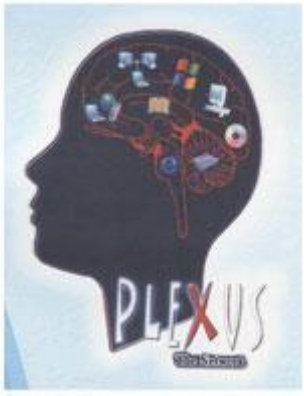
NALLAMUTHU GOUNDER MAHALINGAM COLLEGE (AUTONOMOUS)

U.G.DEPARTMENT OF COMPUTER APPLICATIONS

(B.C.A)



SCHEME OF EXAMINATIONS

(With effect from 2020-2023 Batch and onwards)

NALLAMUTHU GOUNDER MAHALINGAM COLLEGE

(AUTONOMOUS)

U.G DEPARTMENT OF COMPUTER APPLICATIONS

UNDER CBCS PATTERN GUIDED BY UNIVERSITY AND TANSCHE
(FOR THOSE WHO ADMITTED FROM THE ACADEMIC YEAR 2020-2023 BATCH AND ONWARDS)

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER I								
I	20 UTL 101	TAMIL - I	6	3	30	70	100	3
	20 UHN 101	HINDI - I						
II	20 UEN 101	ENGLISH - I	6	3	30	70	100	3
III	20 UBC 101	CORE I: PROGRAMMING IN C	4	3	30	70	100	4
	20 UBC 102	CORE II:DIGITAL COMPUTER FUNDAMENTALS	4	3	30	70	100	4
	20 UBC 1A1	ALLIED I: MATHEMATICS I - COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS	4	3	30	70	100	4
	20 UBC 103	LAB - I :PROGRAMMING IN C	4	3	20	30	50	2
IV	20 UHR 101	HUMAN RIGHTS	1	2	-	50	50	2
	20 HEC 101	HUMAN EXCELLENCE-PERSONAL VALUES & SKY YOGA PRACTICE-I	1	2	25	25	50	1
V	**Extension Activity - List Attached - Annexure I**		-					
TOTAL			30	-	195	455	650	23
SEMESTER II								
I	20 UTL 202	TAMIL - II	6	3	30	70	100	3
	20 UHN 202	HINDI - II						
II	20 UEN 202	ENGLISH - II	5	3	30	70	100	3
III	20 UBC 204	CORE III: OBJECT ORIENTED PROGRAMMING WITH 'C++'	4	3	30	70	100	4
	20 UBC 205	CORE IV: DATA STRUCTURES	4	3	30	70	100	4
	20 UBC 2A2	ALLIED II: MATHEMATICS II - MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS	4	3	30	70	100	4
	20 UBC 206	LAB - II : PROGRAMMING IN C++	4	3	20	30	50	2
IV	20 EVS 201	ENVIRONMENTAL STUDIES	2	2	-	50	50	2
	20 HEC 202	HUMAN EXCELLENCE - FAMILY VALUES & SKY YOGA PRACTICE - II	1	2	25	25	50	1
V	**Extension Activity - List Attached - Annexure I**		-					
TOTAL			30	-	195	455	650	23
Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER III								
	20 UBC 307	CORE V: RELATIONAL DATABASE MANAGEMENT SYSTEM AND ORACLE	5	3	30	70	100	4

	20 UBC 308	CORE VI: OPERATING SYSTEMS	5	3	30	70	100	4
	20 UBC 309	CORE VII: ORGANIZATIONAL BEHAVIOUR	4	3	30	70	100	3
III	20 UBC 3A3	ALLIED III: ACCOUNTANCY FOR DECISION MAKING	5	3	30	70	100	4
	20 UBC 310	LAB - III : RELATIONAL DATABASE MANAGEMENT SYSTEM AND ORACLE	4	3	20	30	50	2
	20 UBC 311	LAB - IV: OPERATING SYSTEMS	4	3	20	30	50	2
	20 UBC 312	LAB - V: GRAPHICS	1	2	20	30	50	1
IV	20 HEC 303	HUMAN EXCELLENCE - PROFESSIONAL VALUES & SKY YOGA PRACTICE - III	1	2	25	25	50	1
	20 UBC 3N1 20 UBC 3N2	NON- MAJOR ELECTIVE I - WEB DESIGNING LAB NON- MAJOR ELECTIVE I -DESKTOP PUBLISHING LAB	1	2	-	50	50	2
V	Extension Activity - List Attached - Annexure I		-					
TOTAL			30	-	205	445	650	23
SEMESTER IV								
III	20 UBC 413	CORE VIII: WEB TECHNOLOGY	5	3	30	70	100	4
	20 UBC 414	CORE IX: COMPUTER SYSTEM ARCHITECTURE	5	3	30	70	100	4
	20 UBC 415	CORE X: SOFTWARE ENGINEERING	4	3	30	70	100	3
	20 UBC 4A4	ALLIED IV: MATHEMATICS III - COMPUTER BASED OPTIMIZATION TECHNIQUES	5	3	30	70	100	4
	20 UBC 416	LAB - VI: ASP.NET	4	3	20	30	50	2
	20 UBC 417	LAB - VII: PHP PROGRAMMING	4	3	20	30	50	2
	20 UBC 418	LAB - VIII: WEB DESIGNING	1	2	20	30	50	1
IV	20 HEC 404	HUMAN EXCELLENCE - SOCIAL VALUES & SKY YOGA PRACTICE - IV	1	2	25	25	50	1
	20 UBC 4N3 20 UBC 4N4	NON-MAJOR ELECTIVE II - PHOTO EFFECTS LAB NON MAJOR ELECTIVE II - ANIMATION LAB	1	2	-	50	50	2
V	Extension Activity - List Attached - Annexure I		-	-	-	50	50	1
TOTAL			30	-	205	495	700	24

Part	Subject Code	Subject	Ins.Hours Per Week	Exam				Credit
				Hours	CIA	ESE	Total	
SEMESTER V								
III	20 UBC 519	CORE XI: JAVA PROGRAMMING	4	3	30	70	100	3
	20 UBC 520	CORE XII: SOFTWARE TESTING	4	3	30	70	100	3
	20 UBC 5E1 20 UBC 5E2	ELECTIVE I	5	3	30	70	100	5
	20 UBC 5E3 20 UBC 5E4	ELECTIVE II	5	3	30	70	100	5
	20 UBC 521	LAB -IX: JAVA PROGRAMMING	5	3	20	30	50	2
	20 UBC 522	LAB - X: SOFTWARE TESTING	5	3	20	30	50	2

IV	20 HEC 505	HUMAN EXCELLENCE - NATIONAL VALUES & SKY YOGA PRACTICE - V	1	2	25	25	50	1
	20 GKL 501	GENERAL KNOWLEDGE AND GENERAL AWARENESS	SS	2	-	50	50	2
	20 UBC 5S1 20 UBC 5S2 20 UBC 5S3	SKILL BASED MAJOR ELECTIVE I : MOBILE PHONE SERVICES INTERNET OF THINGS DESKTOP PUBLISHING LAB	1	2	-	50	50	2
TOTAL			30	-	185	465	650	25
SEMESTER VI								
III	20 UBC 623	CORE XIII: PYTHON PROGRAMMING	5	3	30	70	100	4
	20 UBC 624	CORE XIV: INFORMATION SECURITY	4	3	30	70	100	3
	20 UBC 625	CORE XV: MOBILE APPLICATION DEVELOPMENT	4	3	30	70	100	3
	20 UBC 6E5 20 UBC 6E6	ELECTIVE-III	5	3	30	70	100	5
	20 UBC 626	LAB -XI: PYTHON PROGRAMMING	5	3	20	30	50	2
	20 UBC 627	LAB - XII: MOBILE APPLICATION DEVELOPMENT	5	3	20	30	50	2
IV	20 HEC 606	HUMAN EXCELLENCE - GLOBAL VALUES & SKY YOGA PRACTICE - VI	1	2	25	25	50	1
	20 UBC 6S4 20 UBC 6S5 20 UBC 6S6	SKILL BASED MAJOR ELECTIVE II : CORPORATE SYSTEMS MULTIMEDIA AND ANIMATION PERSONALITY DEVELOPMENT SKILLS	1	2	-	50	50	2
TOTAL			30	-	185	415	600	22
TOTAL			180	-	1170	2730	3900	140

ADD-ON COURSE: Mini Project	-		-	20	80	100	2

*Note: List of Part - V subjects attached

LIST OF MAJOR ELECTIVE PAPERS

ELECTIVE -I	20 UBC 5E1 - NETWORKS
	20 UBC 5E2 - GRID COMPUTING
ELECTIVE -II	20 UBC 5E3 - STORAGE MANAGEMENT
	20 UBC 5E4 - CURRENT TRENDS AND TECHNOLOGIES
ELECTIVE - III	20 UBC 6E5 - DATA MINING AND WAREHOUSING
	20 UBC 6E6 - CLOUD COMPUTING

ANNEXURE - I - LIST OF SUBJECTS

S.NO	SUBJECT	SUBJECT CODE
1	NATIONAL CADET CORPS	20 UNC 401
2	NATIONAL SERVICE SCHEME	20 UNS 402
3	SPORTS AND GAMES	20 USG 403
4	ROTARACT CLUB	20 URO 404
5	RED RIBBON CLUB	20 URR 405
6	YOUTH RED CROSS	20 UYR 406
7	CONSUMER AWARENESS CLUB	20 UCA 407
8	ENTREPRENEURSHIP DEVELOPMENT CELL	20 UED 408
9	CENTRE FOR RURAL DEVELOPMENT	20 UCR 409
10	STUDENT GUILD OF SERVICE	20 USS 410
11	GREEN SOCIETY	20 UGS 411
12	EQUAL OPPORTUNITY CELL	20 UEO 412
13	FINE ARTS CLUB	20 UFA 413

NGM College

Vision

Our dream is to make the college an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure, upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

UG DEPARTMENT OF COMPUTER APPLICATIONS

Vision

Moving ahead towards all-inclusive advancement of the nation through the creation of human power to generate wealth in terms of culture, technology, by providing extremely prospective, ingenious, rationalized, vital curriculum and consequently imparting knowledge required to face global life and its challenges.

Mission

Increasing the dimensionality of education through the effective use of information Technology and providing the comprehensive environment and other resources required to observe and explore that result in improvement of individual competence.

Bloom's Taxonomy Based Assessment Pattern

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

1. Theory: 70 Marks

(i) TEST- I & II and ESE:

Knowledge Level	Section	Marks	Description	Total
K1 (1-5) K2 (6-10)	A(Answer all)	10x1=10	MCQ Define	70
K2 (11-15)	B (Either or pattern)	5x4=20	Short Answers	
K3& K4 (16-20)	C(Answer 4 out of 6) 16TH Question is compulsory	4x10=40	Descriptive/ Detailed	

2. Theory: 50 Marks

Knowledge Level	Section	Marks	Description	Total
K1	A(Answer all)	10x1=10	MCQ/Define	50
K2, K3 & K4	B (Answer 5 out of 8)	5 x 8=40	Descriptive/ Detailed	

3. Practical Examinations:

Knowledge Level	Section	Marks	Total
K3	Practicals & Record work	60/30	100
K4		40/20	
K5			

IV

Components of Continuous Assessment

Components		Calculation	CIA Total
Test 1	70	$\frac{70+70+10}{5}$	30
Test 2	70		
Assignment/Seminar	10		

Programme Outcomes

PO1:

To make the grade of the students to meet the requirements of corporate industry, society and business to race worldwide.

PO2:

Analyze and apply latest technologies to solve problems in the areas of computer applications and to synthesize computing systems through quantitative and qualitative techniques in order to achieve better decisions.

Programme Specific Outcomes

PSO1:

To apply new techniques and technologies to bring out innovative and novelistic solution this emerges continuous professional development for the growth of the society.

PSO2:

To prepare successful graduates to their chosen career track.

PSO3:

To offer the students about computing principles and corporate practices in software solutions, outsourcing services in both public and private sectors.

PSO4:

To develop skills to work effectively with a range of audiences and to function on multidisciplinary teams to accomplish a common goal.

PSO5:

To employ in professional career or to get post graduate education in the fields of Information Technology and management education.

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 101	Title	Batch:	2020-2023
Hrs/Week:	4	PROGRAMMING IN C	Semester	I
			Credits	04

Course Objective

To understand the basic concepts of programming language and develop well-structured programs using 'C' language. To develop programming skills in order to meet the day to day IT demands.

Course Outcomes (CO)

K1	CO1	To recollect the structured programming concepts.
K2	CO2	To understand the branching statements and looping statements.
K3	CO3	To apply programming concepts such as Arrays, Functions, Structures, Pointers, etc.
K4	CO4	To analyze the File concepts and usage of storing the data in files.

Units	Content	Hrs
Unit I	Overview of C-Introduction-Importance of C-Basic Structure of C Program- Character Set- Tokens-Keywords and Identifiers-Constants-Variables - Data Types-Declaration of Variables-Assigning Values to Variables-Defining Symbolic Constants-Operations & Expressions-Arithmetic Operators-Relational – Logical- Assignment- Increment & Decrement- Conditional Operator-Bitwise and Special Operator-Arithmetic Expressions-Evaluation of Expressions-Precedence of Arithmetic Operators-Type Conversions in Expressions-Operator Precedence and Associativity- Mathematical Functions.	10
Unit II	Managing I/O operations-Reading a character-Writing a Character-Formatted Input-Formatted Output-Decision Making and Branching- Decision Making with IF Statement-Simple IF Statement-IF…ELSE-Nesting of IF…ELSE Statements-ELSE…IF LADDER-	10

	Switch Statement-?:- GOTO Statement-Decision Making and Looping-WHILE Statement-DO Statement-FOR Statement-JUMP IN LOOPS.	
Unit III	Arrays-One Dimensional Array-Two Dimensional Arrays-Initializing Two Dimensional Arrays-Multi Dimensional Arrays-Handling of Character Strings-Declaring and Initializing String Variables- Reading Strings from terminal-Writing Strings to Screen-Arithmetic Operations on Characters-Putting Strings Together-Comparison of Two strings-String Handling Functions-Table of Strings-User Defined Functions- Need for User Defined Functions-Form of C Functions- Return Values and their Types-Calling a Function-Category of Functions-No Arguments and No Return Types-Argument but No Return Types-Arguments with Return Values-Handling of Non-Integer-Functions- Nesting of Functions-Recursion-Function with Arrays-*Scope and Life Time of Variables in Functions*.	12
Unit IV	Structures and Unions-Structure Definition-Giving Values to members-Structure Initialization- Comparison of Structure Variables-Arrays of Structures-Arrays with Structures - Structures and Functions-Unions-Size of Structures-Bitwise Fields-Pointers-Understanding Pointers-Accessing the Address of Variables-Declaring and Initializing Pointers-Increments and Scale Factor-Pointer and Arrays-Pointer and Character Strings- Pointers and Functions- Pointers and Structures-Points on Pointers.	10
Unit V	File Management in C-Defining and Opening a File-Closing a File-I/O Operation on Files-Error Handling during I/O Operations-Random Access Files-File Inclusion- *Compiler Control Directives*.	10
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. E.Balagurusamy, *Programming in ANSI C,* Tata McGraw-Hill publications, Fourth Edition, 2007(Unit 1 to 5).

Books for Reference
1. Yashavant Kanetkar, *Let Us C*, BPB Publications, *3rd Edition, 1999*
2. Yashavant Kanetkar, *Test Your C Skills*, BPB Publications, First Indian Edition, 1997.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	H	H	H	M	M
CO3	H	H	H	M	H
CO4	H	H	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 102**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**4**	**DIGITAL COMPUTER FUNDAMENTALS**	**Semester**	**I**
			Credits	**04**

Course Objective

To provide a comprehensive introduction to digital logic design leading to the ability to understand number system representations and Boolean algebra, combinational logic and IO devices.

Course Outcomes (CO)

K1	CO1	To recollect the knowledge about binary number system, Boolean algebra and binary codes.
K2	CO2	To get the idea about combinational systems composed of standard combinational modules, such as multiplexers, flip-flops, demultiplexers and decoders.
K3	CO3	To analyze and design sequential systems composed of standard sequential modules, such as counters and registers.
K4	CO4	To review the various Input and Output devices such as printers, keyboards, mouse, etc.

Units	Content	Hrs
Unit I	Flowchart and Number Systems: Logic and Flowcharting - Flowcharting-Flowcharting Symbols-Program Specification Analysis - Program Specification - Introduction- Input-Output - Throughput. Number system – Digital Computers and Digital Systems – Binary Numbers – Number Based Conversions – Octal and Hexadecimal Numbers – Complements – Binary Codes.	10
Unit II	Boolean Algebra: Boolean Algebra and Logic Gates-Basic Definition – Axiomatic Definition of Boolean Algebra – Basic Theorems and Properties of Boolean Algebra – Boolean Functions – Other Logic Operations – Digital Logic Gates – IC Digital Logic Families – Semiconductor Memory – Bipolar MDS – ROM – RAM – PROM –	10

	EPROM.	
Unit III	Combinational Logic: Introduction – Adders – Full Adder – Half Adder- Subtractor – Half Subtractor - Full Subtractor – Multilevel NAND circuits – Multilevel NOR Circuits – Binary Parallel Adder – Decimal Adder – *BCD Adder* – Decoders – Encoder – Multiplexers – De Multiplexers.	12
Unit IV	Introduction – Flip Flops – Triggers of Flip Flops – Flip Flops Excitation Table – Design Procedure – Design Counters – Registers, Counters and Memory Unit. Registers – Shift Registers – Ripple Counters – Synchronous Counters – Timing Sequence.	10
Unit V	Input-Output Devices**:** Punched Tape, Tape Readers – Punched Cards – Card Readers – Alphanumeric Codes – Character Recognition – MICR – OCR –Output Equipment - Printers – CRT Output Devices – Output Offline Operation – Error Detecting and Error Correcting Codes – Keyboards – Terminals – Floppy Disks – Magnetic tape – *Tape Cassettes & Cartridges.*	10
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. M.Morris Mano – *Digital Logic and Computer Design* – Prentice Hall Of India, 1998. (1 to 4). 2. Thomas C.Bartee- *Digital Computer Fundamentals,* Tata McGraw-Hill, Sixth Edition, 1991 3. J. Maynard, *Computer Programming*, International Edition (Unit 5).

Books for Reference
1. Donald P Leach, Albert Paul Malvino, Goutam Saha, *Digital Principles and Applications*, Tata McGraw-Hill, Sixth Edition, 2006

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	L	H
CO2	M	H	H	M	H
CO3	M	H	H	L	H
CO4	H	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20UBC103	Title	Batch:	2020-2023
Hrs/Week:	4	Lab-I: Programming in C	Semester	I
			Credits	02

Course Objective

To understand the programming logic and problem solving methods using 'C' Programming.

Course Outcomes (CO)

K3	CO1	To remember the Programming concepts using branching statements and looping statements.
K4	CO2	To get the idea about Arrays, Functions, Structures, Pointers, etc.
K5	CO3	To verify the files created using C.

1. Write a C program to check to whether the given number is Armstrong number or not.
2. Write a C program to find whether the given number is prime or not.
3. Write a C program to check the greatest among three numbers using the conditional operator.
4. Write a C program to generate the Fibonacci series for the given number.
5. Write a C program to find the addition of matrix.
6. Write a C program to find the matrix multiplication of the given number.
7. Write a c program to display the transpose of a Matrix.
8. Write a C program to find the given string is palindrome or not.
9. Write a C program to count the number of words, characters and lines in a given text.
10. Write a C program using types of functions for the arithmetic operations.
11. Write a C program to calculate the factorial value for the given number using recursion.
12. Write a C program to process a student detail using structures.
13. Write a C program to add the arrays using pointers.
14. Write a C program to create a student file with reg no, name, mark1, mark2.

15. Write a C program to create and process an employee file.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	H	H	H	L	M
CO3	H	H	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 1A1	Title	Batch:	2020-2023
Hrs/Week:	4	Mathematics-I: Computer Oriented Numerical and Statistical Methods	Semester	I
			Credits	04

Course Objective

To develop appropriate Numerical Methods to solve differential equations and to provide and understand on statistical methods. To make inferences about the population based on information we get from sample taken from the population**.**

Course Outcomes (CO)

K1	CO1	To recollect the samples accuracy, locate and use good mathematical software.
K2	CO2	To understand the number representation errors and convergence properties.
K3	CO3	To apply numerical methods as the basis of procedural language such as C, C++and JAVA.
K4	CO4	To analyze the influence of data representation and computer architecture on algorithm choice and development.

Units	Content	Hrs
Unit I	Introduction - Bisection Method – Method of Successive Approximations or the Iteration Method- Method of False Position- Newton Raphson Method –Horner's Method	10
Unit II	System of Linear Algebraic Equations- Gauss Elimination- Inverse of Matrix using Gauss Elimination- Gauss Jordan – Triangularization-Gauss Jacobi and Gauss Seidal Method	11
Unit III	Interpolation and Approximation – Newton, Lagrange's Method- Numerical Differentiation and Integration- Method's Based on Interpolation- Trapezoidal Rule- *Simpson's 1/3 and 3/8th rule*.	10

Unit IV	Correlation Analysis-Meaning-*Types*-Degrees of Correlating-Scatter Diagram-Correlation Graph-Karl Pearson's Coefficient of Correlation- Rank Correlation- Coefficient of Concurrent Deviations-Methods of Least Squares.	11
Unit V	Regression Analysis-Meaning- *Types of Regression* –Regression Equations-Regression Equations from Mean-Regression Coefficients-Properties of Regression Coefficients-Correlation and Regression, a Comparison.	10
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. P.Kandasamy, K.Thilagavathy, K.Gunavathi, Numerical Methods, S.Chand & Company Ltd, First Edition 1999 (Unit 1,2,3).
2. S.P Gupta, *Statistical Methods, Sultana* Chand & Sons, Thirty-Fourth Edition, 2004 (Unit 4,5).

Books for Reference

1. Mark L.Crossley, The Desk Reference of Statistical Quality Methods, American Society for Quality, Quality Press, Second Edition 2008.
2. Rao V.Dukkipati, Numerical Methods, New Age International, First Edition, 2010.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	H	M	L
CO2	M	L	M	M	L

CO3	H	H	H	M	H
CO4	H	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 204	Title	Batch:	2020-2023
Hrs/Week:	4	OBJECT ORIENTED PROGRAMMING WITH C++	Semester	II
			Credits	04

Course Objective

To understand the object oriented concepts and to develop well-structured object oriented programming using C++ language. To train to meet the day – to –day demands of IT industry.

Course Outcomes (CO)

K1	CO1	To recollect the Object Oriented Programming concepts.
K2	CO2	To understand the usage of various significant operators.
K3	CO3	To apply programming concepts such as Functions, Classes and Objects along with overloading concepts.
K4	CO4	To analyze the File concepts and in usage of storing the data in files.

Units	Content	Hrs
Unit I	Procedure Oriented Programming-Object Oriented Programming Paradigm-Basic Concepts of Object -Oriented Programming-Benefits of OOP-Object Oriented Languages-Applications of OOP-Steps in Object Oriented Analysis- Steps in Object Oriented Design.	10
Unit II	Tokens-Keywords-Identifiers and Constants-Data Types-Reference Variables-Operators in C++-Scope Resolution Operator-Member Dereferencing Operator-Memory Management Operators-Manipulators-Type Cast Operators-Expression and their Types-Control Structures.	10

Unit III	Functions: Function Prototype-Call By Reference-Return By Reference-Inline Functions-Default and Constant Arguments-Function Overloading-Friend and Virtual Functions-*Classes and Objects*- Constructors and Destructors.	12
Unit IV	Operator Overloading-Inheritance-Pointers-Virtual Functions and Polymorphism.	10
Unit V	Managing Console Input / Output operations: C++ Streams-C++ Stream Classes-Formatted and Unformatted I/O Operations-Managing Output Manipulations-*Working Files*.	10
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

2. E.Balagurusamy, *Object Oriented Programming with C++*, Tata McGrawHill Publications Ltd, Second Edition, 1999(Unit 1 to 5).

Books for Reference

1. C.Ravichandran, *Programming in C++*, Tata McGraw Hill Publications, Fourteenth Edition, 2001.

2. K.R Venugopal, Rajkumar Buyya, T Ravishankar, *Mastering C++*, Muhammadali Shaduli Publisher,1997

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	H	H	L	M	M
CO3	H	H	H	M	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 205	Title	Batch:	2020-2023
Hrs/Week:	4	DATA STRUCTURES	Semester	II
			Credits	04

Course Objective

To instill knowledge on computer algorithms thereby enable the students to develop efficient program.

Course Outcomes (CO)

K1	CO1	To use linear and non-linear data structures like stacks, queues , linked list etc.
K2	CO2	To handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
K3	CO3	To solve problems like sorting, searching, insertion and deletion of data
K4	CO4	To learn a number of algorithm design techniques and to analyze the efficiency and the correctness of algorithms.

Units	Content	Hrs
Unit I	Introduction- Linear data structures: Arrays-Representation of Array-Operations of Array- Stacks - Queues. Linked Lists-Types of Linked Lists-Linked List Operations- Linked Stacks and Queues.	10
Unit II	Trees - Definitions and Concepts- Binary Trees – Representations-Operations-Traversals: In order-Pre order-Post order- Threaded Binary Trees - Binary Search Trees.	10
Unit III	GRAPHS- Terminology –Representations: Adjacency Matrix - Adjacency Lists - Adjacency Multi lists -Depth First Search-Breadth First Search-Shortest paths Dijkstra algorithm- *Minimum spanning Tree*- Kruskal's Algorithm & Prim's Algorithm.	12

Unit IV	Basic Steps-Greedy method- The traveling salesperson problem- Knapsack problem- Job Scheduling Problem- Backtracking- Divide and conquer algorithms -The 8 Queen s problem- Sum of subsets.	10
Unit V	Sorting Techniques: Insertion sort – Merge sort – Quick sort – Heap sort. *Searching*-Searching Techniques: Linear search –Binary Search.	10
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Books for Study
1. Elliz Horowitz, Sartaj Sahani, *Fundamentals of Data Structures*, Galgotia Publishers, 1984 (Unit 1, 2 &3). 2. Elliz Horowitz, Sartaj Sahani,Sanguthevar Rajasekaran, *Fundamentals of Computer Algorithms*, Galgotia Publishers,2008 (Unit 4 & 5).

Books for references
1. Seymour Lipschutz, *Data Structures*, Mc - Graw- Hill, Indian Adapted Edition, 2006. 2. Jean- Paul Trembly, Paul G.Sorenson, *An Introduction to data structures with application*, Mc - Graw-Hill, Second Edition, 1991.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	M
CO2	H	M	L	M	M
CO3	H	H	M	H	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 206	Title	Batch:	2020-2023
Hrs/Week:	4	LAB –II: PROGRAMMING IN C++	Semester	II
			Credits	02

Course Objective

To understand the object oriented concepts and problem solving methods using 'C++' Programming.

Course Outcomes (CO)

K3	CO1	To remember the Programming concepts using branching statements and looping statements.
K4	CO2	To get the idea about OOPS concepts such as inheritance, overloading, etc
K5	CO3	To verify the files created using C++.

1. Write a C++ Program to calculate simple interest using default arguments.
2. Write a C++ Program to perform arithmetic operations using inline functions.
3. Write a C++ Program to find the greatest of two numbers and three numbers using Friend function.
4. Write a C++ Program to print the Student Details using Single Inheritance.
5. Write a C++ Program to print the Student Details using Multiple Inheritance.
6. Write a C++ Program to print the Student Details using Multilevel Inheritance.
7. Write a C++ Program to print the Student Details using Hybrid Inheritance.
8. Write a C++ Program to calculate the sum of two numbers using Constructors.
9. Write a C++ Program to change the sign value of the inputs by overloaded unary operator.
10. Write a C++ Program to add input values by overloading binary operator.
11. Write a C++ Program to calculate the area using Function Overloading.
12. Write a C++ Program to find the inverse of the given number using formatted I/O operations.
13. Write a C++ Program to perform string operations using unformatted I/O operations.
14. Write a C++ Program to open and close multiple files.
15. Write a C++ Program to arrange the even and odd numbers in separate files using command line arguments.

Assignment, Case Study

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	H	H	H	L	M
CO3	H	H	H	L	H

Mapping

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Dr.M.DURAIRAJU Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 2A2	Title	Batch:	2020-2023
Hrs/Week:	4	MATHEMATICS – II: MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS	Semester	II
			Credits	04

Course Objective

To recollect the samples accuracy, locate and use good mathematical software.
To understand the number representation errors and convergence properties.
To apply mathematical foundations as the basis of procedural language such as C, C++and JAVA.
To analyze the influence of data representation and computer architecture on algorithm choice and development.

Course Outcomes (CO)

K1	CO1	Be able to construct simple mathematical proofs and possess the ability to verify them.
K2	CO2	Acquire ability to describe computer programs in a formal mathematical manner.
K3	CO3	To prove simple mathematical properties of a variety of discrete structures.
K4	CO4	Be able to specify and manipulate basic mathematical objects such as Sets, functions, and relations and will also be able to verify simple mathematical properties.

Units	Content	Hrs
Unit I	**Set Theory:** Introduction - SET - Finite Set-Cardinality - SubSet-Equal Sets - Null Set (or) Empty Set- Singleton Set - Universal Set – Union –Intersection - Disjoint Sets - Difference Set - Complement Set - Power Set - Principle of Inclusion and Exclusion - Ordered Pair - Cartesian Products -Partition of Set - Min Sets - Max Set.	10

Unit II	**Functions:** Introduction - Types of Functions - Classification of functions - Algebraic function - Transcendental function - Composition of functions(Simple Problems Only)-Identity function - Inverse of a function(Simple Problems Only) - Characteristic function of a Set (Properties only) -Hashing functions. **Relations:** Binary Relation - Complementary Relation - Inverse Relation-Union and Intersection of two relations - Symmetric Relation - Anti-Symmetric Relation - Reflexive Relation - Transitive Relation-Equivalence Relation(Simple Problems only).	9
Unit III	**Graph Theory:** Graph: Undirected Graph - Directed Graph - Multi Graph - Pseudo Graph - Simple Graph - General Graph - Degree of Vertex - Finite Graph - Order of a Graph - Size of a Graph - Null Graph - Isolated Graph - Regular Graph - Isomorphic Graphs (Simple Problems Only). **Matrix Representation of Graphs:** Adjacency Matrices - Incidence Matrix - *Sub Graph* - Euler Graph - Hamiltonian Graph (Simple Problems Only).	11
Unit IV	**Matrices:** Introduction - Definition - Rank of a Matrix - Elementary Transformations - Solution of a System of linear equations (Simple Problems Only). Eigen values and Eigen Vectors - Singular and Non Singular Matrix –Inverse (or reciprocal) of a Square Matrix –Adjoint of a Square Matrix (Simple Problems Only).	11
Unit V	**Discrete Probability :**Introduction - Sample space – Event - Exhaustive event - Favorable event - Mutually exclusive events - Equally likely events - Independent events – Probability - Axioms of probability - Extension of general law of addition of probabilities - Conditional property - Multiplication law of Probability - Multiplication law of Probability for independent events - *Extension of multiplication law of probability* - Total Probability - Baye's theorem(Simple Problems only).	11
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Books for Study
1. P.Geetha "Discrete Mathematics", SCITECH PUBLICATIONS (INDIA) PVT. LTD., Chennai 2011 (Unit 1-5). 2. Dr.M.K.Venkataraman, Dr.N.Sridharan, N.Chandrasekaran, "Discrete Mathematics", National Publishing Company, First Edition - 2000.
Books for References
1. 1 Ralph P.Grimaldi, *Discrete and Combinatoral Mathematics - An applied introduction*, Third Edition, Addison Wesley Publishing Company, 1994. 2. Tremblay J. P and Manohar R, *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, 2001. 3. A K Sharma, *Text Book of Matrix*, Discovery Publishing House, 1993.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	H	H
CO2	H	M	H	M	H
CO3	H	H	H	H	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 307	Title	Batch:	2020-2023
Hrs/Week:	5	RELATIONAL DATABASE MANAGEMENT SYSTEM AND ORACLE	Semester	III
			Credits	04

Course Objective

To present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS to improve the programming skill through ORACLE to solve practical problems in variety of disciplines.

Course Outcomes (CO)

K1	CO1	remember the data base system for the decision-support level of organizations
K2	CO2	To understand and carefully apply the system concepts using ORACLE techniques
K3	CO3	implement and evaluate a computer-based system, process, component or program to meet desired needs
K4	CO4	estimate students how to retrieve, display and format data from any data source in numerous reporting styles and publish the output to any destination for different applications.

Units	Content	Hrs
Unit I	Introduction - Database System - Applications - Database System Vs File Systems - View of Data- Data Models - Database Language - Database Users And Administrators – Transactions Management – Database System Structure – Application Architecture. Entity–Relationship Model - Basic Concepts – Constraints Keys - Design Issues – ER Diagram – Weak Entity Sets – *Extended ER Features* - Design of ER Database Scheme -Reduction of ER Scheme to Tables	13
Unit II	Relationship Model - Structure of Relational Database – The Relational Algebra – Extended Relational Algebra Operation - Modification of Database – Views - The Tuple Relational Calculus - *The Domain Relational Calculus*.	13
Unit III	Integrity and Security – Domain Constraints – Referential Integrity –	13

	Assertion – Triggers – *Security and Authentication* – Authorisation in SQL - Encryption and Authentication. Relational Database Design – First Normal Form – Pitfalls in Relational Database Design – Functional Dependencies – Decomposition – Desirable Properties of Decomposition – BCNF (Boyce Code Normal Form) - Third Normal Form – Fourth Normal Form – *More Normal Form*.	
Unit IV	ORACLE: Introduction – CODD's Rule – Tools of ORACLE - Introduction to SQL – *Benefits of SQL* - Data Types – DDL – DML – DCL - TCL - Data Constraints. ORACLE SQL Functions – Single Row Functions: Date, Number, Miscellaneous, Conversions, Character Functions - Group Functions – SQL Operators: Arithmetic, Comparison and Logical Operators – Set Operators – Joins – Sub Queries – Views.	13
Unit V	PL/SQL : Introduction – Advantages of PL/SQL – Architecture of PL/SQL – Introduction to PL/SQL Block - Data Types – Control Structures - *Concepts of Error Handling* – Cursor - Procedure - Functions – Triggers - Types of Triggers. SQL * Forms – Basic Concepts – Components of ORACLE FORM – SQL * - Forms System Variables – Creating a Form - Generating and Running a Form – Reports.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Silberschatz, Korth,Sudarshan, "*Database System Concept*", 5th Edition, McGraw – Hill International Edition (Unit I,II & III) 2. Ivan Bayross – "*ORACLE – 7 The Complete Reference*", BPB Publications. (Unit IV & V)
Books for Reference

1. Bipin C.Desai – "*An Introduction to Database System*" – Asian Student Edition – Galgotia Publications.

2. C.J.Date – "*An Introduction to Database System*" – Seventh Edition, Pearson Education.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	H	H	H	H
CO3	H	H	M	H	M
CO4	H	M	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 308**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**5**	**OPERATING SYSTEMS**	**Semester**	**III**
			Credits	**04**

Course Objective

To study and apply concepts relating to operating systems, such as concurrency and control of asynchronous processes, deadlocks, memory management, processor and disk scheduling, parallel processing, and file system organization.

Course Outcomes (CO)

K1	CO1	To remember the Master functions, structures and history of operating systems.
K2	CO2	To understand the implementation of file systems and directories along with the interfacing of IO devices with the operating system.
K3	CO3	To deploy, Linux has become sufficiently mainstream that deploying it isn't a mystery.
K4	CO4	To analyze the need for security measures for a Linux environment.

Units	Content	Hrs
Unit I	Introduction to OS – Early History – Hardware: Interrupts and Polling, Buffering, Storage Protection, Online – Offline Operation-Cycle Stealing- Processing-Storage Hierarchy- Reduced Instruction Set Computing (RISC). Semaphores – Process Synchronization with Semaphores – Counting Semaphores. Storage Management: Real Storage – Storage Organization – Storage Management Storage Hierarchy –Swapping – Virtual Storage – Basic Concepts.	13

Unit II	PAGING: Basic Concepts – Segmentation. Dead Lock: Examples – Dead Lock Preventions – Dead Lock Avoidance – Bankers Algorithms Only – Dead Lock Detection – Dead Lock Recovery. Processor Management: Job and Processor Scheduling – Introduction – Scheduling Levels – Scheduling Objectives – Preemptive Vs Non preemptive Scheduling – Priorities – FIFO Scheduling – Round Robin Scheduling – Quantum Size Shortest Job First Scheduling – Shortest Remaining Time Scheduling – Highest Response Ratio Next Scheduling.	13
Unit III	Auxiliary Storage Management: Disk Performance Optimization – Why Disk – Scheduling is Necessary – Desirable Characteristics of Disk Scheduling Policies – Seek Optimization – Disk Caching – RAM Disks. FILE Database System: Introduction – The File System – File System Functions – Blocking and Buffering – File Organization – Allocating and Freeing Space – File Description – Access Control Matrix – Access Control by User Classes – *Backup Recovery*.	13
Unit IV	Linux: Introduction – File structure of Linux – Directory hierarchy – Environmental variables –file access permissions –utility commands- files – print – login details. VI-editors - three modes. File splitting – pipes and filters – paginating files – head – tail – grep – process termination – timing process.	13
Unit V	Shell Programming: Creation and execution – command line arguments – logical operations – condition statements – System administration – Booting and shutting down – super user status – Disk management – security – user services – mount – unmount- *installing and managing printers*.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. H. M. Deitel, *Operating Systems*, Addison Wesley Publication, Second Edition. (Unit 1, 2 & 3). 2. Sumitabha Das, "Unix system Concepts and applications" Tata McGraw Hill, 1995(Unit 4 & 5).

Books for Reference
1. Stewart E. Madnick, John J.Donovan, *Operating Systems*,Tata McGraw Hill, Sixth Edition, 2008. 2. Williams Stallings, *Operating Systems- Internals and Design Principles*, Prentice hall of India, Fifth Edition, 2005. 3. Mark.G.Gobell "Red Hat Linux" – Reference Manual, Pearson Edition, First Edition, 2003.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	M	L
CO2	L	M	M	L	L
CO3	M	L	M	H	L
CO4	H	M	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 309	Title	Batch:	2020-2023
Hrs/Week:	4	ORGANIZATIONAL BEHAVIOUR	Semester	III
			Credits	03

Course Objective

To develop the knowledge in personality, perception, attitudes and motivation and to learn about stress management, communication, leadership, organization structure and organization culture.

Course Outcomes (CO)

K1	CO1	To recollect the Individual Behaviour and its effects.
K2	CO2	To understand the Personality, Perception, Attitudes and Values.
K3	CO3	To apply Learning and Motivation concepts in an Organization.
K4	CO4	To analyze the Organizational Culture and Organizational Structure.

Units	Content	Hrs
Unit I	Introduction: Elements of OB – Nature and Scope of OB - Contributing Disciplines to OB - Foundations of Individual Behaviour: Introduction – The Individual and Individual Differences – Human Behaviour and its Causation – Personality: Concepts – Determinants – Types.	10
Unit II	Perception: Perceptual Process – Factors affecting perception – Improving Perception – Impression management - Attitudes: Concept of Attitudes – Formation of Attitudes – Types of Attitudes - Values: Concept of Value – Types of Values – Formation of Values – Values and Behaviour - Job Satisfaction.	10
Unit III	Learning: Meaning and Definition – Determinants of Learning - Learning Principles – Reinforcement – Punishment – Learning and Behaviour - Motivation: Concepts – Meaning of Motivation – Nature of Motivation – Motivation Cycle or Process – Need for Motivation – Theories of Motivation – *Group Behaviour.*	12
Unit IV	Organizational Conflicts: Definition of Conflict – Sources of Conflict – Types of	10

	Conflicts – Aspects of Conflicts – Functional Conflict – Dysfunctional Conflict – Conflict Process – Conflict Management - Job Frustration - Stress Management.	
Unit V	Communication: Nature and Need for Communication – Communication Process –Communication Channel – Communication Networks –Communication Barriers – Effective Communication - Leadership – Organizational Culture: Types – Functions – *Team Building*.	10
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. S.S Khanka, *"**Organizational Behaviour**",* S.Chand & Company Ltd, 2002 (Unit 1 to 5).
Books for Reference
1. John W Newstorm and Keith Davis – *"Organizational Behaviour"* – TMH, 2001. 2. Hugh J Arnold and Daniel C Fieldman – *"Organizational Behaviour"* – MC Graw Hill, 1996.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	L	H
CO2	H	H	L	M	M
CO3	H	H	H	M	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 310**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**4**	**LAB –III: RELATIONAL DATABASE MANAGEMENT SYSTEM AND ORACLE**	**Semester**	**III**
			Credits	**02**

Course Objective

To introduce students, the basic applications, concepts and techniques of Mobile Application development and make the student to design and develop android application.

Course Outcomes (CO)

K1	CO1	remember structured query language (SQL) queries using DDL,DML,DCL,TCL commands.
K2	CO2	To understand the basic concept how storage techniques are used to store the data and maintain data access performance in application development
K3	CO3	apply techniques pertaining to Database design practices
K4	CO4	Evaluate options to make informed decisions that meet data storage, processing, and retrieval needs.

1. Write Oracle Queries in Data Definition Language.
2. Write Oracle Queries in Data Manipulation Language.
3. Write Oracle Queries in Transaction Control Language.
4. Write Oracle Queries in Data Control Language.
5. Write Oracle Queries using Data Constraints.
6. Manipulate Single Row Function.
7. Manipulate Function – Group function.
8. Generate Operators in SQL plus.
9. Manipulate SET Operators.
10. Generate View.
11. Generate Join functions.

12. Write PL/SQL to find whether the given number is Even or Odd.
13. Write PL/SQL to find whether the given number is Armstrong or Not.
14. Write PL/SQL to Display ten numbers.
15. Write PL/SQL to reverse of given number.
16. Write PL/SQL to find whether the given number is Prime number or not.
17. Write PL/SQL queries to create Procedure.
18. Write PL/SQL queries to create Function.
19. Write PL/SQL queries to create Cursor.
20. Write PL/SQL queries to create Trigger.
21. Write PL/SQL to Access Restriction Trigger.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	H	H
CO2	H	H	L	H	M
CO3	H	H	H	M	M
CO4	H	M	H	H	L

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 311	Title	Batch:	2020-2023
Hrs/Week:	4	LAB –IV: Operating Systems	Semester	III
			Credits	02

Course Objective

To familiarize students with the Linux environment, fundamentals of shell scripting/programming with basic linux administration.

Course Outcomes (CO)

K3	CO1	To remember the various commands on a standard Operating system.
K4	CO2	To get the idea about be able to do shell programming on UNIX OS.
K5	CO3	To verify the files to understand and handle UNIX system calls.

1. Work with utility commands.
2. Work with directory commands.
3. Work with handling file commands.
4. Work with file access commands.
5. Work with pipes and filters.
6. Work with VI editors.
7. Create a program to find simple interest
8. Create a program to find factorial value
9. Create a program to find Fibonacci series.
10. Create a program to find sum of N numbers.
11. Write a program with case condition.
12. Create a program to find reverse the digit.
13. Create a program to find sum of individual digit.
14. Create a program to swap any two numbers.

15. Create a program for sorting of N numbers.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	M	L
CO2	L	H	M	H	M
CO3	L	M	M	M	L

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 312**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**1**	**LAB –V: GRAPHICS**	**Semester**	**III**
			Credits	**01**

Course Objective

To understand the need of developing graphics application and to learn multimedia animation tools such as Photoshop, Flash and Graphics in C programming.

Course Outcomes (CO)

K3	CO1	remember the Graphics Programming concepts
K4	CO2	To understand the basic concept and Develop design drawings that demonstrate computer graphics and design skills
K5	CO3	create interactive graphics applications using one or more graphics application programming interfaces.

GRPAHICS UNING C

1. Digital Differential Analyzer Algorithm
2. Bresenham's Line Drawing Algorithm
3. Midpoint Circle Generation Algorithm
4. Ellipse Generation Algorithm
5. Creating various types of texts and fonts
6. Creating two dimensional objects
7. Two Dimensional Transformations
8. Scaling
9. Rotation
10. Reflection along x-axis:

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	H	H
CO2	H	H	L	H	M
CO3	H	H	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	20UBC3A3	Title	Batch :	2020-2023
		ACCOUNTANCY FOR DECISION MAKING	Semester	III
Hrs/Week:	5		Credits:	04

Course Objective

To enlighten the students on the basics of Accountancy.

Course Outcomes (CO)

K1	CO1	To recollect the knowledge of accounting theory based on conceptual framework of accounting.
K2	CO2	To enable students to understand the concept of accounting.
K3	CO3	To execute the knowledge going in accounting for decision making.
K4	CO4	To analyze and interpret accounting related transactions in accordance with accounting theory.

Units	Content	Hrs
Unit I	Financial Accounting – Meaning - Definition– Concepts – Conventions – Accounting Cycle – Methods of Book Keeping– Journal – Ledger –*Trial Balance.*	13
Unit II	Subsidiary Books – Purchase Book and Sales Book – Purchase Returns and Sales Returns Book – *Cash Book* - Preparation of Final Accounts with Simple Adjustments.	13
Unit III	Cost Accounting – *Elements of Cost* – Cost Sheet –Stock Valuation – FIFO - LIFO - Simple Average Method .	13
Unit IV	Management Accounting – Meaning - Definition – *Objectives of Management Accounting* - Budgetary Control – Cash Budget – Flexible Budget.	13
Unit V	Ratio Analysis – Meaning - *Significance of Ratio Analysis* -Types – Liquidity Ratio – Profitability Ratio – Solvency Ratio.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Group discussion, Seminars and Assignment

Books for Study
1. Shukla. M.C And Grewal. T.S And Gupta. S.L.(2010), Advanced Accountancy, New Delhi, S.Chand & Co. (Unit 1-5)

Books for Reference
1. Jain. S.P and Narang. K.L. ,Cost Accounting (2012), New Delhi, Kalyan Publishers. 2. Sharma. K, Sasi.K.Gupta. (2012), Management Accounting, New Delhi, Kalyani Publishers.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M
CO2	H	M	M	M	H
CO3	H	H	H	H	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 3N1**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**1**	**NME I: WEB DESIGNING LAB**	**Semester**	**III**
			Credit	**02**

Course Objective

To develop the basic concepts of HTML and to equip with the programming skills in implementing and debugging Web based applications.

Course Outcomes (CO)

K3	CO1	To recollect the logic behind advanced Web page applications.
K4	CO2	To understand the HTML and CSS programming.
K5	CO3	To verify the files created in Web applications.

1. Write HTML code to develop a web page for giving details of your name, age, address. It contains the different background and foreground color, with different attributes of Font tags like italic, bold, underline etc. and give suitable heading style

2. Create a Web Page using HREF tag having the attribute ALINK, VLINK etc.

3. Create a Web Page, when user clicks on the link it should go to the bottom of the page.

4. Write a HTML code to create a Web Page of pink color and display moving message in red color.

5. Create a Web Page, showing an ordered list of name of your five friends and unordered list of any five your hobbies.

6. Create a HTML document containing a nested list showing the content page of any book.

7. Write a HTML program to reload the page which contains an image that should reload automatically for every 5 seconds.

8. Create the following table in HTML with Dummy Data.

Name of the train	Place	Destination	Train No	Time Arrival	Departure	Fare

9.Design a form using all input types.

10. Create a simple form for accepting –Name, Register No, and use Submit Button.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	H	H	H	M
CO3	M	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 3N2**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**1**	**NME I: DESKTOP PUBLISHING LAB**	**Semester**	**III**
			Credits	**02**

Course Objective

To provide a deep knowledge in various image processing effects.

Course Outcomes (CO)

K3	CO1	To remember the basic technical tools.
K4	CO2	To get the idea for handling tools and applying various effects.
K5	CO3	To access various formats in this platform for editing.

1. Design the Wedding Invitation using the associated tools in Photoshop.
2. Apply special art effects for the image using various options from the Filter Gallery.
3. Design the Banner.
4. Implement the Usage of different modes in a Single Image.
5. Design the College Profile.
6. Work with different images to implement Sharpen tool and Smudge Tool
7. Design the Calendar.
8. Edit the image using Blur tool.
9. Design the Visiting Card.
10 Edit the image using Burn and Sponge tool.
11. Edit the image using Clone tool.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	H	H
CO2	M	M	H	H	H
CO3	H	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 413	Title	Batch:	2020-2023
Hrs/Week:	5	WEB TECHNOLOGY	Semester	IV
			Credits	04

Course Objective

To gain knowledge about the methodologies behind ASP.Net and helps the students to develop Dot Net based application using ADO.NET and SQL.

Course Outcomes (CO)

K1	CO1	To collect the basic structure of .net and main features of IDE.
K2	CO2	To understand the .net framework and describe some of the major enhancement to the new version of visual studio.
K3	CO3	To apply a web development platform, this provides software infrastructure and build up robust web applications for PC, as well as mobile devices.
K4	CO4	To analyze the applications using Microsoft windows forms and ADO .Net.

Units	Content	Hrs
Unit I	Overview of .NET – Advantages of .NET over the other languages, overview of .NET binaries, Intermediate Language, metadata, .NET Namespaces, Common Language runtime, common type system, common Language Specification Introducing ASP .NET – ASP.NET namespaces - Creating and deploying ASP .NET applications – Web forms – Basic Web controls – working with events – Rich web controls: AdRotator Control, Calendar Control – Custom web controls – Validation controls	13
Unit II	Web Development and ASP.NET- Web applications and Web servers, HTML form Development, Client side Scripting, GET and POST, ASP.NET	13

	application, Caching in ASP .NET – ASP .NET security – Localizing ASP .NET applications.	
Unit III	Introduction to ADO.NET- ADO Vs ADO.NET - Building Data Table, Data View, Data Set, Data Relations, ADO.NET managed Providers, OleDb Managed Provider – OleDb Data Adapter Type.	13
Unit IV	Server Side Scripting: Difference between Client side and Server side scripting languages. Introduction to PHP – variables - Control statements – Loops – Operator and Expression - Arrays - String handling - PHP forms, Functions in PHP, Regular expression and pattern matching.	13
Unit V	Database programming: PHP with Mysql - Tables to Display Data - Insertion , deletion and updating data – XML - State management in web applications – Cookies - Application and session state – Securing PHP. Case Study: User authentication and management.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Vikram Vaswani, “PHP : a Beginner's Guide”, McGraw Hill Professional, 1st Edition. (Unit 1-5)

Books for Reference
1. Mridula Parihar, et. al., ASP .NET Bible, Wiley Dreamtech India Pvt. Ltd., 2002 2. Mark Birbeck, stev Livingstone, Stephen F. Mohr , Jonathan Pinnock , Steven Livingston, Professional XML, 2nd Edition, Wrox Publications, 2000 3. Alex Homer et. al., Professional ASP .NET 1.1, Wiley Dreamtech India Pvt. Ltd., 2004

4. Eric Ladd, Jim O' Donnel, Using HTML 4, XML and Java, Prentice Hall of India - QUE, 1999

5. Andrew Troelsen, C# and the .NET Platform, APress, 2001

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	H	H	H	M
CO3	M	M	M	M	L
CO4	H	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC414	Title	Batch:	2020-2023
Hrs/Week:	5	COMPUTER SYSTEM ARCHITECTURE	Semester	IV
			Credits	04

Course Objective

To develop knowledge about the architecture of computer and to understand the concepts CPU, ALU design, I/O instruction format and different processors**.** To conceptualize the basics of organizational and architectural issues of digital computer.

Course Outcomes (CO)

K1	CO1	To recollect basic structure of computer and control unit operations.
K2	CO2	To understand the concept of computer arithmetic operations and memory system design.
K3	CO3	To apply the cache mapping techniques and conceptualize instruction level parallelism.
K4	CO4	To analyze the concept of I/O organization and to identify high performance architecture.

Units	Content	Hrs
Unit I	Basic Computer Organization- Instruction Codes-Computer Registers-Computer Instructions-Timing and Control-Instruction Cycle-Memory Reference Instructions-Input-Output Interrupts.	13
Unit II	CPU-General Register Organization-Control Word-Examples of Micro Operations-Stack Organization-Instruction Formats-Addressing Modes-Data Transfer and Manipulation-Program Control-RISC.	13
Unit III	Computer Arithmetic-Addition & Subtraction-Multiplication Algorithm-Division Algorithm-Floating Point Arithmetic Operations-*Register Configurations*-Addition & Subtractions- Decimal Arithmetic -Decimal Arithmetic Operation.	13
Unit IV	I/O Organization- Peripheral devices-I/O Interface- Synchronous and Asynchronous Data Transfer-Modes of Transfer-Priority Interrupt-DMA-IOP.	13

Unit V	Memory Organization-Memory Hierarchy-*Main Memory*-Auxiliary Memory-Associative Memory-Cache Memory –Virtual Memory- Memory Management Hardware.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Morris Mano, Computer System Architecture, Prentice Hall Of India, Third Edition, 1994 (Unit 1 to 5).
Books for references
1. David A. Patterson and John L.Hennessy, Computer Organisation and Design, Harcourt Asia Pvt Ltd, Second Edition, 1999. 2. William Stallings, Computer Organization & Architecture, Designing for Performance, Pearson Education, Sixth Edition.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M
CO2	H	H	H	M	H
CO3	H	H	M	H	H
CO4	M	H	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 415	Title	Batch:	2020-2023
Hrs/Week:	4	SOFTWARE ENGINEERING	Semester	IV
			Credits	03

Course Objective

To prepare graduates who will be successful in the chosen career path. It develops a broad understanding of the discipline of software engineering and encompasses with a detailed knowledge of techniques for the analysis and design of complex software intensive systems and to get success in their chosen profession.

Course Outcomes (CO)

K1	CO1	To recollect the system concepts, software models, techniques and technologies to bring out the innovative and novelistic solutions for the growth of the society.
K2	CO2	To understand the issues affecting the organization planning and control of software based systems development.
K3	CO3	To apply the end user requirements into system and software requirements.
K4	CO4	To analyze fundamental concepts in software testing, various testing issues and its types.

Units	Content	Hrs
Unit I	System Concepts and the Information Systems Environment: System Definition-Characteristics of System-Elements of a System- Types of System- The System Development Life Cycle: Recognition of Need - Feasibility Study – Analysis – Design – Implementation - Post implementation and Maintenance-Consideration for Candidate System.	10
Unit II	Software-Software Characteristics-Software Components-Software Applications-The Process-Software Engineering a Layered Technology-The	10

	Process, Methods, Tools-A Generic View of Software Engineering- The Software Process- Software Process Models-Linear Sequential Models-Prototyping Model-RAD Model-Evolutionary Software Model-The Incremental Model-Spiral Model-Component Assembly Model-Concurrent Model.	
Unit III	Analysis Concepts and Principles-Requirement Analysis-Communication Techniques-Initiating the Process-FAST-QFD-Analysis Principles-Information Domain-Modeling-Partitioning-Essential and Implementation Views- Analysis Modeling-Elements of Analysis Model-Data Modeling-Data Objects, Attributes and Relationship Diagram-Function Modeling-Data Flow Diagram - *Behavioral Modeling.*	10
Unit IV	Design Concepts and Principles-The Design Process-Design Principles-Design Concepts-Abstraction, Refinement, Modularity, Software Architecture, Control Hierarchy, Structured Partitioning, Software Procedure, Information Hiding-Effective Modular Design-Functional Independence-Cohesion-Coupling-Design Documentation.	10
Unit V	An Agile view of Process-Agility-Agility Process-The Politics of Agile Development-Human Factors-Agile Process Models-Extreme Programming-Adaptive Software Development –Dynamic System Development Method-Scrum-Crystal-Feature Driven Development-Agile Modeling. Software Testing Fundamentals – Testing Objectives – Testing Principles – Testability – White-Box Testing – Black-Box Testing – Testing for Specialized Environments and Applications – Testing of Client/Server Architectures – Testing Documentation and Help Facilities – Testing for Real-Time Systems- *Software Evolution.*	12
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Elias M.Awad, *System Analysis and Design*, Galgotia Publications (P) Ltd, Second Edition, 1996 (Unit 1). 2. Roger Pressman, *Software Engineering*, A Practioner's Approach, Fourth Edition, 1997 (Unit 2,3,4 &5). 3. Roger Pressman, *Software Engineering*, A Practioner's Approach, Sixth Edition, 2005 (Unit 5). 4. Sommerville, Software Engineering, Pearson education, Sixth Edition.(Unit 5)

Books for Reference
1. Sommerville, *Software Engineering*, Pearson education, Sixth Edition.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	H	H	H	M
CO3	M	M	M	M	L
CO4	H	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 416	Title	Batch:	2020-2023
Hrs/Week:	4	LAB- VI:ASP.Net	Semester	IV
			Credits	02

Course Objective

To introduce to .Net IDE Component Framework and learn Programming concepts in .Net Framework and create website using ASP.Net Controls.

Course Outcomes (CO)

K3	CO1	Create user interactive web pages using ASP.Net.
K4	CO2	Create simple data binding applications using ADO.Net connectivity.
K5	CO3	Performing Database operations for Windows Form and web applications.

1. Create a windows form with the following controls Textbox, Radio button, Check box, Command Button
2. Write a program for Menu option.
3. Create a program to connect with database and manipulate the records in the database using ADO .NET
4. Create a program to implement the concepts of OOPS for creating class with inheritance.
5. Create a program to perform input validation using procedure.
6. Write a program to open a file and using I/O operations write contents into a file and read the contents from the file.
7. Create a window form using HTML controls.
8. Create a program to perform validation using validation controls.
9. Create a program in ASP .NET to connect with the database using ADODB connectivity and

manipulate the records.

10. Write a program to store the employee details using class and methods in C# .NET
11. Write a program to Handle Exceptions
12. Write a program to create a form with Basic controls in c#. NET.
13. Write a program in ASP to display the session properties.
14. Write a program in ASP that makes use of Ad rotator component.
15. Write a program in ASP that makes use of Browser capabilities component.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 417	Title	Batch:	2020-2023
Hrs/Week:	4	LAB- VII:PHP Programming	Semester	IV
			Credits	02

Course Objective

To measure the student's knowledge about the PHP script languages.

To demonstrate how to store and retrieve data from the database. .

Course Outcomes (CO)

K3	CO1	To know about the practical fundamentals of php script.
K4	CO2	To get the idea about function and array using php.
K5	CO3	To access the database connection

1. Write a PHP script for Arithmetic operation.
2. Write a PHP script which will display the colors.
3. Write a PHP script using nested for loop that creates a chess board.
4. Write a function to sort an array.
5. Write a PHP function that checks if a string is all lowercase.
6. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birthday.
7. Write a PHP script to generate simple random password.
8. Program to Store and Read a image in Database.
9. Program to Insert records to the table in Database and fetch records from the table in Database.
10. Create a Contact Form using PHP and WAMP server connectivity

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	H	H	H	H
CO3	M	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 418**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**1**	**LAB –VIII: WEB DESIGNING**	**Semester**	**IV**
			Credits	**01**

Course Objective

To apply basic knowledge about designing web pages.

Course Outcomes (CO)

K3	CO1	To keep in mind about the HTML tags.
K4	CO2	To get the idea about to design web page.
K5	CO3	To access the scripting languages.

1. Design a home page which will display your information i.e. Bio data.
2. Create Hyperlinks in home page i.e educational details, Hobbies, Achievement, My Ideals etc.
3. Design a timetable and display it in tabular format.
4. Design a Registration form in HTML.
5. Design a webpage for Biodata using CSS.
6. Design webpage using Frames, Framesets.
7. Embedding Javascripts in HTML pages.
8. Design a Biodata page whose content can be changed using JavaScript like events.
9. Design a Signup form with all validations.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 4A4	Title	Batch:	2020-2023
Hrs/Week:	5	MATHEMATICS-III: COMPUTER BASED OPTIMIZATION TECHNIQUES	Semester	IV
			Credits	04

Course Objective

Every industrial organization faces multifaceted problems to identify best possible solution to their problems. OR aims to help the executives to obtain optimal solution with the use of OR techniques and to locate best or optimal solution.

Course Outcomes (CO)

K1	CO1	To recollect the modeling tools and computational tools as well as analytic skills to evaluate the problems.
K2	CO2	To understand how to translate real world problem given in words into a mathematical formulation.
K3	CO3	To apply mathematical optimization techniques, existing optimization tool kits to write computer programs and to implement algorithms and solve problems.
K4	CO4	To analyze the problem situation leading to better control, better co-ordination, better systems and finally better decisions.

Units	Content	Hrs
Unit I	Linear Programming Problem: Graphical Solution Method- General Linear Programming Problem (Definition alone) - Canonical and Standard forms of LPP. Simplex Method: Basic Solution and Degenerate Solutions to Linear Equation- Simplex Method- Big M Method (Only Simple Problems).	13
Unit II	Transportation Problem: North West Corner Method- Least Cost Method- Vogel's Approximation Method- Moving towards optimality UV Method. Assignment Problem: Definition- Assignment Algorithm-Hungarian Assignment Method- Unbalanced AP.	13
Unit III	Inventory Control: Introduction- *Types of Inventory*- Inventory	13

	Decision- Economical Order Quantity (EOQ) - Deterministic Inventory Problems.	
Unit IV	Sequencing Problems: Introduction- Problems with n Jobs and 2 Machines- Problems with n Jobs and k Machines- Problems with 2 Jobs and k Machines (Simple Problems).	13
Unit V	Network Scheduling: Introduction- Network and Basic Components- *Rules of Network Construction*- Time calculation in Networks-CPM-PERT-PERT Calculations- Difference between CPM and Pert Network.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Kanti Swarup, P.K.Gupta, Man Mohan *Operations Research,* Sultan Chand & Sons, Seventh Edition, 1996(Unit 1 to 5).
Books for Reference
1. R. Paneer Selvam, *Operation Research,* Prentice Hall of India Pvt Ltd, Second Edition.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	M	H	H
CO2	H	M	M	H	M
CO3	M	M	H	L	M
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 4N3**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**1**	**NME:II – PHOTO EFFECTS LAB**	**Semester**	**IV**
			Credits	**02**

Course Objective

To create a high-end image manipulation application that is free to use and modify by everyone, ever.

Course Outcomes (CO)

K3	CO1	To keep in mind about the open source software and their opportunity in their career.
K4	CO2	To get the idea about the Graphic Design open software software.
K5	CO3	To verify their creativity skill using GIMP Free open source software.

1. Create a Business Card.
2. Create a Monthly Calendar.
3. Change the Background Transparent and Save it in Transparent Image.
4. Create a Poster with a Fancy Font.
5. Convert Blur Image into Correct Image.
6. Changing Hair Color into Simply Fix Grey Hair.
7. Convert an Image into Blend Images using Layer Masking.
8. Create a 3D Text.
9. Create an Outline using a Brush Strokes.
10. Create a Photo Manipulation.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	H	M	M	H
CO3	M	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 4N4**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**1**	**NME:II - ANIMATION**	**Semester**	**IV**
			Credits	**02**

Course Objective

To provide a depth knowledge in designing text animation and lighting effects.

Course Outcomes (CO)

K3	CO1	To remember graphics primitives and demonstrate geometrical transformations.
K4	CO2	To get the idea with interactive graphics applications using one or more graphics application programming interfaces.
K5	CO3	To identify effectively and creatively solve a wide range of graphic design problems.

1. Setting Motion for a Butterfly.
2. Create a Rain Effect.
3. Create a masking.
4. Create a Basket Ball.
5. Create a Text Animation.
6. Design a Cartoon Background.
7. Create a Water Effect.
8. Create a flash website.
9. Create a Lightening Effect for Text.
10. Create an Image Gallery using Buttons.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 519	Title :	Batch:	2020-2023
Hrs/Week:	4	JAVA PROGRAMMING	Semester	V
			Credits	03

Course Objective

To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. Test Java servlets while developing Java programs which incorporate advanced graphic functions

Course Outcomes (CO)

K1	CO1	To remember the structure and model of the Java Programming Language.
K2	CO2	To understand the usage of Java Programming Language for various programming technologies.
K3	CO3	To implement the Internet Programming, using Java Applets
K4	CO4	To apply event handling on AWT and Swing components.

Units	Content	Hrs
Unit I	Java Evolution - Overview of Java language, Constants, Variables and Data types - Operators and Expressions. Decision Making and Branching - Decision Making and Looping - Classes, Objects and Methods - Arrays, Strings and Vectors.	10
Unit II	Interface: Multiple Inheritance - Packages: Putting Classes Together- Multithreaded Programming - Managing Errors and Exceptions.	10
Unit III	Applets Programming - Graphics Programming - The Graphics Class - *Lines and Rectangles* - Circles and Ellipses - Drawing Arcs - Drawing Polygons.	10
Unit IV	A Tour of Swing**:** Japplet - Icons and Labels - Text Fields – Buttons - The JButton Class - Check Boxes - Radio Button - Combo Boxes - TabbedPane - Scroll Panes - Tree - JMenus.	10
Unit V	Servlet Overview and Architecture**:** Movement to Server Side Java - What is	12

	Java Servlet - *Practical Applications for Java Servlet* - Java Servlet Alternatives - Reasons to use Java Servlets - Java Servlet Architecture. Servlet Basics**:** Life cycle of a Servlet - A Basic Servlet - Dissecting the Basic Servlet - Servlet Chaining.	
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. E.Balagurusamy, Programming With Java, Tata McGraw Hill, Fourth Edition, 2007(Unit 1 to 3). 2. Herbert Schildt, Java: *The Complete Reference*, J2SE, Tata McGraw-Hill, Fifth Edition, 2005 (Unit 4). 3. James Goodwill, *Developing Java Servlet*, Techmedia, First Edition, 1999 (Unit 5).
Books for Reference
1. ISRD Group, *Introduction to Object Oriented Programming through Java*, Tata Mc-GrawHill Publishing Company Limited, 2007. 2. James Keogh, Jim Keogh, *J2EE: The Complete Reference,* McGraw- Hill/Osborne, Seventh Edition, 2002. 3. Bruce W.Perry, Java Servlet and JSP Cookbook, O'Reilly, First Edition, 2004. 4. John R. Hubbard, Schaum's Outline of Programming with Java.

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	H	H	M
CO2	H	H	H	M	H
CO3	H	H	H	M	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 520	Title:	Batch:	2020-2023
Hrs/Week:	4	SOFTWARE TESTING	Semester	V
			Credits	03

Course Objective

To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies and methods. To gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects using Win Runner tool.

Course Outcomes (CO)

K1	CO1	To keep in mind the fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
K2	CO2	To understand how to plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report and how to write software testing documents.
K3	CO3	To execute software testing automation problems and solutions.
K4	CO4	To analyze the techniques and skills on how to use modern software testing tools to support software testing projects.

Units	Content	Hrs
Unit I	Software Quality Assurance (SQA), Quality Control (QC), Comparison between QA & QC. Introduction to Testing, Black Box Testing: Equivalence Partitioning- Boundary Value Analysis-Error Guessing- White Box Testing: Statement Coverage-Decision Coverage-Path Coverage- Test Case- Levels of Testing: Unit Testing-Integration Testing- Sub System Testing-System Testing- Acceptance Testing.	10

Unit II	Software Testing Life Cycle-Special Types of Testing: Documentation Testing- Smoke Testing- Sanitary Testing- Compatibility Testing- Usability Testing- Configuration Testing- Disaster Testing- Interoperability Testing- Acceptance Testing- Load Testing-Stress Testing- Recovery Testing-Regression Testing- Security Testing, Client/Server Testing- Web Testing-Performance Testing.	10
Unit III	Test Plan- Phases of Test Plan-*Hierarchy of Test Plan*-Hierarchy of Test Document-Test Plan Process-Components of a Test Plan.-Verification and Validation- Audits-Reviews- Software Metrics- Process Metrics- Project Metrics-Product Metrics- Testing Metrics.	10
Unit IV	Introduction to Automation Test Tools- Automation Process- Features of Automation Tools: Record and Playback- Integration- Environment Support- Database Test- Data Function- Object Mapping-Image Testing- Object Name-Map-Object Identity Tool- Test/Error Recover-Web Testing- Extensible Language- Mercury Interactive- Quality Standards	10
Unit V	Introduction to WINRUNNER- *Two Models for Recording Test:* Context Sensitive- Analog Model-Six Main Stages of Testing Process in Win runner- Starting Win runner- Main Win runner-Window- Text Window-User Tool Bar- Executing Commands using Soft Keys- Understanding GUI Map- Viewing GUI Object Properties-Saving the GUI Map.	12
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Course Material prepared by the Department of Computer Science based on the above web references (Unit 1 to 5).

Books for Reference
1. Srinivasan Desikan & Gopalswamy Ramesh, Software Testing, Pearson Edition, 2007.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	H	H	H	M
CO3	H	H	H	H	H
CO4	H	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 521**	**Title**	**Batch:**	**2020-2023**
Hrs/Week:	**5**	**LAB –IX: JAVA PROGRAMMING**	**Semester**	**V**
			Credits	**02**

Course Objective

To provide students with the ability to write programs in Java and Advanced Java by applying concepts described in the Object-Oriented Programming course.

Course Outcomes (CO)

K3	CO1	To recollect object-oriented concepts.
K4	CO2	To understand the usage of Java Programming Language for various programming technologies.
K5	CO3	To remember the interactive user interfaces using the Java Swing class and appropriate layout managers.

1. Write a java program for employee details using single inheritance concept.
2. Write a java program to check the given string is palindrome or not.
3. Write a java program for multithreading concept.
4. Write a program in java to read and write using random access file.
5. Write a java program to draw lines and rectangles using applets.
6. Write a program in java for method overriding.
7. Write a program in Java using the concept of interface.
8. Write a program to add two numbers using applets.
9. Write a program to implement the concept of swing.
10. Write a program to implement the concept of JMenu, JMenuBar.JMenuItem.
11. Write a program to implement the concept of JTabbedPane.
12. Write a program to implement the concept of JTree.
13. Write a program to make use of Generic Servlet.

14. Write a program to make use of HTTP Servlet.
15. Write a program to illustrate servlet chaining.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	M
CO2	H	H	H	M	M
CO3	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	**BCA**	**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**20 UBC 522**	**Title :**	**Batch:**	**2020-2023**
Hrs/Week:	**5**	**LAB –X : SOFTWARE TESTING**	**Semester**	**V**
			Credits	**02**

Course Objective

To learn the strength and weakness of variety of software testing techniques by implementing practically. To learn how to write test cases in programming languages and to practice different testing methodologies.

Course Outcomes (CO)

K3	CO1	To remember the fundamental concepts in software testing
K4	CO2	To understand the current state-of-the-art in software testing.
K5	CO3	To validate software testing automation

1. To perform some basic operation using calculator in context sensitive mode.
2. To perform some basic operation in paint using Win Runner Analog Mode.
3. To create a GUI checkpoint for single Property using Win Runner.
4. To create a GUI-SPY using Win Runner.
5. To perform an operation in data driver wizard using Win Runner.
6. To develop a test script to test addition of two numbers in VB using GUI checkpoint.
7. To develop a test script for testing calculator using GUI checkpoint.
8. To develop a test script for testing Flight Reservation using GUI checkpoint.
9. To develop a test script to test the Timer control application and adding GUI checkpoint.
10. To develop a test script for List box application developed in VB.
11. To develop a test script for student details using GUI in database checkpoint.
12. To develop a test script for testing Railway Reservation using synchronization point.
13. To develop a test script for testing bank details application developed in VB using insert function.
14. To develop a test script for testing Hotel Management application using insert function and

data driver Wizard. 15. To work with insert function for object window in Win Runner.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M
CO2	H	H	H	H	M
CO3	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5E1	Title	Batch:	2020-2023
Hrs/Week:	5	NETWORKS	Semester	V
			Credits	05

Course Objective

To be familiar with the basics of data communication, various types of computer networks, experience in designing communication protocols.

Course Outcomes (CO)

K1	CO1	To remember, use and implement Computer Networks and the basic components of a Network system.
K2	CO2	To understand the layers of OSI and TCP and get knowledge about congestion control and network security.
K3	CO3	To apply pieces of hardware and software to make networks more efficient, faster, more secure, easier to use, able to transmit several simultaneous messages, and able to interconnect with other networks.
K4	CO4	To analyze packet switching networks, evaluate shortest path routing and traffic management at packet level, flow level and flow aggregate level.

Units	Content	Hrs
Unit I	Introduction: Uses of Computer Network-**Network Hardware:** LAN – WAN – MAN – Wireless – Home Networks. **Network Software:** Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. **Reference Models:** OSI Reference Model – TCP/IP reference Model	13
Unit II	**Physical Layer -** Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission:** Electromagnetic Spectrum – Radio Transmission – Microwave Transmission	13

	– Infrared and Millimeter Waves – Light Waves. **Communication Satellites:** Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites – Satellites versus Fiber. **Data-Link Layer:** Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols.	
Unit III	**Network Layer:** Routing algorithms – Congestion Control Algorithms – IPv4 Addresses – IPv6 Addresses. **Transport Layer:** *Elements of Transport Protocols* – Internet Transport Protocols: TCP – Quality of Service.	13
Unit IV	**Session Layer:** Session and Transport Interaction – Synchronization Points – Session Protocol Data Unit. **Presentation Layer:** Translation – Encryption/Decryption – Authentication – Data Compression.	13
Unit V	**Application Layer:** DNS – E-mail: SMTP, POP – File Transfer Protocol – HTTP – Telnet Protocols. **Case Studies:** Network Security.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. Andrew S. Tanenbaum, *"Computer Networks",* 4th edition Reprint 2003, PHI. (Unit -1, 2, 3, 5)
2. Behrouz A.Forouzan, "*Data Communication And Networking"*, 2nd Edition Update, Genuine Tata Mcgraw – Hill Edition. (Unit – 4)

Books for Reference

1. Achyut Godbole, "Data Communication And Networks", 2007, TMH.
2. Uyless Black, *"Computer Networks Protocols, Standards, And Interfaces"* , 2nd Edition.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	H	H
CO2	H	H	H	M	H
CO3	H	M	H	M	M
CO4	H	M	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5E2	Title	Batch:	2020-2023
Hrs/Week:	5	GRID COMPUTING	Semester	V
			Credits	05

Course Objective

To introduce students the basic applications, concepts and techniques of grid computing and to develop skills for applying grid computing techniques and algorithms to solve practical problems in variety of disciplines.

Course Outcomes (CO)

K1	CO1	remember the contribution of data warehousing and data mining to the decision-support level of organizations
K2	CO2	To understand and carefully differentiate between situations for applying different data-mining techniques
K3	CO3	implement different models used for OLAP and data preprocessing
K4	CO4	estimate data-mining solutions for different applications

Units	Content	Hrs
Unit I	Introduction to Grid Computing: Early Grid Activities – Current Grid Activities – An Overview of Grid Business Areas – Grid Applications – Grid Infrastructure.	13
Unit II	Grid Computing Worldwide Initiatives: Grid Computing Organizations and their Roles – The Grid Computing Anatomy – The Grid Computing Road Map.	13
Unit III	The New Generation of Grid Computing Applications : Merging the Grid Services Architecture with the Web Services Architecture – Service Oriented Architecture – Web Service Architecture – XML Related Technologies and their relevance to Web Services – *XML Messages and Enveloping* – Service message Description Mechanisms.	13
Unit IV	The Grid Computing Technological Viewpoints: Open Grid Services Architecture (OGSA): Introduction – OGSA Architecture and Goal – Sample Use	13

	Cases that Drive the OGSA: Commercial Data Center (CDC) – National Fusion Collaboratory (NFS) – The OGSA Platform Components.	
Unit V	Open Grid Services Infrastructure (OGSI) – Technical Details of OGSI Specification – Introduction to Service Data Concepts – Grid Service: Naming and Change Management Recommendations – OGSA Basic Services: Common Management Model (CMM) – Service Domain – Policy Architecture – Security Architecture –*Metering and Accounting*.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Joshy Joseph, Craig Fellenstein, *Grid Computing*, IBM Press – Pearson Education, Fifth Impression – 2009. (Unit 1 to 5).
Books for Reference
1. C.S.R.Prabhu, *Grid and Cluster Computing*, PHI Learning Private Limited, 2009. 2. Katarine Stanoevska, Slabeva Thomas Wozniak, Santi Ristol, *Grid and Cloud Computing*, Springer International Edition – 2015.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	H	H	H	H
CO3	H	H	M	H	M
CO4	H	M	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5E3	Title	Batch:	2020-2023
Hrs/Week:	5	STORAGE MANAGEMENT	Semester	V
			Credits	05

Course Objective

To understand basic storage system architectures and storage performance management.

Course Outcomes (CO)

K1	CO1	To recollect storage architectures, including storage subsystems and variety of storage system environments
K2	CO2	To get the knowledge of different RAID levels and their suitability on different Application environments and understand the characteristics and components of Storage Area Networks (SAN).
K3	CO3	To analyze the components of SAN, Fibre Channel (FC) protocols and topologies, file sharing operations and protocols on Network Attached Storage (NAS).
K4	CO4	To review the different backup, recovery topologies and their role in providing disaster recovery, types of storage virtualization and file level virtualization

Units	Content	Hrs
Unit I	Introduction to Information Storage and Management: Information Storage: Data – Type of Data - Information - Storage – Evolution of Storage Technology and Architecture - Data Center Infrastructure – Core Element - Key Requirement for Data Center Elements - Key Challenges in Managing Information Lifecycle: Information Life Cycle Management.	13
Unit II	Storage System Environment and RA/D: Components of Storage System Environment: Host - Connectivity- Storage Disk Drive Components - Platter, Spindle, Read/Write Head, Actuator Arm Assembly, Controller, Physical Disk Structure, Zoned Bit Recording, Logical Block Addressing - Data Protection: RA/D: Implementation of RA/D Software RA/D - Hardware RA/D-RA/D.	13
Unit III	Intelligent Storage System and Storage Area Network: Components Of An	13

	Intelligent Storage System: Front End - Cache – Back End - High End Storage Systems - Midrange Storage System - Storage Area Network: Fibre Channel: Overview - The SAN and its Evolution - Components of SAN - SAN Management Software - Fibre Channel Architecture.	
Unit IV	Network Attached Storage and Content Addressed Scheme: Network Attached Storage: General Purpose Servers Vs NAS Devices - Benefits of NAS - Content Addressed Storage: Fixed Contents and Archives - Types of Archives - Features and Benefits of CAS.	13
Unit V	Storage Virtualization, Backup and Recovery: Forms of Virtualization: Memory Virtualization - Network Virtualization – Server Virtualization - Storage Virtualization- - Backup And Recovery: Backup Process - Disaster Recovery - Operational Back Up - Backup And Restore Operations - Virtual Tape Library.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. G. Somasundaram and Alok Shrivatsava, "Information Storage Management: Storing, Managing and Protecting Digital Information", Wiley, 2009 (Unit 1 to 5).

Books for Reference

1. Ulf Troppens et al, "Storage Networks Explained: Basics and Application of Fibre Channel SAN, NAS, ISCSI, INFINIB and FOCE", Wiley, 2015.
2. Hubbert Smith, "Data Center Storage: Cost-effective strategies, implementation and management", CRC Press, 2011.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M
CO2	H	L	L	M	H
CO3	H	H	H	H	H
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5E4	Title	Batch:	2020-2023
Hrs/Week:	5	CURRENT TRENDS AND TECHNOLOGIES	Semester	V
			Credits	05

Course Objective

To study and apply IT applications with a wide range of concepts and technical skills in the areas to succeed in the future.

Course Outcomes (CO)

K1	CO1	To implement Data and Knowledge Management and use of Devices in IoT Technology.
K2	CO2	To analyze the terminology used by SAP ABAP, knowledge of big data and its technologies in Big Data Analytics.
K3	CO3	To keep in mind of Cyber Security Policy and Security Evolution.
K4	CO4	To get the idea to apply a Objectives and Guidance of Cyber security.

Units	Content	Hrs
Unit I	Introduction - Putting the Internet of Things forward to the Next Level - Internet of Things Strategic Research and Innovation Agenda: Internet of Things Vision - Internet of Things Strategic Research and Innovation Directions - IoT Smart X Applications.	13
Unit II	Introduction SAP: Definition – SCM Applications component with some definitions – SAP SCM-APO – SCM processes – Activities – Objectives. Technical overview and System Architecture: Business Application components – Middleware – Multi-tier computing architecture – SAP kernel architecture.	13
Unit III	Fundamentals of Big Data: Evolution of Data Management-Managing the data – Big Data – Big data management architecture. Big Data Types: Structured data – Unstructured Data –Real Time and Non- real time requirements – Big Data together. Distributed Computing: History of Distributed Computing – *Basics of Distributing Computing* – Performance.	13

Unit IV	**Data Science**: Introduction- What is Data Science –Big Data and Data Science Hype-Statistic Inference-Exploratory Data Analysis-the Data Science process. Case Study: Real Direct.	12
Unit V	**Block chain** :Introduction: Define block chain- structure and operational aspects of Bitcoin blockchain, - *compare different types of block chains*-The concept of asymmetric key encryption- the concept of hashing- techniques that use algorithms to manage the integrity of transactions and blocks in blockchain.	14
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Internet of Things - From Research Innovation to Market Deployment by OvidiuVermesan and Peter Friess, River Publishers, 2014. (Unit 1). 2**.** Programming in Sap Apo by Agrawal, Mcgraw Hill Edition (Unit 2). 3. Judith Hurwitz, Alan Nurgent, Dr. Fern Halper, Marcia Kaufman,(2013) " Big Data for Dummies" ,First Edition,A Wiley Publication. (Unit 3). 4. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly". 2014(Unit 4). 5. Manav Gupta "Block Chain", 2nd IBM Limited Edition. 2018 (Unit 5)
Books for Reference
1. Designing the Internet of Things by Adrian McEwen and Hakim Cassimally, John Wiley and Sons, Ltd, 2014. 2. Implementing sap erp sales & distribution by glynn c. williams 3. Internet of Things: Principles and Paradigms by Rajkumar Buyya, Amir Vahid Dastjerdi 4. Computer and Cyber Security: Principles, Algorithm, Applications, and by Brij B. Gupta

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	M
CO2	H	M	H	M	M
CO3	H	M	H	M	H
CO4	H	H	M	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5S1	Title	Batch:	2020-2023
Hrs/Week:	1	MOBILE PHONE SERVICES	Semester	V
			Credits	02

Course Objective

To learn and repair Mobile phones as a self-employment occupation to start a mobile phone repair services concern and Entrepreneur.

Course Outcomes (CO)

K1	CO1	To understand the use and features of Mobile Technology and Devices.
K2	CO2	To analyze various hardware of Mobile phones and its usages.
K3	CO3	To keep in mind the precautionary measure when servicing the mobile devices.
K4	CO4	To get the idea to apply a Software problems like device bricks, rooting issues etc.

Units	Content	Hrs
Unit I	**Basics of mobile communication** - Scope and Opportunities for Mobile Repairing business - Identify business opportunities - Types of Mobile Phones and Technologies - Latest Trends.	3
Unit II	**Mobile phone parts** – Motherboard - Integrated Circuit - BGA and SMD chips – Screen - Microphone – Sensors - Cables.	2
Unit III	**Mobile repair Equipments** - Handling - DC Power Supply - Multimeter - soldering iron - Battery Booster - PCB Holder - Microscope.	2
Unit IV	**Hardware Repair - Repairing** procedure – Cleaning - Assembling & disassembling - Change of different ICs - Soldering & DE soldering procedures.	3
Unit V	**Software Repair -** Flashing - Driver Software - Mobile Software - Software Installation methods - Fault finding & Troubleshooting – Mobile Bricking - Antivirus Installation.	3
	Total Contact Hrs	**13**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Sanjib Pandit "Advance Mobile Repairing: Multicolour Circuits, Service Diagrams & Repairing", BPB Publications, 2010.
Books for Reference
5. Mobile Repairing Jumper Book All In One, GT Publications, 2016.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	M
CO2	H	M	H	M	M
CO3	H	M	H	M	H
CO4	H	H	M	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5S2	Title	Batch:	2020-2023
Hrs/Week:	1	INTERNET OF THINGS	Semester	V
			Credits	02

Course Objective

On successful completion of students will understand the fundamentals of Internet of Things, IoT Protocols, built a small low cost embedded system using Raspberry Pi and to apply the concept of Internet of Things in the real world scenario.

Course Outcomes (CO)

K1	CO1	To remember web services to access/control IoT devices
K2	CO2	To understand the portable IoT using Raspberry Pi
K3	CO3	To deploy use of IoT application and connect to the cloud
K4	CO4	To analyze various protocols for IoT

Units	Content	Hrs
Unit I	Introduction to IoT: Internet of Things – Physical Design – Logical Design – *IoT Enabling Technologies* – IoT Levels & Deployment Templates – Domain Specific IoTs.	3
Unit II	IoT Architecture: *M2M high-level ETSI Architecture* – IETF Architecture for IoT. IoT Platform Design Methodology :Introduction-Design Methodology-IoT System Management.	3
Unit III	IoT Reference model – Domain model -information model - functional model –communication model - IoT Reference Architecture-*IoT Protocols*.	3
Unit IV	Building IoT with RASPBERRY Pi : IoT Systems – Logical Design using Python – IoT Physical Devices and Endpoints – IoT Device – Building blocks – Raspberry Pi –*Programming Raspberry Pi with Python*.	2
Unit V	Case studies: IoT Design-Home Automation, Cities, Environment,	2

	Agriculture, *Productivity Applications.*	
	Total Contact Hrs	**13**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Arshdeep Bahga , Vijay Madisetti , "Internet of Things –A hands –on Approach", Universities Press 2015.
Books for Reference
1. Dieter Uckelmann , Mark Harrison, Michahelles,Florian(Eds), "Architecting the Internet of Things", Springer,2011. 2. Honbo Zhou , "The Internet of Things in the cloud: A Middleware Perspective", CRC Press,2012. 3. Jan Holler ,Vlasios Tsiatsis ,Catherine Mulligan , Stamatis , Karnouskos Stefan Avesand , David Boyle ," From Machine – to- Machine to the Internet of Things – Introduction to a New Age of Intelligence " . Elsevier 2014. 4. Olivier Hersent, David Boswarthick ,Omar Elloumi – "The Internet of things – Key applications and Protocols ",Wiley 2012.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	M	H	L
CO3	M	H	H	H	M
CO4	M	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 5S3	Title	Batch:	2020-2023
Hrs/Week:	1	DESKTOP PUBLISHING LAB	Semester	V
			Credits	02

Course Objective

To provide a deep knowledge in various image processing effects.

Course Outcomes (CO)

K3	CO1	To remember the basic technical tools.
K4	CO2	To get the idea for handling tools and applying various effects.
K5	CO3	To access various formats in this platform for editing.

1. Design the Wedding Invitation using the associated tools in Photoshop.
2. Apply special art effects for the image using various options from the Filter Gallery.
3. Design the Banner.
4. Implement the Usage of different modes in a Single Image.
5. Design the College Profile.
6. Work with different images to implement Sharpen tool and Smudge Tool
7. Design the Calendar.
8. Edit the image using Blur tool.
9. Design the Visiting Card.
10 Edit the image using Burn and Sponge tool.
11. Edit the image using Clone tool.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	H	H
CO2	M	M	H	H	H
CO3	H	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 623	Title	Batch:	2020-2023
Hrs/Week:	5	PYTHON PROGRAMMING	Semester	VI
			Credits	04

Course Objective

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Outcomes (CO)

K1	CO1	To develop python programs for core python and data types using objects and functions.
K2	CO2	To develop python programs for List, Stack, Queues.
K3	CO3	To implement File Objects and Object-Oriented Programming using python.
K4	CO4	To manage Errors and Exceptions and summarize the Network Programming.

Units	Content	Hrs
Unit I	Basics: Python- Variables- Executing Python From the Command Line-Editing Python Files-Python Reserved Words-Basic Syntax-Comments-Strings And Numeric Data Types-Simple Input and Output.	13
Unit II	Control Statements: Control Flow and Syntax-Indenting- If Statement-Relational Operators- Logical Operators- Bit Wise Operators- While Loop-Break and Continue- For Loop-Lists-Tuple -Sets-Dictionaries.	13

Unit III	Functions: Definition- Passing Parameters to a Function-Variable Number of Arguments- Scope-Passing Functions to a Function- Mapping Functions in a Dictionary-Lambda-Modules- Standard Modules- Sys-Math- Time- Dir Function.	13
Unit IV	Error Handling: Run Time Errors-Exception Model-Exception Hierarchy-Handling Multiple Exceptions-Data Streams-Access Modes Writing-Data to a File Reading-Data From a File-Additional File Methods-Using Pipes as Data Streams-Handling IO Exceptions-Working With Directories.	13
Unit V	Object Oriented Features: Classes Principles of Object Orientation-*Creating Classes*-Instance Methods-File Organization-Special Methods-*Class Variables- Inheritance*-Polymorphism-Type Identification-Simple Character Methods-*Special Characters-Character Classes*-Quantifiers-Dot Character-Greedy Matches-Grouping-Matching at Beginning or End-Match Objects-Substituting-Splitting a String-Compiling Regular Expressions.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Creating Classes, Special Characters-Character Classes, Class Variables- Inheritance.

Books for Study
1. **Mark Summerfield**, "Programming in Python 3 ", A Complete Introduction to the Python Language", Addison-Wesley Professional, 2009 (Unit 1 to 5). 2. **Martin C.Brown,** "Python: The Complete Reference", McGraw-Hill, 2001 (Unit 1 to 5).
Books for Reference

1. **Allen Downey, Jeffrey Elkner, Chris Meyers**, "Learning With Python**",** Green Tea Press, Wellesley, Massachusetts, 2016.
2. **Wesley J Chun**. Core Python Application Programming.3rd Edition, Prentice Hall Press Upper Saddle River, NJ, USA ©2012.
3. **Mark Lutz**. Learning Python, 5th Edition, O'Reilly & Associates, Inc. Sebastopol, CA,USA ©2003.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	M
CO2	H	M	H	H	M
CO3	H	H	H	H	H
CO4	H	M	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 624	Title	Batch:	2020-2023
Hrs/Week:	4	INFORMATION SECURITY	Semester	VI
			Credits	3

Course Objective

To select appropriate techniques to tackle and solve problems in the discipline of information security management. To know why security and its management are important for any modern organization.

Course Outcomes (CO)

K1	CO1	To recollect the familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
K2	CO2	To understand the information assurance as practiced in computer operating systems, distributed systems, networks and representative applications
K3	CO3	To implement the basic understanding of cryptography, how it has evolved, and some key encryption techniques used today
K4	CO4	To analyze the security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

Units	Content	Hrs
Unit I	**Introduction to Computer Security:** Basic Concepts –Security Trends – OSI Security Architecture – Security Attacks – Security Services – Security Mechanisms - Threat models - Common Security Goals - Memory protection – Block Ciphers, Stream Ciphers - Security Evaluation.	**11**
Unit II	**Cryptography:** Cryptographic Protocols - Encryption – Message Authentication Code – DES - Hash Functions – Symmetric Key Algorithms:	**10**

	DES, AES – Public key Algorithms: RSA, DSA - Secure channels.	
Unit III	**Network Security:** Intruders – Intrusion Detection – Password Management – *Malicious Software* – Viruses and Related Threats – Countermeasures – Distributed Denial of Service Attacks – Firewalls – Design Principles – Trusted Systems.	**10**
Unit IV	**Software Security:** Secure software engineering – Hackers, Crackers, and Attackers – Security Failures – Technical Trends affecting Software Security - Defensive programming and its Techniques- Buffer overruns and other implementation flaws.	**10**
Unit V	**Cyber security:** Classification of Cybercrimes - **Case Studies:** Privacy - Mobile code – Security and the Law - The legal perspective – Indian perspective, Global perspective - Cyber Stalking and Obscenity in Internet – *Electronic Voting*.	**11**
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study

1. William Stallings, "Cryptography and Network Security", 4th Edition, Prentice Hall, 2008 (Unit 1, 2 & 3).
2. Bruice Schneier, "Applied Cryptography – Protocols, Algorithms and Source code in C", 2nd Edition, Wiely India Pvt Ltd (Unit 2).
3. Debby Russell and Sr. G.T.Gangemi, "Computer Security Basics (Paperback)", 2nd Edition, O'Reilly Media, 2006 (Unit 4).
4. Nina Godbole, Sunit Belapure, "Cyber Security – Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Wiely India Pvt Ltd (Unit 5).

Books for Reference
1. Charles P pfleeger and Shai Lawrence pfleeger, "Security in Computing", Fourth Edition, Prentice Hall, 2007. 2. Behrouz A. Forouzan, "Cryptography and Network Security", Special Indian Edition, Tata Mc-Graw Hill Publications, 2007. 3. Thomas R. Peltier, Justin Peltier and John Blackley, "Information Security Fundamentals", 2nd Edition, Prentice Hall, 1996.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	M	H	H	H
CO3	M	H	H	M	M
CO4	M	H	H	L	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 625	Title	Batch:	2020-2023
Hrs/Week:	4	MOBILE APPLICATION DEVELOPMENT	Semester	VI
			Credits	03

Course Objective

To introduce students, the basic applications, concepts and techniques of Mobile Application development and make the student to design and develop android application.

Course Outcomes (CO)

K1	CO1	remember about the Android application development tools.
K2	CO2	To understand the Install and configure Android application development
K3	CO3	implement the design and develop user Interfaces for the Android platform
K4	CO4	estimate the database connection for android application.

Units	Content	Hrs
Unit I	**Getting Started with Android Programming:** What is Android? - Obtaining the Required tools, Creating Your First Android Application, Anatomy of an Android Application.	10
Unit II	**Activities, Fragments and Internets**: Understanding Activities, Linking Activities Using Intents, Calling Built-in Applications Using Intents, Displaying Notifications.	10
Unit III	**Getting to know the Android User Interface**: Understanding the Components of a screen, Adapting to display Orientation, *Managing Changes to Screen Orientation.*	10
Unit IV	**Designing Your Interface with Views**: Using Basic Views, Using Picker Views, Using List Views to Display Long Lists. **Data persistence**: Saving and Loading User Preferences, Persisting Data to Files, Creating and Using Databases. **Content Providers**: Using a Content Provider, Creating Your Own Content	10

	Provider, Using the Content Provider.	
Unit V	**Messaging:** SMS Messaging, Sending E-Mail. **Location-Based Services:** Displaying Maps, *Getting Location Data*.	12
	Total Contact Hrs	**52**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. "Beginning ANDROID 4 Application Development" by Wei-Meng Lee, Wiley Publications, 2015 Edition (Unit 1 to 5).
Books for Reference
1. "Android Application Development AA-in-one for Dummies", by Barry A.Burd, Published on August 2015, 2nd Edition. 2. "Professional Android 2 Application Development",by Reto mier., 2nd Edition.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	H	H
CO2	H	H	L	H	M
CO3	H	H	H	M	M
CO4	H	M	H	H	L

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 626	Title	Batch:	2020-2023
Hrs/Week:	5	LAB –XI: PYTHON PROGRAMMING	Semester	VI
			Credits	02

Course Objective

The course is designed to provide Basic knowledge of Python. Python programming is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Outcomes (CO)

K3	CO1	To develop python programs for list and control statements and understand the Different loops such as “for”, “while” and “do-while”.
K4	CO2	To manage Errors and Exceptions and summarize the Network Understand Programming.
K5	CO3	To implement File Objects and Object-Oriented Programming using python.

1. Write a program to display the following information: Your name, Full address, Mobile number, College name, Course.
2. Write a program to find the largest three integers using if-else and conditional operator.
3. Write a program to find the product of two matrices.
4. Write a program to find the GCD of two integers.
5. Write a program to print the Fibonacci sequence.
6. Write a GUI program that converts Celsius temperature to Fahrenheit temperature.
7. Write a GUI program that displays your details when a button is clicked.
8. Write a program that opens a specified text file and then displays a list of all unique words Found in the file.

9. Write a program to implement the inheritance and polymorphism.
10. Write a program to display prime number.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M
CO2	M	H	M	M	M
CO3	M	M	M	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 627	Title	Batch:	2020-2023
Hrs/Week:	5	LAB –XII: MOBILE APPLICATION DEVELOPMENT	Semester	VI
			Credits	02

Course Objective

To measure the knowledge of student's about the Android Application tool. Primary emphasis will be on Android development, while students will also learn the basics of developing applications for Smartphone's.

Course Outcomes (CO)

K3	CO1	To keep in mind about basic development of Mobile application.
K4	CO2	To get the idea about how to develop the Android Application.
K5	CO3	To access the database connection using Android.

1.Write a program to implement the Activities on ANDROID

2.Write a program to implement the Intent Filters using ANDROID

3.Write a program to implement the User Interface using ANDROID

4.Write a program to implement the Image views using ANDROID

5. Write a program to implement the location tracking using ANDROID

6.Write a program to store the data in SD Card using ANDROID

7.Write a program to implement the Content Providers using ANDROID

8.Write a program to implement the SMS Messaging using ANDROID

9. Write a program to create a database to store the values using ANDROID

10. Write a program to create a database to store and retrive the images using ANDROID

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	H	H
CO2	H	M	H	H	H
CO3	L	H	H	M	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 6E5	Title	Batch:	2020-2023
Hrs/Week:	5	DATA MINING AND WAREHOUSING	Semester	VI
			Credits	05

Course Objective

To introduce students the basic applications, concepts and techniques of data mining and to develop skills for applying data mining techniques and algorithms to solve practical problems in variety of disciplines.

Course Outcomes (CO)

K1	CO1	remember the contribution of data mining to the decision-support level of organizations
K2	CO2	To understand and carefully differentiate between situations for applying different data-mining techniques
K3	CO3	implement different models used for OLAP and data preprocessing
K4	CO4	estimate data-mining and data warehousing solutions for different applications

Units	Content	Hrs
Unit I	Introduction to Data Mining: Definition- Kinds of Data- Kinds of Patterns - Technologies used – Major Issues in Data mining – Data mining Applications & Trends – Data objects & Attribute types – Data visualization.	13
Unit II	Data Preprocessing: Data cleaning: Missing values, Noisy data, Data cleaning as a process-Data Integration: Entity Identification problem, Redundancy and correlation analysis, Tuple Duplication, Data value conflict detection & resolution – Overview of Data reduction strategies – Data transformation strategies overview.	13
Unit III	Knowledge Discovery Process: Data Selection-Cleaning-Enrichment-Coding-Data Mining-*Preliminary Analysis of Data Set Using Relational Query Tools*-Visualization Techniques-Likelihood and Distance-OLAP Tools-K-Nearest Neighbour-Decision Trees-Association Rules-Neural Networks-	13

	Genetic Algorithms-Reporting.	
Unit IV	Setting Up KDD Environment: Introduction-Different forms of Knowledge-Getting Started-Data Selection-Cleaning-Enrichment-Coding-Reporting-10 Golden Rules.	13
Unit V	Data warehousing: Basic concepts – Modeling – Design and usage – Data warehouse Implementation – Data generalized by Attribute – *Oriented Induction*.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Data mining concept and Techniques, Jiawei Han, Micheline Kamber, Jian pei, Morgen Kaufmann publishers, 3rd edition (Unit 1,2 and 5). 2. Peter Andriaans Dolf Zantinge, *Data Mining*,Addison Wesley Publications, Second Edition, 2000(Unit 3, 4).
Books for Reference
1. Ian H. Witten & Edile Frank, *Data Mining- Practical Machine Learning Tools & Techniques*, Second Edition, 2005. 2. Daniel T. Larose, *Data Mining Methods and Models*, John Weiley & Sons, Student Edition, 2006.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	H	H
CO2	H	H	H	H	H
CO3	H	H	M	H	M
CO4	H	M	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 6E6	Title	Batch:	2020-2023
Hrs/Week:	5	CLOUD COMPUTING	Semester	VI
			Credits	05

Course Objective

To introduce students the basic applications, concepts and techniques of data mining and to develop skills for applying data mining techniques and algorithms to solve practical problems in variety of disciplines.

Course Outcomes (CO)

K1	CO1	remember the contribution of data warehousing and data mining to the decision-support level of organizations
K2	CO2	To understand and carefully differentiate between situations for applying different data-mining techniques
K3	CO3	implement different models used for OLAP and data preprocessing
K4	CO4	estimate data-mining solutions for different applications

Units	Content	Hrs
Unit I	Cloud Computing Basics: Cloud Computing Overview-Cloud Components-Infrastructure-Services-Applications-Storage-Database Services-Intranets and the cloud-Components – Hypervisor Applications. First Movers in the Cloud: Amazon- Google-Microsoft.	13
Unit II	Organization and Cloud Computing-Benefits-Limitations of Cloud Computing- Security Concerns-Privacy concerns with a third party-Security Benefits.	13
Unit III	Cloud Computing Technology: Hardware and Infrastructure-Clients-Security-Network-Services-Accessing the cloud-Platforms-Web APIs-Web Browsers-Cloud Storage-Overview-*Cloud Storage Providers*-Standards	13
Unit IV	Cloud Computing with the Titans: Google-Google App Engine-Google Web tool kit-EMC Technologies-VMware Acquisition-Microsoft-Azure Services Platform-Windows live-Exchange online-Sharepoint Services-Microsoft Dynamics	13

	CRM-Amazon-Amazon Elastic Compute Cloud-Amazon Simple Storage Service-Amazon Simple Queue Service -Salesforce.com-IBM.	
Unit V	Security Concerns in Cloud Computing-*Threats in Cloud Computing*.	13
	Total Contact Hrs	**65**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Cloud Computing-A Practical Approach, "*Anthony T.Velte, Toby J.Velte, Robert Elsenpeter",* Mc Graw Hill Publications, 2010 (Unit 1 to 5).
Books for Reference
1. Cloud Computing, *Dr. Kumar Saurabh,* Wiley India, Second Edition, 2012.

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	M	H	H
CO2	H	H	H	H	H
CO3	H	H	M	H	M
CO4	H	M	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 6S4	Title	Batch:	2020-2023
Hrs/Week:	1	CORPORATE SYSTEMS	Semester	VI
			Credits	02

Course Objective

To develop software development processes, including the knowledge, skills and professional competencies necessary to begin practice as a software engineer.

Course Outcomes (CO)

K1	CO1	To recollect the usage of computers in Healthcare systems.
K2	CO2	To understand the process of banking & Insurance with computers.
K3	CO3	To apply IT in Telecommunication and Textiles at various levels.
K4	CO4	To analyze a solution to the utility problem using computer softwares.

Units	Content	Hrs
Unit I	**Health Care Information Systems** : History and evolution of health care information systems – Current and emerging use of clinical information systems – system acquisition – System implementation and support – Security of health care information systems - Organizing information technology services – IT alignment and strategic planning – IT governance and management - Assessing and achieving value in health care information systems - Case study.	3
Unit II	**Banking and Insurance:** Account Management - Hardware Technology - Customer Accounts – Branch Banking Support – Information Systems Audit – Internet Banking - Electronic Transactions - Web-based Banking. The Uses of Computers in Insurance – Record Keeping - Providing Quotes - Assessing Risk – Underwriting - Life Insurance Applications: Life Administration Module - Policy Servicing of existing policies – New Business - Renewal notice/Billing – Loans - Statistics and MIS Claims - Archiving of historical data and imaging Systems.	3

Unit III	**Telecommunication Systems and Technologies:** Fundamental of Telecommunications - Digital Signal Processing - Wireless / Wire line Networks - PCS - GSM - working of dial up connection – ISP - ISDN - *Web enabled systems, virtual reality, and multimedia applications over Internet*. Protocol Engineering: Principles, stages, specification formalisms of telecom protocol design, protocol software development process, and computer aided protocol engineering.	3
Unit IV	**Textile Industry:** Computers in Textiles – Texture Mapping – Computer Integrated Manufacturing – Order processing, Machinery Planning, Manufacturing – Quality Integration – MIS Reporting – Online monitoring in spinning and weaving – Maintenance and Quality control.	2
Unit V	**Energy Utilities:** Multi processor system – Real Time tasks- Energy Minimization – Energy aware scheduling- Dynamic Reconfiguration- Adaptive power management- *Energy Harvesting Embedded system*. Energy Aware Applications: On chip network – Video codec Design – Surveillance camera- Low power mobile storage.	2
	Total Contact Hrs	**13**

- The topics given in **Italics** are noted as Self-Study topics.

Books for Study
1. Course Material prepared by the Department of Computer Applications based on the below web references (Unit 1 to 5).

Websites for Reference	
www.inventors.about.com	www.economywatch.com
www.modernhealthcare.com	www.indiantextilejournal.com
www.atmbanking.net	www.apparelsearch.com
www.banknetindia.com	www. telecoms.org

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	H
CO2	M	M	H	H	H
CO3	H	H	M	H	H
CO4	H	H	H	H	M

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 6S5	Title	Batch:	2020-2023
Hrs/Week:	1	MULTIMEDIA AND ANIMATION	Semester	VI
			Credits	02

Course Objective

To learn the basic elements in basic of drawing, color and implement in the multimedia software and to apply the techniques to design real time pictures.

Course Outcomes (CO)

K1	CO1	To recollect the effects of multimedia in your daily life
K2	CO2	To get the idea about the animation into digital content and multimedia products.
K3	CO3	To execute the animation using computerised animation tools.
K4	CO4	To evaluate projects and presentations utilizing a variety of digital media multimedia technologies.

Units	Content	Hrs
Unit I	Introduction : MM presentation and production – Characteristics of MM presentation – h/w and s/w requirements- Uses of MM – Steps for creating MM presentation. Text - Types of text – Insertion of text – Text Compression – File formats.	3
Unit II	Image: Image types – Seeing color – Color models – Basic steps for image processing – Scanner– Digital Camera – Specification of Digital Images – Device independent Color Models – Image processing s/w – File formats.	3
Unit III	Audio: Nature of Sound-Fundamental characteristics of sound – Musical Note and Pitch –Elements of Audio systems. What is MIDI – MIDI manufacturers Association (MMA)-MDI Specification-MIDI MESSAGES-*MIDI Connections.*	3

Unit IV	Video: Introduction- Analog Video Camera – Transmission of video signals – Video signal formats..	2
Unit V	Introduction – Uses of animation – Key frames and Tweening – Types of animation – Creating movement – Principles of animation – *Techniques of animation* — Animation Software.	2
	Total Contact Hrs	**13**

Seminar, Assignment, Case Study

- The topics given in **Italics** are noted as Self-Study topics.

Books for Study
1.Principles of Multimedia – Ranjan Parekh – Tata McGraw-Hill publishing Company Limited, New Delhi,2007 (Unit 1 to 5).
Books for Reference
1. Multimedia systems design – Prabhat K. Andleigh – Prentice Hall PTR publishing the University of Michigan, 1996.

Mapping

PSO / CO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	H	H	H
CO2	H	H	M	H	H
CO3	M	H	H	H	L
CO4	H	H	H	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	CDC	COE
Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature:

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	20 UBC 6S6	Title	Batch:	2020-2023
Hrs/Week:	1	PERSONALITY DEVELOPMENT SKILLS	Semester	VI
			Credits	02

Course Objective

To develop the student broad career plans, evaluate the employment market, identify the organizations to get good placement, match the job requirements and skill sets.

Course Outcomes (CO)

K1	CO1	To keep in mind about the personality developments.
K2	CO2	To get the idea to connect and work with others to achieve a set task.
K3	CO3	To execute the clear briefing and listening skills, not being afraid to ask for help and support when necessary.
K4	CO4	To interpret the time and resource management, conflict resolution, teaching and mentoring others.

Units	Content	Hrs
Unit I	Introduction – Soft and Hard skills – Communication Skills – Improving Body Language – Interpersonal Skills – Enhancing listening skills – Sharpening writing Skills – Presentation skills.	3
Unit II	Conflict management skills – resolving conflicts – Change management - Stress management – Excelling as a leader – Building Successful Teams – Motivating ourselves.	3
Unit III	Challenges in Indian Educational System- Soft skills at workplace- Soft skills for managers – Challenges in Management Education – *Blending Art and Craft for effective management education*.	3
Unit IV	Employability Skills – Enhancing Employability Skills – Improving Soft skills – Training and Grooming – Teaching Vs Training.	2

Unit V	Soft skills training – Resume Writing – Interview Tips – Common Interview Questions – Group Discussions – *Enhancing employability in management*.	2
	Total Contact Hrs	**13**

- The topics given in **Italics** are noted as Self-Study topics.

Seminar, Assignment, Case Study

Books for Study
1. Barun K.Mitra, *Personality Development and soft skills*, Oxford University Press, 2011. (Unit 1 to 5).
Books for Reference
1. Nitin Bhatnagar, Effective Communication and Soft Skills, Nitin Bhatnagar, Pearson Education India, 2011.

Mapping

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	H
CO2	H	L	H	H	H
CO3	M	L	H	H	M
CO4	M	H	H	M	H

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by
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Name: Signature:	Name: Dr.K.HARIDAS Signature:	Name: Mr.K.SRINIVASAN Signature:	Name: Dr.R.MUTHUKUMARAN Signature: