SRI MEENAKSHI GOVT. ARTS COLLEGE FOR WOMEN (AUTONOMOUS)

MADURAI – 625 002.

DEPARTMENT OF COMPUTER APPLICATIONS

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS TO BE INTRODUCED FOR THE ACADEMIC YEAR 2021 – 2022

OUTCOME BASED EDUCATION

UNDER C.B.C.S.

SRI MEENAKSHI GOVT ARTS COLLEGE FOR WOMEN
(AUTONOMOUS)
DEPARTMENT OF COMPUTER APPLICATIONS

DEPARMENT NAME: COMPUTER APPLICATIONS

INTRODUCTION

The Department of Computer Applications blossomed in the year 1998 offering Master of Computer Applications course approved by AICTE. In August 2018 B.C.A course was started. The Department has an enterprising faculty team of 3 Assistant Professors, 2 Guest faculties and 1 Programmer. It has more than 100 research publications to its credit. They contribute their share of knowledge to academic community through Invited Talks and Paper presentations in National / International Conferences. The Department takes continuous efforts in upgrading the course content and enhancing students skills.

COURSES OFFERED:

- **B.C.A**
- **M.C.A**
- **M.Phil COMPUTER APPLICATIONS**

VISION

Enabling Students to become enterprising Academicians, Young Entrepreneurs and Responsible Citizens.

MISSION

Imparting Quality Knowledge and Essential Virtues Treading Towards Holistic Development.

PROGRAMME OUTCOME OF B.C.A

At the end of the Degree programme the students will be able to:

PO1: Capable of adapting to new technologies and constantly upgrade their skills with an attitude towards independent and lifelong learning. (P)

PO2: Able to analyze and identify the customer requirements in multidisciplinary domains, create high level design and implement robust software applications using latest technological skills .(A)

PO3: Able to design and develop reliable software applications for social needs and excel in IT enabled services.

PO4: Perform professionally with social, cultural and ethical responsibility as an individual as well as in multifaceted teams with positive attitude. (S)

PO5: Proficient in successfully designing innovative solutions for solving real life business problems and addressing business development issues with a passion for quality, competency and holistic approach (C)

PROGRAMME SPECIFIC OUTCOME(PSO)

PSO1: Enhance Professional Skills

PSO2: Attain the ability to Design and Develop computer applications,

PSO3: Evaluate and recognize potential risks and provide innovative solutions.

PSO4 : AcquireSuccessful Entrepreneurship skills

PSO5: Explore technical knowledge in diverse areas of Computer Applications and experience an environment conducive in cultivating skills for higher studies.

TITLE OF THE PAPERS AND DISTRIBUTION OF CREDITS & MARKS

Subject Code	Study Components	Title of paper	Lect. Hrs/ week	Exam Hrs	No. of Credit	Int. Marks	Ext Marks	Total
SEMESTER – I								
1A1	Part-I	Tamil	6	3	3	25	75	100
2A1	Part-II	English	6	3	3	25	75	100
U11	Part-III Core-1	Programming in C	5	3	5	25	75	100
AU1	Allied-1	Discrete Mathematics	5	3	5	25	75	100
PU1	Core-2	Programming in C Lab	5	3	3	40	60	100
SUP1	SBE-1	Office Automation Lab	2	3	2	40	60	100
AV1	Part-IV *	Value Education	1		-			
	Total		30		21			600
SEMESTER – II								
1A2	Part-I	Tamil	6	3	3	25	75	100
2A2	Part-II	English	6	3	3	25	75	100
U21	Part-III Core-3	Object Oriented Programming with C++	4	3	4	25	75	100
U22	Core-4	Digital Principles and Computer Organization	4	3	4	25	75	100
AU2	Allied-1	Probability and Statistics	5	3	5	25	75	100
PU2	Core-5	Programming in C++ Lab	4	3	3	40	60	100
AV1	Part-IV *	Value Education	1	3	2	25	75	100
		Total	30		24			700

*Examination at the end of the Year

Subject	Study	Title of paper	Lect.	Exam	No. of	Int.	Ext	Total

Code	Components		Hrs/ week	Hrs	Credit	Marks	Marks	
SEMESTER - III								
1A3	Part-I	Tamil	6	3	3	25	75	100
2A3	Part-II	English	6	3	3	25	75	100
U31	Part-III Core-6	Operating Systems	4	3	4	25	75	100
U32	Core-7	Programming in Java	4	3	4	25	75	100
PU3	Core-8	Programming in Java Lab	3	3	2	40	60	100
AU3	Allied-2	E Commerce	5	3	4	25	75	100
SUP2	SBE-2	SPSS Lab	2	3	2	40	60	100
	Part-V	Extension Activity / Sports	-	-	1	25	75	100
		Total	30		23			800
SEMESTER –IV								
1A4	Part-I	Tamil	6	3	3	25	75	100
2A4	Part-II	English	6	3	3	25	75	100
U41	Core-9	Data Structures	4	3	4	25	75	100
U42	Core-10	Computer Networks	4	3	4	25	75	100
AU4	Allied-2	Computer Based Financial Accounting	3	3	3	25	75	100
PU4	Core-11	Data Structures Lab	4	3	4	40	60	100
UPA	Allied Lab	TALLY Lab	3	3	3	40	60	100
		Total	30		24			700

Subject Code	Study Components	Title of paper	Lect. Hrs/ week	Exam Hrs	No. of Credit	Int. Marks	Ext Marks	Total
SEMESTER –V								
U51	Core-12	Web Programming with PHP	5	3	5	25	75	100
EU51	Elective-1	Programming with .NET / Artificial Neural Networks / Digital Image Processing	5	3	5	25	75	100
EUP2	Elective-2	.NET Programming Lab / Artificial Neural Network using MATLAB / Digital Image Processing using MATLAB	6	3	5	40	60	100
SU53	SBE-3	DataBase Management Systems	2	3	2	25	75	100
PU5	Core-13	PHP Lab	6	3	5	40	60	100
SUP5	SBE - 5	Oracle Lab	2	3	2	40	60	100
SGK4	SBE-4	GK	2	3	2	25	75	100
NMU1	NME-1	Computer Fundamentals	2	3	2	25	75	100
		Total	30		28			800
SEMESTER –VI								
U61	Core-14	Software Engineering	6	3	4	250	75	100
EU63	Elective-3	Artificial Intelligence / Data Warehousing and Mining / System Software	6	3	5	25	75	100
SU66	SBE-6	Computer Graphics	4	3	2	25	75	100
NMU2	NME-2	Internet and its Applications	2	3	2	25	75	100
ENS6	Part-IV	EVS	2	3	2	25	75	100
UPJ	Core - 15	Project Work	10	3	5	20	80	100
		Total	30		20			600

SEMESTER V:
Elective - 1
1) Programming with .NET
2) Artificial Neural Networks
3) Digital Image Processing

Elective - 2
1) .NET Programming Lab
2) Artificial Neural Network using MATLAB
3) Digital Image Processing using MATLAB

SEMESTER VI:

Elective - 3

1) Artificial Intelligence
2) Data Warehousing and Mining
3) System Software

TOTAL CREDITS = 140   TOTAL MARKS = 4200

Value Added Courses Offered

S.No	Paper No	Title	Institution/Synergy	Target Students
1	#1	Web Programming	Institution	For BCA students
2	#2	Multimedia and its Applications	Institution	Open to all
3	#3	Python Programming	Institution	For BCA students
4	#4	Digital Marketing	Cormet Solutions Chennai	Open to all

SRI MEENAKSHI GOVT. ARTS COLLEGE FOR WOMEN(A), MADURAI–2.
DEPARTMENT OF COMPUTER APPLICATIONS
BACHELOR OF **C**OMPUTER **A**PPLICATIONS

Semester	Part-I	Part-II	Part-III				Part-IV				Part-V	Total
	Tamil	English	Core	Elective	Allied-I	Allied-II	NME	SBE	EVS	VE	NSS/ NCC/ Physical Education/ Extension Activity	
I	3	3	8	-	5	-	-	2	-	-	-	**21**
II	3	3	11	-	5	-	-	-	-	2	-	**24**
III	3	3	10	-	-	4	-	2	-	-	1	**23**
IV	3	3	12	-	-	6	-	-	-	-	-	**24**
V	-	-	10	10	-	-	2	6	-	-	-	**28**
VI	-	-	9	5	-	-	2	2	2	-	-	**20**
Total	**12**	**12**	**60**	**15**	**10**	**10**	**4**	**12**	**2**	**2**	**1**	**140**

I.   QUESTION PAPER PATTERN FOR EXTERNAL EXAMINATION

1. Core, Major Elective and Allied Papers

Section - A	5 compulsory questions (1 question from each unit)	5 X 2 = 10 Marks
Section - B	5 questions to be answered under 'either – or' pattern (2 questions from each unit)	5 X 7 = 35 Marks
Section - C	3 questions to be answered out of 5 questions (one from each unit)	3 X 10 = 30 Marks
	Total	75 Marks

2. Skill Based Elective Papers

Section - A	5 questions to be answered under 'either – or' pattern (2 question from each unit)	5 X 15 =75 Marks
	Total	75 Marks

3. Non Major Elective Papers

Section - A	25 compulsory questions (5 Multiple Choice Questions from each unit)	25 X 1 = 25 Marks
Section - B	5 questions to be answered under 'either – or' pattern (2 questions from each unit)	5 X 10 = 50 Marks
	Total	75 Marks

II. EVALUATION PATTERN

1.**Theory Paper**

Internal

Test	20
Quiz/Assignment	5
Total	25

Internal - 25
External - 75
Total   - 100

2.**Practical Paper**

Internal

Record	10
Viva-Voce	10
Internal Practical Exam	20
Total	40

Internal - 40
External - 60
Total   - 100

3.**Project**

Internal Assessment	20
Viva-Voce	80
Total	100

III. PASSING MINIMUM

External					Project - Passing Minimum		Internal
Theory - Passing Minimum		Practical - Passing Minimum					Passing Minimum
35% (**27** Marks)	Aggregate of **40** Marks in Total	35% (**21** Marks)	Aggregate of **40** Marks in Total	35% (**28** Marks)		Aggregate of **40** Marks in Total	No

Programme :BCA	**Part III: Core**
Semester : I	**Hours : 5 P/W 75 Hrs P/S**
Sub. Code : U11	**Credits : 5**

TITLE OF THE PAPER: PROGRAMMING IN C

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:

To inculcate in students necessary programming skills and to design, code and implement cprograms.To learn the Files and Pointer concepts in C language.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Understand programming concepts by learning algorithms and flowcharts.	1	15
UNIT 2 CO2: Obtain knowledge about the basics of C Programming.	2	15
UNIT 3 CO3: Apply different operations in an array.	3	15
UNIT 4 CO4: Understand use of function , pointers, structures and unions.	4	15
UNIT 5 CO5: Acquire knowledge about the basics of file handling mechanism	5	15

SYLLABUS
UNIT I:

Overview of C:History of C – Importance of C – Basic Structure of C Programs – Programming Style – Character Set – C Tokens – Keywords and Identifiers – Constants, Variables and Data Types – Declaration of Variables – Defining Symbolic Constants – Declaring a variable as a constant – overflow and underflow of data – Operators and Expressions: Arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – Arithmetic Expressions- Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity.

UNIT II:

Managing I/O Operations: Reading and Writing a Character – Formatted Input, Output – Decision Making and Branching: if statement - if else statement - nesting of if else statements - else if ladder – switch statement – the ?: operator – goto statement – the while statement – do statement – the for statement – jumps in loops.

UNIT III:

Arrays: One-Dimensional Arrays – Declaration, Initialization – Two-Dimensional Arrays –

Multi-dimensional Arrays – Dynamic Arrays – Initialization. Strings: Declaration, Initialization of string variables – reading and writing strings – string handling functions.

UNIT IV:

User-defined functions: need – multi-function programs – elements of user defined functions – definition – return values and their types – function calls, declaration, category – all types of arguments and return values – nesting of functions – recursion – passing arrays, strings to functions – scope visibility and life time of variables. Structures and Unions: Defining a structure – declaring a structure variable – accessing structure members – initialization – copying and comparing – operation on individual members – array of structures – arrays within structures – structures within structures – structures and functions – unions – size of structures – bit fields.

UNIT V:

Pointers:Accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through its pointer – chain of pointers – pointer increments and scale factors – pointers and character strings – pointers as function arguments – pointers and structures. Files: Defining, opening, closing a file – IO Operations on files – Error handling during IO operations – command line arguments.

TEXT BOOKS:

Programming in ANSI C, E.Balagurusamy, 6th Edition, McGraw Hill Education (India) Pvt. Ltd., 2017.

Unit I: Chapter 1, Chapter 2, Chapter 3
Unit II: Chapters 4, Chapter 5, Chapter 6
Unit III: Chapter 7, Chapter 8
Unit IV: Chapter 9, Chapter 10
Unit V: Chapter 11, Chapter 12

REFERENCES:

1. B. Gottfried, "Schaum's Outline of Programming with C", 3rd Edition, Tata McGraw Hill,2010.
2. J.R. Hanly and E.B. Koffman, "Problem Solving and Program Design in C", 6th Edition, Pearson Education, 2009.
3. Programming with ANSI and Turbo C, Ashok N.Kamthane , Pearson Education, 2006
4. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.
5. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.

E-LEARNING RESOURCES:

1. http://spoken-tutorial.org/tutorial-search/?search_foss=C+and+Cpp&search_language

=English

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Overview of C:History of C – Importance of C – Basic Structure of C Programs – Programming Style – Character Set – C Tokens – Keywords and Identifiers	5	Lecture
	– Constants, Variables and Data Types – Declaration of Variables – Defining Symbolic Constants – Declaring a variable as a constant – overflow and underflow of data		
	OperatorsandExpressions:Arithmetic, relational, logical, assignment operators – increment and decrement operators, conditional operators, bitwise operators, special operators – Arithmetic Expressions-	5	Lecture
	Evaluation of Expressions – Precedence of Arithmetic Operators – Type Conversions in Expressions – Operator Precedence and Associativity.	5	Lecture
UNIT 11			
	Managing I/O Operations:Reading and Writing a Character – Formatted Input, Output	5	Peer teaching
	Decision Making and Branching: if statement - if else statement - nesting of if else statements - else if ladder – switch statement –	5	Lecture and ICT
	the ?: operator – goto statement – the while statement – do statement – the for statement – jumps in loops.	5	Videos
UNIT III			
	Arrays:One-Dimensional Arrays – Declaration, Initialization – Two-Dimensional Arrays – Multi-dimensional Arrays – Dynamic Arrays – Initialization.	6	Lecture
	Strings: Declaration, Initialization of string variables –	5	Lecture
	reading and writing strings – string handling functions	4	ICT
UNIT IV			
	User-defined functions: need – multi-function programs – elements of user defined functions – definition – return values and their types – function calls, declaration, category – all types of arguments and return values – nesting of functions – recursion –	5	Lecture

16

	passing arrays, strings to functions – scope visibility and life time of variables.		
	Structures and Unions: Defining a structure – declaring a structure variable – accessing structure members – initialization –	5	Videos

	copying and comparing – operation on individual members – array of structures – arrays within structures – structures within structures – structures and functions – unions – size of structures – bit fields.	5	PPT
UNIT V			
	Pointers: Accessing the address of a variable – declaring, initialization of pointer variables – accessing a variable through its pointer – chain of pointers – pointer increments and scale factors – pointers and character strings – pointers as function arguments – pointers and structures.	5	Lecture
	Files: Defining, opening, closing a file – IO Operations on files –	5	ICT
	Error handling during IO operations – command line arguments.	5	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	5	1	5	4	5	2	3	5	3.6
CO2	2	3	4	4	2	4	2	2	5	3	3.1
CO3	3	4	5	3	4	4	5	2	1	3	3.4
CO4	4	4	5	2	4	4	5	2	1	3	3.4
CO5	2	3	5	2	4	4	5	2	2	2	3.1
Mean Overall Score											3.32

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value	Mean Overall Score of COs = Total of Mean Score
Total No. of Pos & PSOs	Total No. of COs

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA	Part III: Allied-1
Semester : I	Hours : 5 P/W 75 Hrs P/S
Sub. Code : AU1	Credits :5

TITLE OF THE PAPER: DISCRETE MATHEMATICS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	5	-	-	-

PREAMBLE:

To equip the students with applications of discrete mathematics in the field of computer science. To cover sets, logic, proving techniques, combinatorial functions, relations a nd Graph theory.

COURSE OUTCOME		Unit	Hrs P/S
At the end of the Semester, the Students will be able to			
UNIT 1 CO1: Apply boolean algebra, the language that simplifies communication in the world of computers.		1	15
UNIT 2 CO2: Use formal logic, and will be able to identify interesting outcomes		2	15
UNIT 3 CO3: Implement mathematical structures (sets, relations, functions, sequences, series, graphs) in real world situations.		3	15
UNIT 4 CO4: Summarize principles of counting and will be able to grasp patterns in data that follows fixed set of rules.		4	15
UNIT 5 CO5: Discuss graph concepts.		5	15

SYLLABUS
UNIT I:

Set Theory: Introduction – Sets – Notation and Description of Sets – Subsets – Venn – Euler Diagrams – Operation on sets – Properties of set operations – Verification of basic laws and algebra by Venn diagram.

UNIT II:

Relations and Functions: Relations – Representation of a relation – Operations on relations – equivalence relation – Closures &Warshalls Algorithm – Partial order Relation – Hasse Diagrams – Lattice.

UNIT III:

Logic: Introduction – IF statements – Connectives – Truth table of a formula – Tautology – Tautological implications and Equivalence of formulae – Quantifiers.

UNIT IV:

Recurrence relations and Generating functions: Recurrence relation – an introduction – Polynomial and their evaluations – Recurrence relations – Solutions of finite order homogeneous (linear) relations – Solutions of non-homogeneous relations – Generating functions (for all the theorem consider the statements without proofs).

UNIT V:

Introduction: What is a graph – Application of graphs – Finite and infinite graphs – Incidence and degree – Isolated vertex, Pendant vertex and null graph. Paths and circuits : Isomorphism – Sub graphs – A puzzle with multicolored cubes – walks, paths and circuits – Connected graphs, disconnected graphs and components – Euler Graphs – Operations on graph – Hamiltonian paths and circuits (Excluding theorems) – The travelling salesman problem. Trees and fundamental circuits: Trees – Some properties of trees (Theorem 3.1, 3.2, 3.3 only) - Pendant vertices in a tree – Distance and centers in a tree (Theorem 3.9 only).

TEXT BOOKS:

1. Discrete Mathematics – M.Venkataraman, N.Sridharan and N.Chandrasekaran – The National Publishing Company, May 2009.
2. Graph Theory with applications to Engineering and Computer Science , NarsinghDeo, Prentice Hall of India Pvt. Limited, 1999
   UnitI :Text Book 1 - Chapter 1.1 to 1.8

   Unit II: Text Book 1 - Chapter 2 (2.2 to 2.6), 10.1

   Unit III: Text Book 1 - Chapter 9 (9.1 to 9.3, 9.6 to 9.8, 9.15)

   Unit IV: Text Book 1 - Chapter 5.1 to 5.6

   Unit V: Text Book 2. Chapter 1.1 – 1.5, 2.1 – 2.7, 2.9(Excluding Theorems), 2.10, 3.1 – 3.2 (Theorem 3.1,3.2,3.3 only), 3.3,3.4(Theorem 3.9 only)

REFERENCES:

1. B. Gottfried, "Schaum's Outline of Programming with C", 3rd Edition, Tata McGraw Hill,2010.
2. J.R. Hanly and E.B. Koffman, "Problem Solving and Program Design in C", 6th Edition, Pearson Education, 2009.
3. Programming with ANSI and Turbo C, Ashok N.Kamthane , Pearson Education, 2006
4. H. Schildt, C: The Complete Reference, 4th Edition, TMH Edition, 2000.
5. Kanetkar Y., Let us C, BPB Pub., New Delhi, 1999.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Set Theory: Introduction – Sets – Notation and Description of Sets – Subsets–	5	Lecture
	– Venn – Euler Diagrams – Operation on sets – Properties of set operations	5	Lecture
	Verification of basic laws and algebra by Venn diagram.	5	Lecture
UNIT 11			
	Relations and Functions: Relations – Representation of a relation —.	5	Lecture
	Operations on relations – equivalence relation – Closures &Warshalls Algorithm	5	Lecture
	Partial order Relation – Hasse Diagrams – Lattices	5	Lecture
UNIT III			
	Logic: Introduction – IF statements – Connectives	5	Lecture
	Truth table of a formula – Tautology	5	Lecture
	Tautological implications and Equivalence of formulae – Quantifiers.	5	Lecture
UNIT IV			
	Recurrence relations and Generating functions: Recurrence relation – an introduction – Polynomial and their evaluations —	5	Lecture
	Recurrence relations – Solutions of finite order homogeneous (linear) relations – Solutions of non-homogeneous relations	5	Lecture
	Generating functions (for all the theorem consider the statements without proofs).	5	Lecture
UNIT V			
	Introduction: What is a graph – Application of graphs – Finite and infinite graphs – Incidence and degree	5	Lecture

	– Isolated vertex, Pendant vertex and null graph.		
	Paths and circuits : Isomorphism – Sub graphs – A puzzle with multicolored cubes – walks, paths and circuits – Connected graphs, disconnected graphs and components – Euler Graphs – Operations on graph – Hamiltonian paths and circuits (Excluding theorems) – The travelling salesman problem.	5	Lecture
	Treesand fundamental circuits: Trees – Some properties of trees (Theorem 3.1, 3.2, 3.3 only) - Pendant vertices in a tree – Distance and centers in a tree (Theorem 3.9 only).	5	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	5	4	5	4	5	3	3	5	4
CO2	2	3	4	4	4	4	5	2	5	3	3.6
CO3	5	4	4	3	5	4	5	2	1	3	3.6
CO4	4	4	5	5	4	4	5	2	1	3	3.7
CO5	4	3	5	2	4	4	5	2	2	2	3.3
Mean Overall Score											3.64

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = $\dfrac{\text{Total of Value}}{\text{Total No. of Pos \& PSOs}}$	Mean Overall Score of COs = $\dfrac{\text{Total of Mean Score}}{\text{Total No. of COs}}$

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III:** Core-2

Semester   : I   **Hours : 5 P/W 75Hrs P/S**
Sub. Code   : PU1   **Credits : 3**

TITLE OF THE PAPER: PROGRAMMING IN C LAB

Pedagogy	Hours	Practicals	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	4	-	1	-

SYLLABUS

1. Write a program in C to find the maximum and minimum element in an array. (user input)
2. Write a program in C to print all unique elements in an array. (user input)
3. Write a Program in C to Check Whether a string is Palindrome or Not (without using default string functions)
4. Write a program in C to menu driven program for string manipulation using switch case
5. Write a program in C to Sum of digit
6. Write a program in C to check a given number Armstrong or not.

7. Write a program in C to print Pascal triangle upto n rows.
    Sample Input: 5
    Sample Output:

            1

           1 1

          1 2 1

         1 3 3 1

        1 4641

8. Write a program in C to convert decimal number to binary number using the function
9. Write a program in C to search an element using linear search technique.
10. Write a program in C to add two Matrices and display matrix format with result
11. Write a program in C to print Fibonacci Series using recursion.
12. Write a program in C to implementation of Digital Clock
13. Write a program in C to count the number of vowels and consonants in a string using a pointer.
14. Write a program in C to create and store information in a text file
15. Write a program in C to extract individual bytes from an unsigned int using union.
16. Write a program in C for multiplication of two matrices (User input: row, column, Matrix A, Matrix B)
17. Write a program in C to Finding the No. of characters, words and lines from a given text file
18. Write a program in C to copy a file in another name.
19. Write a program in C to Binary Search
20. Write a program in C to read and write information of an employee using structure
21. Write a Program in C to design Log In screen, check username and password using structure.

Programme :BCA   **Part III:**Skill Based Elective-1
Semester: I   **Hours :** 2 Hrs **30Hrs P/S**
Sub. Code   : SUP1   **Credits :** 2

TITLE OF THE PAPER: OFFICE AUTOMATION LAB

Pedagogy	Hours	Practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	4		1	-

SYLLABUS
MS – WORD

1. Open a word document to prepare your Resume by performing the following operations.
    a) Formatting the Text – Alignment & Font style
    b) Page setup (margin alignment, page height & width)
2. Create a word document to prepare an application form (College)
3. Create a word document to prepare a student mark sheet.
4. Design an invitation using different fonts, font sizes, bullets and Word Art / Clip Art
5. Prepare an invitation and sent to specific addresses in the data source using .Mail Merge Concept.

MS – EXCEL

 6.Create a student mark sheet with necessary information and use Data sort to displayresults. Also use Data Filters to answer at least five different criteria.

7. Create astudent mark sheet with necessary information and make out a suitable chart showing gridlines,legends and titles for axes.

8. Prepare a salary bill in a worksheet showing Basic Pay, DA, HRA, Gross salary, PF, Tax and Net salary using suitable Excel Function.

POWER POINT

  9.Create a power point presentation to explain various aspects of your college using Auto play.
  10.Create a power point presentation to explain various aspects of ABC company using Auto play.

MS – ACCESS

11.Create a Student Database having Name, Regno, Tamil, English, Maths, Total, and ``Average. Find the total and average marks and check data entered.

12.Create an Inventory database having Item Name, Item no. Quantity and Price.-
Perform query operations to retrieve data.

13.Create a form to enter the details of Book database.

14Create report for the above database.

Programme : B.C.A   **Part III: Core 3**
Semester   **:** II   **Hours : 4 P/W 60Hrs P/S**
Sub. Code   : U21   **Credits : 4**

TITLE OF THE PAPER: OBJECT ORIENTED PROGRAMMING WITH C++

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	2	1	1	-

PREAMBLE:
    To develop knowledge in object oriented programming concepts. To design Programs in C++.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Design programs with object and classes.	1	12
UNIT 2 CO2: Discuss the significance of object oriented concepts for modular development.	2	12
UNIT 3 CO3: Apply Object Oriented Programming Concepts.	3	12
UNIT 4 CO4: Implement the concept of polymorphism and inheritance.	4	12
UNIT 5 CO5: Design the application software using C++.	5	12

SYLLABUS
UNIT I:
    Software Crisis – Software Evolution – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages - Applications of OOP – Application of C++ - Structure of a C++ Program – Tokens – Keywords – Identifiers – Basic Data Types – User-defined Data types – Derived data types – Symbolic constants – Type compatibility – Declaration of variables – Dynamic initialization of variables –Reference variables – Operators in C++ - Manipulators – Type cast operator – Expressions and their types-Implicit conversions – Control structures – The main function – Function prototyping – inline functions – Function overloading.
UNIT II:
    Specifying a class – Defining member functions – Making an outside function inline – Nesting of member functions – Private member functions – Array within a class – Memory allocation for objects – Static data members – Static member functions – Array of objects - Objects as function arguments – Friendly functions – Returning objects – Constant member functions – Constructors – Parameterized constructor – Multiple constructors in a class – Constructors with default arguments – Dynamic initialization of objects – Copy constructor – Destructors.
UNIT III:
    Defining operator overloading – Overloading unary operators – Overloading binary operators – Overloading binary operators using friend function – Rules for overloading operators - Defining derived classes – Single inheritance – Making a private member inheritable – Multilevel inheritance –

23

Multiple inheritance – Hierarchical inheritance – Hybrid inheritance - Virtual base classes – Constructors in derived class – Member classes: Nesting of classes.

UNIT IV:

Pointer to objects – this pointer – Pointers to derived classes – Virtual functions –Pure virtual functions – C++ Stream classes – Unformatted I/O operations –Managing output with manipulator

UNIT V:

Classes of file stream operations – Opening and Closing files – Detecting end of file – More about open() function – File modes, File pointers and their manipulation – Sequential input and output operations – Command-line arguments- Templates: class templates and function templates.

TEXT BOOKS:

Object Oriented Programming with C**++,** E. Balagurusamy, McGraw Hill Education (India) Private Limited, New Delhi, *Sixth Edition***-**2013

REFERENCES:

1. C++ - The Complete Reference, Herbert Schildt, TMH, 1998.
2. C++ How to Program, Paul Deitel, Harvey Deitel, PHI, Ninth edition (2014).
3. Ashok N.Kamthane, Object Oriented Programming with ANSI & Turbo C ++, Pearson Education, 2006.
4. Object-Oriented Programming Using C++, Alok Kumar Jagadev, Amiya Kumar Rath and SatchidanandaDehuri, Prentice-Hall of India Private Limited, New Delhi, 2007.

E-LEARNING RESOURCES:

1.http://spokentutorial.org/tutorialsearch/?search_foss=Advanced+Cpp&search_language=

English

2.http://www.cplusplus.com/files/tutorial.pdf

3.https://www.youtube.com/playlist?list=PLVlQHNRLflP8_DGKcMoRw-

TYJJALgGu4J   4. http://www.learncpp.com

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Software Crisis – Software Evolution – Basic Concepts of Object-Oriented Programming – Benefits of OOP – Object-Oriented Languages - Applications of OOP – Application of C++	4	Lecture
	- Structure of a C++ Program – Tokens – Keywords – Identifiers – Basic Data Types – User-defined Data types – Derived data types – Symbolic constants – Type compatibility – Declaration of variables – Dynamic initialization	4	Peer Teaching

	of variables –Reference variables		
	Operators in C++ - Manipulators – Type cast operator – Expressions and their types-Implicit conversions – Control structures – The main function – Function prototyping – inline functions – Function overloading.	4	Lecture
UNIT 11			
	Specifying a class – Defining member functions – Making an outside function inline – Nesting of member functions – Private member functions – Array within a class – Memory allocation for objects – Static data members – Static member functions	4	Lecture
	Array of objects - Objects as function arguments – Friendly functions – Returning objects – Constant member functions	4	Lecture
	Constructors – Parameterized constructor – Multiple constructors in a class – Constructors with default arguments – Dynamic initialization of objects – Copy constructor – Destructors.	4	Lecture
UNIT III			
	Defining operator overloading – Overloading unary operators – Overloading binary operators – Overloading binary operators using friend function – Rules for overloading	4	Lecture

	operators		
	Defining derived classes – Single inheritance – Making a private member inheritable – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance -	5	Lecture
	Virtual base classes – Constructors in derived class – Member classes: Nesting of classes.	3	Lecture
UNIT IV			
	Pointer to objects – this pointer – Pointers to derived classes –	5	Videos
	Virtual functions – Pure virtual functions –	3	Lecture

	C++ Stream classes – Unformatted I/O operations – Managing output with manipulators.	4	Lecture
UNIT V			
	Classes of file stream operations – Opening and Closing files – Detecting end of file – More about open() function –	4	Lecture
	File modes, File pointers and their manipulation – Sequential input and output operations – Command-line arguments-	4	PPT
	Templates: class templates and function templates.	4	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	3	3	4	5	3	3	5	3.5
CO2	3	3	4	2	2	4	5	2	5	3	3.3
CO3	5	4	2	3	4	4	5	2	1	3	3.3

CO4	4	4	5	5	3	2	5	2	1	3	3.4
CO5	4	3	5	2	4	4	5	2	2	2	3.3
Mean Overall Score											3.36

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = $\dfrac{\text{Total of Value}}{\text{Total No. of Pos \& PSOs}}$

Mean Overall Score of COs = $\dfrac{\text{Total of Mean Score}}{\text{Total No. of COs}}$

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III: Core-4**
Semester   : II   **Hours : 4 P/W 60 Hrs P/S**
Sub. Code   : U22   **Credits : 4**

TITLE OF THE PAPER: DIGITAL PRINCIPLES AND COMPUTER ORGANISATION

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	2	1	1	-

PREAMBLE:

To acquire knowledge in digital logic, combinational logic circuit, flip-flops and   registers. To discuss about the basic structure of computer, I/O system, memory system and processing unit

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Define the basic components of a digital computer and their function	1	12
UNIT 2 CO2: Enhance knowledge on simplifying digital circuits.	2	12
UNIT 3 CO3: Apply Boolean algebra in design of gates.	3	12
UNIT 4 CO4: Simplify and solve the logical expressions.	4	12
UNIT 5 CO5: Design various counters.	5	12

SYLLABUS

UNIT I:

Logic circuits**:**Binary number systems – OR gates – AND gates – Boolean Algebra –NOR gates – NAND Gates. Circuit Analysis and Design: Boolean laws and theorem – Sum of products – Truth table of Karanaugh map – Pairs, Quads and Octets – Karnaugh Simplification – Don"t care conditions - Product of Sums Method – Products of sums simplification.

UNIT II:

Data Processing Circuits: Multiplexers - Demultiplexers – BCD to Decimal Decoders – Encoders – EX OR Gates. Number system and codes: Binary to decimal Conversion – Decimal to Binary conversion – Octal Numbers – Hexa Decimal Numbers.

UNIT III:

Flip Flops: RS Flip flops – D Flipflops – JK Flipflops – JK Master Slave Flip flops. Instruction Codes – Computer Registers – Computer Instruction – Timing and control – Instruction Cycle – Memory reference Instruction – Input – Output and Interrupt – Programming the Basic Computer – Assembly Language.

UNIT IV:

Central Processing Unit – General Register Organization – Stack Organization – Instruction formats

– Addressing mode – Data Transfer and manipulation.

UNIT V:

Input-Output organization – Input-Output Interface – Priority Interrupt – DMA – IOP. – Memory Organisation – Memory Hierarchy –Cache memory – Virtual memory.

TEXT BOOKS:

Digital Principles And Applications by D.P. Leach and A.P. Malvino, Tata McGraw Hill, New Delhi, 6th Edition,.

Computer System Architecture by M.Morris Mano, 3 rd Edition, 1998.

REFERENCES:

Digital Systems Principles and Applications by Ronald J. Tocci, Neal S. Widmer, Gregory L.Moss, Pearson Prentice Hall, 6

dition.Computure Organization by Carl Hamacher, Zvonko Vranesic,

Safwat Zaky, Tata McGraw Hill, 5 th Edition

E-LEARNING RESOURCES:

1. http://nptel.ac.in/courses/117106086/1

2. **https://swayam.gov.in/courses/1392-digital-circuits-and-systems**

3. http://nptel.ac.in/courses/106102062/

4. https://www.tutorialspoint.com/computer_organization/index.asp

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Logic circuits:Binary number systems – OR gates – AND gates – Boolean Algebra –NOR gates – NAND Gates.	4	Lecture
	Circuit Analysis and Design: Boolean laws and theorem – Sum of products – Truth table of Karanaugh map – Pairs, Quads and Octets –	4	Lecture
	Karnaugh Simplification – Don"t care conditions - 4Product of Sums Method – Products of sums simplification.	4	Lecture
UNIT 11			
	Data Processing Circuits: Multiplexers - Demultiplexers – BCD to Decimal Decoders – Encoders – EX OR Gates.	4	Lecture
	Number system and codes: Binary to decimal	4	Lecture

	Conversion –.		
	Decimal to Binary conversion – Octal Numbers – Hexa Decimal Numbers	4	Lecture
UNIT III			
	Flip Flops: RS Flip flops – D Flipflops – JK	4	Lecture

	Flipflops – JK Master Slave Flip flops.		
	Instruction Codes – Computer Registers – Computer Instruction – Timing and control –	4	Lecture
	Instruction Cycle – Memory reference Instruction – Input – Output and Interrupt – Programming the Basic Computer – Assembly Language	4	PPT
UNIT IV			
	Central Processing Unit – General Register Organization – Stack Organization –	6	Lecture
	Instruction formats – Addressing mode –	6	Lecture
	Data Transfer and manipulation		Video
UNIT V			
	Input-Output organization – Input-Output Interface – Priority Interrupt –	6	Lecture
	DMA – IOP. – Memory Organisation – Memory Hierarchy	6	Lecture
	–Cache memory – Virtual memory.		PPT

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	3	5	3.4
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	1	3	3.1
CO4	4	4	5	5	3	4	5	2	1	3	3.6
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.26

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value
                       Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score
                             Total No. of COs

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III:** Allied–1

Semester   : II   **Hours : 5 P/W 75 Hrs P/S**
Sub. Code   : AU2   **Credits : 5**

TITLE OF THE PAPER: PROBABILITY AND STATISTICS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	5	-	-	-

PREAMBLE:

    To impart the basices of Probability and statistical.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Acquire the basic concept of Probability and Conditional probability.	1	15
UNIT 2 CO2: Summarize the concept of random variables, expectations and moment generating functions.	2	15
UNIT 3 CO3: Discuss about some standard distributions.	3	15
UNIT 4 CO4: Know about correlation and regression.	4	15
UNIT 5 CO5: Understand the concept of testing of hypothesis.	5	15

SYLLABUS
UNIT I:

    Mean Medium, Mode, Standard Deviation, Mean Deviation, and Quartile Deviation.

UNIT II:

    Curve Fitting – Principle of Least Square – Fitting a Straight Line – Fitting a Second Degree Parabola – Fitting Exponential Curve.

UNIT III:

    Correlation – Rank Correlation – Regression – Correlation Coefficient for a Vicariate – Frequency Distribution.

UNIT IV:

    Probability – Conditional Probability – Random Variables – Discrete Random Variables – Continuous Random Variables – Mathematical Expectations – Moment Generating Functions.

UNIT V:

    Some Special Distribution – Binomial Distribution – Poisson distribution – Normal Distribution.

TEXT BOOKS:

Statistics, S. Arumugam and A. ThangapandiIssac , New Gamma Publishing House.

REFERENCES:

1. KishorS.Trivedi - Probability and statistics with reliability queuing and Computer Science Applications - Prentice Hall of India(P) Ltd., New Delhi - 1997.
2. S. Arumugam - Statistics, Gamma Publishers, Palayankotai, 1997.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Mean Medium, Mode,.	5	Lecture
	Standard Deviation,	5	Lecture
	Mean Deviation, and Quartile Deviation	5	Lecture
UNIT 11			
	Curve Fitting – Principle of Least Square – Fitting a Straight Line –.	5	Lecture
	Fitting a Second Degree Parabola	5	Lecture
	– Fitting Exponential Curve	5	Lecture
UNIT III			
	Correlation – Rank Correlation –	5	Lecture
	Regression –	5	Lecture
	Correlation Coefficient for a Vicariate – Frequency Distribution.	5	Lecture
UNIT IV			
	Probability – Conditional Probability – Random Variables —	5	Lecture
	.Discrete Random Variables – Continuous Random Variables	5	Lecture
	Mathematical Expectations – Moment Generating Functions	5	Lecture
UNIT V			
	Some Special Distribution – Binomial Distribution –	5	Lecture
	Poisson distribution	6	Lecture
	Normal Distribution.	4	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	3	5	3.4
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	1	3	3.1
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.2

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value

Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

Total No. of COs

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPL	20%	20%

Course Designer: Department of Computer Applications.

34

Programme : B.C.A   **Part III: Core-5**
Semester   : II   **Hours : 4P/W 60Hrs P/S**
Sub. Code   : PU2   **Credits :3**

TITLE OF THE PAPER: PROGRAMMING IN C++ LAB

Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	3	-	1	-

SYLLABUS

1. Generate prime numbers between the given two numbers.
2. Perform arithmetic operations using Inline function.
3. Accept a three digit number and display it in words.*(Example 123 should be printed out as One Two Three)*
4. Find the sum of given numbers using function with default arguments.
5. Swap two values using methods of passing arguments in function
6. Prepare a student Record using class and object.
7. Find the area of geometric shapes using function overloading.
8. Illustrate the concept of Friend function.
9. Demonstrate default constructor or no argument constructor.
10. Demonstrate parameterized constructor.
11. Demonstrate copy constructor.
12. Demonstrate constructor overloading.
13. Demonstrate destructors.
14. Demonstrate constructor using „this‟ pointer.
15. Demonstrate constructor with default arguments.
16. Program using manipulators.
17. Perform operator overloading for Unary minus, unary increment and unary decrement
18. Concatenate two strings using the concept of Binary operator overloading.
19. Perform addition and subtraction of complex numbers using Binary Overloading.
20. Create student mark sheet using single inheritance.
21. Prepare employee information using multiple inheritance.
22. Process employee details using hierarchical inheritance.
23. Implement the concept of Virtual functions.
24. Implement the concept of virtual base class.
25. Sort the given set of numbers using function templates
26. Search the key element in the given set of numbers using class template.
27. Processing mark list using binary file.
28. Count number of objects in a file.
29. Demonstrating the use of Command-line arguments.
30. Implement a file handling concept using sequential access.
31. Implement file handling concept using random access

Programme : BCA   **Part III: Core**
Semester   : III   **Hours : 4 P/W 60Hrs P/S**
Sub. Code : U31   **Credits : 4**

TITLE OF THE PAPER: OPERATING SYSTEMS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	2	1	1	-

PREAMBLE:

To discuses the operating system evolution and its major rule. To understand the various operating system components like process management, memory management, I/O management and file management. To know about issues in resource allocation and management.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Analyze the concepts of file management.	1	12
UNIT 2 CO2: Implement security aspects in appropriate situations.	2	12
UNIT 3 CO3: Discuss various other operating systems.	3	12
UNIT 4 CO4: Apply knowledge gained through processor scheduling to other applications.	4	12
UNIT 5 CO5: Analyze limitations of operating systems.	5	12

SYLLABUS

UNIT I:

Introduction to Operating Systems:Introduction, What is an Operating systems, Operating system components and goals, Operating systems architecture. Process Concepts: Introduction, Process States, Process Management, Interrupts, Interprocess Communication.

UNIT II:

Asynchronous Concurrent Execution:Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, Software solutions to the Mutual Exclusion Problem, Hardware solution to the Mutual Exclusion Problem, Semaphores. Concurrent Programming: Introduction, Monitors.

UNIT III:

Deadlock and Indefinite Postponement:Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource concepts, Four Necessary conditions for Deadlock, Deadlock solution, Deadlock Prevention, Deadlock Avoidance with Dijkstra‟s Banker‟s algorithm, Deadlock Detection, Deadlock Recovery. Processor Scheduling:Introduction, Scheduling levels, Preemptive Vs Non-Preemptive Scheduling Priorities, Scheduling objective, Scheduling criteria, Scheduling

algorithms.

UNIT IV:

Real Memory Organization and Management:Introduction, Memory organization, Memory Management, Memory Hierarchy, Memory Management Strategies, Contiguous Vs Non-Contiguous Memory allocation, Fixed Partition Multiprogrammimg, Variable Partition multiprogramming. Virtual Memory Management:Introduction, Page Replacement, Page Replacement Strategies, Page Fault Frequency (PFF) Page replacement, Page Release, Page Size.

UNIT V:

Disk Performance Optimization:Introduction, Why Disk Scheduling is necessary, Disk Scheduling strategies, Rotational optimization. File and Database Systems:Introduction, Data Hierarchy, Files, File Systems, File Organization, File Allocation, Free Space Management, File Access control.

TEXT BOOKS:

Operating Systems, Deitel&DeitelChoffnes, Pearson education, Third edition, 2008.

REFERENCES:

1. An introduction to Operating systems concepts and Practice, Pramod Chandra P. Bhatt, PHI, Second Edition, 2008.
2. Operating System Concepts, Abraham Silberschatz Peter Galvin Greg Gagne, 6th edition Windows XP Update, Wiley India edition, 2007.
3. Operating Systems Principles and Design, PalChoudhury, PHI Learning, 2011.
4. Operating Systems, A Concept Based Approach DhananjayM.Dhamdhere Tata McGraw Hill, 3rd Edition, 2012.

E-LEARNING RESOURCES:

1. nptel.ac.in/courses/106108101/
2. w3schools.in/operating-system-tutorial
3. https://swayam.gov.in/course/237-operating-system

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction to Operating Systems:Introduction, What is an Operating systems, Operating system components and goals, Operating systems architecture.	4	Lecture
	Process Concepts: Introduction, Process States,	4	Lecture
	ProcessManagement,Interrupts,Interprocess	4	PPT

Communication.			

UNIT 11			
	Asynchronous Concurrent Execution:Introduction, Mutual Exclusion, Implementing Mutual Exclusion Primitives, ,	4	Lecture
	Software solutions to the Mutual Exclusion Problem, Hardware solution to the Mutual Exclusion Problem	3	Videos
	Semaphores. Concurrent Programming: Introduction, Monitors	5	Lecture
UNIT III			
	Deadlock and Indefinite Postponement:Introduction, Examples of Deadlock, Related Problem Indefinite Postponement, Resource concepts, Four Necessary conditions for Deadlock, Deadlock solution, Deadlock Prevention, Deadlock Avoidance with Dijkstra‟s Banker‟s algorithm, Deadlock Detection, Deadlock Recovery.	6	Lecture
	Processor Scheduling:Introduction, Scheduling levels, Preemptive Vs Non-Preemptive Scheduling	2	PPT
	Priorities, Scheduling objective, Scheduling criteria, Scheduling algorithms.	2	Lecture
UNIT IV			
	Real Memory Organization and Management:Introduction, Memory organization, Memory Management, Memory Hierarchy, Memory Management.	4	Lecture
	Strategies, Contiguous Vs Non-Contiguous Memory allocation, Fixed Partition Multiprogrammimg, Variable Partition multiprogramming	4	PPT
	Virtual Memory Management:Introduction, Page Replacement, Page Replacement Strategies, Page Fault Frequency (PFF) Page replacement, Page Release, Page Size.	4	Videos
UNIT V			

	Disk Performance Optimization: Introduction, Why Disk Scheduling is necessary, Disk Scheduling	4	Lecture

	strategies, Rotational optimization.		
	File and Database Systems: Introduction, Data Hierarchy, Files, File Systems, File Organization,	3	PPT
	File Allocation, Free Space Management, File Access control.	4	Video

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	3	3	4	3	2	5	3	3	5	3.3
CO2	2	5	4	2	2	3	5	2	5	3	3.3
CO3	5	3	2	3	4	2	5	2	1	3	3
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.24

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value

              Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

              Total No. of COs

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III: Core-7**
Semester   : III   **Hours : 4 P/W 60Hrs P/S**
Sub. Code   : U32   **Credits :4**

TITLE OF THE PAPER: PROGRAMMING IN JAVA

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	2	1	1	-

PREAMBLE:
- To impart knowledge in Platform Independent programming language Java .
- To explore Package and Applet concepts.
- To enhance the knowledge in Multithread and Graphics concepts.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Develop Java application using OOP concepts with appropriate program structure.	1	12
UNIT 2 CO2: Understand the concepts of polymorphism and inheritance.	2	12
UNIT 3 CO3: Develop packages and interfaces in a Java program.	3	12
UNIT 4 CO4: Implement exception handling in java.	4	12
UNIT 5 CO5: To design an applet program using AWT.	5	12

SYLLABUS

UNIT I:

JavaEvolution: Java Features – How Java differs from C and C++ – Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Environment. Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments. Constants – Variables – Data types – Declaration of Variables – Giving Values to variables – Scope of Variables – Symbolic Constants – Type Casting. Operators and Expressions: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity – Mathematical Functions. Decision Making and Branching: Decision Making with If statement – Simple If Statement – If else Statement – Nesting If Else Statement – the ElseIf Ladder – The switch Statement – The ?: operator. Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops.

UNIT II:

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Visibility Control. Arrays, Strings and Vectors: One – dimensional Arrays – creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types. Interfaces: Multiple Inheritance : Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

UNIT III:

Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import. Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the Runnable Interface.

UNIT IV:

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging. Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet.

UNIT V:

Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses, Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts. Managing Input/Output Files in Java: Concept of Streams – Stream Classes – Byte Stream Classes – Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the file Class – I/O Exceptions – Creation of Files – Reading / Writing Characters – Reading / Writing Bytes – Handling Primitive Data Types – Concatenating and Buffering Files – Random Access Files – Interactive Input and Output.

TEXT BOOKS:
Programming with Java, E.Balagurusamy, A primer, Tata McGraw Hill, Fourth Edition, 2008.
REFERENCES:
1. Object Oriented Programming Through JAVA- P.Radha Krishna, University Press, 2007.
2. Java and Object-Oriented Programming Paradigm, Debasish Jana, Prentice Hall of India Private Limited, New Delhi, 2008. Edition, July 2014 Reprint.
3. The Complete Reference, Java2, Herbert Schildt, Tata McGraw Hill, Fifth Edition, 2002.
4. Introduction to Java Programming ,K.Somasundaram, Jaico Publications, 2013.
5. Core Java - Vol. I – Fundamentals, Cay S. Horstmann, Pearson Education; Tenth edition, 2016.

E-LEARNING RESOURCES:

1. https://swayam.gov.in/course/3482-spoken-tutorials-java
2. http://spoken-tutorial.org/tutorial-search/?search_foss=Java&search_language=English

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	JavaEvolution: Java Features – How Java differs from C and C++ – Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Environment.	5	Lecture
	Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments. Constants – Variables – Data types – Declaration of Variables – Giving Values to variables – Scope of Variables – Symbolic Constants – Type Casting.	4	PPT
	Operators and Expressions: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity – Mathematical Functions. Decision Making and Branching: Decision Making with If statement – Simple If Statement – If else Statement – Nesting If Else Statement – the ElseIf Ladder – The switch Statement – The ?: operator. Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops.	3	Peer Teaching
UNIT 11			
	Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Visibility Control.	4	Lecture
	Arrays, Strings and Vectors: One – dimensional Arrays – creating an Array – Two dimensional Arrays –	4	Peer Teaching

	Strings – Vectors – Wrapper Classes – Enumerated Types.		
	Interfaces: Multiple Inheritance : Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.	4	Lecture
UNIT III			
	Packages: Java API Packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import.	4	Lecture
	Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using.	4	Lecture
	Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the Runnable Interface	4	Lecture
UNIT IV			
	Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging.	4	Lecture
	Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet	4	PPT
	– Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet.	4	Lecture
UNIT V			
	Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses, Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.	4	Lecture
	Managing Input/Output Files in Java: Concept of Streams – Stream Classes – Byte Stream Classes –	4	PPT

	Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the file Class – I/O Exceptions – Creation of Files –		
	Reading / Writing Characters – Reading / Writing 4 Lecture Bytes – Handling Primitive Data Types – Concatenating and Buffering Files – Random Access Files – Interactive Input and Output.		

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	3	3	4	3	2	5	3	3	5	3.3
CO2	2	5	4	2	2	3	5	2	5	3	3.3
CO3	5	3	2	3	4	2	5	2	1	3	3
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.24

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value

Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

Total No. of COs

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III: Core-8**
Semester   : III   **Hours : 3 P/W 45Hrs P/S**

Sub. Code   : PU3   **Credits :2**

TITLE OF THE PAPER: PROGRAMMING IN JAVA LAB

Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	3	3	-	-	-

SYLLABUS
1. To implement a simple temperature conversion program.
2. To perform addition and subtraction of complex numbers using class and objects.
3. To perform volume calculation using method overloading.
4. Using command line arguments, test if the given string is palindrome or not.
5. String manipulation using String Methods (Use of any five String methods are preferred).
6. Write a program to fill names into a list .Also, copy them in reverse order into another list. If the name contains any numeric value throw an exception "Invalid Name"
7. Program to demonstrate the use of any two built-in exceptions in Java.
8. To perform multiplication of matrices using class and objects.
9. Using multilevel inheritance process student marks.
10. Implement multiple inheritance for payroll processing.
11. Implement interface for area calculation for different shapes.
12. Create a package called "Arithmetic" that contains methods to deal with all arithmetic operators. Also write a program to use the package.
13. Create two threads such that one of the thread generate Fibonacci series and another generate perfect numbers between two given limits.
14. Define an exception called **": Marks Out of bound:"** Exception, that is thrown if the entered marks are greater than 100.
15. Program to demonstrate the use of Wrapper class methods.
16. File Processing using Byte stream.
17. File Processing using Character Stream.
18. Write applets to draw the following Shapes:
    (a).Cone (b).Cylinder (c).Square inside a Circle (d).Circle inside a Square
19. Write an applet Program to design a simple calculator.
20. Write an Applet Program to animate a ball across the Screen.

Programme : BCA **Part III: Allied-2**
Semester : III **Hours : 5 P/W 75Hrs P/S**
Sub. Code : AU3 **Credits : 4**

TITLE OF THE PAPER: E-COMMERCE

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	-	1	2

PREAMBLE: To impart the learners the basic concepts of Electronic Commerce and its applications. Toequip the learners with knowledge about Electronic payment procedures and security issues in it.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Summarize the impact of information and Communication Technologies, on the internet in Business Operations.	1	15
UNIT 2 CO2: Analyze Electronic Payment System and its environment.	2	15
UNIT 3 CO3: Make ethical decisions related to e-commerce based on laws, privacy, and security.	3	15
UNIT 4 CO4: Explain the steps, tools, and security considerations needed to start selling online.	4	15
UNIT 5 CO5: Discuss various types of digital documents.	5	15

SYLLABUS
UNIT I:

Welcome to Electronic Commerce: Electronic Commerce Framework - Electronic Commerce and Media Convergence. The Network Infrastructure for Electronic Commerce: Components of I-way – Network Access equipment – Global Information Distribution Networks.

UNIT II:

Network Security and Firewalls: Firewalls and network Security – Data and message Security. Electronic Commerce and World Wide Web: Architectural Framework for Electronic Commerce – World Wide Web as the Architecture – Technology behind the Web – Security and the Web.

UNIT III:

Electronic Payment Systems: Types of Electronic Payment systems – Digital Token-based Electronic Payment Systems – Smart Cards and Electronic Payment Systems – Credit card based Electronic Payment Systems – Designing Electronic Payment Systems.

UNIT IV:

Inter organizational Commerce and EDI – Electronic Data Interchange – EDI: Legal, security and privacy issues. EDI Implementation, MIME and Value-Added Networks – EDI software Implementation – EDI envelope for message transport – Value-Added Network(VAN) .

UNIT V:

Intra organizational Electronic Commerce: Internal Information System – Workflow automation and coordination – Supply Chain Management (SCM). Corporate Digital Library: Type of Digital

Documents. Advertising and Marketing on the Internet : Advertising on the Internet – Chatting online marketing process.

TEXT BOOKS: Frontiers of Electronic Commerce, Ravi Kalakota, Andrew Whinston, PerarsonEducation, New Delhi, 1996.

REFERENCES:

1. E-Commerce and its applications, Dr. U.S. Pandey, Rahul Srivastava, SaurabhShukla, S. Chand & Company Ltd., New Delhi, 2008.
2. Electronic Commerce, Gary Schneider. P., Cengage Learning US, XII Edition, 2017.
3. Electronic Commerce – A Managerial Perspective, Efrain Turban, Jae Lee, David King, Michael Chung, H., Perarson Education, New Delhi, 2000.
4. Electronic Commerce, Peter Loshin, John R. Vacca, Charles River Media, 2003.
5. Electronic Commerce, Principles and Practice, HosseinBidgoli, Academic Press, 2002.
6. Electronic Commerce, Elias M. Awad, Prentice Hall, 2002.

E-LEARNING RESOURCES:

1. http://nptel.ac.in/courses/106105084/35.

2. https://www.tutorialspoint.com/e_commerce/index.htm.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Welcome to Electronic Commerce: Electronic Commerce Framework - Electronic Commerce and MediaConvergence.	5	Lecture
	TheNetworkInfrastructureforElectronic Commerce: Components of I-way –	5	ICT
	Network Access equipment – Global Information Distribution Networks.	5	Lecture
UNIT 11			
	Network Security and Firewalls: Firewalls and network Security – Data and message Security.	5	Lecture
	Electronic Commerce and World Wide Web: Architectural Framework for Electronic Commerce	5	PPT

	– World Wide Web as the Architecture – Technology behind the Web – Security and the Web.	5	PPT

UNIT III			
	Electronic Payment Systems: Types of Electronic Payment systems – Digital Token-based Electronic Payment Systems –	6	Lecture
	Smart Cards and Electronic Payment Systems –	4	Videos
	Credit card based Electronic Payment Systems – Designing Electronic Payment Systems.	5	Videos
UNIT IV			
	Interorganizational Commerce and EDI – Electronic Data Interchange – EDI: Legal, security and privacy issues. EDI Implementation,	5	Lecture
	MIME and Value-Added Networks – EDI software Implementation	4	Lecture
	– EDI envelope for message transport – Value-Added Network(VAN) .	6	Lecture
UNIT V			
	Intraorganizational Electronic Commerce: Internal Information System –	4	Lecture
	Workflow automation and coordination – Supply Chain Management (SCM). Corporate Digital Library: Type of Digital Documents.	4	Lecture
	Advertising and Marketing on the Internet : Advertising on the Internet – Chatting online marketing process.	4	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO2	PSO3	PSO4	PSO5	
CO1	4	4	3	4	3	2	5	3	3	5	3.6
CO2	5	3	4	2	2	3	5	2	5	3	3.4
CO3	2	4	2	3	4	2	5	2	1	3	2.8
CO4	2	4	5	5	3	3	5	2	1	3	3.3
CO5	3	3	5	2	3	5	5	2	2	2	3.2
Mean Overall Score											3.26

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value

                Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

                Total No. of COs

BLOOM"S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III: Skill BasedElective-2**
Semester   : III   **Hours : 2 P/W 30Hrs P/S**
Sub. Code : SUP2   **Credits : 2**

TITLE OF THE PAPER: SPSS LAB

Pedagogy	Hours	Practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	2	2	-	-	-

SYLLABUS
1. Frequency Tables
2. Graphical Representation Of Data
3. Measures Of Central Tendencies
4. Methods Of Dispersion
5. Simple Correlation
6. Correlation Coefficient
7. Regression Trend
8. Test Of Significance Large Sample Test (Z-Test)
9. Test Of Significance Small Sample Test (T-Test)
10. Chi-square Test
11. Testing Hypothesis About Two Independent Means.

Programme : BCA   **Part III: Core-9**
Semester   : IV   **Hours   : 4P/W   60Hrs P/S**
Sub. Code   : U41   **Credits :4**

TITLE OF THE PAPER:DATA STRUCTURES

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	2	1	1	-

PREAMBLE:
- Be exposed to sorting and searching algorithms & their analysis.

- To gain about linear data structures-List, Stack and Queue.

- To acquire about the nonlinear data structures-Tree.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Understand the sorting and searching algorithms.	1	12
UNIT 2 CO2: Apply and implement stacks and queue.	2	12
UNIT 3 CO3: Understand the different types of linked lists.	3	12
UNIT 4 CO4: Study about trees.	4	12
UNIT 5 CO5: Analyze different graphs. Its tree traversal.	5	12

SYLLABUS
UNIT I:
Introduction: Algorithm – Writing structured program, Analyzing algorithm-Divide and conquer – The general method, Binary search, Merge sort, Quick sort, Selection sort.
UNIT II:
      Introduction: Arrays – Ordered List – Sparse Matrices -Representation of Arrays- Stacks and Queues – A Mazing problem – Evaluations of expressions.
UNIT III:
      Linked list: Singly linked list – linked stacks and queues – polynomial addition – more on linked list – equivalence relations – doubly linked list.
UNIT IV:
      Trees: Basic terminology – binary trees – binary tree representations – binary tree traversal –

threaded binary trees – binary tree representation of trees – application of trees -Set Representation.

UNIT V:

    Graphs: Terminology and representations – traversals, spanning trees – shortest paths.

TEXT BOOKS:

3. Fundamentals of Data structures – Ellis Horrowitz, SartajSahani, Galgotia Pub., 1998.(Excluding analysis & Lemma)

4. Fundamentals of Computer Algorithms – Ellis Horrowitz, SartajSahani, SanguthevarRajasekaran, Universities Press – 2nd Edition, 2008.(Excluding analysis & Lemma)

REFERENCES:

1. Data structure using C++, VARSHA H. PATIL, Oxford Higher Education/Oxford University Press, First edition, 2012.
2. Fundamentals of Data structures In C++, Ellis Horowitz, SartajSahni, Dinesh Mehta, University press, 2007.
3. Data Structures using C, Tanaenbaum A.S.,Langram Y. Augestein M.J, Pearson Education , 2004.
4. Introduction to the Design and Analysis of Algorithms, AnanyLevitin, Pearson Education 2003.

E-LEARNING RESOURCES:

1. https://www.w3schools
2. https://www.programiz.com/dsa
3. https://nptel.ac.in/courses/106102064/1

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction: Algorithm – Writing structured program, Analyzing algorithm	5	Lecture
	Divide and conquer – The general method, Binary search, Merge sort,	5	Lecture
	Quick sort, Selection sort.	2	ICT
UNIT 11			

	Introduction: Arrays – Ordered List – Sparse Matrices -	5	Lecture
	Representation of Arrays-Stacks and Queues –	4	Lecture
	A Mazing problem – Evaluations of expressions	3	ICT

UNIT III			
	Linked list: Singly linked list – linked stacks and queues –	5	Lecture
	polynomial addition – more on linked list –	4	ICT
	equivalence relations – doubly linked list.	3	Lecture
UNIT IV			
	Trees: Basic terminology – binary trees – binary tree representations –	5	Lecture
	binary tree traversal – threaded binary trees – binary tree representation of trees	5	ICT
	application of trees -Set Representation.	2	Videos
UNIT V			
	Graphs: Terminology and representations –	5	Videos
	traversals, spanning trees –	6	Lecture
	shortest paths.	1	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	2	5	3
CO2	2	3	4	2	2	3	5	2	5	3	4

CO3	5	4	2	3	4	2	5	2	5	3	2
CO4	4	4	5	5	3	3	5	2	1	3	5
CO5	4	3	5	2	1	5	5	2	3	2	5
Mean Overall Score											3.32

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value

Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

Total No. of COs

LOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III: Core-10**
Semester   : IV   **Hours   : 4 P/W   60Hrs P/S**
Sub. Code   : U42   **Credits :4**

TITLE OF THE PAPER:COMPUTER NETWORKS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	4	2	1	-	1

PREAMBLE:
- To Learn about network models and transmission techniques.
- To study about Communication types of routing algorithms and internet accessing.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Discuss the introduction of networking concepts.	1	12
UNIT 2 CO2: Analyze in detail transmission media .	2	12
UNIT 3 CO3: Examine the layers design and CRC.	3	12
UNIT 4 CO4: Recognize the network routing algorithm and their effectiveness.	4	12
UNIT 5 CO5:Assess the internet domains and its services for any domain.	5	12

SYLLABUS
UNIT I:
       Introduction: Use of Computer Networks – Network Hardware – Network Software – Reference Models – Example Networks: The Internet, Ethernet.

UNIT II:
       Physical Layer: Transmission Media – Wireless Transmission – The Public Switched Telephone Network.

UNIT III:

Data Link Layer: Data Link Layer Design Issues – Error Correction and Detection – Elementary Data Link Protocols.

UNIT IV:

       Network Layer: Network Layer Design Issues – Routing Algorithms: Shortest Path Routing,

Flooding, Distance Vector Routing, Broadcasting, Multicast Routing – Congestion Control Algorithms-Quality of Service- Techniques for achieving good quality of service-Traffic shaping-The leaky bucket algorithm-The token bucket algorithm.

UNIT V:

The Transport Layer : Elements of Transport Protocols -The   Application Layer: Domain Name System – Electronic Mail – The World Wide Web – Multimedia.

TEXT BOOKS:

Computer Networks , Andrew S. Tanenbaum, 4th Edition, Prentice Hall, India.

REFERENCES:

1. Computer Communication &Network , John Fuer, Pitman, Computer System Series.

2. Data & Communication Network ,E. Stallings , PHI, 4thEdition.

 E-LEARNING RESOURCES:

1.http://nptel.ac.in/courses/106105081/

2.http://nptel.ac.in/courses/106106091/

3.http://nptel.ac.in/courses/106105080/

4. https://www.studytonight.com/computer-networks/

5. https://swayam.gov.in/courses/4066-computer-networks

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction: Use of Computer Networks – Network Hardware –	4	Lecture
	Network Software – Reference Models –.	4	Lecture
	Example Networks: The Internet, Ethernet	4	Peer Teaching
UNIT 11			

	Physical Layer: Transmission Media –	4	Lecture
	Wireless Transmission –	4	Videos
	The Public Switched Telephone Network.	4	Peer Teaching

UNIT III			
	Data Link Layer: Data Link Layer Design Issues –	4	Videos
	Error Correction and Detection –	4	ICT
	Elementary Data Link Protocols.	4	Lecture
UNIT IV			
	Network Layer: Network Layer Design Issues –	2	Videos
	Routing Algorithms: Shortest Path Routing, Flooding, Distance Vector Routing, Broadcasting, Multicast Routing –	4	Lecture
	Congestion Control Algorithms-Quality of Service- Techniques for achieving good quality of service-Traffic shaping-The leaky bucket algorithm-The token bucket algorithm.	6	Lecture
UNIT V			
	The Transport Layer : Elements of Transport Protocols	4	Lecture
	The Application Layer: Domain Name System –	4	ICT
	Electronic Mail – The World Wide Web –Multimedia.	4	Videos

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	2	5	3.3
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	5	3	3.5
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	5	5	2	3	2	3.2
Mean Overall Score											3.32

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   <u>Total of Value</u>

           Total No. of Pos & PSOs

Mean Overall Score of COs = <u>Total of Mean Score</u>

           Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applictaions

Programme : BCA   **Part III: Allied-2**
Semester   : IV   **Hours   : 3 P/W   45Hrs P/S**
Sub. Code   : AU4   **Credits :3**

TITLE OF THE PAPER:COMPUTER BASED FINANCIAL ACCOUNTING

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	3	1	-	1

PREAMBLE:
- To enable the students gain insights into the fundamental principles of accounting and use them in day-to-day business scenarios.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Knowing the fundamentals accounting.	1	9
UNIT 2 CO2: Preparation of journal, ledger and trial balance.	2	9
UNIT 3 CO3: Understanding the types of subsidiary books.	3	9
UNIT 4 CO4: Acquiring knowledge on Tally.	4	9
UNIT 5 CO5: Having clear idea of preparing final accounts of individuals.	5	9

SYLLABUS:
UNIT I:

Nature and Scope of Management Accounting- Meaning- Definition- Scope of Management Accounting- Functions of Management Accounting- Management Accounting Vs Financial Accounting- Management Accounting Vs Cost Accounting- Limitation of Financial Accounting- Advantages of Management Accounting- Limitation of Management Accounting.

UNIT II:

Introduction to Accountancy- Definition- Concepts and Conventions- Types of Accounts and the rules- Preparation of Journal, Ledger, Trail Balance- Subsidiary Books

UNIT III:

Final Accounts- Preparation of Trading Account- Preparation of Profit and Loss account- Preparation of Trading, Profit and Loss account and Balance Sheet with Simple Adjustments (Only Simple Problems)

UNIT IV:

Introduction to Tally: Features of Tally 9 – Company info: Create, Select, Alter and Close or Shut Company – Ledger Creation: Creating, Displaying, Altering and Deleting. F11 – Features and F12 – Configuration.

UNIT V:

Voucher Creation: Receipt, Payment, Contra, Journal, Sales, Purchase, Memo, Display, Alter, Delete, Insert, Statement of Reports: Trail balance, Profit and Loss account, Balance sheet.

TEXT BOOKS:

1. Financial and Management AccountingMADE SIMPLE– Dr.P.S.Boopathi Manickam, P.S.G. Publications,2009, Fifth Edition.
   Unit I: Chapter 1
   Unit II : Chapter 2
   Unit III: Chapter 3
2. Tallly (version 9) – C.NellaiKannan, 2007
   Unit IV : Pg. Numbers – 5 to 61
   Unit V : Pg. Numbers – 62 to 102

REFERENCES:

1. Comdex Tally 9 – Dr. NamrataAgrawal, Dream Tech Publications
2. Tally (Accounting Software) S.Palanivel, Margham Publications, 2010

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Financial Accounting: Meaning, Nature and scope, Limitations –	3	Lecture
	Accounting Principles: Basic Concepts and Conventions –	3	ICT
	Objectives of accounting – Accounting rules.	3	Lecture

UNIT 11			
	Books and records : Recording of business transactions –	3	Videos
	Types of accounts – Journal – Ledger – Journal Vs Ledger,	4	Lecture
	Subsidiary books – Trial balance.	2	Lecture
UNIT III			
	Final Accounts: Introduction – Trading account –	3	ICT
	Profit and loss account –	4	Videos
	Balance sheet. (Simple problems)	2	Lecture
UNIT IV			
	Introduction to Tally: Features of Tally 9 – Company info: Create, Select, Alter and Close or Shut Company –	3	Lecture
	Ledger Creation: Creating, Displaying, Altering and Deleting.	4	ICT
	F11 – Features and F12 – Configuration.	2	Lecture
UNIT V			
	Voucher Creation: Receipt, Payment, Contra, Journal, Sales, Purchase,	3	Lecture
	Memo, Display, Alter, Delete, Insert,	2	Videos
	Statement of Reports: Trail balance, Profit and Loss	4	Lecture

account, Balance sheet.		

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	2	3	3	5	3.1
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	1	3	3.1
CO4	4	4	5	5	3	3	2	2	1	3	3.2
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.12

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value

Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme :BCA   **Part III: Core 11**
Semester   : IV   **Hours   : 4 P/W   60Hrs P/S**
Sub. Code   : PU4   **Credits :4**

TITLE OF THE PAPER:DATA STRUCTURE LAB

Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	4	-	1	-

SYLLABUS

1. Linear Search

2. Binary Search

3. Bubble Sort Algorithm Implementation.

4. Insertion Sort Algorithm Implementation .

5. Merge Sort Algorithm Implementation.

6. Quick Sort Algorithm Implementation.

7. Selection Sort Algorithm Implementation.

8. Implementing Stack using an array.

9. Implementing Stack using a linked list.

10. Convert Infix expression to Postfix expression using stack.

11. Convert Infix expression to Prefix expression using Stack.

12. Implementing Queue as an Array.

13. Implement Queue as a linked list.

14. Binary tree traversals.

15. Implement Binary Search Tree.

Programme :BCA   **Part III: Allied Lab**
Semester   : IV   **Hours   : 3 P/W   45Hrs P/S**
Sub. Code   : UPA   **Credits :3**

TITLE OF THE PAPER: TALLY LAB

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	3	2	-	1	-

List of Programs

I. Company Creation

II. Ledger Creation

III. Voucher Creation

      a) Contra voucher

      b) Payment voucher

      c) Receipt voucher

      d) Journal voucher

      e) Purchase voucher

      f) Sales counter

IV. Reports

      a) Day book

      b) Trail balance

      c) Final Accounts

      d) Purchase Register

      e) Sales Register

      f) Outstanding Receivable

      g) Outstanding Payable

      h) Cheque Printing

      i) Bank Reconciliation Statement

Programme : BC A   **Part III: Core 12**
Semester   : V   **Hours   : 5 P/W   75Hrs P/S**
Sub. Code   : U51   **Credits :5**
       TITLE OF THE PAPER: WEB PROGRAMMING WITH PHP

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:
- To introduce the web programming with the open source PHP.
- To learn the program building constructs using SQL and PHP.
- To learn about client and server data using open source.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Understand the general concepts of PHP three-tier architecture and PHP.	1	15
UNIT 2 CO2: Use PHP logical and comparison operators, branching structures programs for developing(if/switch), and loop structures (for, for each, do, do/while) Programs.	2	15
UNIT 3 CO3: Erecit Database using MySQL for any required applications with OOPS concepts.	3	15
UNIT 4 CO4: Construct PHP program to connect and query database.	4	15
UNIT 5 CO5: Understand, develop to web application using PHP and validate them.	5	15

SYLLABUS
UNIT I:

Database applications and the web – The Web – Three tier Architecture, PHP Scripting language – Introducing PHP – Condition and Branches – Loops.

UNIT II:

PHP Scripting Language – Functions – Types – User Defined functions- Arrays, Strings and Advanced Data Manipulation in PHP – Arrays, strings, Regular Expressions, Dates and Times, Integers and Floats.

UNIT III:

      Introduction to Object Oriented Programming with PHP – Classes and Objects, Inheritance,

Throwing and Caching Exceptions, SQL and MySQL – Database Basics, My SQL Command Interpreter, Managing Databases and Tables, Inserting, Updating, and Deleting Data, Querying with SQL SELECT, Join Queries.

UNIT IV:

Querying Web Databases – Querying a MySQL Database using PHP, Processing User Input, PEAR Overview, Core Components, Packages, Writing to Web databases- Database Inserts, Updates, and Deletes.

UNIT V:

Issues in Writing Data to Databases, Validation with PHP and Java Script – Validation and Error Reporting Principles. Server-Side Validation with PHP, JavaScript and Client Side Validation.

TEXT BOOKS:

Web Database Applications with PHP and Mysql by Hugh E. Williams & David Lane, II Edition, SPD O' REILLY

REFERENCES:

1. PHP , MYSQL and APACHE, Julie . C .Meloni.
2. PHP 5 and MYSQL Bible, Joyce park , CharleMorgon

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Database applications and the web – The Web	4	Videos
	Three tier Architecture, PHP Scripting language	5	Lecture
	Introducing PHP – Condition and Branches – Loops.	6	Peer Teaching
UNIT 11			
	PHP Scripting Language – Functions – Types – User Defined functions-	5	Lecture
	Arrays, Strings and Advanced Data Manipulation in PHP–	5	Videos

	Arrays, strings, Regular Expressions, Dates and Times, Integers and Floats.	5	ICT
UNIT III			
	Introduction to Object Oriented Programming with PHP –	5	Videos
	Classes and Objects, Inheritance,	5	Peer Teaching
	Throwing and Caching Exceptions,	5	Lecture
UNIT IV			
	Querying Web Databases – Querying a MySQL Database using PHP, Processing User Input,	5	Lecture
	PEAR Overview, Core Components, Packages,	5	Lecture
	Writing to Web databases-Database Inserts, Updates, and Deletes.	5	Lecture
UNIT V			
	Issues in Writing Data to Databases, Validation with PHP and Java Script –	5	Lecture
	Validation and Error Reporting Principles. Server-	5	Lecture
	Side Validation with PHP, JavaScript and Client SideValidation.	5	Lecture

ourse Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	4	4	3	4	3	2	5	3	3	5	3.6
CO2	5	3	4	2	2	3	5	2	5	3	3.4
CO3	2	4	2	3	4	2	5	2	1	3	2.8
CO4	2	4	5	5	3	3	5	2	1	3	3.3
CO5	3	3	5	2	3	5	5	2	2	2	3.2
Mean Overall Score											3.26

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value

            Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

            Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA **Part III: Elective 1**
Semester   : V **Hours   : 5 P/W   75Hrs P/S**
Sub. Code   : EU51 **Credits :5**

TITLE OF THE PAPER: PROGRAMMING WITH .NET

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:
- To introduce .NET framework and its components.
- To learn about ASP.Net concepts and its applications.
- To inculcate the techniques to connect clients and webdata.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Knowledge about the .NET framework.	1	15
UNIT 2 CO2: Ability to analyze the structure of a .NET.	2	15
UNIT 3 CO3: Programming skills development for n-tier architecture.	3	15
UNIT 4 CO4: Design and develop Web based applications and its validations.	4	15
UNIT 5 CO5: Capable of integrating webpages with database using ADO.Net.	5	15

SYLLABUS
UNIT I:
The .NET Framework: The .NET Programming Framework – VB.NET, C# and the .NET Languages –
The common language runtime –The .NET Class Library – ASP.NET – Visual Studio.NET. Learning
the .NET Languages: The .NET Languages – Data Types – Declaring variables – Scope and
accessibility – Variable operations – Object oriented manipulations – conditional structures – loop
structures – functions and subroutine.
UNIT II:
Types, Objects and Namespaces: The basics about classes – value types and reference types – advances
class programming – understanding namespaces and assemblies. ASP.NET applications: ASP.NET
applications – ASP.NET file types –the bin directory – Application updates – Code behind – The
Global.asax application file – ASP.NET configuration – The web.configfile .
UNIT III:
        Web form fundamentals: A simple Page applet – The page class. Web Controls: Web Controls
Classes – Autopostback and web control events.
UNIT IV:

Validation and rich controls: The calendar control – formatting the calendar – restricting dates – the Adrotator – The Advertisement file – Validation – The validation controls – The validation process –A simple validation example – Server side validation – Understanding regular expression – literals and metacharacters– finding a regular expression.

UNIT V:

Overview of ADO.NET: Characteristics of ADO.NET – Disconnected model – native XML – Extended data format – managed code – comparing ADO and ADO.NET. ADO.NET data access: About the ADO.NET examples – Obtaining the sample database – The SQL select statement – A sample select statement – The Where clause – The SQL update statement – The SQL insert statement – The SQL delete statement. TheDatalist, DataGrid and Repeater: comparing the template controls – the DataList – The DataGrid – The Repeater.

TEXT BOOKS:

1. ASP.NET : The Complete Reference, Matthew MacDonald, Tata McGraw-Hill Publishing Company Ltd, NewDelhi 2008.

Reference Books
1. ASP.Net VB.Net Web Programming, Matt.J.Crouch - Pearson Education.
2. ASP.Net for Developers - Michael Amundsen Paul Litwin

E-LEARNING RESOURCES:

3. http://vb.net-informations.com/framework/framework_tutorials.htm.

4. https://www.tutorialspoint.com/vb.net/index.htm.

5. https://www.javatpoint.com/asp-net-tutorial.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	The .NET Framework: The .NET Programming Framework – VB.NET, C# and the .NET Languages – The common language runtime –	5	Lecture

	The .NET Class Library – ASP.NET – Visual Studio.NET. Learning the .NET Languages:	5	Videos
	The .NET Languages – Data Types – Declaring variables – Scope and	5	Lecture
	accessibility – Variable operations – Object oriented manipulations – conditional structures – loop structures – functions and subroutine.		
UNIT 11			
	Types, Objects and Namespaces: The basics about classes – value types and reference types – advances class programming – understanding namespaces and assemblies. –	6	Lecture
	ASP.NET applications: ASP.NET applications – ASP.NET file types – the bin directory – Application updates – Code behind	6	Lecture

	The Global.asax application file – ASP.NET configuration – The web.configfile .	3	Lecture
UNIT III			
	Web form fundamentals: A simple Page applet – The page class..	6	Lecture

	Web Controls: Web Controls Classes –	6	PPT
	Autopostback and web control events	3	Lecture
UNIT IV			
	Validation and rich controls: The calendar control – formatting the calendar – restricting dates – the Adrotator – The Advertisement file –	5	PPT
	Validation – The validation controls – The validation process –A simple validation example – Server side validation –	5	Lecture
	Understanding regular expression – literals and metacharacters – finding a regular expression.	5	Lecture
UNIT V			

Overview of ADO.NET: Characteristics of ADO.NET – Disconnected model – native XML – Extended data format – managed code – comparing ADO and ADO.NET.	6	PPT
ADO.NET data access: About the	4	Videos

ADO.NET examples – Obtaining the sample database – The SQL select statement – A sample select statement – The Where clause – The SQL update statement – The SQL insert statement – The SQL delete statement.		
TheDatalist, DataGrid and Repeater: comparing the template controls – the DataList – The DataGrid – The Repeater.	5	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	

CO1	2	4	5	3	3	4	2	3	3	5	3.4
CO2	2	3	4	4	4	4	3	2	5	3	3.4
CO3	5	4	2	3	5	4	5	2	1	3	3.4
CO4	4	4	2	5	4	4	5	2	1	3	3.4
CO5	4	3	3	2	4	4	5	2	2	2	3.1
Mean Overall Score											3.34

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value / Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score / Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme : BCA   **Part III: Elective 1**
Semester   :V   **Hours   : 5 P/W   75Hrs P/S**
Sub. Code   : EU51   **Credits :5**

TITLE OF THE PAPER: ARTIFICIAL NEURAL NETWORKS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:
- To study and design artificial neural network and its working methodology.
- To explore various neural network models for traning various domains.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Introductions of learning and training neurons.	1	15
UNIT 2 CO2: Understanding various models of neural networks.	2	15
UNIT 3 CO3: Explore applications network models for various domains.	3	15
UNIT 4 CO4: Analysis of back propagation methods scrutiny.	4	15
UNIT 5 CO5:Implementation Applications of neural network concepts	5	15

SYLLABUS
UNIT I:
Introduction: Brain as a neural network – Basic properties of neurons – Artificial Neural Networks.
Learning: Learning and training – Learning rules – Stability and plasticity
UNIT II:
Hopfield, Perceptron and Related models: Hop field model – basic model of hop-field network – cellular neural networks – perceptron – Other associative models – Bidirectional Associative memory

UNIT III:
Self Organization Map: Kohenen map – adaptive of learning vector quantization – multilayer self organizing feature map.
UNIT IV:
        Feed-Forward back propagation networks: Training of multilayer feed –forward – training aspects and variations of back propagation method – Back propagation of stochastic approximation.

UNIT V:
        Hybrid learning Neural Network: counter propagation network – radial basis functional networks. Probabilistic models, fuzzy ART map and recurrent networks – Probabilistic neural

networks.

TEXT BOOKS: Neural Networks Algorithms and Applications, M.AnandaRao, J .Srinivas, Narosa Publishing House, 2010.

REFERENCES:

1. Neural networks, James A.Freeman, David N.Skepura.
2. Neural Networks Fundamentals with Graphs, Algorithms and Applications, N.K.Bose, P.Liang

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction: Brain as a neural network – Basic properties of neurons	5	PPT
	Artificial Neural Networks. Learning: Learning and training –	7	Lecture
	Learning rules – Stability and plasticity.	3	Lecture
UNIT 11			
	Hopfield, Perceptron and Related models: Hop field model	6	Lecture
	basic model of hop-field network – cellular neural networks – perceptron	6	Lecture
	Other associative models – Bidirectional Associative memory	3	PPT
UNIT III			
	Self Organization Map: Kohenen map –	4	Lecture
	adaptive of learning vector quantization –	5	Lecture
	multilayerself organizing feature map.	6	Lecture

UNIT IV			
	Feed-Forward back propagation networks: Training of multilayer feed	6	PPT
	–forward – training aspects and variations of back propagation method –	3	Lecture
	Back propagation of stochastic approximation.	6	Lecture
UNIT V			
	Hybrid learning Neural Network: counter propagation network —	6	Lecture
	radial basis functional networks. Probabilistic models, fuzzy ART map and recurrent networks	6	Lecture
	Probabilistic neural networks.	3	PPT

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	3	4	3.3
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	1	2	3
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	5	5	2	2	5	3.4
Mean Overall Score											3.26

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value	Mean Overall Score of COs = Total of Mean Score
Total No. of Pos & PSOs	Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Programme : BCA   **Part III: Elective 1**
Semester   : V   **Hours   : 5 P/W   75Hrs P/S**
Sub. Code   : EU51   **Credits :5**

TITLE OF THE PAPER: DIGITAL IMAGE PROCESSING

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:

- To learn the image formation model and various representations of an image.

- To inculcate the image and feature extraction processing techniques.

- To learn the image segmentation and various analysis methodologies.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Understand the image conversion approaches.	1	15
UNIT 2 CO2: Build knowledge about pixels and signal passing methodologies.	2	15
UNIT 3 CO3: Learn to develop color image processing approaches using Image	3	15
UNIT 4 CO4: Understands various processing involved in analyzing digital images.	4	15
UNIT 5 CO5: Capable of segmating image based on its boundaries.	5	15

SYLLABUS
UNIT I:

Introduction: Fundamental steps in Digital Image Processing – Image sensing and acquisition - Simple image formation - Image Sampling and Quantization – Basic concepts in sampling and quantization – Representing Digital Image.

UNIT II:

Some basic relationships between pixels - Histogram processing – Histogram equalization. Filtering in the frequency domain : Image Smoothing using frequency domain – Ideal Low pass Filter – Butter worth low pass filter – Guassian low pass filter.

UNIT III:

Image Sharpening using frequency domain filters – Ideal high pass filter – butter worth high pass filter – Gaussian high pass filter. Color fundamentals - Color models - Full color image processing

UNIT IV:

Erosion and Dilation - Opening and Closing - Hit or Miss Transformation - Basic Morphological algorithm –Boundary extraction – Hole filling.

UNIT V:

Fundamentals - Point, Line and Edge detection - Region based Segmentation - Segmentation using Morphological Watersheds.

TEXT BOOKS:

Digital Image Processing, Rafael C.Gonzalez, Richard E.Woods, Prentice Hall 3rd Edition, 2008

REFERENCES:

Digital Image Processing Using MATLAB, Rafael C.Gonzalez, Richard E.Woods, Steven L.Eddins, Prentice Hall, 2004.

1. Digital Image Processing, Bernd Jahne, Springer, 5th revised edition.

2. Digital image processing, Jayaraman S, Veerakumar T, Esakkirajan S, McGrawHill, 2009.

3. Digital Image Processing, PoonamYadav, AbhishekYadav, University Science Press, 2010.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction: Fundamental steps in Digital Image Processing	6	PPT
	Image sensing and acquisition - Simple image formation - Image Sampling and Quantization	6	Lecture

	Basic concepts in sampling and quantization – Representing Digital Image.	3	Lecture
UNIT 11			
	Some basic relationships between pixels -	7	Videos
	Histogram processing – Histogram equalization. Filtering in the frequency domain :	3	Lecture
	Image Smoothing using frequency domain – Ideal Low pass Filter – Butter worth low pass filter – Guassian low pass filter.	5	PPT
UNIT III			
	Image Sharpening using frequency domain filters – Ideal high pass filter –	6	Lecture
	butter worth high pass filter – Gaussian high pass filter.	6	Lecture
	Color fundamentals - Color models - Full color image processing.	3	Lecture
UNIT IV			
	Erosion and Dilation - Opening and Closing - Hit or Miss Transformation -	6	PPT
	Basic Morphological algorithm –	6	Lecture
	Boundary extraction – Hole	3	Lecture

	filling.		
UNIT V			
	Fundamentals - Point, Line and Edge detection	6	PPT
	Region based Segmentation -.	5	Video
	Segmentation using Morphological Watersheds	4	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	4	5	3	3	5	3.6
CO2	2	3	4	2	2	4	5	2	5	3	3.2
CO3	5	4	2	3	4	4	5	2	1	3	3.3
CO4	4	4	5	5	3	2	5	2	1	3	3.4
CO5	4	3	5	2	1	4	5	2	2	2	3
Mean Overall Score											3.3

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score ofCOs =   Total ofValue

Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

rogramme : BCA **Part III: Elective-2**
Semester : V **Hours : 6 P/W 90Hrs P/S**
Sub. Code : EUP2 **Credits :5**

TITLE OF THE PAPER: .NET PROGRAMMING LAB

Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	6	5	-	1	-

SYLLABUS

1) Illustrating various loops
2) Programs to manipulate objects
3) Creation and using name spaces
4) Illustrating function and subroutine concepts
5) Handling global.asax file in web page like showing numbers of visitors of the web page
6) Illustrating web controls of .NET
7) Handling Calendar – Highlighting a specific date, view setting in calendar, setting a schedule on a specific date, restricting calendar.
8) Validating web page using validator controls
9) Implementing Disconnected data model of .ADO.NET
10) Implementing connected data model of ADO.NET
11) Illustrating Data Grid, Data List and Repeater Control
12) Illustration of Regular Expression
13) Performing Server side Validation
14) Handling Literals and meta characters

Programme : BCA   **Part III: Elective-2**
Semester   : V   **Hours   : 6 P/W   90Hrs P/S**
Sub. Code   : EUP2   **Credits :5**

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TITLE OF THE PAPER: ARTIFICIAL NEURAL NETWORKUSING MATLAB

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Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	6	5	-	1	-

SYLLABUS

1) Implementation of Perceptron
2) Implementation of Hop field network
3) Implementation of Associative Neural Network model
4) Implementation of Self Organizing Memory(SOM) Neural Network
5) Implementation of multi-layer SOM.
6) Implementation of simple Feed forward Neural Network
7) Implementation of Feed Forward with Back Propagation Training
8) Implementation of Counter Propagation Neural Network
9) Implementation of Radial Basis Functional Networks
10) Implementation of recurrent Neural Network

Programme : BCA   **Part III: Core/Allied/Elective-2**
Semester   : V   **Hours   : 6 P/W   90Hrs P/S**
Sub. Code   : EUP2   **Credits :5**

TITLE OF THE PAPER: DIGITAL IMAGE PROCESSING USING MATLAB

Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	6	5	-	1	-

SYLLABUS

1) Generating Histogram of given Image
2) Performing Histogram Equalization
3) Smoothing an image with
   I)   Ideal Low pass filter
   II)   Butter Worth Low pass Filter
   III)   Gaussian Low Pass Filter
4) Image Sharpening with
   I)   Ideal High pass filter
   II)   Butter Worth High pass Filter
   III)   Gaussian High Pass Filter

5) Color image processing like, various color representation of the given image RGB, HSI, CMYK and Gray scale.
6) Performing Erosion
7) Performing Dilation
8) Working with morphological algorithm
9) Extracting the Boundary of the given image
10) Detecting points and lines in the given image
11) Implementation of Region based segmentation
12) Segmentation using Morphological Watershed.

Programme : BCA   **Part III: SBE 3**
Semester   : V   **Hours   : 2P/W   30Hrs P/S**
Sub. Code   :SU53   **Credits :2**

TITLE OF THE PAPER: DATABASE MANAGEMENT SYSTEMS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	2	1	-	--	1

PREAMBLE:
- To understand the concept of creating accessing and storing of database.
- To study about relational database design, Constraints, DDL, DML, SQL and triggers.
- To impart knowledge on Normalization.

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: .Familiar with the file database management systems and its applications.	1	6
UNIT 2 CO2: Understand the various models like E-R model.	2	6
UNIT 3 CO3: Master the basics of SQL and construct queries using SQL.	3	6
UNIT 4 CO4: Design a relational database schema using SQL for a given problem-domain	4	6
UNIT 5 CO5:Understand the concept of concurrency control of database processing	5	6

SYLLABUS
UNIT I:
Overview of database systems: Managing Data – A Historical Perspective – File Systems Versus a DBMS – Advantages of a DBMS – Describing and Storing Data in a DBMS – Queries in a DBMS – Transaction Management – Structure of a DBMS – People Who Work with Databases.
UNIT II:
Introduction to database design: Database Design and ER Diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets – Additional Features of ER Model – Conceptual Design with the ER Model.
UNIT III:
The relational model: Introduction to the Relational Model – Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data – Logical Database Design: ER to

Relational – Introduction to Views – Destroying / Altering Tables and Views

UNIT IV:

Relational algebra and calculus: Preliminaries – Relational Algebra: Selection and Projection – Set Operations –Renaming – Joins - Division Relational Calculus: Tuple Relational Calculus – Domain Relational Calculus. SQL:QUERIES, CONSTRAINTS, TRIGGERS: The Form of a Basic SQL Query - UNION, INTERSECT, and EXCEPT – Nested Queries – Aggregate Operators – Null Values – Complex Integrity Constraints in SQL – Triggers and Active Databases – Designing Active Databases

UNIT V:

Schema refinement and normal forms: Introduction to Schema Refinement – Functional Dependencies – Reasoning about FD's – Normal Forms – Properties of Decompositions – Normalization – Schema Refinement in Database Design

TEXT BOOKS:

Database Management Systems – Raghu Ramakrishnan& Johannes Gehrke, McGraw Hill International Edition – Third Edition – 2003

REFERENCES:

1. Database Management Systems - Alexis leon&mathews Leon, "Leon Vikas Publishing, Chennai, 2002.
2. Modern Database Management - Frad R. McFadden, Jeffrey A.Hoffer& Mary. B. Prescott, 5th Edition, Pearson Education Asia, 2001.
3. Database System Concepts – Abraham Silberschatz, Henry F.Korth, S.Sudarshan, McGraw Hill, 2006

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Overview of database systems: Managing Data – A Historical Perspective – File Systems Versus a DBMS —	2	Lecture
	Advantages of a DBMS – Describing and Storing Data in a DBMS – Queries in a DBMS – Transaction Management	2	Lecture
	Structure of a DBMS – People Who Work with Databases.	2	ICT
UNIT 11			

	Introduction to database design: Database Design and.	2	PPT
	ER Diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets –	2	PPT
	. Additional Features of ER Model – Conceptual Design with the ER Model	2	Lecture
UNIT III			
	The relational model: Introduction to the Relational Model – Integrity Constraints over Relations –	2	Videos
	Enforcing Integrity Constraints – Querying Relational Data – Logical	2	PPT
	Database Design: ER to Relational – Introduction to Views – Destroying / Altering Tables and Views	2	Lecture
UNIT IV			
	Relational algebra and calculus: Preliminaries – Relational Algebra: Selection and Projection – Set Operations – Renaming – Joins - Division Relational Calculus: Tuple T –	2	Lecture
	Relational Calculus – Domain Relational Calculus. SQL:QUERIES, CONSTRAINTS, TRIGGERS: The Form of a Basic SQL Query - UNION, INTERSECT, and EXCEP	2	Lecture

	. Nested Queries – Aggregate Operators – Null Values – Complex Integrity Constraints in SQL – Triggers and Active Databases – Designing Active Databases	2	Lecture
UNIT V			
	. Schema refinement and normal forms: Introduction to Schema Refinement –	2	Lecture
	. Functional Dependencies – Reasoning about FD's – Normal Forms –	2	Lecture
	Properties of Decompositions – Normalization – Schema Refinement in Database Design	2	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	4	5	3	3	5	3.6
CO2	4	3	4	2	2	4	5	2	5	3	3.4
CO3	5	4	2	3	4	4	5	2	1	3	3.3
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	4	5	2	2	2	3
Mean Overall Score											3.36

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score ofCOs =   Total ofValue

                    Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

                    Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications.

Programme : BCA   **Part III: Core -13**
Semester : V   **Hours : 6 P/W 90Hrs P/S**
Sub. Code :PU5   **Credits :5**

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TITLE OF THE PAPER: PHP LAB

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Pedagogy	Hours	practical	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	6	5	-	1	-

SYLLABUS

1. Working with Branching statements
2. Working with Looping Statements
3. Working with 1 Dimensional, 2 Dimensional Arrays.
4. Working with Strings and String handling functions
5. Working with Date and Time functions
6. Working with Regular Expressions
7. Working with DDL commands of MYSQL
8. Working with DML commands of MYSQL
9. Working with SQL Commands of MYSQL
10. Working with PEAR database
11. Client side Validation
12. Server side validation
13. Reporting errors

Programme : BCA   **Part III: SBE 5**
Semester   : V   **Hours   : 2P/W   30Hrs P/S**
Sub. Code   :SUP5   **Credits :2**

TITLE OF THE PAPER: ORCLE LAB

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	2	1	-	1	-

SYLLABUS

1. Working with DDL Commands

2. Working with DML Commands

3. Working with date and time handling functions

4. Working with Constraints – NotNull, Primary Key, Check, Unique, Foreign Key

5. Working with simple SQL commands

6. Working with GROUP..BY , HAVING queries

7. Working with Aggregate Queries – COUNT, MIN, MAX, SUM and AVG

8. Working with set operations – UNION, INTERSECTION and MINUS

9. Working with OUTER JOINS (left outer, right outer and full outer)

10. Working with nested queries

11. Fibonacci series generation using PL/SQL

12. Factorial calculation using PL/SQL

13. Raising Build in Exceptions

14. Raising User defined exceptions

15 Creating and Calling functions

16. Creating and Calling Procedures

17. Creating triggers

Programme : BCA   **Part III: Non Major Elective-1**
Semester : V   **Hours : 2P/W 30Hrs P/S**
Sub. Code :NMU1   **Credits :2**

TITLE OF THE PAPER: COMPUTER FUNDAMENTALS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	2	1	-	1	-

PREAMBLE:
- To introduce about computer and its various parts
- To study about various input, output and memory devices which are widely used
- To study about variety of computer software and its functionalities

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Gain knowledge on data representation and Binary codes used.	1	6
UNIT 2 CO2: Ability to apply Boolean algebra in circuit design.	2	6
UNIT 3 CO3: Acquaintance of knowledge to design combinational and sequential circuits.	3	6
UNIT 4 CO4: Understanding the hardware used in computer arithmetic.	4	6
UNIT 5 CO5: Familiarity in information storage and retrieval concepts.	5	6

SYLLABUS
UNIT I:
     Introduction to computers: Types of computers-Characteristics of computers-What computer can't do.
UNIT II:
     Classification of digital computer system: Microcomputers-Mini computers-Mainframe computers-Supercomputers-Network computers.
UNIT III:
     Anatomy of digital computer: Function and components of a computer-Central processing unit(CPU)-Memory-How the CPU and memory work.
UNIT IV:
     Auxiliary storage devices: Hard disk-CD-ROM. Input devices: Keyboard-Mouse-Joystick-Scanners-Digital camera-Magnetic ink character recognition (MICR)-Optical character recognition (OCR)-Optical mark recognition -Bar code reader-Speech input devices –Touch screen-Light

pen.Output devices: classification of monitors- Based on color-characteristics of monitor-printer-plotter-Sound cards and Speakers.

UNIT V:

Introduction to computer software: Operating systems-Utilities-compilers and interpreters-Word processors-Spreadsheets-Presentation Graphics-Database management systems (DBMS) –Image Processors. Operating Systems: Functions of an operating system-Classification of operating system.

TEXT BOOKS:

1) Fundamentals of Information Technology, Alexis Leon and Mathews Leon, Vikas Publishers.

REFERENCES:

1) The Internet Book, Douglas E. Comer, Fourth Edition, PHI Learning Pvt. ltd. , New Delhi, 2009.
2) Using the Internet the Easy Way, Young Kai Seng, Minerva Publications, First Edition, 2000.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction to computers: Types of computers-	2	Peer Teaching
	Characteristics of computers-	2	Lecture
	What computer can't do.	2	ICT
UNIT 11			
	Classification of digital computer system: Microcomputers-	2	PPT
	Mini computers-Mainframe computers-	2	PPT
	Supercomputers-Network computers.	2	Lecture
UNIT III			
	Anatomy of digital computer: Function and components of a computer-	2	Videos
	Central processing unit(CPU)-Memory-	2	PPT

	How the CPU and memory work.	2	Lecture
UNIT IV			
	Auxiliary storage devices: Hard disk-CD-ROM. Input devices: Keyboard-Mouse-Joystick-Scanners-Digital camera-Magnetic ink character recognition	2	Lecture
	(MICR)-Optical character recognition (OCR)-Optical mark recognition -Bar code reader-Speech input devices – Touch screen-Light pen.	2	Lecture
	Output devices: classification of monitors- Based on color-characteristics of monitor-printer-plotter-Sound cards and Speakers.	2	Lecture
UNIT V			
	Introduction to computer software: Operating systems-Utilities-compilers and interpreters Operating Systems: Functions of an operating system-Classification of operating systems.	2	Lecture
	-Word processors-Spreadsheets-Presentation Graphics-Database management systems (DBMS) –Image Processors.	2	Lecture
	Operating Systems: Functions of an operating system-Classification of operating systems.	2	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	3	5	3.4
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	1	3	3.1
CO4	4	4	5	5	3	3	5	2	1	3	3.5
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.24

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score ofCOs =   Total ofValue

           Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

            Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

Course Designer: Department of Computer Applications

Programme:BCA   **Part III:Core-14**
Semester   :VI   **Hours : 6 P/W 90HrsP/S**

Sub.Code   :U61   **Credits :4**

TITLE OF THE PAPER: SOFTWARE ENGINEERING

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:
- To introduce the software life cycle and development approaches

- To explore various estimation techniques, requirement analysis, software designing and testingstrategies

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Acquire fundamental knowledge in software engineering.	1	18
UNIT 2 CO2: Estimating and analysing the cost for software.	2	18
UNIT 3 CO3: Effectively demonstrate competence in communication, planning, analysis, design, construction, testing and deployment	3	18
UNIT 4 CO4: Adapt to design notations and techniques	4	18
UNIT 5 CO5: Incorporating .testing , verification and validation techniques into a software	5	18

SYLLABUS
UNIT I:

Introduction to Software Engineering and Planning: Introduction - definition - some size factors - quality and Productivity factors.Planning a Software Project: Introduction - Defining the problem - Developing a solution strategy - Planning the development process - Planning an organizationalstructur

UNIT II:

Software Cost Estimation: Introduction - Software cost factors - software cost estimation techniques - staffing - level estimation .

UNIT III:

SoftwareRequirementDefinition:Introduction   - the software   requirement specification– formal specification techniques - languages and processors for requirements.

UNIT IV:

 Software Design: Introduction - fundamental design concepts - modules and modularization criteria - design notations - design techniques .

UNIT V:

Verification and Validation Techniques:Introduction - quality assurance - walkthroughs and inspection - unit testing and debugging - system testing -Software Maintenance.

TEXT BOOKS:

1) Software engineering concepts, Richard Fairley, Tata McGraw Hillpublications, 1997.

REFERENCES:

1) Software Engineering, Roger S.Pressman, McGraw Hill Publications, 4[th]Edition.

2) Software Engineering, Ian Somerville, Addison Wesley PublishingCo.

E-LEARNING RESOURCES:
1. nptel.ac.in/courses/106101061
2. tutorialspoint.com

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Introduction toSoftware Engineering and Planning: Introduction - definition - some size factors - quality and Productivity factors-	6	Lecture
	.Planning a Software Project: Introduction - Defining the problem - Developing a solution strategy	6	Lecture
	Planning the development process - Planning an organizationalstructure.	6	Lecture
UNIT II			
	Software Cost Estimation:Introduction - Software cost factors-	6	PPT
	software cost estimation techniques	6	Lecture
	staffing - level estimation	6	Lecture
UNIT III			
	Software Requirement Definition:Introduction -	6	PPT
	thesoftware requirement	4	ICT

	specification - formal specificationtechniques - languages and processors for requirements.	8	Lecture
UNIT IV			
	Software Design: Introduction -	6	ICT
	fundamental design concepts - modules and modularization criteria -	6	PPT
	design notations - design techniques .	6	Lecture
UNIT V			
	Verification and Validation Techniques:Introduction - quality assurance -	5	Lecture
	walkthroughs and inspection --.	4	
	unit testing and debugging	4	PPT
	system testing - Software Maintenance	5	PPT

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO5	
CO1	2	4	3	4	3	4	5	3	3	5	3.6
CO2	2	3	4	2	2	4	5	2	5	3	3.2
CO3	5	4	2	3	4	4	5	2	1	3	3.3
CO4	4	4	5	5	3	2	5	2	1	3	3.4
CO5	4	3	5	2	1	4	5	2	2	2	3
Mean Overall Score											3.3

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score ofCOs =   Total ofValue

                Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

                Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

CourseDesigner: Department of ComputerApplications

Programme:BCA   **Part III:Elective-3**
Semester   :VI   **Hours : 6 P/W 90HrsP/S**

Sub.Code   :EU63   **Credits :5**

TITLE OF THE PAPER: ARTIFICIAL INTELLIGENCE

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:

- To make the system to think.

- To study and implement various heuristic searchtechniques

- To reconnoitre the knowledge representations and reasoningtechniques

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Examine the problems and its solutions	1	18
UNIT 2 CO2: Designate the fundamentals of knowledge representation.	2	18
UNIT 3 CO3: Analyse the reasoning and searching methods.	3	18
UNIT 4 CO4: Comprehend and design various game playing approaches	4	18
UNIT 5 CO5: Study and implement learning methods	5	18

SYLLAB
US
UNIT I:

What is Artificial Intelligence: The AI problems – The underlying assumptions – what is an AI   technique? – The Level of the Model – Criteria for Success. Problems, Problem spaces and Search: Defining the problem as a state space search – production systems – problem characteristics – productive system characteristics – issues in a design of a search programs.

UNIT II:

Heuristic search techniques: generate and test – Hill Climbing – Best First Search – Problem   Reduction – Constraint satisfaction – Means Ends Analysis. Knowledge Representation Issues: Representation and mapping – Approaches to Knowledge representation. Using Predicate Logic: Representing simple facts in logic – Representing instance and isa relationships- computable functions   and predicates- Resolution- Natural deduction.

UNIT III:

Representing Knowledge using rules: procedural vs declarative knowledge – Logic programming –   forward vs backward reasoning – matching – control knowledge. Symbolic reasoning under uncertainty: Introduction to no monotonic reasoning – logics for non monotonic reasoning – implementation issues –   augmenting a problem solver- Implementation: Depth first search – Implementation: breadth first   search.

UNIT IV:

Game playing: Overview – the min-max search procedure – adding alpha beta cutoffs – additional   refinements- iterative deepening.

UNIT V:

Learning: What is learning? – Rote Learning – Learning by taking advise – learning in problem solving

– learning from examples: Induction – Explanation – Based Learning – Discovery – Analogy – Formal   Learning theory – Neural net learning and genetic learning.

TEXT BOOKS:

1) Artificial Intelligence, Elaine Rich, Kevin Knight, Tata McGraw Hill Edition, 2nd Edition.

REFERENCES:

1   Foundations of Artificial Intelligents and Experts systems, JanakiRaman, Sarukesi
2   Artificial Intelligence, Patrick Henry Winston

E-LEARNING RESOURCES:

1. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-

artificial   intelligence-fall-2010/tutorials.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	What is Artificial Intelligence: The AI problems – The underlying assumptions – what is an AI technique? — productive system characteristics – issues in a design of a searchprograms.	6	Lecture

	The Level of the Model – Criteria for Success. Problems, Problem spaces and	6	Lecture
	Search: Defining the problem as a state space search –	3	
	production systems – problem characteristics	3	Videos
UNIT 11			
	Heuristic search techniques: generate and test – Hill Climbing – Best First Search – Problem Reduction – Constraintsatisfaction – Means Ends Analysis. Knowledge	6	Lecture

	Representation Issues: Representation and mapping – Approaches to Knowledge representation.	6	ICT
	Using Predicate Logic: Representing simple facts in logic – Representing instance and isa relationships- computable functions and predicates- Resolution- Natural deduction.	6	PPT
UNIT III			

	Representing Knowledge using rules: procedural vs declarativeknowledge	6	Lecture
	Logicprogramming forward vs backward reasoning – matching – control knowledge.–	3	
	Symbolic reasoning under uncertainty: Introduction to no monotonicreasoning logics for non monotonicreasoning implementation issues	5	PPT

	augmenting a problem solver-Implementation: Depth first search – Implementation: breadth firstsearch.	4	PPT
UNIT IV			
	Game playing: Overview – the min- max searchprocedure	6	Lecture
	adding alpha beta cutoffs	6	Lecture
	additional refinements- iterative deepening.	6	PPT
UNIT V			

	Learning: What is learning? – Rote Learning – Learning by taking advise – learning in problemsolving	6	Lecture
	learning from examples: Induction – Explanation – Based Learning – Discovery – Analogy	6	Lecture
	Formal Learning theory – Neural net learning and genetic learning.	6	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	5	4	5	4	5	3	3	5	4
CO2	2	3	4	4	4	4	5	2	5	3	3.6
CO3	5	4	4	3	5	4	5	2	1	3	3.6
CO4	4	4	5	5	4	4	5	2	1	3	3.7
CO5	4	3	5	2	4	4	5	2	2	2	3.3
Mean Overall Score											3.64

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value

Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score

Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

CourseDesigner: Department of ComputerApplications

Programme:BCA   **Part III:Elective-3**

Semester   :VI   **Hours :6P/W   90 HrsP/S**

Sub.Code   :EU63   **Credits :5**

TITLE OF THE PAPER: DATA WAREHOUSING ANDMINING

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	5	2	1	1	1

PREAMBLE:

- To recognize the need of huge, voluminous datastorage

- To learn about storing, accessing data from datawarehouse

- To learn how to mine data from warehouse using different methodologies

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: Know about the data warehouse and its architecture	1	18
UNIT 2 CO2: Understand the data mining definitions, techniques and its challenges	2	18
UNIT 3 CO3: Familiar with how to find and group any data set	3	18
UNIT 4 CO4: Designing and using various classification methods and prediction methods	4	18
UNIT 5 CO5:Apply data mining techniques to all real time applications	5	18

SYLLABUS

UNIT I:

Data Warehousing: Introduction – What is data warehouse? – Definition – Multidimensional datamodel – OLAP operation – Warehouse schema – Data Warehousing Architecture – Warehouse server – Mata data – OLAP engine – Datawarehouse backend process.

UNIT II:

Data mining: introduction – what is data mining – data mining definitions – KDD Vs Data mining - DBMSVs Data mining – Other related areas – DM techniques – Issues and challenges in data mining.

UNIT III:

Association rules: introduction – what is an Associative Rule? – Method to discover

Association Rules – Apriori Algorithm – Dynamic itemset counting algorithm – FP growth algorithm – Border Algorithm. Clustering Techniques: Introduction – clustering paradigms – partitioning algorithms – K medoid algorithms – Hierarchial Clustering – DBSCAN –CURE.

UNIT IV:

Classification Based Concept: Basic Concepts – Decision tree induction - Bayes Classification methods: Bayes Theorem – Naïve Bayesian Classification.

UNIT V:

Other Techniques: Introduction – What is Neural Network? – Learning in NN – Unsupervised Learning – Datamining using NN: A case study – Genetic Algorithm – Rough Sets – Support Vector Machines.

TEXT BOOKS:

1. Data Mining Techniques ,Arun K. Pujari , University Press. (For Unit I, II, III andV)

Data Mining concepts and techniques, Jawei Han, MichelineKamber, Jian Pei, Margan Kaufmann Publishers – imprint of Elsevier, 3rd Edition. – (For Unit IV only)

REFERENCES:

1. Advances in Knowledge Discovery and Data Mining Usama M. Farrad, GeogoryPiatetsky – Shapiro, padhrai Smyth and RamasamyUthurusamy, The M.I.T.press.

2. The Data Warehouse Life Cycle Toolhit, Ralph Kimball, John Wiley & SonsInc.

3. Data warehousing in Action, Sean Kelly, John Wiley & SonsInc.

4. Insights into data Mining, Theory and Practice, K.P. Soman, ShyamDiwakar, V. Ajay PHI Publications Eastern Economy Edition 6th Printing,2012

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Data Warehousing: Introduction – What is data warehouse? – Definition – Multidimensional datamodel – OLAP operation – Warehouse schema–	6	Lecture

	Data Warehousing Architecture – Warehouse server –	6	Videos
	Mata data – OLAP engine – Datawarehouse backend process.	6	Lecture
UNIT 11			
	Data mining: introduction – what is data mining – data mining definitions—	6	Lecture
	KDD Vs Data mining - DBMS Vs Data mining – Other related areas	6	Lecture
	DM techniques – Issues and challenges in data mining.	6	PPT
UNIT III			
	Association rules: introduction – what is an Associative Rule? – Method to discover Association Rules – Apriori Algorithm –	6	Lecture
	Dynamic itemset counting algorithm– FP growthalgorithm – BorderAlgorithm.	6	PPT
	Clustering Techniques: Introduction – clustering paradigms – partitioning algorithms – K medoid algorithms –	6	Lecture

	Hierarchial Clustering – DBSCAN – CURE		
UNIT IV			
	Classification Based Concept: Basic Concepts – Decision tree induction -–	6	Lecture
	Bayes Classification methods: Bayes Theorem	6	Lecture
	Naïve Bayesian Classification.	6	PPT
UNIT V			
	Other Techniques: Introduction – What is Neural Network? – Learning in NN – Unsupervised Learning–	6	Lecture
	Datamining using NN: A case study–	6	PPT
	Genetic Algorithm – Rough Sets – Support Vector Machines.	6	PPT

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	5	4	5	3	3	5	3.8
CO2	2	3	4	2	4	4	5	2	5	3	3.4
CO3	5	4	2	3	5	4	5	2	1	3	3.4
CO4	4	4	5	5	2	2	5	2	1	3	3.3
CO5	4	3	5	2	4	4	5	2	2	2	3.3
Mean Overall Score											3.44

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score ofCOs =   Total ofValue   Mean Overall Score of COs = Total of Mean Score

           Total No. of Pos & PSOs   Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

CourseDesigner: Department Of Computer Applications

Programme:BCA   **Part III:Elective-3**

Semester   :VI   **Hours : 6 P/W 90 HrsP/S**

Sub.Code   :EU63   **Credits :5**

TITLE OF THE PAPER: SYSTEM SOFTWARE

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT	
	5	2	1	1	1	

PREAMBLE:

- To introduce the low level functioning softwares

- To present about translators - assemblers andcompliers

- To learn about the working principle of Loaders andLinkers

COURSE OUTCOME	Unit	Hrs P/S
At the end of the Semester, the Students will be able to		
UNIT 1 CO1: . To know about the translation process with various types of instructions and computers	1	18
UNIT 2 CO2: . To study about the assembler and its functions	2	18
UNIT 3 CO3: Understand and identify the types of loaders and their functions	3	18
UNIT 4 CO4: Analyse about macro processors	4	18
UNIT 5 CO5: Know about the working principle of compiler	5	18

SYLLABUS
UNIT I:

System Software and Machine Architecture-Simplified Instructional Computer (SIC), SIC/XE, CISC machines and RISC machine.

UNIT II:

Basic Assembler functions – Assembler algorithm and data structures – Machine Dependent Assembler features – Machine Independent Assembler features – one pass assemblers – multi pass assemblers

UNITIII:

Basic Loader functions – Design of Absolute Loader – Bootstrap Loader – Machine Dependent Loader features – Machine Independent Loader features – Loader design options – Linkage editors – Dynamic linking.

UNIT IV:

Basic Macro processor functions – Machine independent macro processor features – Macro processor design options.

UNIT V:

Basic Compiler functions – grammars – lexical analysis – Syntactic analysis – code generation – Machine dependent compiler features – machine Independent compiler features.

1. TEXT BOOKS:
1) System Software an Introduction to System Programming - by Leland L. Beck, Addison – Wesley, III Edition 1999.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	System Software and Machine Architecture-	6	Lecture
	Simplified Instructional Computer (SIC), SIC/XE,	6	Lecture
	CISC machines and RISC machine.	6	PPT

UNIT 11			
	Basic Assembler functions – Assembler algorithm and data structures –	6	Lecture
	Machine Dependent Assembler features – Machine Independent	6	Lecture
	. Assembler features– one pass assemblers– multi passassemblers	6	Videos
UNIT III			
	Basic Loader functions – Design of Absolute Loader – Bootstrap Loader –	6	PPT
	Machine Dependent Loader features – Machine Independent	6	Videos
	Loader features – Loader design options – Linkage editors – Dynamic linking	6	PPT
UNIT IV			
	Basic Macro processor functions–	6	Videos
	Machine independent macro processor features –	6	PPT
	. Macro processor designoptions.	6	Lecture
UNIT V			

120

	Basic Compiler functions –grammars – lexical analysis – Machine dependent	6	Lecture
	Syntactic analysis – code generation –	6	Lecture
	compiler features – machine Independent compiler features	6	PPT

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	4	5	3	3	5	3.6
CO2	2	3	4	2	2	4	5	2	5	3	3.2
CO3	5	4	2	3	4	4	5	2	1	3	3.3
CO4	4	4	5	5	3	2	5	2	1	3	3.4
CO5	4	3	5	2	1	4	5	2	2	2	3
Mean Overall Score											3.3

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Mean Score of COs = Total of Value Total No. of Pos & PSOs			Mean Overall Score of COs = Total of Mean Score Total No. of COs		

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

CourseDesigner: Department of ComputerApplications

Programme:BCA   **Part III: SBE -6**

Semester   :VI   **Hours : 4 P/W 60HrsP/S**

Sub.Code   :SU66   **Credits :2**

TITLE OF THE PAPER: COMPUTER GRAPHICS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	2	2	-	-	-

PREAMBLE:

- To know about the basics of computer graphics fundamentals.

- To train the 2D and 3D transformations foranimation.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: Gain proficiency computer graphics and graphics devices	1	12
UNIT 2 CO2: Understand about the primitive drawing and its generation algorithms	2	12
UNIT 3 CO3: Enhance the perspective of modern computer system with modeling, analysis and interpretation of 2D and 3D visual information.	3	12
UNIT 4 CO4: Able to develop clipping and viewing process	4	12
UNIT 5 CO5: Gain the knowledge of 3D and its transformations	5	12

SYLLABUS
UNIT I:

A survey of computer graphics: Computer-Aided Design – Presentation Graphics Computer Art – Entertainment – Education and Training. Overview of Graphic Systems: Video Display Devices – Raster Scan Systems - Random Scan Systems.

UNIT II:

Output Primitives: Points and Lines – Line Drawing Algorithms – Circle Generation Algorithm

UNIT III:

Two-Dimensional Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – OtherTransformations
UNIT IV:

Two dimensional viewing: The viewing pipeline –clipping operations – point clipping – Line clipping - Cohen Sutherland line clipping only – Polygon clipping - Sutherland Hodgmann polygon clipping only – Curve clipping - Text clipping – Exterior clipping.

UNIT V:

Three dimensional geometric and modeling transformations: Translation – rotation – scaling.

TEXT BOOKS:

1) Computer graphics – Donald Hearn, M.Pauline Baker, PHI, 2^{nd}Edition
REFERENCES:

1) Principles of Interactive Computer Graphics , William M. Newman andF.Sproull.

2) Computer Graphics , Steven Harrigton, McGraw Hill InternationalEdition,2^{nd}Ed.

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	A survey of computer graphics: Computer- Aided Design – Presentation Graphics Computer Art – Entertainment – Education and Training.–	4	Lecture
	Overview of Graphic Systems: Video Display Devices	4	PPT
	Raster Scan Systems - Random Scan Systems.	4	Lecture
UNIT 11			
	Output Primitives: Points and Lines —	4	Lecture
	Line Drawing Algorithms	4	Lecture
	Circle Generation Algorithm	4	Lecture
UNIT III			
	Two-Dimensional Geometric Transformations:–	4	PPT

	Basic Transformations – Matrix Representations – Composite Transformations	4	PPT
	Other Transformations	4	PPT
UNIT IV			
	Two dimensional viewing: The viewing pipeline	4	Lecture
	–clipping operations – point clipping – Line clipping - Cohen Sutherland line clipping only – Polygon clipping -	4	Lecture
	Sutherland Hodgmann polygon clipping only – Curve clipping - Text clipping – Exterior clipping.	4	Videos
UNIT V			
	Three dimensional geometric andmodel ing	4	Video
	transformations: Translation –	4	PPT
	rotation – scaling.	4	Lecture

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	3	3	4	5	3	3	5	3.5
CO2	3	3	4	2	2	4	5	2	5	3	3.3
CO3	5	4	2	3	4	4	5	2	1	3	3.3
CO4	4	4	5	5	3	2	5	2	1	3	3.4
CO5	4	3	5	2	4	4	5	2	2	2	3.3
Mean Overall Score											3.36

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs =   Total of Value
                    Total No. of Pos & PSOs

Mean Overall Score of COs = Total of Mean Score
                            Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

CourseDesigner: Department of ComputerApplications

Programme:BCA   **Part III: Non majorElective-2**
Semester   :VI   **Hours : 2 P/W 30HrsP/S**

Sub.Code   :NMU2   **Credits :2**

TITLE OF THE PAPER: INTERNET AND ITS APPLICATIONS

Pedagogy	Hours	Lecture	Peer Teaching	GD/VIDOES/TUTORIAL	ICT
	2	1	-	1	-

PREAMBLE:

- To learn the basic concepts of internet and its applications.

- To familiarize on internet protocols, E-mail services, intranet andextranet.

COURSE OUTCOME At the end of the Semester, the Students will be able to	Unit	Hrs P/S
UNIT 1 CO1: learning the basic concepts of computer network and its topologies to accesss	1	6
UNIT 2 CO2: introducing communication media and its principles	2	6
UNIT 3 CO3: Able to understand the internet accessing methodologies	3	6
UNIT 4 CO4: Able to realize the revolution of Internet in Mobile Devices, Clouds using mail services	4	6
UNIT 5 CO5: · Understand the value added networks with its working principle and applications	5	6

**SYLLAB
US UNIT
I:**

Computer Networks: Introduction-overview of network – Communication processors – Modem – Message Switchers - Communication media – Types of networks – Network Topologies – Network protocols – network architecture

UNIT II:

Communication systems: Microwave systems – Communication satellites – Cross link – Component of a satellite - Radar – Fiber optics.

UNIT III:

Internet and World Wide Web: Whats special about internet – Internet Access – Internet Protocols – Internet Addressing – The World Wide Web (WWW) – Web Pages and HTML – Searching the Web.

UNIT IV:

Electronic Mail: Why use E-Mail? – How private is E-Mail? – How E-Mail Works? – E-Mail Names and Addresses – Mailing Basis – Spamming- Mailing Lists – News Groups.

UNIT V:

Intranets: Introduction – Characteristics of Intranet – Advantages of Intranet- Business Benefits of Intranet – Drawbacks of Intranet – Extranet . Introduction to Multimedia: Multimedia in entertainment – multimedia in education and training – multimedia on the web – multimedia in office work – multimedia servers and databases.

TEXT BOOKS:

1. Fundamentals of Information Technology, Alexis Leon and Mathews Leon, Vikas publishers.

REFERENCES:

1. The Internet Complete Reference, Harley Hahn,2nd Ed.
2. Internet in a Nut Shell, Alexis Leon, Mathew Leon, Leon Press, 1st Edition

E-LEARNING RESOURCES:

1.www.pubnub.com/blog/2015-05-27-internet-of-things-101-getting-started-w-raspberry-pi/

2.www.theinternetofthings.eu/what-is-the-internet-of-things

3.www.ibm.com/blogs/bluemix/2015/04/tutorial-using-a-raspberry-pi-python-iot-twilio-bluemix/

UNITS	TOPIC	LECTURE HOURS	MODE OF TEACHING
UNIT 1			
	Computer Networks: Introduction- overview of network – Communication–	2	Lecture

	processors – Modem – Message Switchers - Communication media – Types of networks	2	Lecture
	Network Topologies – Network protocols – network architecture.	2	PPT
UNIT 11			
	Communication systems: Microwave systems – Communication satellites –	2	Lecture
	Cross link – Component of a satellite	2	Lecture
	- Radar – Fiber optics.	2	Videos
UNIT III			
	Internet and World Wide Web: Whats special about internet	2	PPT
	Internet Access – Internet Protocols – Internet Addressing	2	Videos
	The World Wide Web (WWW) – Web Pages and HTML – Searching the Web.	2	PPT
UNIT IV			
	Electronic Mail: Why use E-Mail? – How private is E-Mail? —	2	Videos

	How E-Mail Works? – E-Mail Namesand Addresses – Mailing Basis	2	PPT
	Spamming- Mailing Lists – NewsGroups.	2	Lecture
UNIT V			
	Intranets:Introduction – Characteristics of Intranet – Advantages of Intranet- Business Benefits of Intranet – Drawbacks ofIntranet	2	Lecture
	Extranet . Introduction to Multimedia: Multimedia in entertainment – multimedia in education andtraining	2	Lecture
	multimedia on the web – multimedia in office work – multimedia servers anddatabases.	2	PPT

Course Outcomes (Cos)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					Mean scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	2	4	3	4	3	2	5	3	3	5	3.4
CO2	2	3	4	2	2	3	5	2	5	3	3.1
CO3	5	4	2	3	4	2	5	2	1	3	3.1
CO4	4	4	5	5	3	4	5	2	1	3	3.6
CO5	4	3	5	2	1	5	5	2	2	2	3.1
Mean Overall Score											3.26

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Mean Score of COs = Total of Value Total No. of Pos & PSOs	Mean Overall Score of COs = Total of Mean Score Total No. of COs

BLOOM'S TAXANOMY	INTERNAL	EXTERNAL
KNOWLEDGE	50%	50%
UNDERSTANDING	30%	30%
APPLY	20%	20%

CourseDesigner: Department of ComputerApplications