to:
- To introduce the fundamentals of Python Programming.
- To teach about the concept of Functions in Python.
- To impart the knowledge of Lists, Tuples, Files and Directories.
- To learn about dictionaries in python.
- To explore the object-oriented programming concepts, Graphical programming aspects of Python with help of built-in modules.

Course Outcomes:
- Remembering the concept of operators, data types, looping statements in Python programming.
- Understanding the concepts of Input / Output operations in file.
- Applying the concept of functions and exception handling
- Analyzing the structures of list, tuples and maintaining dictionaries

UNIT I

Introduction to Python: Features of Python – Execution of a Python program – Flavors of Python – Python Virtual machine (PVM) – Memory Management in Python – Garbage Collection – Comparison of Python with C and Java.

Datatypes in Python: Built in Data types: None Type - Numeric types: int, float, complex - datatype conversion - booldatatype.

Sequences : string , bytes , bytearray , list , tuple , range - set datatype – mapping datatype - literals.

Operators: Arithmetic operators – Assignment operators – Unary minus operator – Relational operators – Logical operators – Boolean operators – Bitwise operators - Membership operators – Identity operators - Operator precedence - Mathematical functions.

UNIT II

Input and Output: print() - input() - command line arguments.

Conditionals and Loops: if statement - if…else statement - if…elif statement - while loop - for loop - the else suite - break statement - continue statement - pass statement - assert statement - return statement .

Arrays in Python: Creating array – Importing the array module – Indexing and slicing on arrays – Types of arrays – Working with arrays using numpy – Mathematical operations on arrays – Working with multidimensional array – Matrices in numpy.

UNIT III

Strings and characters: Slicing the strings – String functions and methods – working with characters.

Functions: Defining a function – Calling a function – Pass by object reference – Recursive functions – lambda functions – Function decorators – Generators.

Lists: list operations – list slices – aliasing and cloning list - Methods to process lists – Nested list – list comprehension.

Tuples: Creating tuples - Basic operations on tuples – Functions to process tuples.

UNIT IV

Dictionaries: Operations on dictionary – Dictionary methods – Using loops with dictionaries – Converting lists, strings into dictionary – Passing dictionary to functions – Ordered dictionaries.
Exceptions: Errors in Python program - Exception - Types of exceptions - except Block - assert statement - user defined exceptions - logging the exception.
Files: text files - binary files - opening a file - closing a file - working with text file - working with binary files - pickle in Python - seek() and tell() methods - random accessing of binary files - zipping and unzipping files - working with directories.

UNIT V

Classes and objects: Creating a class - the self variable - constructor – instance variables - class variables - namespaces - Instance methods - class methods - static methods - passing members of one class to another class - inner class.
Inheritance: Constructors in inheritance - overriding super class constructors and methods - super() method - types of inheritance - Method Resolution Order (MRO).
Polymorphism: Duck Typing Philosophy of Python - Operator overloading - Method overloading - Method overriding.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS01, PSO5	M/M	K1
CO2	PO2, PO3	H/M	PS02, PSO3	H/M	K2
CO3	PO4	H	PSO4,PS06	H/M	K5
CO4	PO5,PO6	M/H	PSO5	M	K6

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

Text Book
        R. NageswaraRao, "Core Python Programming", Second Edition, Dreamtech Press, 2019.
Reference Books
1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, O'REILLY, 2012.
2. Wesley J Chun, "Core Python Applications Programming", Prentice Hall, 2012.
3. Martin C. Brown, "PYTHON: The Complete Reference", McGraw-Hill, 2001.
4. E. Balagurusamy, "Problem Solving and Python Programming", McGraw-Hill, First Edition, 2017.

SOFTWARE ENGINEERING

Course Code: --------

L	T	P	C
3	0	0	4

COURSE OBJECTIVES:

- To understand the nature of software & software engineering.
- To introduce principles of software development
- To learn about planning, developing, designing testing and validating a project.

COURSE OUTCOMES:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to identify, formulates, and solves engineering problems.

UNIT – 1 SOFTWARE AND SOFTWARE ENGINEERING

The Nature of Software – What is Software Engineering? - Software engineering as a branch of the engineering profession – Stack holders in Software engineering - Software quality - Software engineering projects – Activities common to Software projects – Difficult and risk in software engineering as a whole. Review of Object Orientation: What is object orientation/ - Classes and objects – Instance variables – Methods, Operations and Polymorphism – Concepts best define object orientation – Difficulties and risks in programming language choice and object – oriented programming.

UNIT – 2 DEVELOPING REQUIREMENTS

Domain analysis – The starting point for software projects – Defining the problem and the scope – What is a requirement? – Types of requirements – Some techniques for gathering and analyzing requirements – Managing changing requirements – Difficulties and risks in domain and requirements analysis.

UNIT – 3 MODELING WITH CLASSES

What is UML? – Essentials of UML class diagrams – Associations and Multiplicity – Generalization – Instance diagrams – More advanced features of class diagrams. Modeling Interactions and Behavior: Interaction diagram – State diagrams – Activity diagrams.

UNIT - 4 ARCHITECTING AND DESIGNING SOFTWARE

The process of design – Principles leading to good design – Techniques for making good design decisions – Software architecture – Architectural patterns – Writing a good designing document.

UNIT – 5 TESTING AND INSPECTING TO ENSURE HIGH QUALITY

Basic definitions – Effective and efficient testing – Defects in ordinary Algorithms – Defects in numerical algorithms – Defects in timing and co-ordination. Managing the Software Process: What is project management? – Software process models – Cost estimation – building software engineering teams – Project scheduling and tracking.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS04	M	K2
CO2	PO2, PO4	M/H	PS01,PS05	M/H	K4
CO3	PO3,PO5	H/H	PS02	M	K3
CO4	PO6	H	PS03, PS06	H/M	K5

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOK:

1. Object Oriented Software Engineering - Timothy C.Lethbridge and Robert Laganiere,2nd Edition, McGraw Hill Education, 2005.

REFERENCE BOOKS:

1. Object Oriented and classical Software Engineering - Stephen, R. Schach, 5th Edition,McGraw Hill Education, 2011.

2. Fundamentals of Software Engineering - Carlo Ghezzi, MedhiJazayeri, Dino Mandrioli, 2nd Edition, Pearson, 2015.

PYTHON Programming LAB

Course Code: ---------

L	T	P	C
2	0	0	2

OBJECTIVES:

• To implement the python programming features in practical applications.
• To write, test, and debug simple Python programs.
• To implement Python programs with conditionals and loops.
• Use functions for structuring Python programs.
• Represent compound data using Python lists, tuples, dictionaries, turtles, Files and modules.

OUTCOMES:

• Understand the numeric or real life application problems and solve them.
• Apply a solution clearly and accurately in a program using Python.
• Apply the best features available in Python to solve the situational problems.

LIST OF EXERCISES:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.

2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:

Grade A: Percentage >=80 Grade B: Percentage >=70 and <80

Grade C: Percentage >=60 and <70 Grade D: Percentage >=40 and <60.

Grade E: Percentage <40

3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.

 4. Program to display the first n terms of Fibonacci series.

 5. Program to find factorial of the given number using recursive function.

6. Write a Python program to count the number of even and odd numbers from array of N numbers.

7. Python function that accepts a string and calculate the number of upper case letters and lower case letters.

 8. Python program to reverse a given string and check whether the give string is palindrome or not.

9. Write a program to find sum of all items in a dictionary.

10. Write a Python program to construct the following pattern, using a nested loop

```
1
 22
333
4444
 55555
666666
 7777777
88888888
999999999
```

11. Read a file content and copy only the contents at odd lines into a new file.

12. Create a Turtle graphics window with specific size.

13. Write a Python program for Towers of Hanoi using recursion

14. Create a menu driven Python program with a dictionary for words and their meanings.

15. Devise a Python program to implement the Hangman Game.

ALLIED – IV

ACCOUNTING SOFTWARE – TALLY

L T P C
3 0 0 3

COURSE OBJECTIVES:

- This course is designed to impart knowledge regarding concepts of Financial AccountingTally is an accounting package which is used for learning to maintain accounts.
- As this course is useful for Commerce and computer students to get placements indifferent offices as well as companies in Accounts departments.

UNIT – 1 CREATING COMPANY IN TALLY

Creating Accounting and Inventory Ledger - creating stock item group, category, pos – Trialbalance - Final accounts with adjustments. **(10L)**

UNIT – 2 VALUES DDED TAX

Values added Tax – VAT Rate – VAT classification – VAT composition Report – VAT compositereturns – Voucher entry. **(10 L)**

UNIT – 3 TDS, TCS, ST

Features of TDS – TDS Deduction for advance payment & Balance payment – TDScomputation report – TCS report Service Tax Reports. **(10 L)**

UNIT – 4 EXISE DEALER

Dealer Excise report – Excise stock register – Bank Reconciliation statement – Ledger creationand effective Date for Reconciliation. **(8 L)**

UNIT – 5 PAYROLL

Payroll info - pay heads –employee groups – salary- unit of a attendance – pay sheet report –payslip pay roll statement – payroll with PF and ESI. **(7 L)**

COURSE OUTCOMES:

- Company Setup & Configurations.
- Charts of Accounts Setup.
- Recording Financial Transactions.
- Financial Reports Analysis.

TEXT BOOK :

Accounting Package Tally 9.0 – A.K. Nanthini, Himalaya Publications, 2008.

REFERENCE BOOK:

Tally 9.0 by Dr. Namrata Agrawal, Professor, NIFS.

ALLIED PRACTICAL IV
TALLY LAB [ACCOUNTING PACKAGE]

L T P C

0 0 4 2

PRACTICAL LIST

1(a). Develop a purchase day book as your own data

(b). Create a sales daybook as your imaginary figures

(c). Give a format of a petty cash book with your own figure

(d). Prepare an invoice book with your own figure

2. With the following particulars, prepare a trail balance:

1	Capital	50,000
2	Sales	5,50,000
3	Purchases	5,60,000
4	Salaries	2,200
5	Carriage inwards	400
6	Lightings	300
7	Rates & insurance	400
8	Discount earned	500
9	Buildings	30,850
10	Furnitures	6,000
11	Carriage Outwards	500
12	Sundry Debtors	8,000
13	Sundry Creditors	20,000
14	Cash at Bank	12,850

3. Prepare a proper Subsidiary book and do the transactions with your own data

4. Prepare a Petty Cash bool with your own data

5. Prepare a Balance Sheet of a Software company with your own data

6. Prepare Sales invoice of a medical store with your own data

MICROPROCESSOR

Course Code: ---------

L	T	P	C
3	0	0	4

COURSE OBJECTIVES:
- To study about microprocessor Architecture.
- To learn about basic 8085 microprocessor and its operations and applications.
- To do arithmetic manipulations using 8085 processor.

COURSE OUTCOMES:
- To write programs to run on 8086 microprocessor-based systems.
- Design system using memory chips and peripheral chips for 16-bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.

UNIT – 1 MICROPROCESSORS, MICROCOMPUTER AND ASSEMBLY LANGUAGE

Microprocessors – Microprocessors Instruction set and Computer Languages – Computers to single chip microcontrollers. Mention to 8085 assembly language Programming – The 8085 Programming model action Classification – Instruction, data format and storage – How to write, store and execute simple program, Overview of 8085 instruction set.

UNIT – 2 MICROPROCESSOR ARCHITECTURE AND MICRO COMPUTER SYSTEMS

Microprocessor Architecture and its operations – Memory – Input and Output (I/O) – Example of a Micro Computer System. Microprocessor Architecture and Memory interfacing: The 8085 MPU – Example 8085 based microcomputer - Memory interfacing - Interfacing the 8155 memory.

UNIT – 3 DATA TRANSFER OPERATION

Arithmetic operations – Logic operations – Branch operations - Writing assembling Language programs – Debugging a program.Programming techniques with additional Instruction: Programming techniques – Counting and Indexing – Additional data transfer and 16-bit arithmetic operations – Arithmetic operations related to memory - Logic operations related to memory - Logic operations – Rotate – Dynamic debugging.

UNIT - 4 COUNTERS AND TIME DELAYS

Counters Time Delays – Hexa decimal counter. Modulo ten counter – Pulse Wave forms – Debugging counter and time Delay programs. Subroutine: Stack – Subroutine – Restart – Conditional call and Return subroutine concepts.

UNIT – 5 CONVERSIONS

BCD to Binary conversion – Binary to BCD conversion - BCD to seven segment.LED code conversion – BCD addition – BCD Subtraction – Multiplication- Subtraction with carry.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	M	PS01,PS03	M	K2
CO2	PO1, PO4	M/M	PS05	M/H	K3
CO3	PO5	H	PS06	H	K5

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOKS:

1. Ramesh S. Goanker - Microprocessor Architecture Programming and Applications with the 8085 – 5th Edition, Penram International Publisher 2000.
2. Microprocessor and Microcontrollers N. Senthil Kumar, M. Saravanan, S. Jeevananthan. Oxford University Press, 2016

REFERENCE BOOK:

1.8085 Microprocessor Programming and Interfacing - N.K.Srinath, PHI Publication, 2005.

INTRODUCTION TO INTERNET WITH HTML

Course Code: ---------

COURSE OBJECTIVES

L	T	P	C
2	0	0	2

- To learn the principle of Web page design.
- To visualize the basic concept of HTML.
- To recognize the elements of HTML.

COURSE OUTCOMES:
- Understand basic concepts in HTML.
- Create basic web pages.
- Implement a variety of hyperlinks to connect pages and communicate with users via email link.

UNIT – 1 INTRODUCTION TO INTERNET

Computer is business – networking – internet - e-mail-gopher-world wide web, Internet Technologies – Internet Browsers.

UNIT – 2 INTRODUCTION TO HTML

History of HTML - HTML generation and Documents – Tags and Links, Head and Body Section.

UNIT - 3 DESIGNING

Body Section – Ordered and Unordered List – Table Handling.

UNIT - 4 INTRODUCTION TO DHTML

Features of DHTML – Defining styles – Working with Colors – Text and Fonts with Style.

UNIT V FRAMES

Frame set Definition – Nested frames – A web design project – forms.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1,PO2	H/H	PS01	H	K1
CO2	PO5	H	PS02, PSO5	H/M	K2
CO3	PO3,PO6	H/H	PS04	H	K3

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOK:

World Wide Web Design with HTML - C.XAVIER, McGraw Hill Education, 2017

REFERENCE BOOK:

1. The Complete Reference HTML & CSS - Thomas A.Powell, McGraw Hill Education, 2017
2. Fundamental of the internet and the World Wide Web - Greenlaw and Hepp, TMH Publications. 2008

<mark>MS WORD</mark>   **Office Automation**

<div align="right">

L T P C
2 0 0 2

</div>

Course Outcomes:

- To identify word processing terminology and concepts, create technical documents,format and edit documents, use simple tools and utilities, and print documents.
- To do Mail merging process.
- To Create and edit a Word document.

UNIT - 1
Introduction to Microsoft word 2007 **(6 L)**

UNIT - 2
Creating a document in Microsoft word 2007 **(6 L)**

UNIT - 3
Working with tables, Charts, Graphics **(6 L)**

UNIT - 4
Additional commands of Microsoft word 2007 **(6 L)**

UNIT - 5
Menu commands of Microsoft word 2007 **(6 L)**

COURSE OUTCOMES:
- Demonstrate fundamental knowledge of MS Word.
- Relate real-life MS Word applications for professional or personal use.
- Develop an informal business letter.
- Apply MS Word techniques to create promotional hand-outs.

TEXT BOOK:
1. Straight to the Point Microsoft Word 2007 - Dinesh Maidasani, Laxmi

Publication 2007.

REFERENCE BOOK

1. Microsoft Office 2007: Introductory concepts and techniques - Shelly, Cashman, Cengage Learning Inc, 2007

V Semester

MACHINE LEARNING WITH PYTHON

L T P C
4 0 0 4

COURSE OBJECTIVE:
- To understand the Machine Learning Basics and steps in developing ML applications.
- To understand the concept of KNN, Decision tree , plotting concepts with Matplotlib.
- To learn about the classification concepts with Naive Bayes, Logistic Regression and various classifiers in ML.

Course Outcomes:
- Upon completion of the course the student will be able to
- **CO1**: Describe the concepts of machine Learning
- **CO2**: Explain the fundamentals of Classification and probability theory
- **CO3**: Analyse the supervised learning techniques
- **CO4**: Analyse the un-supervised learning techniques
- **CO5**: Illustrate Big Data using machine learning
- **CO6**: Develop applications using Hadoop and Map Reduce

Course Outline:

UNIT I

Classification - Machine learning basics - Key terminology - Key tasks of machine learning - How to choose the right algorithm - Steps in developing a machine learning application - Getting started with the NumPy library - Classifying with k-Nearest Neighbors - Classifying with distance measurements - **Example**: a handwriting recognition system - **Splitting datasets one feature at a time**: decision trees - Tree construction - Plotting trees in Python with Matplotlib annotations - Testing and storing the classifier.

UNIT II

Classifying with probability theory: naïve Bayes - Classifying with Bayesian decision theory - Classifying with conditional probabilities - Document classification with Naïve Bayes - Classifying text with Python - Logistic regression - Classification with logistic regression -

Using optimization to find the best regression - Support vector machines - Separating data with the maximum margin - Finding the maximum margin - Efficient optimization with the SMO algorithm - Speeding up optimization with the full Platt SMO - Using kernels for more complex data - Improving classification with the AdaBoost meta-algorithm - Classifiers using multiple samples of the dataset - **Train:** improving the classifier by focusing on errors - Creating a weak learner with a decision stump - Implementing the full AdaBoost algorithm - **Test:** classifying with AdaBoost.

UNIT III

Forecasting numeric values with regression - Finding best-fit lines with linear regression - Locally weighted linear regression - Shrinking coefficients to understand our data - The bias/variance tradeoff - Tree-based regression - Locally modeling complex data - Building trees with continuous and discrete features - Using CART for regression - Tree pruning - Model trees - **Example:** comparing tree methods to standard regression - Using Tkinter to create a GUI in Python.

UNIT IV

Unsupervised learning - Grouping unlabeled items using k-means clustering - The k-means clustering algorithm - Improving cluster performance with post processing - Bisecting k-means - Association analysis with the Apriori algorithm - Association analysis - The Apriori principle - Finding frequent itemsets with the Apriori algorithm – Mining association rules from frequent item sets - Efficiently finding frequent itemsets with FP-growth - **FP-trees:** an efficient way to encode a dataset - Build an FP-tree - Mining frequent items from an FP-tree.

UNIT V

Using Principal Component analysis to simplify data - Dimensionality reduction techniques - Principal component analysis - Simplifying data with the singular value decomposition - Applications of the SVD - Matrix factorization - SVD in Python - Collaborative filtering– based recommendation - Big data and MapReduce - **MapReduce**: a framework for distributed computing - Hadoop Streaming - Running Hadoop jobs on Amazon Web Services - Machine learning in MapReduce - Using mrjob to automate MapReduce in Python - **Example:** the Pegasos algorithm for distributed SVMs.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2

CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO5	H	K4
CO5	PO4, PO5	H/M	PSO4, PSO5	H/M	K5
CO6	PO5, PO6	H/M	PSO5,PSO6	H/M	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK

 Peter Harrington," Machine Learning in Action", Manning Publications Co., 2012.

REFERENCE BOOKS

1. WilliRichert, Luis Pedro Coelho, "Building Machine Learning Systems with Python", Packt Publishing, 2013.

2. Andreas C. Müller, Sarah Guido, "Introduction to Machine Learning with Python: A Guide for Data Scientists", O'Reilly Media, 2016.

WEB TECHNOLOGY

L T P C
5 0 0 4

COURSE OBJECTIVE:

- To provide the conceptual and technological developments in the field of Internet and web designing with the emphasis on comprehensive knowledge of Internet, Describe the basic concepts for network implementation.
- To learn the basic working scheme of the Internet and World Wide Web.
- Understand fundamental tools and technologies for web design.

COURSE OUTCOME (COs):

- Upon Completion of the course, the students should be able to:
- **CO1:** Employ fundamental computer theory to basic programming techniques.
- **CO2:** Use fundamental skills to maintain web server services required to host a website.
- **CO3:** Select and apply markup languages for processing, identifying, and presenting of information in web pages.
- **CO4:** Use scripting languages and web services to transfer data and add interactive components to web pages.

COURSE OUTLINE:

UNIT - 1 INTRODUCTION TO THE WEB

Understanding the Internet and World Wide Web – History of the Web – Protocols Governing the Web – Creating Websites for Individuals and the Corporate World – Web Applications – Writing Web projects – Identification of Objects – Target Users – Web Team – Planning and Process Development – Web Architecture –Internet Standards – TCP/IP Protocol Suite – IP Address – MIME – Cyber Laws. Hyper Text Transfer Protocol (HTTP): Introduction – Web servers and clients – Resources – URL and its Anatomy – Message Format. (14 L)

UNIT - 2 HYPER TEXT MARKUP LANGUAGE (HTML)

History of HTML and W3C – HTML and its Flavors – HTML Basics – Elements, Attributes, and Tags – Basic Tags – Advanced Tags – Frames. (12 L)

UNIT - 3 JAVA SCRIPT

Introduction – Variables – Literals – Operators – Control Structure – Conditional statements – Arrays – Functions – Objects. (10 L)

UNIT - 4 EXTENSIBLE MARKUP LANGUAGE (XML)

Common Usage – Role of XML – Prolog – Body – Elements – Attributes – Validation – Displaying XML – Namespace.XML DTD: XML Schema Languages– Validation – Introduction to DTD– Purpose of DTD – Using a DTD in an XML Document. (12 L)

UNIT - 5 COMMON GATEWAY INTERFACE (CGI)

Internet Programming Paradigm – Server – side Programming – Languages for CGI – Applications – Server Environment – Environment Variables – CGI Building Blocks – CGI Scripting Using C, Shell Script – Writing CGI programs – CGI Security – Alternatives and Enhancements to CGI. Servlet: Server – Side Java – Advantages Over Applets - Servlet Alternatives – Servlet Strength – Servlet Architecture – Servlet Life Cycle. (12 L)

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K3
CO4	PO1, PO5	H/M	PSO5	H	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

1. Web Technologies - Uttam K. Roy, Oxford University Press 2010.

REFERENCE BOOKS:

Web Technology and Design - C. Xavier, New Age International Publishers, 2005.

Web Technologies TCP/IP Architecture and Java Programming -Achyut S. Godbole&AtulKahate, Tata McGraw Hill, Second Edition, 2008.

CORE SUBJECT – III
Relational Database Management Systems

L T P C
6 0 0 4

COURSE OBJECTIVES:
- To understand relational database concepts and transaction management concepts in database system.
- To write PL/SQL programs that use: procedure, function, package, cursor and Exceptions.
- To Use current techniques and tools necessary for complex computingpractices.

COURSE OUTCOMES:

- Master the basic concepts and appreciate the applications of databasesystems.
- Master the basics of SQL and construct queries usingSQL.
- Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.

Course Outline:

UNIT – 1 AN OVERVIEW
Personal database - Client server databases – Oracle 9i An introduction – The SQL*Plus Environment – SQL – SQL*PLUS commands – Sample Databases. Oracle Tables; Naming rules and conventions – Data types – Constraints – Creating an Oracle table – Displaying table information's – Altering and exiting table – Dropping a table – Renaming a table – Truncating a table. **(12 L)**

UNIT - 2 WORKING WITH TABLES

DML – Adding a new Rows/Records – Customized Prompts – Updating existing rows/records – Deleting existing rows/records – Retrieving data from a table -   Arithmetic operations – Where clause – sorting. **(10 L)**

UNIT - 3 MULTIPLE TABLES
Joins–Set   operators.   Subqueries: Subquery–Top–NAnalysis.   Advanced   features:Views–Subsequences - Synonyms–Index. **(12L)**

UNIT - 4 PL/SQL: FUNDAMENTALS
PL/SQL: fundamentals – Block structure – Comments – Data types –Variable declaration – Anchored declaration – Assignment operation – Bind variables – Substitution Variables –

Arithmetic operators. Control Structures: Control structures – Nested blocks – SQL in PL/SQL DML in PL/SQL – Transaction Control Statements. **(14 L)**

UNIT - 5   PL/SQL CURSORS &EXCEPTIONS

Cursors – Implicit cursors – Explicit cursor – Explicit cursor attributes – Implicit cursor attributes – cursor FOR loops – SELECT … FOR UPDATE- WHERE CURRENT of clause – cursor with parameters – Exceptions – Exception types – Records, Tables: PL/SQL Records – PL/SQL Tables – PL/SQL Varrays. **(12L)**

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K1
CO2	PO3, PO6	H/M	PSO2, PSO6	H/M	K3
CO3	PO1, PO2, PO5	H/M/M	PSO4, PSO5	H	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:
   1. Database System Using Oracle - Nilesh Shah, 2nd Edition, Pearson, 2016.

REFERENCE BOOK:
   1.   Oracle 9i Complete Reference - Loney, Koch, Tata McGraw Hill, 2005.

	RDBMS LAB	L	T	P	C
		0	0	4	2

1. Create an employee database with tables department, employee details, address, pay details and project details. After the tables and add constraints relevant to the fields in the tables. Insert records into all the tables.

2. Create queries to retrieve relevant information from a table.

3. Create a table from the exiting tables. Create views from the tables.

4. Develop queries to retrieve information from more than one table. Develop summary queries to retrieve relevant information from the table

5. Create a partition table and query the records.

6. Create a PL / SQL Program to print multiplication table.

7. Create a PL / SQL Program to check whether a given string is palindrome or not.

8. Create a PL / SQL Program to print student details using report.

9. Create a PL/SQL Program to update using various triggers.

10. Create a PL/SQL Program to find factorial of numbers using function and procedure.

DESIGN AND ANALYSIS OF ALGORITHMS

COURESE OBJECTIVES:

L	T	P	C
4	0	0	4

- To know the basics of various sorting methods.
- To provide a thorough knowledge of the most common algorithms and data structures.
- To understand the design of algorithms

COURSE OUTCOMES:

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyse worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm.

UNIT – 1 INTRODUCTION

What is performance? – Space Complexity: Components of space complexity. Time Complexity: Components of time complexity – Operation counts – Best, worst Average counts – Step counts. Asymptotic Notations: Introduction – Big Oh Notation – Omega and Theta Notations – Complexity analysis examples

UNIT – 2 DIVIDE & CONQUER APPROACHES

The Method – Applications [Merge Sort, Quick Sort, Defective chessboard] – Solving recurrence equations – Lower bound complexity.

UNIT -3 GREEDY METHOD

Optimization problems – The Greedy Method – Applications [Container Loading, Topological sorting, Single Source Shortest Paths]

UNIT – 4 BACKTRACKING
Method – Applications [Max Clique, Travelling Salesperson, Board Permutation]
UNIT – 5 DYNAMIC PROGRAMMING
The Method – Applications [Matrix Multiplication chains – All pairs shortest path – Single source shortest path with negative costs]
Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS01,PS03	M/H	K2
CO2	PO4	M	PS04	M	K3
CO3	PO5/ PO2	H/M	PS06	H	K5

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOK

1. Data Structures, algorithms and applications in Java - SartajSahni, Second Edition,

University Press 2005

REFERENCE BOOKS

1. Algorithms - Dasgupta, Papadimitrou and Vazirani, McGraw-Hill Education, 2006.

2. Computer Algorithms - Horowitz, Sahni, and Rajasekaran, Silicon Press, 2007.

MULTIMEDIA

COURSE OBJECTIVES:

L	T	P	C
4	0	0	4

- To define the principles, characteristics and forms of Visual Design in Multimedia Development.
- To define the role of Visual Reading Elements.
- To learn how to use multimedia software.

COURSE OUTCOMES:

- Describe different realizations of multimedia tools and the way in which they are used.
- Analyse the structure of the tools in the light of low-level constraints imposed by the adoption of various QoS schemes (ie bottom up approach).
- Plan experiments to test user perception of multimedia tools.

UNIT - 1 MULTIMEDIA FUNDAMENTALS

Basic concepts - Multimedia applications Design consideration – Multimedia Application Goals & Objectives –Opportunities in multimedia production: Important in Multimedia development Application Design and production.

UNIT - 2 MULTIMEDIA APPLICATION

Structure and organization: Considering Interface design – Planning the production of your Application – Creating multimedia building blocks.

UNIT - 3MULTIMEDIA PRESENTATION

Building blocks: Text - Graphics.

UNIT - 4 OTHER MULTIMEDIA TOOLS

Multimedia presentation building blocks: video capturing, Sound Capturing and Editing.

UNIT - 5 STRUCTURE AND FUNCTION OF AUTHORING SOFTWARE

Authoring software, selection of authoring program - Fundamentals of Macromedia Director 5.0

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	M	PS01,PS03	M	K2
CO2	PO2, PO4	M/M	PS04	M/H	K3
CO3	PO5	H	PS02	H	K5

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOK:

1. Multimedia An Introduction- John Villain – Casanova- Louis Molina Prentice –Hall/Macmillan Computer Publishing, Reprint.

REFERENCE BOOK:

1. Multimedia: Making it works - TayVaughan, 6th Edition, TataMacGraw Hill.

E – COMMERCE

L	T	P	C
4	0	0	4

COURSE OBJECTIVES
- To provide adequate basic understanding about Management Education among the students.
- To prepare students to exploit opportunities being newly created in the Management Profession.
- To train the students in communication skills effectively.

COURSE OUTCOMES:
- Design and implement an e-commerce application with a shopping cart.
- Integrate the waterfall model in the development of e-commerce applications.
- Integrate user-centered design guidelines in developing user-friendly websites.

UNIT – 1 INTRODUCTION
What is Electronic Commerce? – Types of Electronic Commerce Technology

UNIT – 2 MODELS AND TYPES
Types of E-Business Models and Markets - Types of E-Commerce Providers and Vendors E- Commerce website Creation.

UNIT - 3 E-COM WEB DEVELOPMENT
Managing E-Commerce website Development – Building Shopping Cart Applications – Mobile Electronic Commerce.

UNIT - 4 E-COM DATABASES
Enhancing a web server with E-Commerce Application Development – Strategies, Techniques and tools – Implementing Merchandising Strategies – Implementing E-Commerce Databases.

UNIT - 5 E-COMMERCE APPLICATIONS
Applying and Managing E-Business Intelligence Tools for Application Development – Types of Security Technologies – protocols for the Public Transport of Private Information.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO2	M	PS01,PS03	M	K2
CO2	PO1, PO4	M/M	PS05	M/H	K3
CO3	PO6	H	PS04	H	K5

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOKS:
- Electronic Commerce - Pete Loshin and John Vacca, Fourth edition, Firewall Media, New Delhi, 2006.
- E-Business - ParagKulkarni, SunitaJahirabadkar, and PradipChande, Oxford University Press, 2013.

REFERENCE BOOKS:
- Electronic Commerce - Gary O.Schnelder James T.Perry, First edition, Thomson Learning 2000.
- Electronic Commerce - Elias M.Awad, Prentice Hall of India 2002.

CYBER SECURITY

L T P C
4 0 0 4

COURSE OBJECTIVES

- To describe different classes of attacks.
- To describe new and emerging IT and IS technologies.
- To analyze threats and risks within context of the cyber security architecture.

COURSE OUTCOMES:

- Evaluate the computer network and information security needs of an organization.
- Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
- Measure the performance of security systems within an enterprise-level information system.

Course Outline:

UNIT – 1 INTRODUCTION TO INFORMATION SECURITY

Introduction–TheHistoryofInformationSecurity –WhatisSecurity–CriticalCharacteristicsof Information – NSTISSC Security Model – Components of an Information System – Securing Components – Balancing Information Security and Access – Approaches to Information Security Implementation–TheSystemsDevelopmentLifeCycle –TheSecuritySystemsdevelopmentlife cycle – Security Professional and the Organization – Communities of Interest - Information Security – Is it an Art or a Science. **The Need for Security**: Introduction – Business Needs First – Threats – Attacks – Secure SoftwareDevelopment. **(12 L)**

UNIT – 2 RISK MANAGEMENT &PLANNING

Introduction – An overview of Risk Management – Risk Identification – Risk Assessment – Risk control Strategies – Selecting a Risk control Strategy – Quantitative versus qualitative risk control practices - Risk Management Discussion Points – Recommended Risk Control Practices. **Planning for Security**: Introduction – Information Security Policy, Standards and Practices – The Information Security Blueprint – Security Education, Training and Awareness Program – Continuity Strategies.**Security Technology**: Firewalls and VPNs: Introduction – Physical Design – Firewalls – Protecting Remote Connections. **(12 L)**

UNIT – 3 SECURITY TECHNOLOGY

Introduction – Intrusion Detection and Prevention System (IDS and IPSs) – Honey Pots, Honey Nets and Padded Cell Systems – Scanning and Analysis Tools – Access Control Devices. **Cryptography:** Introduction – Foundations of Cryptology – Cipher Methods – Cryptographic Algorithms – Cryptographic Tools. **(12 L)**

UNIT – 4 SECURITY IMPLEMENTATION

Physical Security: Introduction – Physical Access Controls – Fire Security and Safety – Failure of Supporting Utilities and Structural Collapse – Interception of Data – Mobile and Portable Systems – Special Considerations for Physical Security Threats. **Implementing Information Security:** Introduction – Information Security Project Management – Technical Topics of Implementation – Non technical Aspects of Implementation – Information Systems Security CertificationandAccreditation.**(12L)**

UNIT – 5 SECURITY AND INFORMATION SECURITY

SecurityandPersonnel:Introduction–Positioning&StaffingtheSecurityFunction–Credentials of Information Security Professionals – Employment Policies and Practices – Security Considerations for Nonemployees – Internal Control Strategies – Privacy and the Security of Personal Data. **Information Security Maintenance:** Introduction – Security Management Models – The Maintenance Model – DigitalForensics. **(12 L)**

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO3	H	PSO1	H	K4
CO2	PO4, PO6	H/M	PSO2, PSO6	H/M	K3
CO3	PO1, PO2, PO5	H/M/M	PSO3,PSO4	M/H	K5

(L – Low, M – Medium, H – High; K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create)

TEXT BOOK:

1. Principles and Practices of Information Security – Dr Michael E.Whitman, CISM, CISSP

Herbert J.Mattord, CISM, CISSP – Cengage Learning India Private Limited, Indian fourth edition

Reprint , 2010.

VI Semester

Cloud Computing

L	T	P	C
4	0	0	4

a. Course Objectives:
- ➢ To study the basics of cloud computing and different Cloud Computing services
- ➢ To understand the key concepts of virtualization, Cloud Implementation, Programming and Mobile cloud computing

b. Course Prerequisites:
- ➢ Basic knowledge of programming, operating systems, databases and networking is recommended

c. Course Outcomes (COs):

Upon completion of the course, the students should be able to:

 CO1: Understand the basics of Cloud Computing

 CO2: Comprehend the concepts of Virtualization and the design of Cloud Services

 CO3: Classify appropriate techniques and tools to develop Cloud applications

 CO4: Apply the knowledge of Python for Cloud Services

 CO5: Develop the security architecture for a Cloud environment

d.   **Course Outline:**

UNIT I: CLOUD COMPUTING FOUNDATION Introduction to Cloud Computing - Cloud Computing Basics - History of Cloud Computing - Importance of Cloud Computing - Characteristics - Move to Cloud Computing: Pros and Cons of Cloud Computing - Nature of the Cloud - Technologies in Cloud Computing - Migrating into the Cloud - Seven-step Model. Types of Cloud - Cloud Infrastructure - Cloud Application Architecture. Working of Cloud Computing: Trends in Computing - Cloud Service Models - Cloud Deployment Models

Unit II: CLOUD COMPUTING ARCHITECTURE Cloud Computing Technology: Cloud Lifecycle Model - Role of Cloud Modeling and Architecture - Reference Model for Cloud

Computing-Cloud Industry Standard. Cloud Architecture: Developing Holistic Cloud Computing Reference Model - Cloud System Architecture. Cloud Modelling and Design: Basic Principles - Model for Federated Cloud Computing- Cloud Eco System - Cloud Governance.

Unit III: VIRTUALIZATION Definition of Virtualization - Adopting Virtualization -Types of Virtualization - Virtualization Architecture and Software - Virtual Clustering - Introduction to Cluster - Virtualization Application - Pitfalls of Virtualization. Grid, Cloud and Virtualization: Virtualization in Grid - Virtualization in Cloud. Virtualization and Cloud Computing : Anatomy of Cloud Infrastructure - Anatomy of Cloud Computing - Virtual Infrastructures - CPU Virtualization - Network and Storage Virtualization

Unit IV: DATA STORAGE AND SECURITY Data Storage: Introduction to Enterprise Data Storage - Data Storage Management - File Systems - Cloud Data Stores - Using Grids for Data Storage. Cloud Storage: Overview of Cloud Storage - Data Management for Cloud Storage - Provisioning Cloud Storage - Data-intensive Technologies for Cloud Computing. Risks in Cloud Computing: Introduction - Risk Management - Cloud Impact - Enterprise Wide Risk Management - Types of Risks in Cloud Computing . Data Security in Cloud: Introduction - Current State - Homo Sapiens and Digital Information - Cloud, Digital Persona and Data Security - Content Level Security (CLS).

Unit V: CLOUD COMPUTING SERVICES Cloud Services: Cloud Types and Services - Software as a Service (SaaS) - Platform as a Service (PaaS)- Infrastructure as a Service (IaaS) - Other Clouds Services . Cloud Computing at Work: Cloud Service Development Tool - Management/Administrative Services. Tools and Technologies for Cloud - Parallel Computing - Cloud Computing Application Platform - Cloud Computing Platform - Tools for Building Cloud - Programming in Cloud. Cloud Tools: VMWare – Eucalyptus – CloudSim – OpenNebula – Nimbus - Microsoft Cloud Service: Windows Azure Platform - Google Cloud Applications - Amazon Cloud Services

f. Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K_1 to K_6
CO1	PO1, PO2, PO5	H/H/H	PSO1, PSO2, PSO5	H/M/M	K_1
CO2	PO1, PO2, PO5	H/M/H	PSO1, PSO2, PSO4, PSO5	H/M/H/M	K_3
CO3	PO1, PO2, PO3	H/M/M	PSO1, PSO2, PSO4, PSO5	M/H/H/M	K_3
CO4	PO2, PO3, PO4	H/M/H	PSO2, PSO3, PSO4	H/H/M	K_4

| CO5 | PO1, PO2, PO4, PO5 | H/M/H/H | PSO1, PSO4, PSO5 | H/M/H | K_5 |

(L – Low, M – Medium, H – High; K_1 –Understand, K_2 –Apply, K_3 –Analyze, K_4 –Evaluate, K_5 Create**.**

Reference Books:

1. Srinivasan.A, J. . Suresh , "Cloud Computing: A Practical Approach For Learning And Implementation", Pearson Education India, 2014.

2. Barrie Sosinsky, Cloud Computing Bible, New Delhi: Wiley India Pvt. Ltd, 2012.

3. Buyya, Vecciola and Selvi, Mastering Cloud Computing:Foundations and Applications Programming, Tata McGraw Hill,2013.

Data Communications and Networking

a.

L C	T	P	C
5 T	0	0	4

Course Objectives:
- ➤ o understand the concept of Computer network.
- ➤ To impart knowledge about networking and internetworking devices.
- ➤ To be familiar with the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.

b. **Course Prerequisites:**
- ➤ basic knowledge on computer connectivity and connectivity peripherals

c. **Course Outcomes (COs):**

Upon completion of the course, the students should be able to:

CO1: Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.

CO2: Understand Internet structure and can see how standard problems are solved

CO3: Apply knowledge of different techniques of error detection and correction

CO4: Analyze the requirements for a given organizational structure and select the most

appropriate networking architecture and technologies

CO5: Knowledge about different computer networks, reference models and the functions of each layer in the models

e. Course Outline:

UNIT - 1

Introduction: Data Communications, Networks, Protocols and Standards. Basic Concepts: Line Configuration, Topology, Transmission mode, Categories of Networks.OSI Model: Layered architecture, Functions of the layers, TCP/IP Protocol suite

UNIT – 2

Signals: Analog and digital, periodic and aperiodic signals, analog signals, Digital signals. **Transmission media:** Guided media, unguided media.
Multiplexing: FDM, WDM, TDM, Multiplexing Application-The Telephone system.LAN: Project, Ethernet, Other Ethernet networks, Token bus, Token Ring, FDDI, Comparison

UNIT – 3

Switching: Circuit Switching, Packet Switching, Message Switching. **ISDN:** Services, ISDN Layers, Broadband ISDN. **Frame Relay:** Introduction, operation, Congestion control. **ATM:** ATM Layers applications**. SONET:** physical configuration, SONET layers, Applications

UNIT - 4

Networking and internetworking devices: Repeaters, Bridges, Routers, Gateways, other devices, Routing algorithms, Distance vector routing, link state routing. **Transport layer**: Duties, Connection TCP/IP Protocol suite: **Overview of TCP/IP**: Internet protocol, Addressing, Subnetting.

UNIT – 5

Other protocols in the network layer: ARP, RARP, ICMP, IGMP Transport layer: TCP UDP

TCP/IP Protocol suite: Application layer: Client server model, BOOTP, DHCP DNS, FTP, SMTP, WWW and HTTP.

f. Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K_1 to K_6
CO1	PO3,PO6, PO7	H/H/H	PSO1	H	K_1
CO2	PO1, PO2, PO4, PO6	H/M/H/ M	PSO2, PSO6	H/M	K_2
CO3	PO1, PO2, PO5	H/M/M	PSO4	M	K_3
CO4	PO1, PO5, PO6	H/M/H	PSO4	H	K_4
CO5	PO1, PO3, PO7	H/M/H	PSO4, PSO5	H/M	K_5

(L – Low, M – Medium, H – High; K_1 –Understand, K_2 –Apply, K_3 –Analyze, K_4 –Evaluate, K_5 Create**.**

g. Reference Books:

1. Data Communications and Networking, Behuouz A. Forouzan, 2nd Edition Tata McGrawHill Edition, 2017.

2. Computer Networks A.S Tanenbaum, Pearson Education

3. Data and Computer Communications - Seventh edition , William Stallings PHI

VB.NET

a.

Course Objectives:

LC	T	P	C
6	0	0	4

To understand the concept of Dot net programming.
To impart knowledge about given problem and design solutions using VB.NET.
Illustrate various Data base concepts using ADO dot Net.
Develop real time applications using VB.NET

b.Course Prerequisites:

> Basic knowledge of web application and any existing object-oriented programming languages like C++ or C# is recommended

c.Course Outcomes (COs):

Upon completion of the course, the students should be able to:

CO1: Understanding the basic concepts of visual programming

CO2: Able to Design simple applications using VB.Net

CO3: Apply knowledge and Work with GUI applications

CO4: Understand database applications

CO5: Develop creative windows applications

d. Course Outline:

UNIT I
VB.NET 2005 Training: The .NET Framework Architecture Part 2-Introducing Windows Forms- Implementing Class Library Object in VB.NET 2005 -Introduction and Implementing Inheritance in VB.NET 2005- Visual Studio.NET Namespaces.

UNIT II
Windows Designing a Form using Forms Designer Window-Exploring the Forms Designer generated code-Using Application Class and Message Class-Setting and Adding Properties to a Windows Form - Event Handling In Visual Basic .NET 2005.

UNIT III
Building graphical interface elements-Adding Controls -Common Controls and Handling Control Events-Dialog Boxes in Visual Basic .NET 2005 -Common Windows Forms Controls Section-DomainUpDown and NumericUpDown -Creating Menu and Menu Items-

Creating Multiple-Document Interface (MDI) Applications Validation-Exceptions.

UNIT IV
Creating and Managing Components Section-Creating and Managing .NET Assemblies-Simple Data Binding-Complex Data Binding-Using the Data Form Wizard-Access and Manipulate Data - The ADO .NET Object Model-Access and Manipulate Data - Using DataSets-Using XML Data.

UNIT V
Finding and Sorting Data in DataSets-Editing Data With ADO .NET-Web Services - SOAP, WSDL, Disco and UDDI-Instantiating - Invoking Web Services, Creating Proxy Classes with WSDL-Creating Web Service Project.

e. **Mapping of COs to POs and PSOs**

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K_1 to K_6
CO1	PO1,PO4, PO5	H/H/H	PSO1	H	K_1
CO2	PO1, PO2, PO3, PO5	H/M/H/ M	PSO2, PSO6	H/M	K_4
CO3	PO1, PO3	H/M	PSO3	M	K_3
CO4	PO2, PO4	H/M	PSO4	H	K_2
CO5	PO2, PO4, PO1, PO5	H/M/H/ H	PSO4, PSO5	H/M	K_5

(L – Low, M – Medium, H – High; K_1 –Understand, K_2 –Apply, K_3 –Analyze, K_4 –Evaluate, K_5 Create**.**

f. **Reference Books:**
    1. Programming Visual Basic .NET, Dave Grundgeiger, 2008.
    2. Beginning VB.Net, Richard Blaire, Jonathan Crossland, Mathew Renolds, 2nd Edition, 2008.
    3. Programming VB.Net, Garry Cornell, Jonathan Morrison, APress Publications, 2007.

VB.Net LAB

L	T	P	C
0	0	4	2

Course Outline

1. Write a program to count number of times the click event occurs

2. Write a program using image lists

3. Write a program using rich textbox control

4. Write a program using Menus and Built-In Dialogs

5. Write a program using Exception Handling

6. Write a program using function

7. Write a program deploying Polymorphism using VB.NET

8. Write a program developing Inheritance using VB.NET

9. Create a Simple web application

10. Create a web application using Validation Controls

11. Write a program using Page Redirection Concept

12. Create Student Information System

13. Create a program using Data Grid control

COMPUTER GRAPHICS

Course Code: ---------

L	T	P	C
4	0	0	4

COURSE OBJECTIVIES:

- To study various graphical Input and Output devices.
- To study how to manipulate graphics object by applying different transformations.
- To study different algorithms for drawing lines, ellipse, circle parabola etc.

COURSE OUTCOMES:

- Understand the structure of modern computer graphics systems.
- Understand the basic principles of implementing computer graphics primitives.
- Develop design and problem-solving skills with application to compute graphics.

UNIT – 1 INPUT AND OUTPUT DEVICES

Introduction: Application and Operations of Computer Graphics - Graphics Packages – Requirements of a Graphical System – GUI. Common Input Devices – Graphical output Devices Raster Scan Video Principle - Raster Scan CRT Monitors – Color Raster Scan System – Plasma Display – LCD – Hard copy Raster Devices - Raster Scan System – Memory Tube Displays – Plotters – Graphics Accelerators –Coprocessors.

UNIT – 2 ALGORITHMS

Scan Conversion – Methods – Polynomial Method –DDA algorithms for line drawing Algorithm, Circle,Ellipse,Parabola–Bresenham'sLineDrawingAlgorithm-Bresenham'sCircleDrawing Algorithm – Problem of Scan Conversion – Solid Areas – Odd Even Methods – Winding Number Method - Solid Area Filling – Algorithms –Boundary, Flood Fill Algorithm.

UNIT - 3TRANSFORMATION

Two Dimension Transformations – Translation – Scaling – Rotation – Transformations of Points and Objects – Homogenous Coordinate System and Transformations – Reflection – Shearing – Three Dimension Transformations - Translation – Scaling – Rotation – Reflection – Shearing.

UNIT - 4 CLIPPING ALGORITHMS

2D Viewing and Clipping – Windows and View Ports – Viewing Transformations – Clipping of lines in 2D – Cohen Sutherland Clipping Algorithms – Visibility – Midpoint subdivision method – parametric Clipping – Polygon Clipping – Sutherland Hodgeman Algorithm – Clipping against Concave windows.

UNITV HIDDEN SURFACEALGORITHMS

Hidden Surface Elimination – Black Face Removable Algorithm Z buffer Algorithm.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	H	PS01, PS05	H/H	K1
CO2	PO5	M	PS02, PS03	M/H	K6

| CO3 | PO4,PO3 | H/H | PS07 | H | K4 |

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOK:

1. Computer Graphics Multimedia and Animation – Malay K.Pakira – PHI Learning 2008.

REFERENCE BOOK:

1. Computer Graphics – Apurva Desai – PHI –2008.
2. PrabhatAndleigh, KiranThakrar – Multimedia system and Design – Prentice Hall2000.

MSU/ 2021-22 / UG-Colleges / Part-III (B.C.A) / Semester – VI / Major Elective II

WEB SERVICES

Course Code: ---------

COURSE OBJECTIVES

- To study XML Technologies & XML Applications.
- To study service-Oriented Architecture (SOA) and Application Integration.
- To study services such as. XML,SOAP

COURSE OUTCOMES:

- To create secured Web services.
- Develop Web services using a variety of advanced computer languages and applications.
- Create, develop, and test Web services including a mobile application.

UNIT– 1 INTRODUCTION TO WEBSERVICES

Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services – Applications that consume Web Services.

UNIT - 2XML

XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDI specification –and Introduction.

UNIT – 3 WEBSERVICES

A brief outline of web services – conversation – static and interactive aspects of system interface and its implementation, work flow – Orchestration and refinement, Transactions , Security issues – the common attacks – security attacks facilitated within web services quality of services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless services – energy consumption, network band width utilization, portals and services management.

UNIT – 4 WEB APPLICATIONS

Building real world enterprise application using web services – sample source codes to develop web services – steps necessary to build and deploy web services and client applications to meet customer's requirement – Easier development, customization, maintenance, transactional requirements,

seamless porting to multiple devices   and platforms.

UNIT - 5   WEBDEVELOPMENT

Development of Web Services and applications onto tomcat application server and Axis SOAP server (both are free wares) - Web Services Platform as a set of enabling technologies for XML based distributed computing.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO2	H	PS01	H	K2
CO2	PO4	M	PS02	M	K4
CO3	PO5,PO5	H/H	PS05	H	K5

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

REFERENCE BOOKS:

- Developing Enterprise Web Services: An Architects Guide – Sandeep Chatterjee, James Webber, Prentice Hall,2003.
- NET web services, Architecture and Implementation with .Net - Keith Ballinger, Pearson Education, First Edition 2003.
- Developing Java Web Services: Architecting and developing secure web services using Java - Ramesh Nagappan, John Wiley and Sons, first edition, 2003.
- Executive Guide to Web Services - Eric A marks and Mark J Werrell, John Wiley and sons, 2003.
- Web Services: A managers Guide - Anne Thomas Manes, Addison Wesley, 2003
- Web Services – An Introduction – B.V.Kumar, S.V.Subrahmanya, Tata McGraw-Hill Publishing Company Limited, 2004.

SOFTWARE PROJECT MANAGEMENT

Course Code: ---------

L	T	P	C
4	0	0	4

Course Objectives:

- To outline the need for Software Project Management.
- To highlight different technique for software cost estimation and activity planning.
- To know about what is Software Project Management.

Course Outcomes:

- Employ Analytical and Modern project development methodology for the process of project management in delivering successful Real time IT projects.
- Evaluate a project to develop the scope of work, provide accurate cost estimates, software development size, effort, and schedule and network diagram for new program proposals or enhancements to existing Software.
- Understanding and using the risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
- Identifying the resources required for a project and to produce a work plan and resource Schedule.

UNIT - 1 CONVENTIONAL SOFTWARE MANAGEMENT

Waterfall Model - Conventional Software Management Performance – Evolution of Software economics - Software economics – Pragmatic software cost estimation – Improving software economics – Reducing software product size – Improving software process – Team effectiveness – Automation through software environments.

UNIT - 2 VARIOUS STAGES

Lift cycle phases – Engineering and Production stages – Inception, Elaboration, Construction and Transition Phases – Artifacts of the process – The artifact sets – Management, Engineering and Pragmatic artifacts – Model based software architectures.

UNIT – 3 WORKFLOWS OF THE PROCESS

Workflows of the process – Software process Workflows – Iteration Workflows – Iterative process planning – work breakdown structures – Planning guidelines – cost & schedule estimation process – iteration planning process – pragmatic planning – Project Organizations & responsibilities.

UNIT – 4 VARIOUSPROCESSES

Process automation – Tools – The project environment – Project control and Process Instrumentation – The seven-core metrics – Management indicators – Quality indicators – Life cycle expectations – Pragmatic software metrics – Metrics automation –Tailoring the Process – Process discriminates.

UNIT - 5 MODERN PROJECT PROFILE

Continuous Integration – Early risk resolution – Evolutionary requirements – software management Principles Next generation software economics – Modern Process transitions.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO1	H	PS06	M	K1
CO2	PO2, PO3	M/M	PS01,PS05	M/H	K5
CO3	PO4,PO5	H/M	PS02, PS07	H/M	K2
CO4	PO6	M	PS03	H	K6

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOKS:

1. Software Project Management - Walker Royce, Pearson Education,2012.

2. Software Project Management - Bob Hughes and Mike Cotterell, Tata McGrawHill,2011.

3. Software Project Management in practice –Pankaj Jalote, Pearson Education,2012.

ARTIFICAL INTELLIGENCE

Course Code: ---------

Course Objectives:

L	T	P	C
4	0	0	4

- To introduce the basic principles, techniques, and applications of Artificial Intelligence.
- Emphasis will be placed on the teaching of these fundamentals, not on providing a mastery of specific software tools or programming environments.
- Assigned projects promote a 'hands-on' approach for understanding, as well as a challenging avenue for exploration and creativity.

Course Outcomes:

- Knowledge of what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
- Explain how Artificial Intelligence enables capabilities that are beyond conventional technology, for example, chess-playing computers, self-driving cars, robotic vacuum cleaners.
- Ability to apply Artificial Intelligence techniques for problem solving.

UNIT – 1 PROBLEM, PROBLEM SPACES AND SEARCH

What is AI? – AI Problems – What is an AI technique – Defining the problem as a state space search – Production system - Production system – Characteristics – Problem Characteristics.

UNIT – 2 HEURISTIC SEARCH TECHNIQUES

Generate and test – Hill Climbing – Best First Search – Problem Reduction – Constraints satisfaction – Means end analysis.

UNIT – 3 KNOWLEDGE REPRESENTATION

Representations and Mappings – Approaches to Knowledge Representation. Using predicate Logic: Representing simple facts in logic – Computable functions and prediction – Resolution – The basic of resolution – Resolution in Propositional Logic – The Unification algorithm – Resolution in Predicate Logic.

UNIT – 4 REPRESENTING KNOWLEDGE USING RULES

Procedural versus – Declarative Knowledge – logic Programming – Forward versus Backward Reasoning–Matching.

UNIT – 5 GAME PLAYING

The Minimax search procedure – Adding Alpha Beta cut offs – Addition Refinements – Waiting for Quiescence – Secondary Searches – Using Book moves.

Mapping of COs to POs and PSOs

Course Outcome	PO Addressed PO1 to PO7	Correlation Level L/M/H	PSO Addressed PSO1 to PSO7	Correlation Level L/ M/ H	Cognitive Level K1 to K6
CO1	PO5	H	PS03	H	K1
CO2	PO3, PO1	M/H	PS01, PS05	M/M	K3

CO3	PO4	H	PS07	H	K6

(L – Low, M – Medium, H – High; K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5– Evaluate, K6 – Create)

TEXT BOOKS:

1. Artificial Intelligence – Elaine Rich, Kevin Knight &Shiv shankar, Tata McGraw Hill, 2008.

2. Artificial Intelligence and Intelligent Systems –N.P.Padhy, 2005.

REFERENCE BOOKS:

1. Artificial Intelligence: A modern approach - Stuart Jonathan, Russell, Pearson, 2019

2.   Introduction to Artificial Intelligence - Rajendra, Akerkar, PHI, 2014.