



Don Bosco College of Arts and Science, Keela Eral

VISION AND MISSION

Vision:

Don Bosco College of Arts and Science, inspired by divine and human values, envisages enlightenment and empowerment of the youth towards personal and social transformation.

Mission:

1. To make higher education qualitative, inclusive, cost effective and accessible to the rural masses.
2. To exercise a preferential option in favor of the rural youth especially the First Generation Learners and socially and economically weaker sections of the society.
3. To facilitate the actualization of individual potential, integrating knowledge, skills, values and behaviour and prepare the students to face the global opportunities and challenges of a meaningful life and career.
4. To constantly pursue higher standards of excellence, integrity and credibility in all endeavors and transform the students, in collaboration with all the stakeholders of higher education, to be agents of social transformation.

DEPARTMENT OF COMPUTER APPLICATIONS

VISION AND MISSION

Vission of the Department : We envision proficient students of technology who embody character and service.

Mission of the Department : To inculcate values and self-discipline in the students. To impart knowledge of the new trends in technology. To make the students proficient in the academic subjects. To instill employability skills and life coping skills. To inspire confidence and service mindedness

REAMBLE

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

4. PROGRAMME STRUCTURE

BCA (ChoiceBased Credit System)

Sem. (1)	Pt .I/II/ III/ IV/V (2)	Sub No. (3)	Course Status(4)	Course Title(5)	Con- tact Hrs/ Week (6)	L Hrs./ Week (7)	T Hrs./ Week (8)	P Hrs./ Week (9)	C Credi ts (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 PhysicalSciences - 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	6	6	0	0	4
	III	1 0	Core-II	Object Oriented Programmingwith C++	4	5	0	0	4
	III	1 1	Major Practical - II	Object Oriented Programmingwith C++ Lab	4	0	0	4	2
	III	1 2	Add on Major (Mandatory)	Professional English for PhysicalSciences - II	4				4
	III	1 3	Allied - II	Mathematical Foundation forComputer Science	4	3	0	0	3
	IV	1 4	Common	Value Based Education / r%fxOf;fq;fSk gz;ghL;L tpOkpaq;fSk / Social Harmony	2	2	0	0	2
Subtotal					30				23

Se m	PartI /II/II I/IV/ V/VI	Sub . No.	Subject Status	Subject Title	Contact Hrs/ week	L Hrs/ Week	T Hrs/ Week	P Hrs/ Week	Cre dit s
III	III	15	Core	Java Programming	5	5	0	0	4
	III	16	Core	Financial Accounting	4	4	0	0	4
		17	Core	Introduction to Operating Systems	4	4	0	0	4
	III	18	Major Practical III	Java Programming Lab	4	0 0	0	4	2
	III	19	Allied - III	Data Structures	3	3	0	0	3
	III	20	Allied Practical III	Data Structures LAB	4	0	0	4	2

	III	21	Skill based Core Theory I	Programming with PHP and MySQL	4	4	0	0	4
	IV	22	Non major elective	Introduction to IT/Introduction to Computers	2	2	0	0	2
	IV	23	Common	Yoga(Excluding Contact Hours & Credit)	2	2	0	0	2
	Sub Total				30	25			
IV	III	24	Core	Python Programming	5	5	0	0	4
	III	25	Core	Software Engineering	4	4	0	0	4
		26	Core	Resource Management Techniques	4	4	0	0	4
	III	27	Major Practical IV	Python Programming Lab	4	0	0	4	2
		28	Allied - IV	Accounting Software- Tally	3	3	0	0	3
	III	29	Allied Practical IV	Tally Lab	4	0	0	4	2
	III	30	Skill Based core Theory II	Micro Processor	4	4	0	0	4
	IV	31	Non major elective	Introduction to Internet with HTML/ Office Automation	2	2	0	0	2
	IV	32	Common	Computer for digital era(Excluding Contact Hours & Credit)	2	2	0	0	2
	V	33	Extension activity	NCC,NSS,YRC,YWF	-	0	0	-	1
	Sub Total				30	26			
V	II I	34	Core	Machine Learning Using Python	4	4	0	0	4
	II I	35	Core	Web Technology	5	5	0	0	4
	II I	36	Core	Relational Database Management Systems	6	6	0	0	4
	II I	37	Major Practical V	RDBMS Lab	4	0	0	4	2
	II I	38	Major Elective I	E-Commerce/Design and Analysis of Algorithms/Cyber Security/Multimedia	4	4	0	0	4
	II I	37	Project	Mini Project	5	0	0	5	4
	I V	38	Common	Personality Development	2	2	0	0	2
	Sub Total				30	24			
	II I	39	Core	Cloud Computing	4	4	0	0	4

VI	II I	40	Core	Data Communications and Networking	5	5	0	0	4
	II I	41	Core	VB.Net	6	6	0	0	4
	II I	43	Major Practical VI	VB.Net Lab	4	0	0	4	2
	II I	44	Major elective II	Computer Graphics/Web Services/Software Project Management/ Artificial Intelligence	4	4	0	0	4
	II I	45	Project	Major Project -(group)	7	0	0	0	7
Sub Total					30				25

5. EVALUATION SCHEME (INTERNAL,EXTERNAL,PASSING MINIMUM)

Evaluation Scheme

Internal Marks	25 Marks
External Marks	75 Marks
Maximum Marks	100 Marks
Passing Minimum	40 Marks

6. MODEL QUESTION PAPER

MODEL QUESTION PAPER- CBCS-PATTERN (UG COMPUTER APPLICATIONS)

MAXIMUM MARKS: 75

TIME: 3 HOURS

Part –A (10×1 = 10 Marks)

Answer all the questions, Choose the correct answer

Question No. 1,2	Unit –I	Question No. 7,8	Unit –IV
Question No. 3,4	Unit -II	Question No. 9,10	Unit –V
Question No. 5,6	Unit –III		

Part –B(5×5 = 25 Marks)

Answer all the questions, Choosing either (a) or (b).

Question No. 11(a) or 11 (b)	Unit –I	Question No. 14(a) or 14 (b)	Unit –IV
Question No. 12(a) or 12 (b)	Unit -II	Question No. 15(a) or 15 (b)	Unit –V
Question No. 13(a) or 13 (b)	Unit –III		

Part –A (8×5 = 40 Marks)

Answer all the questions, Choosing either (a) or (b).

Question No. 16(a) or 16 (b)	Unit –I	Question No. 19(a) or 19 (b)	Unit –IV
Question No. 17(a) or 17 (b)	Unit –II	Question No. 20(a) or 20 (b)	Unit –V
Question No. 18(a) or 18 (b)	Unit –III		

7. PROGRAMME OUTCOMES FOR BCA

PROGRAMME OUTCOMES

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 way 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. PROGRAM SPECIFIC OUTCOMES

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.

COURSE OUTCOMES

Semester-I

Core-I

Programming in C

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Core-I		Programming in C	60	----	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
I	I	25	75	100

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 Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Course Attainment
CO1	To understand basic understanding of computers and programming syntax.	K1
CO2	To explore basic understanding of computers and programming syntax.	K2
CO3	To implement standard libraries, operators, functions and arrays	K3
CO4	To create C programming with features like pointers and structures.	K4

CO5	To implement various file handling techniques.	K5
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K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create

Course Content

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.

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.

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

**Semester-I
Allied Paper-I
DIGITAL DESIGN**

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Allied		Digital Design	45	-	-	3

Contact hours per semester:45

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
I	I	25	75	100

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 Outcomes: On successful completion of the course ,the students should be able to

CO No.	Course Outcomes	Knowledge Level
CO 1	Definition of digital logics and Circuits	K1
CO 2	Understand about the digital devices	K2
CO 3	Understand about digital arithmetic circuits	K2
CO 4	Acquire Knowledge on basics of Gates and its Applications.	K4
CO 5	Have the necessary understanding on Registers for Counting Applications	K4

K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create

Course Content

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.

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

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

Semester -II

Core II

OBJECT ORIENTED PROGRAMMING WITH C++

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
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Part-IV	Core-II		OBJECT ORIENTED PROGRAMMING WITH C++	4	-	-	4
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Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
I	II	25	75	100

Objective: 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: On successful completion of the course, the students should be able to

CO No.	Course Outcomes	Knowledge Level
CO1	Define complete overview of Data types, functions, control statements and pointers.	K1
CO2	Apply Object Oriented Programming Concepts.	K2
CO3	Demonstrate the use of virtual functions to implement polymorphism.	K5
CO4	Demonstrate Function Overloading and Operator Overloading concepts	K6
CO5	Illustrate Templates, Files and Exception Handling.	K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate,K6 – Create

Course Content

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.

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	PSO1, PSO5	M/M	K1
CO2	PO2, PO4	H/M	PSO2, PSO3	H/M	K2
CO3	PO3	H	PSO4,PSO6	H/M	K5
CO4	PO5,PO6	M/H	PSO5	M	K6
CO5	PO7	H	PSO4,PSO7	H/H	K4

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.

Semester -II/IV
Allied Paper -II
Mathematical Foundation for Computer Science

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-IV	Allied		Mathematical Foundation for Computer Science	3	-	-	3

Contact hours per semester:45

Contact hours per week:3

Year	Semester	Internal Marks	External Marks	Total marks
I	II	25	75	100

Objective: 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: On successful completion of the course, the students should be able to

CO No.	Course Outcomes	Knowledge Level
CO 1	Ability to apply mathematical logic to solve problems.	K1
CO2	Understand sets, relations, functions, and discrete structures.	K3
CO3	Able to use logical notation to define and reason about fundamental mathematical concepts such as sets,relations, and functions.	K6
CO4	Able to model and solve real-world problems using graphs and trees.	K4

K1 – Remember, K2 – Understand, K3 – Apply, K4 – Analyze, K5–Evaluate,K6 – Create
Course Content

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 NormalForms

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.

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	PSO1, PSO3	M/H	K1
CO2	PO3	H/M	PSO2, PSO5	H/H	K3
CO3	PO2,PO4	M/H	PSO5,PSO6	H/M	K6
CO4	PO5	H	PSO4	M	K4

Text Book:

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

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.

Semester-III

Core-III

JAVA PROGRAMMING

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Core-III		Java Programming	5	-	-	4

Contact hours per semester:90

Contact hours per week:6

Year	Semester	Internal Marks	External Marks	Total marks
II	III	25	75	100

Objective: 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: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	To get knowledge of the structure and model of the Java programming language.	K1
CO2	To understand how to design applications with threads in Java.	K2
CO3	To get Knowledge for developing software in the Java programming language.	K3
CO4	To learn how to use exception handling in Java applications.	K4
CO5	To use the Java programming language for various programming technologies.	K5

K1 – Understand, K2 – Apply, K3 – Analyze, K4 – Evaluate, K5 Create
Course Content

UNIT – 1 HISTORY, DATA TYPES AND OPERATORS

(12 Hours)

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.

UNIT - 2 CLASSES, METHODS AND INHERITANCE AND ABSTRACT CLASS (12 Hours)

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.

UNIT-3 PACKAGES, INTERFACES, EXCEPTION HANDLING AND MULTITHREADING (12 Hours)

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.

UNIT – 4 NETWORKING, APPLETS AND EVENT HANDLING

(12 Hours)

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.

UNIT - 5 AWT AND AWT CONTROLS

(12 Hours)

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.

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

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.

Semester -III Core FINANCIAL ACCOUNTING

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Core		Financial Accounting	4	-	-	4

Contact hours per semester:60
Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
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II	III	25	75	100
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Objective: 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 Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	To acquire knowledge about general aspects of business operations.	
CO2	To explain the concepts and procedures of financial reporting, including income and expenditure statement, balance sheet etc.	
CO3	To locate and analyze financial data from annual reports of corporations.	

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

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.

(12L)

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)

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.

SEMESTER-III

CORE

Introduction to Internet with HTML

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Core		Introduction to Internet with HTML	4	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
II	III	25	75	100

Objective: To learn the principle of Web page design. ☑ To visualize the basic concept of HTML. To recognize the elements of HTML.

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	To create a web page.	K6
CO2	To validate a web page.	K5
CO3	To publish a web page	K3

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I INTRODUCTION TO INTERNET

Computer in business-networking-internet- e-mail-gopher-world wide web, Internet Technologies – Internet Browsers. (12L)

UNIT II INTRODUCTION TO HTML

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

(12 L)

UNIT III DESIGNING TABLES

Designing Body Section – Ordered and Unordered List – Table Handling. (12 L)

UNIT IV INTRODUCTION TO DHTML

Features of DHTML – Defining styles – Working with Colors – Text and Fonts with Style. **(12 L)**

UNIT V FRAMES

Frame set Definition – Nested frames – A web design project – forms. **(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	PO1,PO2	H/H	PS01	H	K1
CO2	PO5	H	PS02, PSO5	H/M	K2
CO3	PO3,PO6	H/H	PS04	H	K3

TEXT BOOK:

1. World Wide Design with HTML by C.XAVIER – TMH Publications.

REFERENCE BOOK:

1. Fundamental of the internet and the World Wide Web by Greenlaw and Hepp. TMH Publications.

Semester –III

ALLIED -III

DATA STRUCTURE

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Allied		Data structure	3	-	-	3

Contact hours per semester:45

Contact hours per week:3

Year	Semester	Internal Marks	External Marks	Total marks
II	III	25	75	100

Objective: 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: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	An understanding of the basic data structures. .	K2
CO2	An understanding of the basic search and sort algorithms.	K2
CO3	The appropriate use of a particular data structure and algorithm to solve a problem.	K3,K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I 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 II LINKED LISTS

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

UNIT III STACKS AND QUEUES

Basic Stacks Operations – Stack Linked List Implementation – Stack Applications – Queue operations – Queue Linked List Design.

(10L)

UNIT IV TREES

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

(8L)

UNIT V INTRODUCTION TO GRAPHS

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

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

TextBook:

1.Data Structures a Pseudo code Approach with C++, Richard F. Gilberg& Behrouz A forouzan, ThomsanBrooks / Cple.

REFERENCE BOOKS:

1.Fundamentals of Data Structures Eilis Horowitz & Sartaj Gal Gotia Publications. 2.Data Structures & Algorithm in Java third edition – Adam Drozdek.

SEMESTER -III

Skill Based Core-Paper- I

Programming with PHP and My SQL

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Skill Based Core		Programming with PHP and My SQL	4	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
II	III	25	75	100

Objective:

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: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	To understand the concepts of open sources.	K2,K3
CO2	To create dynamic web pages and websites.	K6
CO3	To connect webpages with database.	K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content:

UNIT-I

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. (12L)

UNIT - II

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

UNIT -III

File Handling Opening files using fopen - looping over a files content with feof- reading text from a file using fgets - closing a file- reading character with fgetc- reading whole file with file_get_contentsreading a file into into an array with file-checking if a file exists- fscanfparse_ini_file- Getting file information with stat-fseek- copying files with copy- deleting fileswriting to a file-reading and writing binary files –locking files. (12L)

UNIT-IV MySQL:

Effectiveness of MySQL -MySQL Tools-Prerequisites for MySQL connectionDatabases 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 filteringData manipulation functions-Aggregate functions -Grouping data- Sub queriesJoining Tables- Set operators-Full text searching. (12L)

UNIT-V PHP with MySQL:

Working MySQL with PHP-database connectivity- usage of MYSQLcommands in PHPprocessing result sets of queries- handling errors-debugging and diagnostic functionsvalidating user input through Database layer and Application layerformatting query output with Character- Numeric- Date and time –sample database applications. (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	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

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:

- Tim Converse- Joyce Park and Clark Morgan- "PHP 5 and MySQL" -Wiley India reprint - 2008.
- Robert Sheldon- Geoff Moes- "Beginning MySQL"-Wrox- 2005

SEMESTER -IV**CORE****VISUAL BASIC**

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credit (C)
Part-III	Core		Visual Basic	5	-	-	4

Contact hours per semester:75

Contact hours per week:5

Year	Semester	Internal Marks	External Marks	Total marks
II	IV	25	75	100

Objective: To study properties and events, methods of controls and how to handle events of different controls. To understand the use of active controls and how to design VB application. To study connectivity between VB and databases.

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Demonstrate knowledge of programming terminology and how applied using Visual Basic	K4,K6
CO2	Develop a Graphical User Interface (GUI) based on problem description.	K4,K5
CO3	Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events.	K3,K6

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content:**UNIT I GETTING STARTED WITH VISUAL BASIC 6.0**

Introduction to Visual Basic, Visual Basic 6.0 Programming Environment, Working with Forms, Developing an Application, Variables, Data types and Modules, Procedure and Control Structures, Array in Visual Basic, Additional examples. Working with Controls: Introduction, Creating and Using Controls, Working with Control Arrays, Additional examples.

(12 L)

UNIT II MENUS & GRAPHICS

Menus, Mouse Events and Dialog Boxes: Introduction, Mouse Events, Dialog Boxes, Additional examples. Graphics, MDI and Flex Grid: Introduction, Graphics for Applications, Multiple Document Interface (MDI), Using the flex Grid Control, Additional examples.

(12 L)
UNIT III OPEN DATABASE CONNECTIVITY
 ODBC and Data Access Objects: Evolution of Computer Architecture, Data Options, Additional examples. ODBC Using Data Access Objects and Remote Data objects: Open Database Connectivity (ODBC), Remote Data objects, Additional examples.

(12 L)
UNIT IV REPORT CREATION
 Data Environment and Data Report: Introduction, Data Environment Designer, Data Report, Additional examples. Object Linking and Embedding: Introduction, OLE Fundamentals, Using OLE Container Controls, Using OLE Automation Objects, OLE Drag and Drop, Additional examples. **(12 L)**

UNIT V ACTIVE X CONTROLS
 Built – in Active X Controls: Working with Built – In Active X Controls, Additional examples. Working with Active X Data objects; An Overview of ADO and OLE DB, ADO Object Model, Additional examples. Files, and File System Controls: Introduction, File System Controls, Accessing Files, Interface with Windows, Additional examples. **(12 L)**

TEXT BOOK:
 1. Visual Basic 6.0 Programming – Content Development Group – Tata McGraw hill Publishing Company Limited, New Delhi. (Chapters 1,2,3,4,5,6,7,8,9,13,16,17)

REFERENCE BOOKS:
 1. Microsoft Visual Basic 6.0 Professionals, Michael Halvorson – PHI.
 2. Visual Basic 6 in Record Time by Steve Brown, BPB Publications.
 3. Visual Basic 6 from the Ground UP – Gary Cornell - Tata McGraw hill.

**Semester-IV
 Core-V
 E COMMERCE**

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		E Commerce	4	-	-	4

Contact hours per semester:60
 Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
II	IV	25	75	100

Objective: 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: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Design and implement an e-commerce application with a shopping cart.	K3, K6

CO2	Integrate the waterfall model in the development of e-commerce applications.	K5
CO3	Integrate user-centered design guidelines in developing user-friendly websites.	K5,K6

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT 1 E - COMMERCE INTRODUCTION

What is Electronic Commerce? – Types of Electronic Commerce Technology. **(12 L)** **UNIT II E - COMMERCE MODELS AND TYPES**

Types of E-Business Models and Markets - Types of E-Commerce Providers and Vendors - E-Commerce website Creation. **(12 L)**

UNIT III E - COM WEB DEVELOPMENT

Managing E-Commerce website Development – Building Shopping Cart Applications – Mobile Electronic Commerce. **(12 L)**

UNIT IV E - COM DATABASES

Enhancing a web server with E-Commerce Application Development – Strategies, Techniques and tools – Implementing Merchandising Strategies – Implementing E-Commerce Databases. **(12 L)**

UNIT V 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. **(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	PO2	M	PS01,PS03	M	K2
CO2	PO1, PO4	M/M	PS05	M/H	K3
CO3	PO6	H	PS04	H	K5

TextBook:

1. Electronic Commerce, by Pete Loshin and John Vacca, Fourth edition, Firewall Media, New Delhi.
2. E-Business Parag Kulkarni, SunitaJahirabdkar, and Pradip Chande.Oxford University Press.

REFERENCE BOOKS:

1. Electronic Commerce, by Gary O.Schnelder James T.Perry, First edition 2000, Thomson Learning.
2. Electronic Commerce, by Elias M.Awad, Prentice Hall of India 2002

Semester-IV

Core

RESOURCE MANAGEMENT TECHNIQUES

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		Resourt Techniq uesce Manage men	4	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
II	IV	25	75	100

Objective: To solve optimization problems using simplex method. To learn to solve problems in linear programming and Integer programming. To use PERT and CPM for problems in project management.

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Make use of simplex method to solve optimization problems.	K4
CO2	To find solution for various shortest route problems.	K5
CO3	Utilize PERT and CPM in project management.	K3,K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I LINEAR PROGRAMMING I

Introduction – Advantages and disadvantages of LP – Basic characteristics of LP – General linear Programming problem – Algebraic solution of a LP (Simplex Method).

(10 L)

UNIT II ASSIGNMENT PROBLEM

Introduction – Definition and Mathematical formulation – Methods of solutions – Application area of AP – Comparison between AP and TP – Basic theorems – Hungarian method – Exceptional cases of AP – AP with restrictions – Multiple optimal solution of an AP.

(12 L)

UNIT III JOB SEQUENCING & NETWORK MODEL PROBLEMS

Introduction, Basic terms and Notations used in Sequencing – Priority sequencing rules – Gantt Chart – Types of Job sequencing problems. Network models: Introduction – Basic features of Network models – Main advantages of Network models – Network models – Minimum spanning tree algorithm – Shortest route problem – Maximum flow and minimum cost flow problems – Travelling salesman problem as a network model – Unifying model: Minimum cost flow network – Linear programming approach to a network model.

(14 L)

UNIT IV PROJECT MANAGEMENT

Introduction – Basic concepts – Project planning techniques – CPM & PERT techniques – Critical path method – The PERT approach – Expected length of a project - Probability of project completion by due date – cost consideration in project scheduling – similarities and differences in CPM & PERT. **(12 L)**

UNIT V GAME THEORY

Introduction – Definitions and Terminology – Basic game theory models – Fundamental Principles of game theory – Assumptions underlying game theory – Pure strategies: Games with saddle point – The rules of Dominance – mixed strategies: Games without saddle point – Solution of 2xn and mx2 Games (graphical approach) – Linear programming solutions of Games. Inventory control: Fundamentals of Inventory theory – Basic terminology – Advantages & disadvantages of Inventory – formula for the quantity to order and lead time – EOQ with price-breaks. **(12 L)**

TEXT BOOK:

1. Operations Research Models & Methods – Chandrasekhar Salimath, Bhupenderparashar – Universities press 2014.

REFERENCE BOOKS:

1. Operations Research – Nita H. Shah, Ravi M. Gor, Hardik Soni – PHI Learning Private Limited, New Delhi, 2009.
2. Operations Research – P.K. Gupta.

3. Operations Research – Taha.

Semester-IV
ALLIED-IV
ACCOUNTING SOFTWARE- TALLY

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Allied		Accounting Software Tally	3	-	-	3

Contact hours per semester:45

Contact hours per week:3

Year	Semester	Internal Marks	External Marks	Total marks
II	IV	25	75	100

Objective: This course is designed to impart knowledge regarding concepts of Financial Accounting Tally 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 in different offices as well as companies in Accounts departments.

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Company Setup & Configurations.	K4,K6
CO2	Charts of Accounts Setup.	K6
CO3	Recording Financial Transactions.	K3,K5
CO4	Financial Reports Analysis.	K4

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I CREATING COMPANY IN TALLY

Creating Accounting and Inventory Ledger - creating stock item group, category, pos – Trial balance - Final accounts with adjustments.

(10L)

UNIT II VALUES DDED TAX

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

UNIT III TDS, TCS, ST

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

UNIT IV EXISE DEALER

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

UNIT V PAYROLL

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

TEXT BOOK :

1. Accounting Package Tally 9.0. by Ms,A.KNanthini Himalaya publications.

REFERENCE BOOK:

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

**Semester-IV
Skill Based Core
MICROPROCESSOR**

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Skill Based Core		Microprocessor	4	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
II	IV	25	75	100

Objective:

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: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	To write programs to run on 8086 microprocessor based systems.	K2,K4
CO2	Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.	K3,K6
CO3	Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.	K2,K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content**UNIT I 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.

(12 L)

UNIT II 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. **(12 L)**

UNIT III 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.

(12 L)

UNIT IV 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. **(12 L)**

UNIT V CONVERSIONS

BCD to Binary conversion – Binary to BCD conversion - BCD to seven segment. LED code conversion – BCD addition – BCD Subtraction – Multiplication- Subtraction with carry. **(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	M	PS01,PS03	M	K2
CO2	PO1, PO4	M/M	PS05	M/H	K3
CO3	PO5	H	PS06	H	K5

TEXT BOOKS:

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

REFERENCE BOOK:

1. 8085 Microprocessor Programming and Interfacing N.K.Srinath, PHI Publication. Semester-V

**CORE
SOFTWARE ENGINEERING**

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		Software Engineering	4	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
III	V	25	75	100

Objective: 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: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	An ability to apply knowledge of mathematics, science, and engineering.	K2,K3
CO2	An ability to design and conduct experiments, as well as to analyze and interpret data.	K2,K6
CO3	An ability to design a system, component, or process to meet desired needs within realistic constraints such as	K6

	economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	
CO4	An ability to identify, formulates, and solves engineering problems.	K4

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I 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. **(12 L)**

UNIT II 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. **(12 L)**

UNIT III 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.

(12 L)

UNIT IV 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. **(12 L)**

UNIT V 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.

(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	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

TEXT BOOK:

1. Object Oriented Software Engineering, Timothy C.Lethbridge and Robert Laganriere, TMH 2004.

REFERENCE BOOKS:

1. Object Oriented and classical Software Engineering, Fifth Edition, Stephen, R. Schach, TMH.

2. Fundamentals of Software Engineering, Second Edition, CarioGhezzi, MedhiJazayeri, Dino Mandrioli, PHI.

Semester-V

CORE WEB TECHNOLOGY

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		Web Technology	5	-	-	4

Contact hours per semester:5

Contact hours per week:75

Year	Semester	Internal Marks	External Marks	Total marks
III	V	25	75	100

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 Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Employ fundamental computer theory to basic programming techniques.	K2
CO2	Use fundamental skills to maintain web server services required to host a website.	K3
CO3	Select and apply markup languages for processing, identifying, and presenting of information in web pages.	K3,K4
CO4	Use scripting languages and web services to transfer data and add interactive components to web pages.	K6

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I 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 II 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 III JAVA SCRIPT

Introduction – Variables – Literals – Operators – Control Structure – Conditional statements – Arrays – Functions – Objects.

(10 L)

UNIT IV 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 V 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

TEXT BOOK:

1. Web Technologies – UttamK.Roy – OxfordUniversity Press 2010.

REFERENCE BOOKS:

1. Web Technology and Design, C. Xavier, New Age International Publishers.
2. Web Technologies TCp/IP Architecture and Java Programming Second Edition, Achyut S. Godbole&AtulKahate, Tata McGraw Hill.
3. Web Technology A Developer’s Perspective, N.P.Gopalan, J.Akilandeswari, PHI.

**Semester-V
Core
RDBMS**

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		RDBMS	6	-	-	4

Contact hours per semester:90

Contact hours per week:6

Year	Semester	Internal Marks	External Marks	Total marks
III	V	25	75	100

Objective: 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 computing practices.

Course Outcomes: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Master the basic concepts and appreciate the applications of database systems.	K1, K3
CO2	Master the basics of SQL and construct queries using SQL.	K1,K3

CO3	Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.	K5,K6
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K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I AN OVERVIEW: PERSONAL DATABASES

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 II WORKING WITH TABLES

DML statements – Arithmetic operations – Where clause – sorting – Define command – Built in functions – Grouping data. (10 L)

UNIT III MULTIPLE TABLES

Joints – Set operators – Subquery – Top – N Analysis .Advanced features: Views – Subsequences – Synonyms – Index. (12 L)

UNIT IV PL/SQL: FUNDAMENTALS

PL/SQL: FUNDAMENTALS – Block structure – Comments – Data types –Variable declaration – Anchored declaration – Assignment operation – Bind variables – Substitution Variables – Arithmetic operators. Structures in PL/SQL: Control structures – Nested blocks – SQL in PL/SQL DML in PL/SQL – Transaction Control Statements.

(14 L)

UNIT V PL/SQL CURSORS & EXCEPTIONS

PL/SQL Cursors & Exceptions - PL/SQL Composite data types: Records, Tables and 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

TEXT BOOK:

1. Database System Using Oracle – Second edition – Nilesh Shan – PHI 2007.

REFERENCE BOOK:

Oracle 9i Complete reference – Loney Koch - Tata McGraw Hill 2005.

Semester-V ELECTIVE MULTIMEDIA

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Elective		Multimedia	4	0	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
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III	V	25	75	100
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Objective: 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: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Describe different realizations of multimedia tools and the way in which they are used.	K2,K3
CO2	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).	K3,K5
CO3	Plan experiments to test user perception of multimedia tools.	K3,K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I MULTIMEDIA FUNDAMENTALS

Basic concepts - Multimedia applications Design consideration – Multimedia Application Goals & Objectives – Opportunities in multimedia production: Important in Multimedia development – Application Design and production. **(12 L)**

UNIT II MULTIMEDIA APPLICATION

Structure and organization: Considering Interface design – Planning the production of your Application – Creating multimedia building blocks. **(12 L)**

UNIT III MULTIMEDIA PRESENTATION

Building blocks: Text - Graphics. **(10 L)**

UNIT IV OTHER MULTIMEDIA TOOLS

Multimedia presentation building blocks: video capturing, Sound Capturing and Editing. **(14 L)**

UNIT V STRUCTURE AND FUNCTION OF AUTHORING SOFTWARE

Authoring software, selection of authoring program - Fundamentals of Macromedia Director **(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	PO1	M	PS01,PS03	M	K2
CO2	PO2, PO4	M/M	PS04	M/H	K3
CO3	PO5	H	PS02	H	K5

TEXT BOOK:

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

REFERENCE BOOK:

Multimedia: Making it works, 6th edition, TayVaughan;TMH, 6th Edition.

Semester-VI

Core OPERATING SYSTEM

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		Operating System	4	-	-	4

Contact hours per semester:60

Contact hours per week:4

Year	Semester	Internal Marks	External Marks	Total marks
III	VI	25	75	100

Objective: To understand design issues related to process management and various related algorithms. To understand design issues related to memory management and various related algorithms. To understand design issues related to File management and various related algorithms.

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Master functions, structures and history of operating systems.	K1,K2
CO2	Master various process management concepts including scheduling, synchronization, and deadlocks.	K1,K2
CO3	Be familiar with multithreading.	K2
CO4	Master concepts of memory management including virtual memory.	K2

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I INTRODUCTION

What is an Operating System: Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real – time Systems – Handheld Systems.

(10 L)

UNIT II PROCESS CONCEPT

Process Concept – Process Scheduling – Operations on Process – Co-operating processes – Inter Processes - Inter Process communication. CPU Scheduling: Basic Concepts – Scheduling Criteria - Scheduling algorithms – Multi processor Scheduling - Real time Scheduling – Algorithms evaluation.

(12 L)

UNIT III PROCESS SYNCHRONIZATION & DEADLOCKS

Process Synchronization: Background – the critical section problem – Synchronization hardware – Semaphores – Classical problems of Synchronization – critical regions – Monitors – Atomic transaction. Deadlocks: System model – Deadlock Characterization – methods for handling Deadlocks – Deadlock prevention – Deadlock Avoidance – Deadlock detection – recovery from Deadlock. (14 L)

UNIT IV MEMORY MANAGEMENT

Memory management: Background – Swapping – Contiguous memory allocation – paging – segmentation – segmentation with paging. Virtual Memory: Background – Demand paging – Page replacement – Allocation of frames.

(12 L)

UNIT V FILE MANAGEMENT

File System Interface: File concept – Access methods – File system structure – File system implementation – Directories structure - Directory implementation – Allocation methods – Free space management – Efficiency and performance – Recovery. Mass Storage Structure: Disk Structure – Disk Scheduling – Disk management – Swap space management – RAID structure – Disk attachment – Stable Storage. **(12 L)**

TEXT BOOK:

1. Operating System Concepts – Abraham Silverschatz and Peter Baer Galvin Addition Wesley publishing company – Sixth Edition.

REFERENCE BOOK:

1. Operating System: Intel and Design Principles – Fifth Edition, William Stallings, PHI.
2. Understanding Operating System, Ida M.Flynn, Ann McIverMchoes.
3. Operating Systems – Second Edition, Achyuts.Godbole, TMH.

Semester-VI Core Computer Network

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core-XII		Computer Network	5	-	-	4

Contact hours per semester:75

Contact hours per week:5

Year	Semester	Internal Marks	External Marks	Total marks
III	VI	25	75	100

Objective: To understand the basic networking concepts, types of addresses, data communication, protocols etc. To understand wired and wireless networks, its types, functionality of each layer. To understand importance of network security and cryptography.

Course Outcomes: On successful completion of the course, the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.	K2,K4
CO2	To be familiar with wireless networking concepts.	K2
CO3	To be familiar with network tools and network programming.	K2

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I NETWORK HARDWARE& SOFTWARE

LAN-WAN-MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design issues for the layers – connection oriented and connection less services – Service primitives – The relationship of services to protocols. Reference Models: OSI Reference Model - TCP/IP reference Model Comparison of OSI and TCP/IP Critique of OSI and protocols – Critique of TCP/IP reference Model

(12 L)

UNIT II PHYSICAL LAYER

Guided Transmission Media: Magnetic Media: Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable, Wireless Transmission: Electro Magnetic Spectrum - Radio Transmission - Microwave Transmission – Infrared and Millimeter Waves – Light waves – Communication satellites: Geostationary, Medium- Earth orbit, Low earth Orbit Satellites – Satellites versus fiber.

(12 L)
UNIT III DATA LINK LAYER
 Error Detection and corrections – Elementary Data – Link protocols - Sliding window protocols, Medium –access control – Sub Layer: Multiple Access Protocols – Ethernet –Wireless LANs – Broad band wireless – Bluetooth. **(12 L)**

UNIT IV NETWORK & TRANSPORT LAYER
 Network layers: Routing algorithms – congestion control algorithms. Transport layer: Elements of transport protocols – Internet Transfer protocols: TCP. **(12 L)**

UNIT V APPLICATION LAYER
 Application Layer: DNS – Email, network security: cryptography – symmetric key algorithms – public key algorithms - digital signatures.
(12 L)

TEXT BOOK:

Computer Networks – Andrew S Tenenbaum, 4th Edition PHI (Unit I – 1.2 – 1.4, Unit II -2.2-2.4, Unit III 4.2-4.6, Unit-IV – 5.2,5.3,6.2,6.5, Unit-V – 7.1,7.2,8.1-8.4).

REFERENCE BOOKS:

1. Computer Networks – Bhushan Trivedi, Oxford University Press.
2. Data communication and Networks – Achut Godbole, 2007 PHI.
3. Computer Networks Protocol, Standards and Interfaces – Uyles Black, 2nd Edition PHI.

Semester-VI

Core

COMPUTER GRAPHICS

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
Part-III	Core		Computer Graphics	6	-	-	4

Contact hours per semester:90

Contact hours per week:6

Year	Semester	Internal Marks	External Marks	Total marks
III	VI	25	75	100

Objective: 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: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Understand the structure of modern computer graphics systems.	K2,K3
CO2	Understand the basic principles of implementing computer graphics primitives.	K2,K6

CO3	Develop design and problem solving skills with application to computer graphics.	K5,K6
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K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create **Course Content**

UNIT I 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.

(12 L)

UNIT II ALGORITHMS

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

(12 L)

UNIT III TRANSFORMATION

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.

(12 L)

UNIT IV 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.

(14 L)

UNIT V HIDDEN SURFACE ALGORITHMS

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

(10 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	PO1	H	PS01, PS05	H/H	K1
CO2	PO5	M	PS02, PS03	M/H	K6
CO3	PO4,PO3	H/H	PS07	H	K4

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, Kiran Thakrar – Multimedia system and Design – Prentice Hall 2000.

Semester-VI Major Elective SOFTWARE PROJECT MANAGEMENT

Category	Course Type	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical	Credits (C)
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Part-III	Major Elective -III		Software Project Management	4	-	-	4
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Contact hours per semester:60

Contact hours per week :4

Year	Semester	Internal Marks	External Marks	Total marks
III	VI	25	75	100

Objective: 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: On successful completion of the course,the students should be able to

CO No.	Course Outcome	Knowledge Level
CO1	Employ Analytical and Modern project development methodology for the process of project management in delivering successful Real time IT projects.	K4,K5
CO2	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.	K5,K6
CO3	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.	K2,K3
CO4	Identifying the resources required for a project and to produce a work plan and resource Schedule.	K2,K3,K5

K1-Remember, K2-Understand, K3-Apply, K4-Analyze, K5-Evaluate, K6-Create

Course Content

UNIT I 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.

(12 L)

UNIT II 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.

(12 L)

UNIT III 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. **(12 L)**

UNIT IV VARIOUS PROCESS

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. **(12 L)**

UNIT V MODERN PROJECT PROFILE

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

(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	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

TEXT BOOKS:

1. Software Project Management – Walker Royce – Pearson Education 2012.
2. Software Project Management, Bob Hughes and Mike Cotterell- Tata McGraw Hill,2011.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education 2012.