

MARTIN LUTHER CHRISTIAN UNIVERSITY



**CURRICULUM
2016-2017**

**DEPARTMENT OF COMPUTER SCIENCES
MARTIN LUTHER CHRISTIAN UNIVERSITY
NONGRAH, DONGKTIEH, BLOCK-1, SHILLONG, MEGHALAYA**

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Bachelor of Computer Applications (BCA)

Course Outline for 2016-17 batch as per CBCS

Total Credits:132

First Semester

Sl. No.	Course	Course Code	Credits	Type
1	Fundamentals of Computer & PC Software	BCA101	3	CC
2	Concepts of Algorithms & Programming	BCA102	3	CC
3	Concepts of Algorithms & Programming -	BCA103	3	CC
4	Basics of Web Designing	BCA104	2	CC
5	PC Software and Hardware	BCA105	3	CC
6	Foundation Mathematics	MATH101	3	CC
7	Problem Solving Proficiency	BCA106	2	SE
8	English and Communication-I	ENGL101	4	AE
	Total Credits		23	

Second Semester

Sl. No.	Course	Course Code	Credits	Type
1	Programming with Java	BCA111	3	CC
2	Fundamental of Operating System	BCA112	4	CC
3	Programming with Java-Practical	BCA113	3	CC
4	Basics of Linux Operating System	BCA114	2	CC
5	Fundamental Discrete Mathematics	MATH111	3	CC
6	Fundamental of Computer Organization and Architecture	BCA201	4	CC
7	Personality Development	BCA314	2	SE
8	English and Communication-II	ENGL111	4	AE
	Total Credits		25	

Third Semester

Sl. No.	Course	Course Code	Credits	Type
1	Computer Networks	BCA202	4	CC
2	Data Structures and Algorithms	BCA203	3	CC
3	Data Structure and Algorithms-Practical	BCA204	3	CC
4	Numerical and Statistical Methods	MATH201	3	CC
5	Entrepreneurship Development	BCA305	2	SE
6	English and Communication- III	ENGL201	3	AE
7	Minor Course		4	MN
	Total Credits		22	

*Life Skills

Fourth Semester

Sl. No.	Course	Course Code	Credits	Type
1	Database Management System	BCA212	3	CC
2	Database Management System –Practical	BCA213	3	CC
3	<i>Specialization</i> - 1(a) / 2(a) / 3(a) / 4(a)		3	SP
4	<i>Specialization</i> - 1(b) / 2(b) / 3(b) / 4(b)		3	SP
5	CMS and Web Hosting	BCA218	1	SE
6	Environmental Studies		2	AE
7	English and Communication-IV	ENGL211	3	AE
8	Human Values		1	SE
9	Minor Course		4	MN
	Total Credits		23	

* Introducing in 2016 batch as per CBCS and the Course Code BCA211 to BCA217 is used in BCA 2014 batch

Fifth Semester

Sl. No.	Course	Course Code	Credits	Type
1	Software Engineering	BCA211	4	CC
2	<i>Specialization</i> - 1(c) / 2(c) / 3(c) /4(c)		3	SP
3	<i>Specialization</i> -1(d) / 2(d) / 3(d) /4(d)		3	SP
4	Project Work	BCA304	4	CC
5	English and Communication-V	ENGL301	3	AE
6	Minor Course		4	MN
	Total Credits		21	

Sixth Semester

Sl. No.	Course	Course Code	Credits	Type
1	<i>Specialization</i> - 1(e) / 2(e) /3(e) /4(e)		3	SP
2	<i>Specialization</i> -1(f) / 2(f) /3(f) /4(f)		3	SP
3	Real Time Project Implementation	BCA313	9	CC
4	English and Communication-VI	ENGL311	3	AE
	Total Credits		18	

CC=Core Course SE=Skill Enhancement AE=Ability Enhancement MN= Minor Course SP=Specialization

SPECIALIZATION

Sl. No.	Course	Course Code	Specialization
1.a	Fundamental of Web Services	BCAE301	Web Technology
1.b	Advanced Web Designing	BCAE215	Web Technology
2.a	Windows Server Administration	BCAH301	Hardware and Networking
2.b	Wireless Network Security	BCAH303	Hardware and Networking
3.a	Responsive Web Designing	BCAM211	Mobile Applications
3.b	Responsive Web Designing-Practical	BCAM212	Mobile Applications
4.a	Visual Design-Practical	BCAG212	Animation and Multimedia
4.b	Visual Effects-Practical	BCAG312	Animation and Multimedia
1.c	.Net Technology–I (Theory)	BCAE301	Web Technology
	PHP–I (Theory)	BCAE303	Web Technology
	JSP –I (Theory)	BCAE305	Web Technology
1.d	.Net Technology–I (Practical)	BCAE302	Web Technology
	PHP–I (Practical)	BCAE304	Web Technology
	JSP –I (Practical)	BCAE306	Web Technology
2.c	Linux Server Administration	BCAH302	Hardware and Networking
2.d	Network Switching and Routing Technology	BCAH304	Hardware and Networking
3.c	Android Apps Development-I(Theory)	BCAM302	Mobile Applications
3.d	Android Apps Development-I(Practical)	BCAM303	Mobile Applications
4.c	2D Animation(Theory)	BCAG301	Animation and Multimedia
4.d	2D Animation-Practical	BCAG302	Animation and Multimedia
1.e	.Net Technology–II(Theory)	BCAE311	Web Technology
	PHP–II(Theory)	BCAE313	Web Technology
	JSP–II(Theory)	BCAE315	Web Technology
1.f	.Net Technology–II(Practical)	BCAE312	Web Technology
	PHP–II(Practical)	BCAE314	Web Technology
	JSP–II(Practical)	BCAE316	Web Technology
2.e	Router Configuration and Security	BCAH311	Hardware and Networking
2.f	Router Configuration-Practical	BCAH312	Hardware and Networking
3.e	Android Apps Development-II(Theory)	BCAM311	Mobile Applications
3.f	Android Apps Development-II(Practical)	BCAM312	Mobile Applications
4.e	3D Animation(Theory)	BCAG311	Animation and Multimedia
4.f	3D Animation –Practical	BCAG315	Animation and Multimedia

MINORS TO BE OFFERED: (Total=12)

OFFICE AUTOMATION SYSTEMS

Sl. No.	Course	Course Code	Credit
1	<i>Office Suites</i>		04
2	<i>Windows and Linux Operating Systems</i>		04
3	<i>Common Office Electronic Devices</i>		04

Post Graduate Diploma in Computer Applications (PGDCA)
Course Outline for 2016-17 Batch

Total Credits:42

First Semester

Sl. No	Course	Course Code	Credits
1	Concepts of Computer Applications	PDCA501	3
2	Concepts of Algorithms & Programming(CAP)	PDCA502	3
3	CAP-Practical	PDCA503	3
4	Office Package -Practical	PDCA504	3
5	General Proficiency	PDCA505	2
6	Web Designing-Practical	PDCA506	3
7	Project Work	PDCA507	4
	Total Credits		21

Second Semester

Sl. No	Course	Course Code	Credits
1	Fundamentals of Networking	PDCA511	4
2	Visual Programming	PDCA512	3
3	Relational Database Management System-Practical	PDCA513	3
4	PC Assembling and Troubleshooting-Practical	PDCA514	3
5	Visual Programming-Practical	PDCA515	3
6	Real Time Implementation Project	PDCA516	5
	Total Credits		21

Master of Computer Applications (MCA)
Course Outline for 2016-17 Batch

Total Credits: 125 (Regular)/ 80 (Lateral Entry)

First Semester

Sl. No.	Course	Course Code	Credits
1	Computer Organization & Architecture	MCA501	4
2	Concepts of Algorithm and Programming	MCA502	3
3	Concepts of Algorithm and Programming -Practical	MCA503	3
4	Web Designing-Practical	MCA504	3
5	PC Software and Hardware-Practical	MCA505	3
6	Discrete Mathematics	MATH501	3
7	English and Communication-I	ENGL501	3
	Total Credits		22

Second Semester

Sl. No.	Course	Course Code	Credits
1	Operating Systems	MCA511	4
2	Fundamentals of Networking	MCA512	4
3	Visual Programming	MCA513	3
4	Data Structures using C++	MCA514	3
5	Data Structure using C++ -Practical	MCA515	3
6	Statistics and Probability	MATH511	3
7	English and Communication-II	ENGL511	3
	Total Credits		23

Third Semester

Sl. No.	Course	Course Code	Credits
1	Advanced Java Programming	MCA601	3
2	Advanced Java Programming-Practical	MCA602	3
3	Analysis and Design of Algorithms	MCA603	4
4	Advanced Database Management System (ADBMS)	MCA604	3
5	Advanced Database Management System-Practical	MCA605	3
6	Financial Accounting	MCA606	4
7	English and Communication-III	ENGL601	2
	Total Credits		22

Fourth Semester

Sl. No.	Course	Course Code	Credits
1	Specialization I (Theory)		3
	1. PHP Technology	MCAS611	
	2. .Net Technology	MCAS613	
	3. J2EE Technology	MCAS615	
2	Specialization I -Practical		3
	1. PHP Technology Practical	MCAS612	
	2. .Net Technology Practical	MCAS614	
	3. J2EE Technology Practical	MCAS616	
3	Advanced Computer Networks	MCA611	4
4	Theory Of Computation	MCA612	4
5	Linux Shell Programming-Practical	MCA613	3
6	Entrepreneurship Development	MCA614	3
7	English and Communication-IV	ENGL611	2
	Total Credits		22

Fifth Semester

Sl. No.	Course	Course Code	Credits
1	Software Project Management	MCA701	4
2	Elective I		4
	1. Data Mining & Data Warehousing	MCAE701	
	2. Distributed Database System	MCAE702	
	3. Cloud Computing	MCAE703	
3	Elective II		4
	1. Client Server Architecture	MCAE704	
	2. Computer Graphics	MCAE705	
	3. Artificial Intelligence	MCAE706	
4	Specialization II		3
	1. Advanced PHP Technology	MCAS701	
	2. Advanced .Net Technology	MCAS703	
	3. Advanced J2EE Technology	MCAS705	
5	Specialization II- Practical		3
	4. Advanced PHP Technology Practical	MCAS702	
	5. Advanced .Net Technology Practical	MCAS704	
	6. Advanced J2EE Technology Practical	MCAS706	
6	Project Work	MCA705	6
	Total Credits		24

Sixth Semester

Sl. No.	Course	Course Code	Credits
1	Real Time Implementation Project	MCA711	12
	Total Credits		12

Master of Science (Information Technology)
Course Outline for 2016-17 Batch

Total Credits: 81

First Semester

Sl. No.	Course	Course Code	Credits
1	Computer Organization & Architecture	MST501	4
2	Concepts of Algorithm and Programming	MST502	3
3	Concepts of Algorithm and Programming-Practical	MST503	3
4	Web Designing-Practical	MST504	3
5	PC Software and Hardware-Practical	MST505	3
6	English and Communication-I	ENGL501	3
	Total Credits		19

Second Semester

Sl. No.	Course	Course Code	Credits
1	Operating Systems	MST511	4
2	Advanced Computer Networks	MST512	4
3	Relational Database Management System-Practical	MST513	3
4	Data Structures using C++	MST514	3
5	Data Structure using C++ -Practical	MST515	3
6	Linux Shell Programming-Practical	MST516	3
7	English and Communication-II	ENGL511	3
	Total Credits		23

Third Semester

Sl. No.	Course	Course Code	Credits
1	Advanced Java Programming	MST601	3
2	Advanced Java Programming-Practical	MST602	3
3	Analysis and Design of Algorithm	MST603	4
4	Software Project Management	MST604	4
5	Elective I		4
	1. Data Mining & Data Warehousing	MSTE601	
	2. Computer Graphics	MSTE602	
	3. Information Security	MSTE603	
	4. Cloud Computing	MSTE604	
6	English and Communication-III	ENGL601	2
	Total Credits		20

Fourth Semester

Sl. No.	Course	Course Code	Credits
1	Elective II		3
	1. PHP Technology	MSTE611	
	2. .Net Technology	MSTE613	
	3. J2EE Technology	MSTE615	
2	Elective II -Practical		3
	1. PHP Technology Practical	MSTE612	
	2. .Net Technology Practical	MSTE614	
	3. J2EE Technology Practical	MSTE616	
3	Real Time Implementation Project	MST611	8
4	Entrepreneurship Development	MST614	3
5	English and Communication-IV	ENGL611	2
	Total Credits		19

Bachelor of Computer Applications (BCA)

Course: FUNDAMENTALS OF COMPUTER & PC SOFTWARE

Code: BCA101

Credits: 3

OBJECTIVES: (i) To enable students to acquire basic knowledge of fundamentals of computer and become familiar with the use of IT tools and they will also learn about the benefits and importance of IT in today's world. (ii) This Course also intends to familiarize the students with MS Office and its applications in the relevant fields.

UNIT-I

Introduction to computer - Definition of Computer, Generation of Computers – First, Second, Third, Fourth & Fifth generations, Characteristics of computers, Capabilities and Limitations; Types of computer and their characteristics – analog, digital, hybrid, micro, mini, mainframe and super computers; Types of PC's and their characteristics – Desktop, Laptop, Notebook and Palmtop; Basic components & Block diagram of computer system – Control Unit, ALU, Memory (RAM, ROM, EPROM, PROM); Input & Output Devices – Keyboard, Mouse, Trackball, Joystick, Scanner, MICR, OCR, Touch Screen; Monitor – Types – Digital, Analog, Characteristics- size, resolution, refresh rate, interlaced/non-interlaced, dot pitch, video standard- VGA, SGVA, XGA; Printer- Daisy wheel, dot matrix, inkjet, laser; Plotter.

UNIT-II

Storage devices- Storage fundamentals- Primary and Secondary; Data storage and retrieval method- sequential, direct and index sequential; Various storage devices- Magnetic tape, magnetic disk, cartridge tape, data drives, hard disk drives, floppy drive, pendrive; Number system- data representation in computers, number system of computers – binary, octal, decimal, hexadecimal- representation and their conversion; Computer software- Need, types of software-system software and application software; System software-Operating system, assembler, compiler & interpreter; Operating Systems-functions, types-batch, single user, multi-user, multiprogramming, multiprocessing; Programming language-machine, assembly, high level, their merits and demerits, Application software-word processor, spreadsheet, presentation graphics, database management software-their characteristics, uses, examples and area of applications.

UNIT-III

MS Word – Introduction to MS Word- Creating and saving a document, opening an existing file, saving a file using a new name; Editing a document- inserting, overwriting and deleting text, cut, copy and paste, correcting spelling and grammatical errors, using the Thesaurus, finding and replacing text; Formatting text- character formatting, paragraph formatting and document formatting; Advanced formatting and editing techniques- bullets and numbering, borders and shading, changing case, auto correct tool, working with tables and pictures; Mail merge- merging excel to word.

UNIT-IV

MS PowerPoint- Introduction & area of use, Creating a new presentation, saving, closing and opening a presentation, inserting, deleting and copying slides, slide setup, slide master, adding animation and transition effect, slide show, printing presentation.

UNIT-V

MS Excel – Introduction, workbook and worksheet, understanding ranges, selecting cells, edition data, rearranging cell contents, saving a workbook, opening an existing workbook, protecting a workbook; Formulae in Excel- addressing method, using auto sum, functions; Formatting data- cell formatting, using auto format, row format; Managing workbooks- inserting sheets, copying and moving sheets, renaming sheets, deleting sheets; Managing data- data list, sorting data, filtering data, automatic subtotals; working with charts.

TEXTBOOKS:

1. Pooja Jain, “Computer Basics”, Pee Vee books
2. S.K Basandra, “Computers Today”, Galgotia Publications

REFERENCES:

1. Anurag Seetha, “Introduction to computer and information technology”, Ram Prasad & Sons
2. Virginia Anderson, “The Complete Reference Microsoft Office 2007”, Tata McGraw Hill Edition

Course: CONCEPTS OF ALGORITHMS & PROGRAMMING

Code: BCA102

Credits: 3

OBJECTIVES: C provides an introductory programming course for student before they take up any programming language. C is reliable, simple and easy to use. Before learning other higher programming language, learning C in the first stage is important.

UNIT-I

Introduction to Programming-Computer Programming, Programming Technique, Procedural Programming ,Object Oriented Programming; Design of Algorithm- Definition ,Features of Algorithm, Development of Algorithm for simple problems; Flowcharts-Definition, Features of Flowchart, Basic Symbols used in Flowchart, Development of Flowchart for simple problem; Fundamentals of C Programming - character set, Keywords, identifier, Datatypes, statement, Symbolic constant; Input/ output statement- getchar, putchar, scanf, printf, gets, puts; Operators and expression – arithmetic, relational , unary, logical, assignment operator, conditional operator

UNIT-II

Control statement- if statement, if – else statement, nested if – else statement.. Loop control structure: while, do – while, for, switch, break, continue, goto. Array: single and multi dimensional array, array declaration and initialization; Strings - declaration, initialization, standard library string functions

UNIT-III

Functions-Need and definition, user defined and library function, declaration and prototype, function arguments, return values and nesting of function, calling of function, recursion

UNIT-IV

Structures: Structure declaration, accessing structures elements, nested structures, array of structures, uses of structures. Unions, unions of structures; Pointers- Introduction to pointers, Dynamic memory allocation; Files- fopen(), fclose(), fseek()

UNIT- V

Graphics Programming: Library file- graphics.h, 2-D Coordinate system, Simple Graphics Functions(initgraph(), line(), circle(), arc(), rectangle(), ellipse(), drawpoly(), closegraph(), restorecrtmode(), setfillstyle(), putpixel(), getmaxx(), getmaxy(), outtextxy(), setcolor(), fillcolor(), settextstyle(), moveto(), lineto(), moverel(), linerel()) Pallete and color, Animation functions(imagesize(),getimage(),putimage())

TEXTBOOKS:

1. E. Balagurusamy, “Programming in C”, TMH Publications
2. Peter Juliff, “Program design”, PPH Publications
3. E. Balagurusamy, “Programming in C++”, TMH Publications.

REFERENCES:

1. Yashavant Kanetkar, “Let Us C”, BPB publications
2. S.K Basandra, “Computers Today”, Galgotia Publications
3. Gottfried, B. S., “Theory and Problems of Programming with C”, New Delhi: Tata McGraw-Hill Publication, 1997

Course: CAP-PRACTICAL

Code: BCA103

Credits: 3

OBJECTIVE: To enable students to program different problem using C language and introduce the basics of C++.

LIST OF PROGRAMS:

1. Development of Algorithm for simple problem.
2. Development of Flowcharts for simple problem.
3. Program to simulate a simple Calculator that performs Arithmetic Operations.
4. Program to implement Decision Control statements.
5. Program to implement Looping Structures.
6. Program to implement Arrays and Multi-Dimensional Arrays.
7. Program to implement Functions.
8. Program to perform String Handling Functions.
9. Program to demonstrate Structure and Union.
10. Program to demonstrate the use of Pointer concepts.
11. Program to demonstrate Basic C++ program.

Course: BASICS OF WEB DESIGNING-PRACTICAL

Code: BCA104

Credits: 3

OBJECTIVE: To enable students to design websites using HTML 4, CSS 2 and Javascript.

LIST OF PROGRAMS:

1. Creating web page using basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image; different attributes like align, color, bgcolor, font face, border, size
2. Write HTML code to develop a Web page having the background in red and title "My First Page" in any other color
3. Create an HTML document giving details of your name, age, telephone number, address, TLC code & enrolment number aligned in proper order
4. Write an HTML code to design a page containing text, in form of paragraphs giving suitable heading style
5. Create a page to show different attributes of Font tag
6. Create a page to show different attributes: italics, bold, underline
7. Creating web page having navigation links using anchor tag, internal, external, mail and image links; lists-ordered, unordered
8. Creating web page having table tag; HTML Form controls-form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frame
9. Write an HTML code to create a Web page of blue color and display links in red colour
10. Create a Web page with appropriate content and insert an image towards the left hand side of the page. When user clicks on the image, it should open another Web page
11. Create a Web page, which should contain a table having two rows and two columns.
12. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows.
13. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows and then divide the second row into two equal columns.
14. Write an HTML code to develop a Web page having frames as described in the above question and then fill each frame with a different background color
15. Design a page with a text box called 'name' and a button with label 'Enter'. When you click on the button another page should open, with the message "Hello < name > ", where name should be equal to the name entered in the first page
16. Design a Web Page, which is like 'compose' page of e-mail 1. Design a Web Page, which is like 'compose' page of e-mail
17. Writing programs implementing cascading style Sheet (CSS), CSS syntax, comments, id and class, background color, background image- text - text color, text alignment, text decoration, text transformation, text indentation; CSS font - font families, font style, font size - setting text size , using pixels and em; CSS lists - different list item markers, unordered list, ordered list, an image as the list item marker
18. Writing programs implementing CSS tables - table borders, collapse borders, table width and height, table text alignment, table padding, table color; CSS positioning - static

- positioning, fixed positioning, relative positioning, absolute positioning, overlapping elements, float, horizontal align, image gallery, image opacity/transparency
19. Writing program using Javascript tag, comments, variables, document methods-write and writeln methods, alert; operators-arithmetic, assignment, relational, logical, javascript functions, conditional Statements, loops, break and continue; events familiarization-onLoad, onClick, onBlur, onSubmit, onChange
 20. Write a JavaScript code to create a pull down menu box.
 21. Write a program to move a text with mouse pointer and to change colour of text randomly
 22. Create a Web page using two image files, which switch b/w one another as the mouse pointer moves over the image. Use the On Mouse over and On Mouse out event handler
 23. Create an HTML form that has a number of text boxes. The user fills the textboxes with data. Write a script that verifies that all textboxes have been filled. If a text box has been left empty pop up an alert message indicating the box that has been left empty. When OK button is clicked, set focus to that specific textbox. If all the textboxes are filled, display thank you.

TEXTBOOK:

1. Julie C. Meloni, "Sams Teach Yourself HTML, CSS And JavaScript All In One", Pearson Publication

REFERENCES:

1. Craig Grannell, "The Essential Guide to CSS and HTML Web Design", Apress Publication
2. Thomas Powell, "HTML & CSS: The Complete Reference", McGraw Hills Publication

Course: PC SOFTWARE and HARDWARE-PRACTICAL

Code: BCA105

Credits: 3

OBJECTIVE: This Course intends to familiarize the students with MS Office and its applications and PC assembling.

CONTENTS:

1. Introduction to MS Word and its area of use
2. Identify the different components of the document window and their functions
3. Creating and saving a document, open an existing file and saving a file using a new name
4. Protecting the document window using a password
5. Document creation- text selection and editing, cut, copy, paste, finding and replacing text
6. Formatting the text- font and size selection, alignment and spacing of text, paragraph indenting, bullets & numbering, headers & footers and changing case
7. Working with themes, table of contents, watermark, margins, size and orientation of page
8. Working with hyperlink, columns, drop cap, page setup, print preview and printing of documents
9. Working with tables- insert table, changing cell width & height, alignment of text in cell, insert / delete rows and columns, merging & splitting of cells
10. Working with pictures- picture style, aligning, text wrapping & cropping
11. Working with mail merge

12. Introduction to MS PowerPoint and its area of use
13. Identify the different components of the PowerPoint window and their functions
14. Creating and saving a presentation, open an existing presentation and saving it using a new name and Protecting the presentation using a password and working with slides- insert, delete and copying of slides
15. Working with themes- color, fonts & effects, slide design, background styles, animation and transition effects, setting the slide timer
16. Working with tables, hyperlinks, insert textbox, slide number, header & footer, wordart
17. Creating a photo album, picture and clipart and working with media clips- insert movie and sound clip
18. Changing page setup, slide orientation, printing a presentation and running the presentation using the slide show and function key
19. Introduction to MS Excel and its area of use and
20. Identify the different components of the excel window and their functions
21. Understanding what is a workbook, worksheet, cells, range and auto fill handle Open, save, close & renaming a workbook and Protecting the workbook using a password
22. Inserting worksheets, copying & renaming sheets, deleting sheets, editing text, selecting cells, rearranging & merging of cell contents and working with cell formatting using auto row format, row and column formatting, cell border, hyperlink
23. Working with formula using addressing method, auto sum and functions, merging from excel workbook to word document
24. Managing data-sorting data, filtering data, freezing rows & columns, cell contents, working subtotals and data form and working with charts
25. Understanding the different components of a desktop computer
26. Understanding the different brands of the components
27. Assembling a computer
28. Partitioning and Installing operating system and drivers
29. Installing application soft wares
30. Troubleshooting RAM, hard drive, SMPS problems

Course: FOUNDATION MATHEMATICS

Code: MATH101

Credits: 3

OBJECTIVE: To provide foundations and concept related to mathematical skills and knowledge for understanding the basic rules of mathematics.

UNIT-I

Sets – Brief review of basics in set theory such as ways of describing a set, Finite and Infinite Set, Set Operation, Union, Intersection of Set, Complement of Sets, Empty Set, Disjoint Set, De Morgan's Law, Power Sets Cartesian Product, Simple Applications

UNIT-II

Relations and functions – Relations on a Set, Reflexive, Symmetric, Anti – Symmetric, Transitive, Examples, Equivalence Relations and Equivalence Classes, Function/Mapping

from A to B as a Rule of Correspondence, Identity Maps, Inclusion Map, Composition of Maps, Associatively, Onto or Into and One- One Functions, Bijective Maps Simple Applications

UNIT-III

Matrices – A brief review of $M \times N$ Matrix, Square Matrix, Equality of Matrices, Addition, Scalar Multiplication and Product of Matrices, Transpose, Conjugate Transpose, Inverse of a Matrix, Special Types of Matrices: Diagonal, Upper/Lower Triangular, Nilpotent, Idempotent, Symmetric, Skew Symmetric, Hermitian, Skew Hermitian Matrices, Trace of a Square Matrix

UNIT-IV

Matrices (Continue) – Elementary Operations, Elementary Matrices, Row/Column Rank, Rank of a Matrix, Determination of the Rank by Elementary Operations, Determinants Properties (without proof), Adjoint of a Matrix, Inverse in Terms of Adjoint, Cramer's Rule

UNIT-V

Binary Operations, Properties of Binary Operations, Commutative and Associative Binary Operations, Identities and Inverses, Examples, Groups: Definition, Detailed Study of Groups such as \mathbb{Z} , \mathbb{N} , \mathbb{Q} , \mathbb{R} , group Tables of Groups of low order, Uniqueness of Identity and Inverses, Order of a Group, Problems

TEXTBOOK:

1. Vasishtha, A.R and Vasishtha, A.K.”Modern Algebra”, Krishna Prakashan Media Pvt. Ltd

REFERENCE:

1. Bhattacharya, P.B., Jain, S.K and Nagpaul, S.K., “A First Course Linear Algebra “ Wiley Eastern Publication.

Course: PROBLEM SOLVING PROFICIENCY

Code: BCA106

Credits: 2

OBJECTIVE: To provide foundation and concepts related to mathematical skills and knowledge for understanding the basic rules of mathematics.

UNIT-I

Arithmetic Ability - Number, LCM and HCF, Fraction, Simplification, Square and cube root, Average, Problem on ages, Surd and indices, Percentage, Profit and loss, Ratio and proportion, partnership, time & work, time and distance, allegation or mixture, Simple & compound interest, area, volume and surfaces, clock & calendar.

Permutations and Combinations: Fundamental principle of counting. Factorial n . Permutations and combinations derivation of Formulae and their connections, simple applications.

Data interpretation: Tabulation, graph and chart

UNIT-II

Principle of Mathematical Induction: Process of the proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple applications.

Complex Numbers and Quadratic Equations: Need for complex numbers, especially i , to be motivated by inability to solve every quadratic equation. Brief description of algebraic properties of complex numbers. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system, Square-root of a Complex number.

Linear Inequalities: Linear inequalities, Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables - graphically.

Binomial Theorem: History, statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, general and middle term in binomial expansion, simple applications.

Sequence and Series: Sequence and Series. Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), general term of a G.P., sum of n terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean (G.M.).

Relation between A.M. and G.M. Sum to n terms of the special series: $\sum n$, $\sum n^2$ and $\sum n^3$

UNIT-III

Mathematical Reasoning - Mathematically acceptable statements. Connecting words/phrases - consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety of examples related to real life and Mathematics. Validating the statements involving the connecting words - difference between contradiction, converse and contrapositive.

UNIT-IV

Statistics: Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

Probability: Random experiments: outcomes, sample spaces (set representation). Events: Occurrence of events, 'not', 'and' & 'or' events, exhaustive events, mutually exclusive events. Axiomatic (set theoretic) probability, connections with the theories of earlier classes. Probability of an event, probability of 'not', 'and', & 'or' events.

UNIT-V

Straight Lines: Brief recall of 2-D from earlier classes, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line. Equation of family of lines passing through the point of intersection of two lines. Distance of a point from a line.

Conic Sections: Sections of a cone: Circles, ellipse, parabola, hyperbola, a point, a straight line and pair of intersecting lines as a degenerated case of a conic section. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.

Introduction to Three-dimensional Geometry - Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula.

TEXTBOOKS:

1. R. D Sharma, “Mathematics Vol. 1 & 2”, Dhanpat Rai Publications; 2017 edition
2. NCERT Materials on Mathematics

REFERENCES

1. R.S Aggarwal, “Quantitative Aptitude, S Chand Publications; 20th edition
2. NPTEL Materials

Course: PROGRAMMING WITH JAVA

Code: BCA111

Credits: 3

OBJECTIVES: To adapt to changes in environment and to implement advances in the art of programming. Java also embodies changes in the way that people approach the writing of programs. For example- Java enhanced and refined the object-oriented paradigm used by C++, added integrated support for multithreading, and provided a library that simplified Internet access.

UNIT-I

Basic concepts of OOP-Benefits and Applications of OOP; Java Evolution -Java History and Features, Difference of Java from C and C++, Java and Internet, Java and WWW, Web browsers, Hardware and Software requirements, Java Support systems, Java Environment; Overview of Java Language-Simple java Program, An application with two classes, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, JVM, Command Line Arguments, JIT, Bytecodes

UNIT-II

Constants, Variables, Arrays and Data Types; Operators and Expressions- Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, bitwise Operators. Arithmetic Expression and Evaluation, Conversion and Casting Decision Making and Branching - If statement-If...Else statement-Nested If...Else statement- Switch Statement- Conditional Operator; Decision making and Looping-While, do, for Statements, Jumps in loops

UNIT-III

Classes, Objects, Methods ; Inheritance; basic swings; Interfaces: Multiple Inheritance; Packages-Putting Classes together; Introduction to Multithread Programming,, Multi threading, Thread Life cycle, Multi threading advantages and issues, Simple thread program, Thread synchronization.

UNIT-IV

Managing Errors and Exceptions; I/O Basics, Reading Console Input, writing Console Output; Networking

UNIT-V

GUI: Introduction to AWT programming, Layout and component managers, Event handling, Applet class; Applet life cycle, Passing parameters, embedding in HTML, Applet Basics and Applet Programming; Graphics programming; Swing components, JApplet, JButton, JFrame, etc. Sample swing programs, The Java Library: Strings

TEXTBOOKS:

1. Herbert Schildt, “The Complete Reference Java 2”, Fifth Edition, Tata McGraw Hills Publishing Company Limited.
2. E Balagurusamy, “Programming with Java- A Primer”, Third Edition, Tata McGraw Hill Publishing Company Limited.

REFERENCES:

1. John Hubbard, “Programming with Java”, Schaum’s Outlines, Tata McGraw Hill Publishing Company Limited.
2. Cay S. Horstmann, “Core Java, Volume I : Fundamentals (English)”, 9th Edition
3. Joyce Farrell, “Java Programming”, Seventh Edition

Course: FUNDAMENTAL OF OPERATING SYSTEM

Code: BCA112

Credits: 4

OBJECTIVES: To describe the major components of an operating system, their functions and purpose to achieve the various case studies of different types of Operating System.

UNIT-I

Introduction – Definition, Types of Operating System, Functions of the Operating System, Operating Systems Services, System Components, System Calls, Single User, Multi User and Multitasking Operating System

UNIT-II

Process Management – Process, Scheduling, CPU Scheduling Concepts, Process Synchronization, Semaphore, Classical Problems of Synchronization, Deadlocks, Deadlock Detection, Deadlock Recovery

UNIT-III

Memory Management – Introduction, Logical address V/s Physical address, Swapping, Contiguous Allocation, Partitioned Memory Allocation, Fragmentation, Paging, Segmentation, Virtual Memory, Page Replacement, Page Replacement Algorithms, Frame Allocation Algorithm

UNIT-IV

File Management – File concepts, Access Methods, Directory Structure, Allocation Methods, Free Space Management, Secondary Storage Structure, Disk Scheduling, FCFS Scheduling, Disk Management

UNIT-V

Distributed System and Security – Client/Server Computing, Remote Procedure Calls, Clusters, Threats and its Goals, Types of threats, Protection Mechanism, Digital Signature, Case Study on MS-DOS, Windows NT, Windows XP, Windows 7, Windows Ultimate, Android, Jelly Beans

TEXTBOOKS:

1. Stalling, W., “Operating system,” Sixth Edition, Prentice Hall (India)
2. Sibsanakar Haldar and Alex A. Aravind, “Operating Systems”, Pearson Education.

REFERENCE:

1. Abraham Silberschatz and Peter Baer Galvin, “Operating System Principles”, Seventh Edition, Wiley-India Publication

Course: PROGRAMMING WITH JAVA-PRACTICAL

Code: BCA113

Credits: 3

OBJECTIVES: To adapt to changes in environment and to implement advances in the art of programming. Java also embodies changes in the way that people approach the writing of programs.

CONTENTS:

1. To implement simple program based on operator loop decision statements
2. To implement Program to define Class and instantiate Objects
1. Program to implement constructor and Method overloading and Method overriding
2. Program to create components using Swing
3. Program to implement Wrapper Class and command line argument
4. Program to demonstrate packages and interfaces
5. Program to demonstrate Single level and Multi level inheritance
6. Program to demonstrate Exception Handling
7. Program to demonstrate Multithreading and Synchronization
8. Program to implement Server and client using networking
9. Program s using Applet Class
10. Program to perform String Class and String Buffer Class

Course: BASICS OF LINUX OPERATING SYSTEM- PRACTICAL

Code: BCA114

Credits: 2

OBJECTIVE: To provide the essential skills needed to be proficient at the Linux operating system.

CONTENTS:

1. Installing Ubuntu Linux
2. Working with Ubuntu Desktop- Main Menu, System Settings, Launcher , Various Applications (eg: Libre office, Video player, calculator etc), Changing the theme of the Desktop, Remove and add applications in the Launcher, Use multiple desktops, Internet connectivity, Sound settings Time and Date settings and switch to other user accounts
3. Working with Synaptic Package Manager
4. Working with Ubuntu Linux Software Center- Ubuntu-Software-Center, Installing softwares through Ubuntu Software Center
5. To work with different linux basic commands- Command interpreter, Shell, Using man, Apropos, Whatis, Using --help option,
6. Working with General Purpose Utilities in Linux-echo, uname, who, passwd, date, cal, pwd, ls, cat
7. Working Linux File system-file, directories, File node, types of file, home directories, current directories, change directories, mkdir, rmdir; regular file-cat, rm, cp, mv, cmp, wc
8. Working with linux file attributes- chown, chmod, chmod -R, displaying files with ls -l, chmod u+, chmod a-w, chmod g+w, chmod -r, chgrp, inode, hard link, symbolic link
9. Working with redirection pipes- Input, output and error stream, Redirection : > and >>, Pipes : |
10. Working with linux environment variable- set command env command SHELL, HOME, PATH, LOGNAME, PS1, PS2 history ! and ~ ali..
11. Implementing basic system administration-root login-su ,user management - UID, GID, useradd, usermod, userdel Discs – Du, df
12. Working with the grep command-to see the content of a file, to list the entries of a particular stream, to ignore cases lines that do not match the pattern, to list, to match more than one pattern, to check a word that has different spelling, character class, the use of *,to match any one character using dot, to match a pattern at the beginning of the file, to match a pattern at the end of the file

TEXTBOOKS:

1. Richard Petersen, “The Complete Reference Linux”, First Edition, Tata McGraw Hills Publishing Company Limited.
2. Keir Thomas, “Beginning Ubuntu Linux: From Novice to Professional”, Third Edition, APress Publication

REFERENCES:

1. Christopher Negus, John Wiley & Sons , “Linux Bible”, 9th Edition

2. James K. L, “Linux: Learning the Essentials”, First Edition, PHI

Course: FUNDAMENTAL DISCRETE MATHEMATICS

Code: MATH111

Credits: 3

OBJECTIVE: To make students understand the basic concepts of discrete mathematical structure like set, relations, functions, propositional logics.

UNIT-I

Relations and functions-properties of relations, equivalence relation, partial order relation
function: domain and range, onto, into and one to one functions, composite and inverse functions

UNIT-II

Propositional Logic-Proposition, First order logic, Basic logical operation, truth tables, tautologies, contradictions, logical implications, logical equivalence, predicates, Universal and existential quantifiers

UNIT-III

Boolean algebra-definition and properties of boolean algebra, a brief introduction to the application of boolean algebra to switching theory, conversion of complicated switching circuits to simple one, disjunctive and conjunctive normal forms

UNIT-IV

Functions- characteristic function, composition of functions, binary and n-ary operations, hashing function, recursive functions, permutation functions

UNIT-V

Algebraic systems- semigroups and monoids, groups, subgroups, normal subgroups and quotient groups, cyclic groups, homomorphism and isomorphism

TEXTBOOK:

1. C.L.Liu, ” Elements of Discrete Mathematics”, McGraw Hill

REFERENCES:

1. Trembley, J.P & R. Manohar,” Discrete Mathematical Structure with Application to Computer Science”, TMH
2. Doerr Alan & Levasseur Kenneth, “Applied Discrete Structures for Computer Science”, Galgotia Pub. Pvt. Ltd

Course: FUNDAMENTAL OF COMPUTER ORGANIZATION AND ARCHITECTURE
Code: BCA201
Credits: 4

OBJECTIVES: This course aims to provide the student with a basic knowledge necessary to understand the operation of digital computers and covers the organization, architecture and design associated with computer hardware. A prior knowledge of Boolean algebra, number systems and gates will be helpful to the student.

UNIT-I

Logic Gates, Boolean Algebra, Map Simplification, Combinational Circuits (Half -Adder, Full-Adder, Binary Parallel Adder, BCD Adder, Universal Property of NAND and NOR gates, Combinational Circuits using NAND and NOR gates); Flip flops (SR, D, JK, T, Master Slave, Edge-Triggered, Excitation Tables); Sequential Circuits (Latches, Flip-Flop Input Equations, State Table, State Diagram, Design Example, Design Procedure)

UNIT-II

Integrated Circuits (Digital Logic Families and Integrated Circuits); Decoders (NAND Gate Decoder, Decoder Expansion, Encoders); Multiplexes (4 to 1 Line Multiplexer, Data Selector); Demultiplexer; CodeConverter; Registers (Register with Parallel Load); Shift Registers (Bidirectional Shift Registers with Parallel Load, Serial Register); Binary Counters (Binary Counter with Parallel Load, Ripple Counter); Memory Unit (Random-Access Memory, Read-Only Memory, Types of ROMs)

UNIT-III

Data Types; Compliments; Fixed Point Representation; Floating Point Representation; Gray Code; Register Transfers ; Bus and Memory Transfers (Three-State Bus Buffers, Memory Transfer); Arithmetic Microoperations (Binary Adder, Binary Adder-Subtractor, Binary Incrementer, Arithmetic Circuit); Logic Microoperations (List of Logic Microoperations, Hardware Implementation, Some Applications (viz. Selective-Set, Selective-Complement, Selective-Clear, Mask, Insert, Clear Operations); Shift Microoperations (Hardware Implementation); Arithmetic Logic Shift Unit (Function Table for Arithmetic Logic Shift Unit)

UNIT-IV

Instruction Codes (Stored Program Organization, Indirect Address); Computer Registers; Common Bus Systems; Computer Instructions (Instruction Set Complements); Timing and Control (Clock Pulses, Hardwired Control, Microprogrammed Control, Control Unit, Timing Signals); *Instruction Cycle* (Fetch and Decode, Determine the Type of Instruction, Register-Reference Instructions); Memory-Reference Instructions (AND to AC, ADD to AC, LDA: Load to AC, STA: Store AC, BUN: Branch Unconditionally, BSA: Branch and Save Return Address, ISZ: Increment and Skip If Zero, Control Flowchart); Input-Output and Interrupt (Input-Output Configuration, Input-Output Instructions, Program Interrupt, Interrupt cycle); Computer Description (Flowchart for Basic Computer); Design of Basic Computer (Control of Logic Gates,

Control of Registers and Memory, Control of Single Flip-Flops, Control of Common Bus); *Design of Accumulator Logic* (Control of AC Register, Adder and Logic Circuit)

UNIT-V

Introduction to Major Components of a CPU; General Register Organization; Stack Organization; Instruction Formats; Addressing Modes; Data Transfer and Manipulation; ProgramControl; Reduced Instruction Set Computer; Characteristics of Multiprocessors Input Output Interface ;Asynchronous Data Transfer; Modes of Transfer; Priority Interrupt Direct MemoryAccess; Main Memory; Auxiliary Memory; Associative Memory; CacheMemory; Virtual Memory; Memory Management

TEXTBOOK:

1. M. Morris Mano, "Computer System Architecture", Prentice Hall of India Pvt. Ltd

REFERENCES:

1. M. Morris Mano, "Digital Logic and Computer Design", Prentice Hall of India Pvt. Ltd
2. M. Morris Mano, "Computer Engineering Hardware Design", Prentice Hall, Inc
3. P. Pal Choudhuri, "Computer Organization and Design", Prentice Hall of India Pvt. Ltd

Course: PERSONALITY DEVELOPMENT

Code: BCA314

Credits: 2

OBJECTIVE: To provide for all round development of students for their survival in this competitive world and to withstand in the race.

UNIT-I

Team Work: Introduction, Working in a team, Effective Team, Team Mission Statement, Team Leader, Team member, Team Failure, Establish Goals and Objectives, Team Contract.

UNIT-II

Communication Skills: Active Listening, Give and Receive Feedback, Development of a Masterful Communication Style, SAVE, SOLENS, Resolve Conflict, Review Performance, Nonverbal Communication in Leadership, Effective Meetings.

UNIT-III

Leadership: Definition, Nurturing Leadership, Transformational Leadership, Positive Leadership, Professional Leadership, Time Management, Effective Communication in Leadership, Learning to Lead.

UNIT-IV

Personality Development: Understanding yourself, Understanding others, Understanding how you affect others, Learning to say no, Negative Self-talk, Positive Self-Talk, Respecting Seniority, Honesty, Humility, Ambition, Hard work, Living the values, Learning and renewal.

TEXTBOOK:

1. Barun K Mitra, "Personality development and soft skills", Oxford Education

REFERENCE:

1. Ram Sharma, "New Aspects of Personality Development and Communication Skills", Neha Publishers & Distributors.

Course: COMPUTER NETWORKS

Code: BCA202

Credits: 4

OBJECTIVE: To understand state-of-the-art in network protocols, architectures, and applications, process of networking.

UNIT-I

Introduction – Basic Communication Model, Data Communications, Computer Network Criteria, Types of connections; Network topology types – Bus Topology, Ring Topology, Star Topology, Mesh Topology and Tree Topology; Man, Wan, LAN; Goals and Applications of computer networks, Network Functions, Network Hardware, Designs Issues for layers, Interfaces and Services, Connection oriented and Connectionless Services; Introduction to OSI Model – Functions of each layers, The TCP/IP Reference Model, Comparison of OSI and TCP/IP Models, Physical Layer, Digital Signals, Data Transmission Concept; Types of transmission – Wired and Wireless Media and its types, Satellite Networks and its types; Packet Switching; Message Switching; Broadband ISDN;

UNIT-II

Introduction to Data Link Layer ;Services Provided by the Data Link Layer to the Network Layer; Framing; Farming Methods – Character Count and Bit Stuffing; Error Control; Introduction to Error Detection and Correction; Error Detection – Content Error and Flow Integrity Errors; Two Dimensional Parity Check; Cyclic Redundancy Check – CRC generator and CRC checker; Check Sum; Hamming Codes, Flow Control; Sliding Window Protocol; Automatic Repeat Request (ARQ) ARQ techniques – Stop and Wait ARQ, Go BACK –n ARQ and Selective Repeat Request;

UNIT-III

Medium Access Layer – CSMA , CSMA/CD, Collision – Free Protocols; IEEE 802 Standards; Token Bus – IEEE 802.4;Token Ring – IEEE 802.5;Introduction to Network Layer; Routing algorithm – Static Algorithm - Dijkstra's Algorithm, Bellman-Ford routing algorithm, Flooding, Flow Based Routing; Dynamic Algorithm - Distance Vector Routing Algorithm and , Count to Infinity Problem, Link State Routing Algorithm; Congestion - Open and Close Loop Control; Congestion control in Datagram Subnets; Traffic Shaping - Leaky bucket and Token Bucket; Fragmentation; Firewall; Tunneling; IP address and its classes; Unicast and Multicast Routing;

UNIT-IV

Transport Layer – Transport layer Services; Sockets and its types; Addressing in Transport Layer; Crash Recovery; TCP and UDP; TCP Protocols; TCP Segment Header; Check Sum; TCP transmission Policy – Silly Window Syndrome; TCP Congestion Protocol; Session Layer and Presentation Layer; Domain Name System; Electronic Mail; MIME; SMTP; Email- Gateways; FTP; TFMP; Caching; Mail Server;

TEXTBOOKS:

1. A.S. Tannenbaum, “Computer networks”, Second Ed., Prentice Hall India.
2. Halsall, “Data Communication, Computer Networks”, Pearson Education.

REFERENCE:

1. D. Bertsekas and R. Gallager, “Data Networks”, PHI Second Edition.

Course: DATA STRUCTURE AND ALGORITHMS

Code: BCA203

Credits: 3

OBJECTIVES: To understand the different methods of the algorithm, its efficiency and the fundamental component of problem solving for organizing large amounts of data to be efficiently implemented to solve a specific problems.

UNIT-I

Introduction – The concept of data structure, Abstract data type, Concept of list & array, Recursion Functions and its implementation; Introduction to Stack – Stack as an abstract data type, primitive operation on stack, Stacks application: Infix, post fix, prefix and recursion, multiple stack

UNIT-II

Introduction to the linked list – Basic operations on linked list, Stacks and queues linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks and queues as a circular linked list, application of linked list; Introduction to queues – Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue;

UNIT-III

TREES – Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree; Traversal of binary trees – Inorder, Preorder & Post order, Application of Binary tree, Threaded binary tree, B-tree & Height balanced tree, Binary tree representation of trees;

UNIT-IV

Sorting – Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods, Hash Table, Collision resolution Techniques; Introduction to graphs –

Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal- Depth first & Breadth first search, Spanning Trees minimum spanning Tree, Shortest path algorithm;

TEXTBOOKS:

1. A .A Puntambekar, “ Data structures Using 'C' “, Technical Publications
2. E. Balagurusamy, “ Data Structures Using C “, TATA McGraw-Hill

REFERENCES:

1. Yashavant Kanetka, “Data Structures Through C”, BPB Publication
2. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, “Data Structures Using C”, Pearson Education India
3. Kruse, Tondo & Leung, “Data Structures and Program Design”, PHI publication.

Course: DATA STRUCTURE AND ALGORITHMS-PRACTICAL

Code: BCA204

Credits: 3

OBJECTIVES: To understand the different methods of the algorithm, its efficiency and the fundamental component of problem solving for organizing large amounts of data to be efficiently implemented to solve a specific problems.

LIST OF PROGRAMS:

1. Implementation of Concatenation & length using for
2. Implementation of Comparison & length using for
3. WAP to Access substring
4. WAP to find the Factorial using recursion
5. WAP to find the GCD of a number using recursion
6. WAP to find the Tower of Hanoi using recursion
7. WAP to find the Fibonacci Series using recursion
8. WAP to implement Insertion in an Array
9. WAP to implement Deletion in an Array
10. WAP to perform Binary output
11. WAP to implement Linear Binary & Sort
12. WAP to implement Bubble sort
13. WAP to implement Insertion
14. WAP to implement Select
15. WAP to implement Merge
16. WAP to implement Quick
17. WAP to implement BST & Tracing
18. WAP to Create a Linked list
19. WAP to implement Insertion in a linked list
20. WAP to implement Deletion in a linked list
21. WAP to implement Searching in a linked list
22. WAP to implement Double Linked list

- 23. WAP to implement Circular Linked list
- 24. WAP to implement Stack push and pop array
- 25. WAP to implement Stack Linked list
- 26. WAP to implement Queue Array and Linked List
- 27. WAP to implement Double and circular Queue
- 28. WAP to implement Circular Stack

Course: NUMERICAL AND STATISTICAL METHODS

Code: MATH201

Credits: 3

OBJECTIVE: To enable students to use different numerical and statistical methods.

UNIT-I

Solution of Linear Equation – Bisection Method, Regular Falsi Method, Secant Method, Newton – Raphson Method for Solving Polynomial Equations Rate of Convergence for these Methods

UNIT-II

Solution of Linear Equation Simultaneous Equation – Cramer’s Rule, Gauss Elimination Method, Gauss – Jordan Elimination Method and to Find Inverse of a Matrix by this Method, Gauss – Jacobi and Gauss – Seidel Method

UNIT-III

Interpolation – Lagrange’s Interpolation Polynomials, Newton Divided Difference Interpolation, Newton Forward Difference and Backward Difference Interpolation

UNIT-IV

Sequence – definition, bounded sequence, upper bounded of a sequence, lower bounded of a sequence; series - infinite series, geometric series, comparison test, ratio test, radius of convergent, applications

UNIT-V

Frequency distribution and frequency charts, histogram, frequency polygons, frequency curves and cumulative frequency distribution, ogives; measures of central tendency- arithmetic mean, weighted arithmetic mean, geometric mean, harmonic mean, median, mode, quartiles, deciles and percentiles; measures of dispersion-range, mean deviation, semi-inter quartile range for quartile deviation, absolute and related dispersion, coefficient of variation

TEXTBOOKS:

1. Rajaraman, V, “Computer Oriented Numerical Methods”, Prentice Hall of India Pvt. Ltd. New Delhi
2. M. Ray and H. S. Sharma,” Mathematical Statistics “, Sultan Chan and Sons

REFERENCES:

1. Friedman, M and Kandel , “ Fundamental of Computer Numerical Analysis”, CRC Press, Boca Raton
2. V.K. Kapoor, S. C. Gupta,” Fundamentals of Applied Statistics”, Sultan Chand & Sons TMGH

Course: DATABASE MANAGEMENT SYSTEM

Code: BCA212

Credits: 3

OBJECTIVES: The objective of this Course is to introduce to the students the fundamental concepts necessary for designing, using and implementing database systems and applications. The Course stresses on database modelling and design, physical file storage techniques and language facilities provided by database management systems.

UNIT-I

Overview of the database management system[1]- Database systems , Need for Database ,Advantages of using a database, Characteristics of data in a database , Functions of DBMS, Data abstraction, Data independence, Overall Architecture of DBMS, Three level architecture; Data Models[1]- Relational Data Models, ER Model, Hierarchical models, Networking models, Advantages and Disadvantages of each models

UNIT-II

Entity Relationship model: Components, Symbols, Class and Objects, Attributes; Specialization –Aggregation; Relational Model[1]– Characteristics of Relational Database Model, CODD’s rules, Tables, Rows, Columns, Domains, Attributes, Candidate Key, Primary Key, Foreign Key, Super Keys, Unique Keys, Constraints; Normalization[1] - Purpose of Normalization, Functional Dependence, Relational database Design, Normal forms, 1NF, 2NF, 3NF, BCNF, 4NF

UNIT-III

Introducing MySQL[2] –History, Role of MySQL in industry, Version of MySQL, Architecture, Engines; MySQL queries[2]- Data types, operators, functions; Working with Databases and Tables-Creating, Copying, Modifying Tables

UNIT-IV

MySQL Advance [2]-Show commands, Working with date and Time data types, Joins like Cross, Inner, Outer, Self, Unions, Subquery, Procedure, Triggers, Views,index, MySQL database export and import

UNIT-V

Database Backup and Recovery: Hardware Protection and Redundancy; Transaction Logs; Importance of Backups; Database recovery; Data storage; Causes of failures ;Concurrency Control; Database Security and Integrity

TEXTBOOKS:

1. Abraham Silberschatz- Henry K. Korth- S. Sudarshan, "Database System Concepts", 4th edition, McGraw Hill International Edition
2. Vikram Vaswani, "MySQL (TM): The Complete Reference", Mc Graw Hill Education Publication

REFERENCES:

1. Madhilika Jain- Vineeta Pillai- Shashi Singh- Satish Jain, "A Level- Introduction to Database Management Systems", BPB Publications
2. R S Gill, "Database Management System", I K International
3. R Elmasri and S B Navathe, "Fundamentals of Database Systems", Pearson Publication
4. G. K. Gupta, "Database Management System", Tata McGraw Hill Publication

Course: DATABASE MANAGEMENT SYSTEM-PRACTICAL

Code: BCA213

Credits: 3

OBJECTIVES: The objective of this Course is to introduce to the students the fundamental concepts necessary for designing, using and implementing database systems and applications.

LIST OF PROGRAMS:

1. Working on MySQL DDL, DML, DTL Basic Data Types
2. Table Constraint definition Commands to create table
3. Commands for table handling Alter table, Drop table, Insert records
4. Commands for record handling Update, Delete Select with operators like arithmetic, comparison, logical Query Expression operators Ordering the records with orderby Grouping the records
5. MySQL functions Date, Numeric, Character, conversion Group functions avg, max, min, sum, count
6. Set operations Union, Union all, intersect, minus
7. Join concept Simple, equi, non equi, self, outer join
8. Query & sub queries
9. Working on View Intro, create, update, drop
10. Working with index
11. Primary introduction to User creation, granting privileges (Grant, Revoke, Commit, Rollback, savepoint)
12. Write a query in Mysql to create a table employee and department.
Employee(empno,ename,deptno,job,hiredate)
Department(deptno,dname,loc)
Include the following constraints on column of emp table.
 - a) to make the empno as primary key of the table and
 - b) to ensure that the ename column does not contain NULL values and
 - c) the job column to have only UPPERCASE entries and
 - d) to put the current date as default date in hire date column in case data is not supplied for the column.

Include the following constraints on column of dept table.

a) to make deptno as primary key.

b) to ensure dname,loc columns does not contain NULL values

Also enforce REFERENTIAL INTEGRITY, declare deptno field of dept table as primary key and deptno field of emp table as foreign key.

Course: CMS and Web Hosting

Code: BCA218

Credits: 1

OBJECTIVE: To enable students to host website and used content management system

UNIT-I

Introduction –What is web hosting, types of web hosting services-free, shared, dedicated, Colocated Hosting, Cloud hosting, Clustered hosting, Grid hosting, DNS; Web Server-Linux and Windows, Choosing a web host- Reliability and Speed, Creditability, Scalability and Portability

UNIT-II

Cpanel Hosting-Introduction to cPanel Hosting,Logging into cPanel, Logging into cPanel from Behind a Firewall,Main cPanel Interface, General Account Information, Resource Usage, Mail and FTP Information, General Server Information, Programming Language and Database Information, cPanel Information,FTP and cPanel's File Manager-FTP Basics,General FTP Tools, Configuring your FTP Client for use with your Main FTP Account, Creating and Managing FTP Accounts in cPanel,Creating a New FTP Account in cPanel,Monitoring your FTP Usage in cPanel, Anonymous FTP Access, cPanel FTP Session Control, Other Types of FTP Connections, Secure FTP, FXP Transfers, cPanel's File Manager, File Permissions

UNIT-III

Working with Databases in cPanel- Creating a Database, Creating a Database User, Adding a User to a Database, Removing or Repairing a Database; Controlling Access to and Organizing Data-Changing your cPanel Password, Subdomains, Redirects, Hotlink Protection: Stop People from Stealing Content, Password-Protect Directories, Leech Protect: Keep Users from Giving Away Access to your Site , Index Manager,IP Deny Manager,Custom Web Error Messages

UNIT-IV

Web Statistics: What's Going On?, Raw (Apache) Web Logs,Raw Log Control,Web Stats to the Rescue!

Analog, Awstats, Webalizer, Urchin, Statistics Configuration; Backing up and Restoring Data-Backups and their Importance,Home Directory Backup, Database Backup,E-mail Aliases (Forwarders) and Filters Backup, Full Backups, Automated Unattended Backups, Restoring Backups

UNIT-V

CMS- Working with Joomla CMS-installation, work areas, control panel, -toolbar; menu-content, component, extensions; Menus; Global setting; Joomla template; Plugins; Site Management-global configuration- site online and offline, metadata setting, change site url ,updating web site, updating extension, disabling and uninstalling extensions, back up site; Working with Wordpress- Installation, dashboard, post, media, pages, comments, Appearance-theme management, widgets, plugins, users, tools publishing,backups;

TEXT BOOKS:

1. Carl Burnham, “Web Hosting”, McGraw-Hill
2. Ron Severdia Kenneth Crowder,”Using Joomla”, Shroff Publications
3. David Damstra, Hal Stern, Brad Williams , “Professional Wordpress : Design And Development”, Wiley India Pvt Ltd

REFERENCES:

1. Tessla Blakerley, “Wordpress Theme Development”, Computer Bookshop
2. Mauresmo Pitt , “Wordpress Web Hosting”, Createspace
3. Peter Pollock, “Web Hosting for Dummies”, John Wiley and Sons

Course: SOFTWARE ENGINEERING

Code: BCA211

Credits: 4

OBJECTIVES: To provide the students with the concept of software engineering fundamentals, principles and skills needed to develop and maintain high quality software products and to make the students to learn the processes and techniques of software engineering which include requirements specification, design, implementation, testing and management of software projects.

UNIT-I

Introduction –Evolution, software definition, S/W types, S/W characteristics, Software failures; Software engineering: definition, Terminology, Components, Application, Myths, Software Engineering Process and Product;

UNIT-II

Software Development Life Cycle (SDLC) Models; SRS and S/W Design – Role of SRS, IEEE Standards for SRS Documents, Requirement Engineering; Structured Information – DFD and Data Dictionary ; Requirements specification design fundamentals – characteristic of SRS, SRS Validation , Components of SRS, Entity-Relationship Diagram;

UNIT-III

Software Project Planning, management and Metrics – Project management process, Measuring software, LOC and function point metrics, metrics for software quality; Estimation – Scope, resources, estimation technique, COCOMO model; Decomposition Technique – Empirical Models , automated tools; Design specification, design objectives and

principles, structured design, Modularity, Coupling, Cohesion, Structured design Methodology, Most Abstract Input(MAI); OO design; verification;

UNIT-IV

Coding and Testing – Program Development, Verification, Monitoring and Control; Testing fundamentals; testing principles and objectives, Functional Testing; Structural testing; Testing Strategies, level of testing, test plan, test case design

SQA and Software Maintenance – SQA Plans; Formal technique reviews; Metrics; Corrective Maintenance; Adaptive Maintenance and Preventive Maintenance;

UNIT-V

IEEE-CS/ACM - Software Engineering Code of Ethics-Introduction, purpose, preamble, principles- public, client and employer, product, judgment, management, profession, colleagues, self; Plagiarism – What is it, types, Five levels or degrees of plagiarism, prevention, MLCU policy, IEEE plagiarism guidelines, citation-APA, IEEE;

TEXTBOOKS:

1. B. B. Agarwal, S. P. Tayal, M. Gupta, “Software engineering & testing”, Jones and Bartlett Publishers
2. Roger Pressman's, “Software Engineering: A Practitioner's Approach”, Pearson Publication

REFERENCES:

1. R.E. Fairley, “Software Engineering Concepts”, Courseback Edition, McGraw Hill
2. IEEE-CS/ACM - Software Engineering Code of Ethics - Don Gotterbarn, Keith Miller, Simon Rogerson Executive Committee, IEEE-CS/ACM Joint Task Force on Software Engineering Ethics and Professional Practices
3. Bruegge, Bernd and Allen H. Dutoit. “Object-Oriented Software Engineering: Using UML, Patterns and Java”, Pearson: Prentice Hall Publishers
4. Schmuller, Joseph “SAMS Teach Yourself UML in 24 Hours”, Sams Publishing

SPECIALIZATION-1(a)

Course: FUNDAMENTAL OF WEB SERVICES

Code: BCAE301

Credits: 3

OBJECTIVE: To provide knowledge on application-to-application interactions on the Web and integrate the existing network computer infrastructure into the Web.

UNIT-I

Introduction to web services- Fundamentals of XML, XML Syntax, XML Document Structure, Schema Languages; DTD,XML Schema; Presentation technologies – XSL,XFORMS,XHTML–Transformation –XSLT ,XLINK ,XPath , Xquery; Developing

Web services-Objectives, Web service standards, SOAP-The Processing model, Faults, Data representation and RPC, Protocol binding, WSDL-Interface Descriptions, Binding description, service description, UDDI-Descriptions ,Discovery

UNIT-II

Business motivations for web services – B2B, B2C, Technical motivations ,limitations of CORBA and DCOM , Service oriented Architecture (SOA), Architecting web services ,Implementation view ,web services technology stack, logical view, composition of web service, deployment view, process view

UNIT-III

Transport protocols for web services, messaging with web services protocols, SOAP, describing web services, WSDL – Anatomy of WSDL, manipulating WSDL; web service policy – Discovering web services, UDDI, Anatomy of UDDI, Web service inspection, Ad-Hoc Discovery, Securing web services

UNIT-IV

Implementing XML in E-business-B2B, B2C Application; Different types of B2B interaction, Components of e-business, XML systems – ebXML, Rosetta Net Applied XML in vertical industry, Web services for mobile devices

UNIT-V

XML and Content Management-Semantic Web, Role of Meta data in web content, Resource Description Framework, RDF schema, Architecture of semantic web, content management workflow, XLANG WSFL

TEXTBOOKS:

1. Ron schmelzer et al, “XML and Web Services”, Pearson Education, 2002
2. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services: An Architect’s Guide”, Prentice Hall, 2004

REFERENCES:

1. Frank P. Coyle, “XML, Web Services and the Data Revolution”, Pearson Education, 2002
2. Keith Ballinger, “.NET Web Services Architecture and Implementation”, Pearson Education, 2003
3. Henry Bequet and Meeraj Kunnumpurath, “Beginning Java Web Services”, Apress, 2004
4. Lorna Jane Mitchell, ”PHP Web Services”, O'Reilly Media

SPECIALIZATION-2(a)

Course: WINDOWS SERVER ADMINISTRATION

Code: BCAH301

Credits: 3

OBJECTIVE: The goal is to equip the students with the skills to Configure, administer and manage a Windows Server.

CONTENTS:

1. Installing and Configuring Windows Server 2008
2. Install Server Core; optimize resource utilization by using Features on Demand; migrate roles from previous versions of Windows Server
3. Configure Server Core; delegate administration; add and remove features in offline images; deploy roles on remote servers; convert Server Core to/from full GUI; configure services; configure NIC teaming
4. Configure local storage ;Design storage spaces; configure basic and dynamic disks; configure MBR and GPT disks; manage volumes; create and mount virtual hard disks (VHDs); configure storage; pools and disk pools
5. Configure server roles and features ;Configure file and share access; Create and configure shares; configure share permissions; configure offline files; configure NTFS permissions; configure access-based enumeration (ABE); configure Volume Shadow Copy Service (VSS); configure NTFS quotas ;Configure print and document services
6. Configure the Easy Print print driver; configure Enterprise Print Management; configure drivers; configure printer pooling; configure print priorities; configure printer; permissions
7. Configure servers for remote management; Configure WinRM; configure down-level server management; configure servers for day-to-day management tasks; configure multi-server management; configure Server Core;
8. Configure Windows Firewall ;Configure Hyper-V
9. Create and configure virtual machine settings ;Configure dynamic memory; configure smart paging; configure Resource Metering; Configure guest integration services
10. Create and configure virtual machine storage ;Create VHDs and VHDX; configure differencing drives; modify VHDs; configure pass-through disks; manage snapshots; implement a virtual Fibre Channel adapter
11. Create and configure virtual networks; Implement Hyper-V Network Virtualization; configure Hyper-V virtual switches; optimize network performance; configure MAC addresses; configure network isolation; configure synthetic and legacy virtual network adapters;
12. Deploy and configure core network services ;Configure IPv4 and IPv6 addressing Configure IP address options; configure subnetting; configure supernetting; configure interoperability between IPv4 and IPv6; configure ISATAP; configure Teredo
13. Deploy and configure Dynamic Host Configuration Protocol (DHCP) service; Create and configure scopes; configure a DHCP reservation; configure DHCP options; Configure client and server for PXE boot; configure DHCP relay agent; authorize DHCPserver

14. Deploy and configure DNS service; Configure Active Directory integration of primary zones; configure forwarders; configure Root Hints; manage DNS cache; create A and PTR resource records
15. Install and administer Active Directory; Install domain controllers; Add or remove a domain controller from a domain; upgrade a domain controller; install Active Directory Domain Services (AD DS) on a Server Core installation; install a domain controller from Install from Media (IFM); resolve DNS SRV record registration issues; configure a global catalog server
16. Create and manage Active Directory users and computers; Automate the creation of Active Directory accounts; create, copy, configure, and delete users and computers; configure templates; perform bulk Active Directory operations; configure user rights; offline domain join; manage inactive and disabled accounts
17. Create and manage Active Directory groups and organizational units (OUs) ;Configure group nesting; convert groups including security, distribution, universal, domain local, and domain global; manage group membership using Group Policy; enumerate group membership; delegate the creation and management of Active Directory objects; manage default Active Directory containers; create, copy, configure, and delete groups and OUs
18. Create and manage Group Policy ;Configure a Central Store; manage starter GPOs; configure GPO links; configure multiple local group policies; configure security filtering
19. Configure security policies; Configure User Rights Assignment; configure Security Options settings; configure ;Security templates; configure Audit Policy; configure Local Users and Groups; configure
20. User Account Control (UAC) ;Configure application restriction policies; Configure rule enforcement; configure Applocker rules; configure Software Restriction Policies
21. Configure Windows Firewall ;Configure rules for multiple profiles using Group Policy; configure connection security rules; configure Windows Firewall to allow or deny applications, scopes, ports, and users; configure authenticated firewall exceptions; import and export

TEXTBOOKS:

1. Hassell J., "Learning Windows Server 2008", O'Reilly Media.
2. Hassell J., "Windows Server 2008: the definitive guide", O'Reilly Media
3. Tom Carpenter, "Microsoft Windows Server Administration Essentials Courseback", Pearson

REFERENCES:

1. MTA Windows Server Administration Fundamentals (Microsoft Official Academic Course) Courseback ;Microsoft Official Academic Course
2. Mark Minasi, Kevin Greene , Christian Booth, Robert Butler, John McCabe, "Mastering Windows Server 2012 R2"

SPECIALIZATION-3(a)

Course: RESPONSIVE WEB DESIGNING

Code: BCAM211

Credits: 3

OBJECTIVES: To enable students designing responsive sites using a combination of fluid layouts, media queries, and fluid media; adopt a responsive workflow from the very start of a project.

UNIT-I

Foundation of responsive design-what is responsive design, why responsive design; Responsive content-content strategy, managing content, content governance, adaptive content

UNIT-II

HTML for responsive sites- working with HTML, basic page structure, viewport, structural elements, creating page, clean and semantic HTML; CSS for responsive sites-how CSS works, CSS version, using cascade, organizing your stylesheet, the box model, display, positioning, float and clear, basic styles; media queries-what is media query-structure-using media queries in stylesheet links, what we can query, browser support, breakpoints, design ranges; Images-way to display images, alt text, image file formats, optimizing images, content images, background images, responsive images

UNIT-III

Working responsively-responsive workflow, strategy and planning, content before layout, thinking about layout, prototypes, visual design, responsive design tools; Mobile and beyond-user experience, device agnostic design, focusing on mobile first, types of devices, touch, screen size, accessibility, deciding which devices to support, testing

UNIT-IV

Designing responsive websites-typography, start with HTML, typefaces, using fonts, sizing text, line length, whitespace, margins and padding, changing typeface for screen size; Navigation and header layout-responsive navigation, branding, navigation links, navigation patterns

UNIT-V

Performance-why performance matters, performance as design, how web pages are loaded and rendered, measuring performance, cleaning up code, minimizing HTTP requests, server stuff, Javascript, CSS, hosting, conditionally loading content, reflows and repaints, RESS

TEXTBOOK:

1. Clarissa Peterson, "Learning Responsive Web Design: A beginner's guide", O'Reilly Media, Inc

REFERENCES:

1. Brett Romero, "Responsive Web Design Overview : For Beginners", Createspace Publication
2. Benjamin LaGrone, "HTML5 and CSS3 Responsive Web Design Cookbook", Shroff / Packt Publication

SPECIALIZATION-4(a)

Course: VISUAL DESIGN-PRACTICAL

Code: BCAG212

Credits: 3

OBJECTIVE: To enable students to design various documents using adobe flash, Photoshop. InDesign

CONTENTS:

1. Installing Flash software and familiar with flash workspace, flash document setup, run and publishing.
2. Working with text tool, transforming text, skew, break apart and color text, vertical text, rotate, zoom text
3. Working with graphic symbol, button symbol, movie clip symbol
4. Working with shape tween, mask, spotlight, motion guides, motion tween, motion presets
5. Working combine flash movies, add scenes, load movies
6. Working with graphic brightness, tint, alpha and remove background
7. Working with sound, video and desco drawing tool
8. Working with time line and produce different animation
9. Installing photoshop and familiarizing with its environment, raster and vector Graphics, Photoshop Environment Elements, Navigating in Photoshop, Sizing Images Image Size and Resolution
10. Working with image cropping, selecting Image Areas, rectangular and elliptical marquee tools, the lasso tools, saving selections, layers, floating versus fixed selections, undoing previous steps, copying selections, creating layers, transforming layers, copying layers between images, arranging layers
11. Working with magic wand tool, the magnetic lasso tool, modifying selections, blending and compositing, defringing, opacity and blending modes, feathering edges, image modes, mode characteristics, grayscale and bitmap modes, color modes, color and painting, selecting colors
12. Painting Tools, The Clone Stamp Tool, Text, Layer Effects, and Filters, Type Layers, Layer Effects, Filters, Merging and Flattening Layers, Adjusting Images, Brightness/Contrast, Levels Adjustment Layers, Toning Tools, Hue/Saturation
13. Working with Adobe Indesign-Getting to know tools, panels, and workspaces, Learning how to navigate and zoom in a document, Working with layers for efficiency and organization, Setting up master pages in a document, Building automatic page numbering and sections, Creating text and graphics placeholder frames

14. Understanding text and graphics frames, Grouping and transforming frames, Formatting text using paragraph and character styles, Flowing, threading, and spell -checking text in text frames, Adding color: swatches, gradients and tints, shortcuts and techniques, Working with typography, including tracking and kerning, drop caps, rules, tabs, dot leaders and hanging indents, paragraph, character and object styles ;Nesting character styles, Working with clipping paths and alpha channel masks, Workflow tips for placing graphics into In Design, Using the Library panel

TEXTBOOKS:

1. Sandor Burkus, "Photoshop Cs5, Pro", Createspace
2. Todd Perkins, "Adobe Flash Professional", Wiley India Pvt Ltd

REFERENCES:

1. Deke McClelland, "Photoshop 7 Bible, Professional Edition", John Wiley & Sons
2. Adobe Creative Team, "Adobe Flash Professional", Pearson

SPECIALIZATION-1(b)

Course: ADVANCED WEB DESIGNING

Code: BCAE215

Credits: 3

OBJECTIVE: To enable students to design professional web page, host and maintain websites.

CONTENTS:

1. Implementing how to structure document on Web using HTML 5 tag, elements, attribute groups like id, class, title, style, dir, lang; core elements like <html>, <head>, <title>, <body> elements; basic text formatting; grouping content- <div>, <header>, <hgroup> <nav> <section>, <article>, <hr>, <blockquote>, <aside>, <footer>, <address>; list-ordered list, ordered list, nesting list
2. Working on fine tuning of text , , , , <i>, , <small>, <cite>, <q>, <dfn>, <abbr>, <time>, <code>, <figure>, <figcaption>, <var>, <samp>, <kbd>, <sup>, <sub>, <mark>
3. Working on Links and Navigation-basics links, absolute and relative URLs; creating in – page links with <a> element
4. Implementing adding Images using element, src, alt, height, width attributes, adding flash, videos and audio to web pages
5. Working on tables on web page with basic table element and attributes- <table>, <tr>, <td>, colspan, rowspan, scope attribute; adding caption to a table, nested tables
6. Creating form with <form> elements, action attribute, method attribute, id attribute, name attribute, enctype attribute, accept-charset attribute, novalidate attribute, target attribute,

- autocomplete attribute, form controls; creating labels for controls and the <label> Element; buttons using <button> and <input> element, using image of button, check button, radio button, <output>
7. Working HTML 5 events using javascript-offline, onabort, onafterprint, onbeforeunload, onbeforeprint, onblur, oncanplay, oncanplaythrough, onclck, oncontextmenu, ondblclick, ondrag, ondragend, ondragcenter, ondragleave, ondragover, ondragstart, ondrop, ondurationchange, onemptied, onended, onerror, onfocus, oninput, oninvalid, onload, onmouseover, onmouseup, onmousewheel, onpagehide, onpageshow, onplaying, onprogress, onratechange, onredo, onresize, onscroll, onseeked, onseeking, onselect, onsubmit, onsuspend, onundo, onunload, onvolumchange, onwaiting
 8. Working with scalable vector graphics-embedding SVG, SVG line, circle, rectangle, ellipse, polygon, gradients; Canvas element-using canvas to draw polygon, path, text, transformation
 9. Working with web storage-session storage, local storage, delete web storage; web socket events-open, message, error, close; web socket methods-socket.send(), socket.close()
 10. Working with Joomla 3.4 CMS-installation, work areas, control panel, -toolbar; menu-content, component, extensions, help menu
 11. Creating menus, adding menus items, modifying menu items, submenus
 12. Working with Joomla modules-create module, breadcrumb module, feed display module, footer module, search module, random image module, whos is online module, syndicate module
 13. Working with Joomla global setting-system setting, media setting, language manager, private messages, mass emailing, cache management, users setting
 14. Working with Joomla template-template manager, customize template, adding template, creating, adding, customize logo, category management, adding content, formatting content, article metadata, adding banners, contacts adding news feed, adding forum, web links
 15. Working with joomla plugins-plugin managers, authentication plugins, content plugins, editor plugins, search plugins, users plugins, extension, system plugins
 16. Working on Site Management-global configuration- site online and offline, metadata setting, change site url ,updating web site, updating extension, disabling and uninstalling extensions, back up site
 17. Web hosting-www, web server, internet service provider, web hosting providers, domain names, web hosting email servers, web hosting technologies and types
 18. Working with Cpanel-using file section tools, mange domains, manage email, manage security section, manage databases, manage software section tools

TEXTBOOKS:

1. Hogan Brian P, "HTML5 and CSS3: Develop with Tomorrow's Standards Today", \ Springer India Private Limited
2. Matt West, "HTML 5 Foundations", Wiley India Pvt Ltd
3. Ron Severdia Kenneth Crowder, "Using Joomla", Shroff Publications

REFERENCES:

1. Hogan Brian P, "Responsive Web Design with HTML5 and CSS3", Shroff Publishers & Distributers Private Limited - Mumbai

2. Ivan Bayross, "HTML 5 and CSS 3 Made Simple", BPB
3. Joshue O Conner, "Joomla Accessibility", Shroff Publications

SPECIALIZATION-2(b)

Course: WIRELESS NETWORK SECURITY

Code: BCAH303

Credits: 3

OBJECTIVES: To enable students to acquire basic knowledge of fundamentals of wireless cellular, ad hoc and sensor networks, wireless communication fundamentals, medium access control, network and transport protocols, unicast and multicast routing algorithms, mobility and its impact on routing protocols, application performance, quality of service guarantees, and security.

UNIT-I

Introduction to wireless network architectures: cellular networks, wireless local area networks, multi-hop networks. Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation - MAC – SDMA – FDMA –TDMA – CDMA – Cellular Wireless Networks.

UNIT-II

Wireless LAN and Wireless Wans-IEEE 802.11 Standards – Architecture – Services, Physical Layer- MAC sublayer- MAC Management Sublayer, Other IEEE 802.11 standards, HIPERLAN, WiMax standard;Wireless wans-First Generation Analog, Second Generation TDMA – GSM, Short Messaging Service in GSM, Second Generation CDMA – IS-95, GPRS - Third Generation Systems (WCDMA/CDMA 2000).

UNIT-III

Wireless MANS AND PANS-Wireless MANs – Physical and MAC layer details, Wireless PANs – Architecture of Bluetooth Systems, Physical and MAC layer details, Standards.

UNIT-IV

Adhoc and sensor networks-Characteristics of MANETs, Table-driven and Source- initiated On Demand routing, protocols, Hybrid protocols, Wireless Sensor networks- Classification, MAC and Routing protocols.

UNIT-V

Services, mechanisms and attacks; Security architecture – security services, authentication, data confidentiality, data integrity, nonrepudiation, availability; Security Mechanisms-attacks; Security network model.; Classical Encryption techniques-Symmetric cipher model, Cryptography, Cryptanalysis; Substitution techniques – Caesar Cipher, Monoalphabetic Cipher, Playfair Cipher, Transposition techniques. Authentication and key establishment ,Buffer overflow attacks ,Web security, Internet worms, viruses, spyware, Spam, phishing,

botnets, denial of service ,TCP/IP and DNS security ,Firewalls and intrusion detection systems Wireless security.

TEXTBOOK:

1. William Stallings, "Wireless Communications and networks", Pearson Education

REFERENCES:

1. Dharma Prakash Agrawal & Qing-An Zeng, "Introduction to Wireless and Mobile Systems", Thomson India Edition
2. Kaufman, Perlman, and Speciner," Network Security", Pearson Education

SPECIALIZATION-3(b)

Course: RESPONSIVE WEB DESIGNING-PRACTICAL

Code: BCAM212

Credits: 3

OBJECTIVE: To enable students to design responsive web page that adapt to the mobile environment.

LIST OF PROGRAMS:

1. Designing responsive a student biodata web page of at least five (5) pages. Your pages should be between 800 and 1000 px wide. The default width of our template is 900 px. Decide on an appropriate navigation strategy with four (4) <a> states (a:link, a:visited, a:hover, a:active). You must change the color of the navigation—make it different from the default. The page should have a logo, banner in default index.html template of 900 x 70 px. Include at least one (1) image on each page, at least one (1) list other than the navigation, at least one (1) table on the site, at least three (3) external links on the site. These external links must open in new tabs (target="_blank"), include your email address somewhere on the site
2. Convert your student bio data web page into a responsive site by adding media queries and fluid layout elements
3. Use JavaScript to add a Bootstrap photo slideshow/carousel in the student bio data web page
4. Implementing techniques to convert any non responsive webpage to a responsive webpage

SPECIALIZATION-4(b)

Course: VISUAL EFFECTS-PRACTICAL

Code: BCAG312

Credits: 3

OBJECTIVE: To enable student design and execute composting in visual effects.

UNIT-I

Visual Effects, Description, Types, Particles, Analysis, Size, Sand Effects, Smoke Effects, Fire Effects, Cloud Effects, Snow Effects.

UNIT-II

Fluid Effects, Coloring, designing Clouds Background, Designing Fog Effects. Explosion Effects, Fire Effects with flames, Space Effects and designs, Designing Thick Smoke.

UNIT-III

Designing Paint Effects, Coloring paints, Designing Trees and green effects, Designing Weather and seasons, Effects on seasons, Designing Glass image, Designing Different glass reflection, Designing Glow Effects, Liquid Effects and Reflection design.

UNIT-IV

Designing Special Effects, Designing effects of Hair and shape, Designing Fur Effects, Designing Clothes and effects.

UNIT-V

Visual Effects Tool and advanced functions, Converting images from 2D to 3D Pictures. Creating 3D Effects, Differentiation 2D effects and 3D effects.

TEXTBOOK:

1. Antony Bolante, "Adobe After effects", Techmedia

REFERENCES:

1. Micheal J. McAlister," The Language of Visual Effects", Lone Eagle Publishing Co
2. Adobe Creative Team, "Adobe After Effects", Pearson Education

SPECIALIZATION-1(c)

Course: .NET TECHNOLOGY-I (THEORY)

Code: BCAE301

Credits: 3

OBJECTIVES: To provide students with the knowledge and skills needed to develop console application, window applications in Microsoft .NET platform using C sharp (C#). The Course focuses on user interfaces, program structure, language syntax, and implementation details.

UNIT-I

Introduction to .NET - Dot NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries; Introduction to visual studio - Project basics, types of project in .Net, IDE of C#.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser; The environment - Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events

UNIT-II

Object oriented Programming - Classes & objects, fields Properties, Methods & Events, constructor, inheritance; Access Specifier - Public Private, Protected. Overloading, My Base & My class keywords; Variables - Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function; Control flow statements: conditional statement, loop statement, MsgBox & Inputbox; Implementation of OOP- Overloading, Overriding, Interfacing

UNIT-III

Working with Form - Loading, showing and hiding forms, controlling one form within another; GUI Programming with Windows Form - Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar and other. Their Properties, Methods and events; Dialog box - OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label; Designing menus - Context Menu, access & shortcut keys; Overview of OLE - Accessing the WIN32 API from C#.NET & Interfacing with MS office, COM technology, advantages of COM+, COM & .NET; User control - Create User control, register User Control

UNIT-IV

Database programming with ADO.NET - Overview of ADO, from ADO to ADO.NET; Accessing Data using Server Explorer - Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB; Working with data bound control - Display Data on data bound controls, display data on data grid. Generate Reports Using CrystalReport Viewer or ReportViewer

UNIT- V

Understanding the ASP.NET Programming Model, ASP.Net page, application lifecycle, Creating Our First ASP.NET Web Page, Postback property; collecting and processing user input - Web Form Basics, Using Text Boxes to Collect Input, Collecting Input Using Drop-Down Lists, Radio Buttons, and Check boxes, Validating User Input with Validation Controls, Implement event handlers by using code-behind files, Navigation controls, Using Master Pages to Provide Site wide Page Templates

TEXTBOOKS:

1. Anders Hejlsberg, Scott Wiltamuth, Peter Golde , “The C# Programming Language”, Addison-Wesley Professional
2. Ian Griffiths, Jon Flanders, Chris Sells, “Mastering Visual Studio .NET”, O'Reilly Media, Inc

REFERENCES:

1. Matthew MacDonald, Adam Freeman, ”Pro ASP.NET 4 in C# 2010”, Apress
- Jesse Liberty, “Programming C#”, 4th Edition, O’Reilly publishing
2. Herbert Schildt, “C Sharp- The complete reference”, McGraw-Hill/Osborne

Course: PHP-I (THEORY)

Code: BCAE303

Credits: 3

OBJECTIVE: To provide students with basic PHP technology with emphasis on program structure, language syntax, and its implementation.

UNIT-I

Essential PHP - Getting PHP, Creating your development Environment, Creating a first PHP Page, Mixing HTML and PHP, Printing some text, Printing some HTML, Echo power, Working with variables, Storing Data in variables, Interpolating Strings, Creating variable variables, Creating constant, Understanding PHP internal Data Types

UNIT-II

Operators and Flow Controls – PHP Math operators, Working with the assignment operators, Incrementing and decrementing values, String operators, Operator precedence, Using If statement, PHP Comparison operators, PHP Logical operators, Else statement, Elseif statement, Switch statement, Using For loops, Using While loops, Using Do...While loops, Using foreach loop, Terminating loops early, PHP alternate syntax

UNIT-III

Strings and Arrays – String functions, Converting to and from strings, Formating Text strings, Building yourself some arrays, Modifying the Data in arrays, Deleting arrays with loops (for loop, print_r function, foreach loop, while loop), PHP array Functions, Extracting Data from arrays, Sorting arrays, Using PHP array operators, Comparing array with each

other, Handling Multidimensional arrays in loops, Splitting and Merging arrays, other array functions

UNIT-IV

Creating Functions – Creating functions in PHP, Passing functions some Data, Passing arrays to functions, Passing by reference, Passing variable numbers to arguments, Returning Data from arrays, Returning arrays, Returning List, returning reference, Introducing variable Scope in PHP, Accessing Global Data, Working with Static variables, PHP conditional functions, PHP variable functions

UNIT-V

Reading Data in Web Pages – Setting up web pages to communicate with PHP, Handling Text fields, Handling Text areas, Handling Check boxes, Handling radio buttons, Handling List boxes, Handling Password controls, Handling Hidden controls, Handling image Maps, Handling Buttons(Making Button data Persist, using Submit Buttons as HTML buttons)

TEXTBOOKS:

1. Peter MacIntyre , Rasmus Lerdorf , Kevin, "Programming PHP", O'Reilly
2. G Steven Holzner, "Php: The Complete Reference", Mcgraw Hill Education

REFERENCES:

1. Vikram Vaswani, "PHP 5.3: A Beginner's Guide : A Beginner's Guide", Mcgraw Hill Education
2. Janet Valade, "PHP and MySQL For Dummies, 4th Edition", John Wiley & Sons Inc

Course: JSP-I (THEORY)

Code: BCAE305

Credits: 3

OBJECTIVES: To provide students with the knowledge and skills needed to develop applications in Java Server Pages using eclipse or netbean framework. The course focuses on user interfaces, program structure, language syntax, and implementation details.

UNIT-I

Introduction to JSP;JSP Life Cycle; Advantages of JSP; Compilation ; JSP Processing; Embedding Dynamic Elements in HTML Pages; Setting up JSP environment; JSP Syntax Summary; JSP Scripting Elements: Expressions, Scriptlets and Declarations

UNIT-II

JSP Directives; Example using JSP Scripting Elements and Directives; Predefined Variables; JSP actions; JSP comments and character escaping conventions; Creating custom JSP Tag libraries; Connecting page; Working with forms; Retrieving the data posted to a JSP file from HTML

UNIT-III

Introduction to Javabeans; Using JavaBean components with JSP; Creating and Using a JavaBeans component; Setting JavaBeans Component Properties; Retrieving JavaBeans Component Properties; Retrieving JavaBeans Component Properties

UNIT-IV

Introduction to servlet; Basic Servlet Structure; Servlet life cycle ; A simple servlet generating plain text; Compiling and Invoking the Servlet; A simple servlet generating HTML; Some simple HTML utilities for servlets

UNIT-V

Interacting database from JSP; Managing JSP session; JSP cookies; Handling errors

TEXTBOOKS:

1. Bruce W. Perry, O'Reilly, "Java Servlet & JSP Cookbook"
2. Giulio Zambon, "Beginning JSP, JSF and Tomcat: Java Web Development", APRESS Publication.

REFERENCES:

1. Phil Hanna, "JSP 2.0: The complete Reference", Tata McGraw- Hill Edition
2. Simon Brown, Sam Dalton, Sing Li, Daniel Jepp, Matt Raible, Dave Johnson, "Pro JSP 2", Apress Publication

SPECIALIZATION-2(c)

Course: LINUX SERVER ADMINISTRATION

Code: BCAH302

Credits: 3

OBJECTIVES: To enable students to gain the knowledge of managing Linux Server and to have a hands-on a Linux Server Management.

UNIT-I

Configuring Your Computer on a LAN - Configuring your ifconfig, Configuring your arp, The Hostname Commands, Network Configuration Files, Configuring Private and Public Networks - Private IP Networks, Configuring a Network, Classless Inter-Domain Routing (CIDR), Creating Internet Connections - The Internet Configuration Wizard, Using minicom Troubleshooting your network - Checking Network Status, Checking connections with ping and traceroute.

UNIT-II

Configuring a dns server - packages, dns concepts, initial dns configuration, a dns slave server, a dns configuration files, starting dns; using dns client-setting up a dns server - packages, basic configuration, the configuration file: /etc/dhcpd.conf, starting the dhcp server, dhcp servers and remote networks, a lease database, working with dhcp and bootp

clients; Using the Internet Print Protocol, Configuring the common Unix Print System - Graphical configuration, The lpadmin command, The lpstat command, Configuration files, /etc/cup/cupsd.conf, Printer management, Using the Line Print Daemon - The LPD Configuration files, Printer Management, Red Hat's Printer Tool.

UNIT-III

Using FTP as a client - Basic commands, Connecting to ftp.redhat.com, The GUI FTP Client The Secure FTP Server - Basic security features, Configuration files Creating an Anonymous FTP Server - Configuring vsFTP Server, Configuring WU-FTP, Anonymous directories, Configuring WU-FTP with Real Users - Configuration Files, Commands, Anonymous Uploads.

UNIT-IV

Bridging the gap between linux and windows - functioning on a microsoft network, licensing, definitions, packages; configuring samba as a client - shared samba directory, samba terminal mode, connecting to a printer; the samba configuration files - samba daemons, other samba configuration files, the main samba file: smb.conf, a samba troubleshooting checklist, the samba web administration tool (swat) - the home menu, samba configuration wizard, the globals menu, the shares menu, the printers menu, the view menu, the password menu, the server status menu, the red-config-samba alternative - server settings, user management, creating a new share.

UNIT-V

Understanding best practices - physical setup, encryption, password security, firewall and dmzs, using pluggable authentication modules - basic configurations, module types, control flags, creating firewalls - data directories and iptables, firewalls as chains, format of iptables, options for iptables, patterns for iptables, actions for iptables, putting it all together, setting up ip masquerading - functionality, ip masquerading commands detecting break-ins - sniffing with ethereal, checking logins, tripwire and suspicious activity, troubleshooting access issues - too much security, denial or rejection.

TEXTBOOK:

1. Micheal Jang, "Mastering Red Hat Linux 9", BPB Publications

REFERENCES:

1. Kurt Wall , Terry Collings , "Red Hat Linux Networking and System Administration", Broadway Books
2. Sander Van Vugt," Red Hat Enterprise Linux 6 Administration: Real World Skills For Red Hat Administrators", Wiley India Pvt Ltd

SPECIALIZATION-3(c)

Course: ANDROID APPS DEVELOPMENT-I (THEORY)

Code: BCAM302

Credits: 3

OBJECTIVE: To enable student to develop android applications and enable to deploy the apps.

UNIT-I

Introduction- android file structure, XML file, R.java file, String.xml, the manifest file, dimens.xml, role of android application component, android API, android project file, activities, manifest file, manifest editor; building blocks of android application design-linear layouts, applying orientation, height, padding, weight, gravity; relative layout, absolute layout, image view, frame layout, table layout, grid layout, list view.

UNIT-II

Android widgets-custom buttons, toggle buttons, checkboxes and radio buttons, spinners, auto-complete text box, map view, web views, time and date pickers; input events; menus-options menu, action bar, context menu, contextual action mode, popup menu, defining menu in XML, dialogs, notification; toasts; search; drag and drop-process, drag event; styles and theme callback method, communicating between activities-switching activities, putting extra, using shared preferences.

UNIT-III

List views-list activities with custom layouts, list activities with custom adapters, displaying multiple items in a list view; storing information on the device-shared preferences, internal storage, external storage, using SQLite databases, data backup, web communication and storage.

UNIT-IV

Animation and Graphics-property animation, view animation, drawable animation, canvas and drawables, OpenGL; hardware acceleration-application level, activity level, view level, window level; Computation-renderscript, runtime API, audio and video-playing audio with the mediaplayer, more audio options, playing video with the media player, recording and storing audio content.

UNIT-V

Location and Sensors-location services, google maps android API, motion sensors, environment sensors, position sensors, sensor framework, events; Connectivity-bluetooth, near field communication(NFC), Wifi direct, USB; Deploying apps-requirement, creating google developer account, create icons, application metadata, packaging the apps, versioning your apps, links and tool.

SPECIALIZATION-4(c)

Course: 2D ANIMATION (THEORY)

Code: BCAG301

Credits: 3

OBJECTIVE: To introduce the fundamental principles and basic techniques of 2D animation.

UNIT-I

Digital 2D Animation orientation, Basic factors affecting the illusion of motion, Impact of digital techniques on the craft of film and video animation, Professional animation practice and job description, Prevailing file format standards and other compatibility issues, History and future trends of computer animation application in the visual arts.

UNIT-II

2D animation application software interface, Default setting and user preferences, Document setup; Import and export formats, Document and timeline window feature, Tools and commands palettes, Media-selection tools and techniques, Asset-management features.

UNIT-III

2D graphics-creation features, Underlying data type-raster, vector, Raster painting and/or import features, Vector shapes, Vector free-form and control-point Placement tools, Features specific to the program in use.

UNIT-IV

2D graphics editing features-Basic geometric transformation, Boolean Operations on shapes, Object stroke attributes, Object fill attributes, Shading Techniques (blends-gradients), Packaged effects (extensions-Plug-ins), Features Specific to the program in use.

UNIT-V

2D animation frame-sequencing features, Straight-ahead animation, Key Frames animation, Motion paths, Applying geometric transformations over time, Intertwining options, Looping and motion, Features specific to the program in use.

TEXTBOOK:

1. Robert R, Snow D, “Flash CS4 Professional Bible”, Wiley Publishing

REFERENCES:

1. Frank Thomas, Ollie Johnston, “Disney Animation “,Abbeville Press
2. Richard Williams, "The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for

SPECIALIZATION-1(d)

Course: .NET TECHNOLOGY-I (PRACTICAL)

Code: BCAE302

Credits: 3

OBJECTIVES: To provide students with the skills needed to develop web – based applications in ASP .NET, window application, console application, class library, etc for the Microsoft .NET platform. The Course focuses on user interfaces, program structure, language syntax, and implementation details.

LIST OF PROGRAMS:

1. Short Story Game
2. Mathematic Game
3. Age Calculator
4. Die roller using Random class
5. Implementation of various Search algorithms
6. Data accessing with database, report generation, data bound control

Course: PHP-I (PRACTICAL)

Code: BCAE304

Credits: 3

OBJECTIVE: To practice writing program using PHP on notepad++.

1. WAP in PHP to print some text
2. WAP in PHP to store data in variables, Interpolating Strings, Creating variable variables, Creating constant.
3. WAP in PHP using math operators, for Incrementing and decrementing values, String operators, Operator precedence.
4. WAP in PHP using If statement, PHP Comparison operators, PHP Logical operators, Else statement, Elseif statement, Switch statement, Using For loops, Using While loops, Using Do...While loops, Using foreach loop, Terminating loops early, PHP alternate syntax.
5. WAP in PHP using String functions, Modifying the Data in arrays, Deleting arrays with loops (for loop, print_r function, foreach loop, while loop), PHP array Functions, Extracting Data from arrays, Sorting arrays, Using PHP array operators, Comparing array with each other, Handling Multidimensional arrays in loops, Splitting and Merging arrays, other array functions
6. WAP in PHP using Creating functions in PHP, Passing functions some Data, Passing arrays to functions, Passing by reference, Passing variable numbers to arguments, Returning Data from arrays, Returning arrays, Returning List, returning reference,

Introducing variable Scope in PHP, Accessing Global Data, Working with Static variables, PHP conditional functions, PHP variable functions.

7. WAP in PHP using Handling Text fields, Handling Text areas, Handling Check boxes, Handling radio buttons, Handling List boxes, Handling Password controls, Handling Hidden controls, Handling image Maps, Handling Buttons(Making Button data Persist, using Submit Buttons as HTML buttons)

Course: JSP-I (PRACTICAL)

Code: BCAE306

Credits: 3

OBJECTIVES: To provide students with the knowledge and skills needed to develop applications in Java Server Pages using eclipse or netbean framework. The course focuses on user interfaces, program structure, language syntax, and implementation details.

CONTENTS:

1. Programs implementing the concept of JSP scripting elements
2. Programs implementing the concept of JSP Actions, Custom Tag libraries, Directives and connecting pages
3. Programs implementing the concept Decision Statements with html forms
4. Programs implementing the concepts of Looping statements with html forms
5. Programs implementing the concept of Beans
6. Programs implementing the concept of Servlets
7. Programs for accessing a database using JSP with html forms

SPECIALIZATION-2(d)

Course: NETWORK SWITCHING AND ROUTING TECHNOLOGY

Code: BCAH304

Credits: 3

OBJECTIVES: To understand how a message manages to flow from source to destination i.e. to understand Network Switching and Routing Technologies.

UNIT-I

Introduction to Switched LAN architecture; The Hierarchical Network Model, Benefits of a hierarchical Network, Principles of a hierarchical network design; Matching Switches to specific LAN functions-Considerations for hierarchical network switches, Switch features, Switch features in a hierarchical network, Switches for Small and Medium Sized Business (SMB).

UNIT-II

Basic switch concepts ;Introduction to Ethernet/802.3 LANs- key elements of Ethernet/802.3 Networks- CSMA/CD, Ethernet Communications, Duplex Settings, Switch port settings,

Switch MAC address table; Design considerations for Ethernet802.3 Networks- Bandwidth and Throughput, Collision Domains, Broadcast Domains, Network Latency, Network Congestion, LAN segmentation; LAN Design Considerations- Forwarding Frames using a switch, Switch forwarding methods, Asymmetric and Symmetric Switching, Memory Buffering.

UNIT-III

Basic Switch Configuration; Prepare how to configure the switch, Management Interface, Default Gateway, Duplex and Speed; Verifying Switch Configuration- Configuring Password Options, Login Banners, Configure Telnet and SSH.

UNIT-IV

VLANs-Introducing VLANs- Defining VLANs, Benefits of VLANs, VLAN ID Ranges, Types of VLANs-data VLANs, the default VLAN, the black hole VLAN, native VLANs, management VLANs, and voice VLANs; VLAN Trunking- VLAN Trunks, configure VLANs, Managing VLANs, configure a Trunk.

UNIT-V

IP Addressing ;IPv4 ; IPv6; IPaddressing for LAN/WAN environment;IPv4 addressing scheme using VLSM ; Routers and Packet Forwarding; Static and Dynamic Routing; Distance Vector Routing Protocols; RIP; Routing Table; EIGRP; OSPF; Link State Routing.

TEXTBOOK:

1. Cisco, “Routing and Switching Essentials”, Pearson Education

REFERENCES:

1. Todd Lammle, “CCNA Routing And Switching Study Guide”, Wiley India Pvt Ltd
2. Radia P A, ”Interconnections: Bridges, Routers, Switches & Internetworking Protocols”, Wesley Professional

SPECIALIZATION-3(d)

Course: ANDROID APPS DEVELOPMENT-I (PRACTICAL)

Code: BCAM303

Credits: 3

OBJECTIVE: To enable student to develop android applications and enable to deploy the apps.

LIST OF PROGRAMS:

1. Create an application that will change color of the screen, based on selected options from the menu
2. Create an application that will display toast (Message) on specific interval of time.
3. Create a background application that will open activity on specific time.
4. Create an application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.

5. Create an UI such that, one screen have list of all the types of cars. On selecting of any car name, next screen should show Car details like: name, launched date, company name, images (using gallery) if available, show different colors in which it is available.
6. Create an application that read phonebook contacts using content providers and display in list.
7. Create an application that Read messages from the mobile and display it on the screen.
8. Create an application to call specific entered number by user in the EditText
9. Create an application that will create database with table of User credential.
10. Create an application to read file from asset folder and copy it in memory card.
11. Create an application that will play a media file from the memory card.
12. Create an application to make Insert, update, Delete and retrieve operation on the database.
13. Create an application to draw line on the screen as user drag his finger. Create an application to send message between two emulators.
14. Create an application to take picture using native application.
15. Create an application to pick up any image from the native application gallery and display it on the screen.
16. Create an application to open any URL inside the application and clicking on any link from that URL should not open Native browser but that URL should open the same screen.
17. Create an application that will store employee information like Employee ID, Name, Address and Designation. User can insert, update, delete and employee search record.
18. Create an application that will change wall Course time by time.
19. Create an application that will work like a calculator. It should be able to perform all arithmetic operation.

SPECIALIZATION-4(d)

Course: 2D ANIMATION-PRACTICAL

Code: BCAG302

Credits: 3

OBJECTIVE: To implement the various techniques of 2D animation and to enable to create various animations.

LIST OF PROGRAMS:

1. Installing adobe flash and overview of the workspace, customize the workshop, U sing the Stage and Tools panel, about the Timeline, Using Flash panels, Property inspector, Library panel, Movie Explorer, History panel, Colour panel
2. Working on flash files-create or open document and set its properties, view a document when multiple document are open, working with project, importing artwork into flash,

- PSD file import preferences, adding media to library, working with time line and scene and working with templates
3. Working with vector and bitmap graphics, flash drawing mode, about overlapping shapes , using flash drawing and painting tools, draw with pencil tools, reshaping lines and shape outlines, working with color, strokes and fills
 4. Working selection objects, moving, copying and deleting objects, arranging objects, transforming object, using symbols, instances and library assets, symbol overview, convert animation on the stage into movie clip
 5. Creating motion, creating key frames, working with representation of animation in the Timeline, frame rates, frame by frame animation, onion skinning, mask layers, timeline effects, twinned animation, special effects, filters, blend mode, working with text and sound

SPECIALIZATION-1(e)

Course: .NET TECHNOLOGY-II (THEORY)

Code: BCAE311

Credits: 3

OBJECTIVES: To provide students with the knowledge and skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user interfaces, program structure, language syntax, working with database and other requirements to build a website.

UNIT-I

Getting started with ASP.NET - Understanding the ASP.NET Programming Model, ASP.Net page, application lifecycle, Creating Our First ASP.NET Web Page, Postback property; Global.asax file, web.config file

UNIT-II

Web form and web controls - Web Form Basics, Using Hyper link, picture box, List box, Text Boxes, etc. ; Collecting Input Using Drop-Down Lists, Text box, Radio Buttons, Check boxes, etc.; Validating User Input with Validation Controls, Implement event handlers by using code-behind files

UNIT-III

More web controls-File upload control, Hidden field, Calendar, Navigation controls: Menu, Treeview, sitemap; Adrotator with XML file

UNIT-IV

Using Master Pages to Provide Site wide Page Templates; Themes; State Management: View state, session, Application state, cookies.

UNIT-V

Working with databases-An Introduction to Databases, Accessing Data with the Data Source Web Controls, Displaying Data with the Data Web Controls, Deleting, Inserting, and Editing

Data; Working with Data-Bound controls Datagridview, DropDownLists, RadioButtons, Checkboxes etc. ; Exploring Data Binding and Other Data-Related Topics

TEXTBOOKS:

1. Herbert Schildt, "C Sharp- The complete reference", McGraw-Hill/Osborne
2. ASP.NET The complete reference, McDonald, McGraw-Hill

REFERENCE:

1. Matthew MacDonald, Adam Freeman, "Pro ASP.NET 4 in C# 2010", Apress

Course: PHP-II (THEORY)

Code: BCAE313

Credits: 3

OBJECTIVE: To provide students with basic PHP technology with emphasis object oriented programming, database connectivity.

UNIT-I

PHP browser – Handling Power – Using PHP's Server variables, Using HTTP Headers, getting the User's browser type, Dumping form's Data all at once, Handling form data with custom arrays, Putting it all in One Pages, Performing data Validation

UNIT-II

Object-oriented programming – Creating Classes, Creating objects, Setting Access to Properties and Methods(Public access, Private access), Using Constructors, Using Destructors, Basing one class on another with Inheritance(Protected access, constructors and Inheritance, Calling Base class methods), Overriding methods, Overloading methods, Autoloading classes.

UNIT-III

Advanced Object-Oriented Programming – Creating static methods(creating static methods, passing data to a static method, using properties in static methods), Static members and Inheritance, Creating Abstract classes, Creating Interfaces

UNIT-IV

File Handling – Opening Files using fopen, Looping over File's contents with feof, Reading Text from a file using fgets, Closing File, Reading from a File Character by Character with fgetc, Reading a whole File at Once with file_get_contents, Reading a File into an array with File

UNIT-V

Working with Database- Database, essential SQL, Creating MySQL Database, Creating Table, Updating Database, Inserting, Deleting, Creating New Tables, Creating New Database, Security measures

TEXTBOOK:

1. Ullman, "PHP Advanced and Object-Oriented Programming", Pearson India

REFERENCES:

1. Peter Moulding, "PHP Black Book", Wiley India Pvt. Ltd.
2. Vikram Vaswani, "How to Do Everything with PHP and MySQL", Tata McGraw Hill

Course: JSP-II (THEORY)

Course Code: BCAE315

Credits: 3

OBJECTIVES: To provide students with the knowledge and skills needed to develop applications in Java Server Pages using eclipse or Netbeans framework. The Course focuses on user interfaces, program structure, language syntax, and implementation details.

UNIT-I

Introduction to JSP; JSP Life Cycle; Advantages of JSP; Compilation ; JSP Processing; Embedding Dynamic Elements in HTML Pages; Setting up JSP environment; JSP Syntax Summary; JSP Scripting Elements: Expressions, Scriptlets and Declarations. Expression Language, Custom Actions, Tag Libraries, JavaServer Pages Standard Tag Library (JSTL)

UNIT-II

JSP Directives; Example using JSP Scripting Elements and Directives; Predefined Variables; JSP actions; JSP comments and character escaping conventions; Creating custom JSP Tag libraries; Connecting page; Working with forms; Retrieving the data posted to a JSP file from HTML. Including and Forwarding from JSP Pages, Exception Handling, JSP session; JSP cookies; Session Management

UNIT-III

Servlet-Web Application Basics, Architecture and challenges of Web Application., Introduction to servlet, Servlet life cycle, Developing and Deploying Servlets, Exploring Deployment Descriptor (web.xml), Handling Request and Response, Initializing a Servlet, Accessing Database, Servlet Chaining, Session Tracking & Management, Dealing with cookies, Transferring Request, Accessing Web Context, Passing INIT and CONTEXT Parameter, Sharing information using scope object, Controlling concurrent access, User Authentication, Filtering Request and Response, Programming Filter, Filter Mapping, Servlet Listeners

UNIT-IV

Working with Databases-Connecting to Databases; Usage of Statements and Resultsets; Prepared Statements; Callable Statements; Locking and Isolation

UNIT-V

Basics of EJB; Session Beans; Using JSP and Servlets with EJB; EJB Query Language

TEXTBOOKS:

1. Bruce W. Perry, "Java Servlet & JSP Cookbook", O'Reilly Media, Inc.
2. Giulio Zambon, "Beginning JSP, JSF and Tomcat: Java Web Development", APRESS Publication.

REFERENCES:

1. Phil Hanna, "JSP 2.0: The Complete Reference", Tata McGraw-Hill Edition.
2. Simon Brown, Sam Dalton, Sing Li, Daniel Jepp, Matt Raible, Dave Johnson, "Pro JSP 2", Apress Publication.

SPECIALIZATION-2(e)

Course: ROUTER CONFIGURATION AND SECURITY

Course Code: BCAH311

Credits: 3

OBJECTIVES: The objective is to develop an understanding of how a router learns about remote networks and determines the best path to those networks. This course includes both static routing and dynamic routing protocols.

UNIT-I

Introduction to Routing- Routers are computers, Router CPU and Memory, Router Boot-up Process, Router Interfaces; Routers and the Network layer.

UNIT-II

Configure a Router- CLI command models, Configuring a router name, Configuring router passwords, Examining the show commands, Configuring a serial interface, Configuring an Ethernet interface. Router Configuration Lab- Cabling a Network and Basic Router Configuration; Routing table principles and protocols (Distance Vector and Link State Protocols) IP Routing Technologies.

UNIT-III

Configure and verify operation status of a device interface, both serial and Ethernet; Verify router configuration and network connectivity; Configure and verify routing configuration for a static or default route given specific routing requirements; Differentiate methods of routing and routing protocols; OSPF ; EIGRP inter VLAN routing-Router on a stick; SVI interfaces.

UNIT-IV

Configure and verify DHCP ; Describe the types, features, and applications of ACLs; ACLs in a network environment; Identify the basic operation of NAT; NAT; NTP as a client; Recognize High availability (FHRP); Syslog; SNMP ; WAN Technologies; WAN serial connection; PPP; Frame Relay; PPPoE.

UNIT-V

Network Security- Introduction to Network Security, Why network security is important?, Common Security Threats, Types of Network Attacks, General Mitigation Techniques, The Network Security Wheel, The Enterprise Security Policy. Securing the Router; Network device security features; Switch Port Security features; ACLs; ACLs and SSH.

TEXTBOOK:

1. Chappell, “Advanced Cisco Router Configuration“, Techmedia

REFERENCES:

1. David Hucaby, Steve McQuerry, Andrew Whitaker,” Cisco Router Configuration Handbook (Networking Technologies)”, Cisco Systems
2. Walter J. Goralski,” Juniper and Cisco Routing: Policy and Protocols for Multivendor IP Networks “,John Wiley & Sons

SPECIALIZATION-3(e)

Course: ANDROID APPS DEVELOPMENT-II (THEORY)

Course Code: BCAM311

Credits: 3

OBJECTIVE: To enable student to develop android applications and enable to deploy the apps.

UNIT-I

Introduction- android file structure, XML file, R.java file, String.xml, the manifest file, dimens.xml, role of android application component, android API, android project file, activities, manifest file, manifest editor; building blocks of android application design-linear layouts, applying orientation, height, padding, weight, gravity; relative layout, absolute layout, image view, frame layout, table layout, grid layout, list view.

UNIT-II

Android widgets-custom buttons, toggle buttons, checkboxes and radio buttons, spinners, auto-complete text box, map view, web views, time and date pickers; input events; menus-options menu, action bar, context menu, contextual action mode, popup menu, defining menu in XML, dialogs, notification; toasts; search; drag and drop-process, drag event; styles and theme callback method, communicating between activities-switching activities, putting extra, using shared preferences.

UNIT-III

List views-list activities with custom layouts, list activities with custom adapters, displaying multiple items in a list view; storing information on the device-shared preferences, internal storage, external storage, using SQLite databases, data backup, web communication and storage.

UNIT-IV

Animation and Graphics-property animation, view animation, drawable animation, canvas and drawables, OpenGL; hardware acceleration-application level, activity level, view level, window level; Computation-renderscript, runtime API, audio and video-playing audio with the mediaplayer, more audio options, playing video with the media player, recording and storing audio content.

UNIT-V

Location and Sensors-location services, google maps android API, motion sensors, environment sensors, position sensors, sensor framework, events; Connectivity-bluetooth, near field communication(NFC), Wifi direct, USB; Deploying apps-requirement, creating google developer account, create icons, application metadata, packaging the apps, versioning your apps, links and tool.

SPECIALIZATION-4(e)

Course: 3D ANIMATION (THEORY)

Course Code: BCAG311

Credits: 3

OBJECTIVE: To introduce students to the principles and techniques of 3D modeling and animation.

UNIT-I

An Introduction on how to make drawings for animation-Shapes and forms,3d drawings, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary- breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

UNIT-II

Modeling methods-modeling with primitives, planning a model, deforming lattices, wire or cluster, Extrusion-object duplication, pivots and CV surfaces, the production process, complex model hierarchy.

UNIT-III

Complexities over various modeling techniques, purpose and modeler dependency, hardware and software consideration.

UNIT-IV

Character Animation, Preparing to Animate, the Animation Process, Pose-to-Pose blocking, Establishing Timings, Refining Animation.

UNIT-V

Non-Linear Animation – Creating Poses, Creating Clips , Modifying, blending and Sharing Clips, Animating with Maya's new Body IK Setup.

TEXTBOOK:

1. Adam Watkins, "Maya A Professional Guide", Dreamtech

REFERENCE:

1. Tom Meade and Shinsaka Anima, "The Complete Reference Maya", Tata MC.Graw – Hill

SPECIALIZATION-1(f)

Course: .NET TECHNOLOGY-II (PRACTICAL)

Code: BCAE312

Credits: 3

OBJECTIVES: To provide students with the skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user interfaces, event driven programming, page validation, website navigation, state management and other implementation details.

LIST OF PROGRAMS:

1. Program demonstrating page postback to the server with user inputs.
2. Working with validation controls
3. Implement event handlers with various controls
4. Program demonstrating file upload
5. Program implementing calendar control, adrotator control.
6. Website navigation
7. Program implementing Master page
8. Implementation of hidden field, State Management
9. Program implementing database connection, Data manipulation; report generation; data bound controls

Course: PHP-II (PRACTICAL)

Code: BCAE314

Credits: 3

OBJECTIVE: To practice the PHP object oriented programming and database connectivity.

LIST OF PROGRAMS:

1. WAP in PHP for dumping form's data all at once, Handling form data with custom arrays, Putting it all in One Pages, Performing data Validation.
2. WAP in PHP for Creating Classes, Creating objects, Setting Access to Properties and Methods(Public access, Private access), Using Constructors, Using Destructors, Overriding methods, Overloading methods, Autoloading classes

3. WAP in PHP for creating static methods (creating static methods, passing data to a static method, using properties in static methods), Static members and Inheritance, Creating Abstract classes, Creating Interfaces.
4. WAP in PHP for Opening Files using fopen, Looping over File's contents with feof, Reading Text from a file using fgets, Closing File, Reading from a File Character by Character with fgetc, Reading a whole File at Once with file_get_contents, Reading a File into an array with File.
5. WAP for Creating MySQL Database, Creating Table, Updating, Database, Inserting, Deleting, Creating New Tables, Creating New Database

Course: JSP-II (PRACTICAL)

Code: BCAE316

Credits: 3

OBJECTIVES: To provide students with the knowledge and skills needed to develop applications in Java Server Pages using eclipse or Netbeans framework. The Course focuses on user interfaces, program structure, language syntax, and implementation details.

LIST OF PROGRAMS:

1. Programs implementing the concept of JSP scripting elements.
2. Programs implementing the concept of JSP Actions, Custom Tag libraries, Directives and connecting pages.
3. Programs implementing the concept of Including and Forwarding from JSP Pages.
4. Programs implementing the concepts of Custom Actions.
5. Programs implementing the concept of servlets
6. Programs for accessing a database using JSP.
7. Programs implementing Programming Filter.
8. Programs using Locking and Isolation.
9. Programs implementing EJB (Enterprise Java Beans)

SPECIALIZATION-2(f)

Course: ROUTER CONFIGURATION-PRACTICAL

Course Code: BCAH312

Credits: 3

OBJECTIVE: To Configure a Router and apply all the necessary security measures to secure the Router.

CONTENTS:

1. Basic Router Configuration
2. Static Route Configuration and Troubleshooting
3. Routing Protocols and Subnetting
4. Configure routes using Distance Vector Routing Protocols
5. RIP configuration and Troubleshooting

6. IGR configuration
7. VLSM (Variable Length Subnet Masks) routing and CIDR(Classless Inter Domain Routing)
8. Close look at Routing Tables
9. EIGRP configuration
10. OSPF configuration
11. Configure and verify interVLAN routing (Router on a stick)
12. Configuring VPN
13. Configuring Access Control List

SPECIALIZATION-3(f)

Course: ANDROID APPS DEVELOPMENT-II (PRACTICAL)

Course Code: BCAM312

Credits: 3

OBJECTIVE: To enable student to develop android applications and enable to deploy the apps.

LIST OF PROGRAMS:

1. Create an application that will change color of the screen, based on selected options from the menu
2. Create an application that will display toast (Message) on specific interval of time.
3. Create a background application that will open activity on specific time.
4. Create an application that will have spinner with list of animation names. On selecting animation name, that animation should affect on the images displayed below.
5. Create an UI such that, one screen have list of all the types of cars. On selecting of any car name, next screen should show Car details like: name, launched date, company name, images (using gallery) if available, show different colors in which it is available.
6. Create an application that read phonebook contacts using content providers and display in list.
7. Create an application that Read messages from the mobile and display it on the screen.
8. Create an application to call specific entered number by user in the EditText
9. Create an application that will create database with table of User credential.
10. Create an application to read file from asset folder and copy it in memory card.
11. Create an application that will play a media file from the memory card.
12. Create an application to make Insert, update, Delete and retrieve operation on the database.
13. Create an application to draw line on the screen as user drag his finger. Create an application to send message between two emulators.
14. Create an application to take picture using native application.
15. Create an application to pick up any image from the native application gallery and display it on the screen.

16. Create an application to open any URL inside the application and clicking on any link from that URL should not open Native browser but that URL should open the same screen.
17. Create an application that will store employee information like Employee ID, Name, Address and Designation. User can insert, update, delete and employee search record.
18. Create an application that will change wall Course time by time.
19. Create an application that will work like a calculator. It should be able to perform all arithmetic operation.

SPECIALIZATION-4(f)

Course: 3D ANIMATION-PRACTICAL

Course Code: BCAG315

Credits: 3

OBJECTIVE: To introduce students to the principles and techniques of 3D modeling and animation.

UNIT-I

An Introduction on how to make drawings for animation-Shapes and forms,3d drawings, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary- breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

UNIT-II

Modeling methods-modeling with primitives, planning a model, deforming lattices, wire or cluster, Extrusion-object duplication, pivots and CV surfaces, the production process, complex model hierarchy.

UNIT-III

Complexities over various modeling techniques, purpose and modeler dependency, hardware and software consideration.

UNIT-IV

Character Animation, Preparing to Animate, the Animation Process, Pose-to-Pose blocking, Establishing Timings, Refining Animation.

UNIT-V

Non-Linear Animation – Creating Poses, Creating Clips , Modifying, blending and Sharing Clips, Animating with Maya's new Body IK Setup.

TEXTBOOK:

1. Adam Watkins, "Maya A Professional Guide", Dreamtech

REFERENCE:

1. Tom Meade and Shinsaka Anima, "The Complete Reference Maya", Tata MC.Graw – Hill

Post Graduate Diploma in Computer Applications (PGDCA)

Course: CONCEPTS OF COMPUTER APPLICATIONS

Code: PDCA501

Credits: 3

OBJECTIVES: To enable students to acquire basic knowledge of fundamentals of computer and become familiar with the use of IT tools and they will also learn about the benefits and importance of IT in today's world

UNIT-I

Introduction to computer - Definition of computer, Generation of Computers – First, Second, Third, Fourth & Fifth generations, Characteristics of computers, Capabilities and Limitations; Types of computer and their characteristics – analog, digital, hybrid, micro, mini, mainframe and super computers; Types of PC's and their characteristics – Desktop, Laptop, Notebook and Palmtop; Basic components & Block diagram of computer system – Control Unit, ALU, Memory (RAM, ROM, EPROM, PROM)

UNIT-II

Input & Output Devices – Keyboard, Mouse, Trackball, Joystick, Scanner, MICR, OCR, Touch Screen; Monitor – Types – Digital, Analog, Characteristics- size, resolution, refresh rate, interlaced/non-interlaced, dot pitch, video standard- VGA, SGVA, XGA; Printer- Daisy wheel, dot matrix, inkjet, laser; Plotter

UNIT-III

Storage devices- Storage fundamentals- Primary and Secondary; Data storage and retrieval method- sequential, direct and index sequential; Various storage devices- Magnetic tape, magnetic disk, cartridge tape, data drives, hard disk drives, floppy drive, pendrive; Number system- data representation in computers, number system of computers – binary, octal, decimal, hexadecimal- representation and their conversion

UNIT-IV

Computer software- Need, types of software-system software and application software; System software-Operating system, assembler, compiler & interpreter; Operating Systems- functions, types-batch, single user, multi-user, multiprogramming, multiprocessing; Programming language-machine, assembly, high level, their merits and demerits, Application software-word processor, spreadsheet, presentation graphics, database management software-their characteristics, uses, examples and area of applications.

UNIT-V

Introduction to open source- what is open source, history, need for open source, advantages, application of open sources, licensing, open source operating system, database management system, programming languages; open source application software

TEXTBOOKS:

1. Sanders, D.H., "Computer Today ", Mc-Graw Hill
2. Suresh K. Basandra, "Computers Today", Galgotia Publications Pvt. Ltd.

REFERENCES:

1. Raja Raman V., "Fundamental of Computers", Prentice Hall of India, New Delhi.
2. Trainer T., et al, "Computers", McGraw Hill.
3. Norton, Peter, "Introduction to Computers", Mc-Graw-Hill.
4. B. Ram, "Computer Fundamentals", New Age International Pvt. Ltd.
5. S. Jaiswal, "Fundamental of Computer & IT", Wiley Dreamtech India.

Course: CONCEPTS OF ALGORITHMS AND PROGRAMMING (CAP)

Code: PDCA502

Credits: 3

OBJECTIVE: The objective of this subject is to discuss the basic techniques and algorithms for attacking and solving various types of problems. The emphasis should be on writing algorithms and programs in C and understanding the object oriented paradigm

UNIT-I

Definition of Algorithms- Writing algorithms- top down design – Program verification- The efficiency of algorithms- Concept of Recursion- some simple example to illustrate these concepts like finding the GCD of two numbers- Swapping two variables- Summation of n given numbers- generation of Fibonacci sequence- Reversing a given number-Base conversion.

UNIT-II

Introduction to- C character set- Delimiters-The C Keywords-Identifiers- Constants- Variables-Rules for Defining Variables-Data Types-Declaring Variables- Initializing Variables – Type Conversion-Priority of Operators and their Clubbing- Comma and Conditional Operator-Arithmetic Operators-Relational Operators –Logical Operators- Bitwise Operators-Input and Output in C-Formatted and Unformatted Functions - Library Functions; if statement- if...else statement-various forms of if- nested if -break statement-continue statement – go to statement - switch statement - nested switch statement - for statement -while statement do while statement - arrays - working with string and standard functions.

UNIT-III

Introduction to pointers – pointer declaration – Arithmetic Operations with pointers – pointers and arrays – pointers and two-dimensional arrays – array of pointers – pointers to pointers – pointers and strings – void pointers – function definition and declaration – proto types - types of functions – call by value and reference – functions returning more values – function as an argument – function with operators – function and decision statements – function and loop statements – function with arrays and pointers – recursion – pointer to

function – storage classes; preprocessor directives– structures and unions – bit wise operators – files – command line arguments – dynamic memory allocation – graphics in C .

UNIT-IV

Introduction to C++: Identifier, Keywords, Constants, data types, Modifiers, reference variables, Operators, Type conversion, Variable declaration, expressions, statements, manipulators Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements. Storage Classes: Automatic, Static, Extern, Register, Functions-Prototyping, Definition and Call, Scope Rules; Function overloading, Default Arguments, Const arguments; Pointer to functions, Inline functions;Classes and Objects-Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control, const data members, Const member functions, this pointer;Friend functions and Friend classes; Constructors-properties, types of constructors;Destructors- Properties, Destroying objects, rules for constructors and destructors

UNIT-V

Inheritance-defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class; types of inheritance-Single, Multiple, Multilevel and Hybrid, types of base classes-Direct, Indirect, Virtual, Abstract, code reusability;Polymorphism: Methods of achieving polymorphic behaviour; Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading: early binding, Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class. Virtual destructors;Difference between function overloading, redefining, and overriding

TEXTBOOKS:

1. E. Balagurusamy, “Programming in C”, TMH Publications
2. Herbert Schildt, “The Complete Reference C++”, Tata McGraw-Hill

REFERENCES:

1. Deitel and Deitel, “C++ How to Program”, Pearson Education, 2001
2. Yashavant Kanetkar, “Let Us C”, BPB publication

Course: CAP-PRACTICAL

Code: PDCA503

Credits: 3

OBJECTIVE: To provide students the skill for programming and algorithms using C and C++

LIST OF PROGRAMS:

1. Development of Algorithm for simple problem.
2. Development of Flowcharts for simple problem.

3. Program to simulate a simple Calculator that performs Arithmetic Operations.
4. Program to implement Decision Control statements.
5. Program to implement Looping Structures.
6. Program to implement Arrays and Multi-Dimensional Arrays.
7. Program to implement Functions.
8. Program to perform String Handling Functions.
9. Program to demonstrate Structure and Union.
10. Program to demonstrate the use of Pointer concepts.
11. WAP to find the roots of a quadratic equation using C language
12. WAP to find whether given number is prime or not using C language
13. WAP using C language to find the reverse of a given number
14. WAP using C language to find whether given number is palindrome or not
15. WAP using C language to find the value of $\sin x$, using series expansion
16. WAP using C language to Sort the elements in a given array, using bubble sort
17. WAP to Sort the elements in a given array, using insertion sort using C language
18. WAP to find the product of two matrices of sizes 3×4 and 4×3 using C language
19. WAP to find the position of given element in the array, using binary search using C language
20. Print the elements in the reverse order of the given elements in the array using C language
21. WAP to find the number of vowels in a given string using C language
22. WAP to find the number of letters in the given string using C language
23. WAP to find the number of words in the given string using C language
24. Write a C++ program to implement flight class with data member as flight no, source, destination and fare. Write a copy constructor and a member function to display the flight information.
25. Write a C++ program to implement a string object. Include member functions to compare two strings and to concatenate two strings
26. Write a C++ program to implement a class to represent complex numbers. Include member functions to add and multiply to complex numbers. Overload assignment operator =
27. Write a C++ program to implement time class that has separate data members for hours, minutes and seconds. Overload + Operator to add two times (object) and ++ operator to increment the time by one second
28. Write a C++ program to implement a student class having roll no., name, rank, addresses as data members. Overload assignment operator =
29. Write a C++ program to implement user defined string class. Overload the constructor and a member function to concatenate two strings.
30. Write a C++ program implement Complex class with the member function Add, Subtract and Multiply two complex Numbers
31. Write a C++ Program to implement a sphere class with appropriate members and member function to find the surface area and the volume ($\text{Surface} = 4 \pi r^2$ and $\text{Volume} = \frac{4}{3} \pi r^3$)
32. Write a C++ program to implements a string class. Overload + Operator to concatenate two strings
33. Write a C++ program to implement matrix class. Add member function to transpose the matrix

34. Write a C++ program to find the number of characters, word and lines in the given text as input
35. Write a C++ program to implement a telephone bill class with Name, Address, Tel. No., No. of calls as data members. Compute the amount to be paid if the charges per call is Rs. 2/-
36. Write a C ++ program to implement a class for complex numbers with add and multiply as member functions. Overload ++ operator to increment a complex number
37. Write a C ++ program to implement a date class with member functions as next, previous which return next date and previous date objects

Course: OFFICE PACKAGE-PRACTICAL

Code: PDCA504

Credits: 3

OBJECTIVE: This paper intends to familiarize the students with MS Office and libre office and its applications in the relevant fields.

UNIT-I

MS Word – Introduction to MS Word- Creating and saving a document, opening an existing file, saving a file using a new name; Editing a document- inserting, overwriting and deleting text, cut, copy and paste, correcting spelling and grammatical errors, using the Thesaurus, finding and replacing text; Formatting text- character formatting, paragraph formatting and document formatting; Advanced formatting and editing techniques- bullets and numbering, borders and shading, changing case, auto correct tool, working with tables and pictures; Mail merge- merging excel to word.

UNIT-II

MS PowerPoint- Introduction & area of use, Creating a new presentation, saving, closing and opening a presentation, inserting, deleting and copying slides, slide setup, slide master, adding animation and transition effect, slide show, printing presentation.

UNIT-III

MS Excel – Introduction, workbook and worksheet, understanding ranges, selecting cells, edition data, rearranging cell contents, saving a workbook, opening an existing workbook, protecting a workbook; Formulae in Excel- addressing method, using auto sum, functions; Formatting data- cell formatting, using auto format, row format; Managing workbooks- inserting sheets, copying and moving sheets, renaming sheets, deleting sheets; Managing data- data list, sorting data, filtering data, automatic subtotals; working with charts.

Course: GENERAL PROFICIENCY

Code: PDCA505

Credits: 2

OBJECTIVE: To provide foundation and concepts related to mathematical skills and knowledge for understanding the basic rules of mathematics.

UNIT-I

Arithmetic Ability - Surd and indices, Percentage, Profit and loss, Ratio and proportion, partnership, time & work, time and distance, allegation or mixture, area, volume and surfaces, clock & calendar.

Permutations and Combinations, Data interpretation: Tabulation, graph and chart

UNIT-II

Principle of Mathematical Induction: Process of the proof by induction. The principle of mathematical induction and simple applications. Complex Numbers and Quadratic Equations. Argand plane and polar representation of complex numbers. Statement of Fundamental Theorem of Algebra, quadratic equations in the complex number system, Square-root of a Complex number.

Linear Inequalities, Binomial Theorem, Sequence and Series: Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.)

UNIT-III

Mathematical Reasoning - Mathematically acceptable statements. Connecting words/phrases - consolidating the understanding of “if and only if (necessary and sufficient) condition”, “implies”, “and/or”, “implied by”, “and”, “or”, “there exists” and their use through variety of examples related to real life and Mathematics.

UNIT-IV

Statistics: Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

Probability: Random experiments: outcomes, sample spaces (set representation). Events: Occurrence of events, ‘not’, ‘and’ & ‘or’ events, exhaustive events, mutually exclusive events. Axiomatic (set theoretic) probability, connections with the theories of earlier classes. Probability of an event, probability of ‘not’, ‘and’, & ‘or’ events.

UNIT-V

Straight Lines: Brief recall of 2-D from earlier classes, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form.

TEXTBOOKS:

1. R. D Sharma, “Mathematics Vol. 1 & 2”, Dhanpat Rai Publications; 2017 edition
2. NCERT Materials on Mathematics

REFERENCES

1. R.S Aggarwal, "Quantitative Aptitude, S Chand Publications; 20th edition
2. NPTEL Materials

Course: WEB DESIGNING-PRACTICAL

Code: PDCA506

Credits: 3

OBJECTIVE: The students will learn about the various web designing techniques and build their own websites using different tools.

CONTENTS:

1. Creating web page using basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image; different attributes like align, color, bgcolor, font face, border, size
2. Write HTML code to develop a Web page having the background in red and title "My First Page" in any other color
3. Create an HTML document giving details of your name, age, telephone number, address, TLC code & enrolment number aligned in proper order
4. Write an HTML code to design a page containing text, in form of paragraphs giving suitable heading style
5. Create a page to show different attributes of Font tag
6. Create a page to show different attributes: italics, bold, underline
7. Creating web page having navigation links using anchor tag, internal, external, mail and image links; lists-ordered, unordered
8. Creating web page having table tag; HTML Form controls-form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frame
9. Write an HTML code to create a Web page of blue color and displaylinks in red colour
10. Create a Web page with appropriate content and insert an image towards the left hand side of the page. When user clicks on the image, it should open another Web page
11. Create a Web page, which should contain a table having two rows and two columns.
12. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows.
13. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows and then divide the second row into two equal columns.
14. Write an HTML code to develop a Web page having frames as described in the above question and then fill each frame with a different background color
15. Design a page with a text box called 'name' and a button with label 'Enter'. When you click on the button another page should open, with the message "Hello < name >", where name should be equal to the name entered in the first page
16. Design a Web Page, which is like 'compose' page of e-mail 1. Design a Web Page, which is like 'compose' page of e-mail
17. Writing programs implementing cascading style Sheet (CSS), CSS syntax, comments, id and class, background color, background image- text - text color, text alignment, text

- decoration, text transformation, text indentation; CSS font - font families, font style, font size - setting text size , using pixels and em; CSS lists - different list item markers, unordered list, ordered list, an image as the list item marker
18. Writing programs implementing CSS tables - table borders, collapse borders, table width and height, table text alignment, table padding, table color; CSS positioning - static positioning, fixed positioning, relative positioning, absolute positioning, overlapping elements, float, horizontal align, image gallery, image opacity/transparency
 19. Writing program using Javascript tag, comments, variables, document methods-write and writeln methods, alert; operators-arithmetic, assignment, relational, logical, javascript functions, conditional Statements, loops, break and continue; events familiarization-onLoad, onClick, onBlur, onSubmit, onChange
 20. Write a JavaScript code to create a pull down menu box.
 21. Write a program to move a text with mouse pointer and to change colour of text randomly
 22. Create a Web page using two image files, which switch b/w one another as the mouse pointer moves over the image. Use the On Mouse over and On Mouse out event handler
 23. Create an HTML form that has a number of text boxes. The user fills the textboxes with data. Write a script that verifies that all textboxes have been filled. If a text box has been left empty pop up an alert message indicating the box that has been left empty. When OK button is clicked, set focus to that specific textbox. If all the textboxes are filled, display thank you.
 24. Working HTML 5 events using javascript-offline, onabort, onafterprint, onbeforeunload, onbeforeprint, onblur, oncanplay, oncanplaythrough, onclick, oncontextmenu, ondblclick, ondrag, ondragend, ondragenter, ondragleave, ondragover, ondragstart, ondrop, ondurationchange, onemptied, onended, onerror, onfocus, oninput, oninvalid, onload, onmouseover, onmouseup, onmousewheel, onpagehide, onpageshow, onplaying, onprogress, onratechange, onredo, onresize, onscroll, onseeked, onseeking, onselect, onsubmit, onsuspend, onundo, onunload, onvolumechange, onwaiting
 25. Working with scalable vector graphics-embedding SVG, SVG line, circle, rectangle, ellipse, polygon, gradients; Canvas element-using canvas to draw polygon, path, text, transformation
 26. Working with web storage-session storage, local storage, delete web storage; web socket events-open, message, error, close; web socket methods-socket.send(), socket.close()
 27. Working with Joomla 3.4 CMS-installation, work areas, control panel, -toolbar; menu-content, component, extensions, help menu
 28. Creating menus, adding menu items, modifying menu items, submenus
 29. Working with Joomla modules-create module, breadcrumb module, feed display module, footer module, search module, random image module, who's online module, syndicate module
 30. Working with Joomla global setting-system setting, media setting, language manager, private messages, mass emailing, cache management, users setting
 31. Working with Joomla template-template manager, customize template, adding template, creating, adding, customize logo, category management, adding content, formatting content, article metadata, adding banners, contacts adding news feed, adding forum, web links
 32. Working with Joomla plugins-plugin managers, authentication plugins, content plugins, editor plugins, search plugins, users plugins, extension, system plugins

33. Working on Site Management-global configuration- site online and offline, metadata setting, change site url ,updating web site, updating extension, disabling and uninstalling extensions, back up site
34. Web hosting-www, web server, internet service provider, web hosting providers,domain names, web hosting email servers,web hosting technologies and types
35. Working with Cpanel-using file section tools, mange domains, manage email, manage security section, manage databases, manage software section tools

TEXTBOOKS:

1. HTML5 and CSS3: Develop with Tomorrow's Standards Today, Hogan Brian P, Springer India Private Limited
2. HTML 5 Foundations, Matt West, Wiley India Pvt Ltd
3. Using Joomla, Ron Severdia Kenneth Crowder, Shroff Publications

REFERENCES:

1. Responsive Web Design with HTML5 and CSS3, Hogan Brian P., Shroff Publishers & Distributers Private Limited - Mumbai
2. HTML 5 and CSS 3 Made Simple, Ivan Bayross, BPB
3. Joomla Accessibility, Joshue O Conner, Shroff Publications

Course: FUNDAMENTALS OF NETWORKING

Code: PDCA511

Credits: 4

OBJECTIVES: It aims to provide the student with a basic knowledge necessary to understand the fundamental building blocks that form a modern network, such as protocols, topologies, hardware, and network operating systems. It then provides in-depth coverage of the most important concepts in contemporary networking, such as TCP/IP, Ethernet, wireless transmission, and security

UNIT-I

Introduction to Networking-Overview, Objectives, Introduction, Networking Connectivity, Network Extension, Network Topologies, Protocols, Programs and Processes, Protocol Layering Concepts, Encapsulation and Decapsulation

UNIT-II

The OSI Model Layers 1 - 4-Overview, Objectives, Introduction, The Physical Layer, The Data Link Layer, The Network Layer, The Transport Layer

UNIT-III

The OSI Model Layers 5 - 7-Overview, Objectives, Introduction, The Session Layer, The Presentation Layer, The Application Layer

UNIT-IV

LAN Architecture-Overview, Objectives, Introduction, History of LANs Transmission, Methods and Media, LAN Protocols, Ethernet, Token Ring, Token Bus, Fiber Distributed Data Interface (FDDI), Wireless LANs, LAN Protocols

UNIT-V

Networking devices- Introduction, Goal of networking devices, Objectives, Repeaters, Hubs, Switches, Bridges, Routers, Gateways

TEXTBOOKS:

1. Andrew S. Tanenbaum, David Wetherall, "Computer Networks"
2. Dr. Madhulika Jain and Satish Jain, "Data Communication And Computer Networks"

REFERENCES:

1. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach"
2. Natalia Olifer , Victor Olifer, "Computer networks: Principles, technologies and protocols"

Course: RELATIONAL DATABASE MANAGEMENT SYSTEM-PRACTICAL

Code: PDCA513

Credits: 3

OBJECTIVE: The objective of this paper is to introduce to the students the fundamental concepts necessary for designing, using and implementing database systems and applications

CONTENTS:

1. Working with MySQL Data Definition, Table Creation, Constraints
2. Working with Insert, Select Commands, Update & Delete Commands
3. Study of SELECT command with different clauses
4. Study of GROUP functions (avg, count, max, min, sum)
5. Study of various type of SET OPERATORS (Union, Intersect, Minus).
6. Writing Nested Queries & Join Queries
7. Working with MySQL date and time format-extracting year, month, calculating present age from date of birth
8. Implementing Views
9. Working with Transaction

Course: PC ASSEMBLING AND TROUBLESHOOTING-PRACTICAL

Code: PDCA514

Credits: 3

OBJECTIVE: To enable the student to understand all the parts of the computer, their relationship and their functionality and also he will be able to identify the problem associated with the computer.

UNIT-I

Introduction to pc-Architecture of the System (PC how does it work?); Understanding the function of a computer, the input device, output device, memory, storage device, CPU, system board, interfaces: parallel and serial, Power system: SMPS, power supply connector, UPS.

UNIT-II

PC assembly- Identification of the different physical parts of the computer -DVD/CD drives, Hard Disk Drive, processor, SMPS, RAM, motherboard, CMOS etc.; Different types of cable used in connecting the parts into the mother board; Mounting Motherboard in cabinet and installing different parts into the motherboard; connecting cables; PC Upgrade Options & Strategies for different usage of computer (professional, Gamer, ordinary)

UNIT-III

Installation and Upgradation-Operating system, devices drivers and other application softwares; Basic of networking, IP configuration, peer to peer connection

UNIT-IV

PC management and maintenance-Basic windows administration: task manager, control panel, disk management, device manager etc. case study on window XP, 7, 8, Antivirus; connecting PC with peripheral devices (projector, printer, etc)

UNIT-V

BIOS-Typical Motherboard BIOS, BIOS Features, BIOS & Boot Sequences, BIOS troubleshooting; Software troubleshooting: Windows troubleshooting; Hardware troubleshooting: POST (Power-on Self Test) routine, mother board problems, HDD problem, Peripherals problems, miscellaneous problems; Error Code: Beep Code, Post Code, Post Reader Card

TEXTBOOK:

1. K. L. James, "Computer Hardware: Installation, Interfacing, Troubleshooting and Maintenance"

REFERENCES:

1. David Groth, "A+ core module"
2. Balvir Singh, "PC Hardware"
3. Scott Mueller, "Upgrading and Repairing PCs"

Course: VISUAL PROGRAMMING-PRACTICAL
Code: PDCA515
Credits: 3

OBJECTIVE: To provide students with the knowledge and skills needed to develop applications in Microsoft Visual Basic .NET for the Microsoft .NET platform. The paper focuses on user interfaces, program structure, language syntax, and implementation details.

LIST OF PROGRAMS:

1. Programs implementing the components of VB Control and its properties
2. Programs implementing the concept of Variables I
3. Programs implementing the concept of Decision Statements
4. Programs implementing the concepts of Looping statements
5. Programs implementing the concept of VB Functions
6. Programs for accessing a database using VB controls and functions

Course: VISUAL PROGRAMMING
Code: PDCA512
Credits: 3

OBJECTIVE: To provide students with the knowledge and skills needed to develop applications in Microsoft Visual Basic .NET for the Microsoft .NET platform. The paper focuses on user interfaces, program structure, language syntax, and implementation details.

UNIT-I

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.

UNIT-II

The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function. Control flow statements: conditional statement, loop statement. MsgBox & Inputbox.

UNIT – III

Working with Forms: Loading, showing and hiding forms, controlling One form within another. GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView,

TreeView, toolbar, StatusBar. There Properties, Methods and events. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menus: ContextMenu, access & shortcut keys.

UNIT-IV

Object oriented Programming: Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers: Public Private, Protected. Overloading, My Base & My class keywords. Overview of OLE, Accessing the WIN32 API from VB.NET & Interfacing with office97, COM technology, advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.

UNIT-V

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid. Generate Reports Using CrystalReportViewer.

TEXTBOOKS:

1. Steven Holzner, “VB.NET Programming Black Book”, Dreamtech publications
2. Evangelos Petroustos, “Mastering VB.NET” - BPB publications

REFERENCES:

1. Introduction to .NET framework-Worx publication
2. msdn.microsoft.com/net/
3. www.gotdotnet.com

Master of Computer Application (MCA)

Course: COMPUTER ORGANIZATION & ARCHITECTURE

Code: MCA501

Credits: 4

OBJECTIVES: This course aims to provide the student with in depth understanding of the structures and behavior of the various functional modules of the computer and how hardware components are organized forming a computer.

UNIT-I

Digital Components Combinational; Flip flops; Sequential Circuits; Integrated Circuits; Decoders; Multiplexes; Demultiplexer; Code Converter; Registers; Shift Registers; Binary Counters; Memory Unit; Register Transfers, Microoperations, Basic Computer Organization & Design Register Transfer; Control Function; Bus and Memory Transfers; Arithmetic Microoperations Logic Microoperations; Shift Microoperations; Arithmetic Logic Shift Unit.

UNIT-II

Instruction Codes; Computer Registers; Common Bus Systems; Computer Instructions; Timing and Control; *Instruction Cycle*; Memory-Reference Instructions; Input-Output and Interrupt; Computer Description; Design of Basic Computer; Design of Accumulator Logic Programming the Basic Computer, Computer Arithmetic Introduction; Programming Arithmetic and Logic Operations; Input Output Programming; Addition and Subtraction; Multiplication Algorithms; Division Algorithms; Floating-Point Arithmetic Operations.

UNIT-III

Introduction to Major Components of a CPU; General Register Organization; Stack Organization; Instruction Formats; Addressing Modes; Data Transfer and Manipulation; Program Control; Reduced Instruction Set Computer; Control Memory; Address Sequencing; Microprogram Example; Design of Control Unit.

UNIT-IV

Characteristics of Multiprocessors; Flynn's Classification; Interconnection Structures; Interprocessor Arbitration; Interprocessor Communication, Synchronization and Mutual Exclusion with a Semaphore; Cache Coherence; Parallel Processing; Pipelining; Arithmetic Pipeline; Instruction Pipeline; RISC Pipeline; Vector Processing; Array Processors.

UNIT-V

Peripheral Devices; Input Output Interface; Asynchronous Data Transfer; Modes of Transfer; Priority Interrupt; Direct Memory Access; Input-Output Processor; Memory Hierarchy; Main Memory; Auxiliary Memory; Associative Memory; Cache Memory; Virtual Memory; Memory Management.

TEXTBOOK:

1. M. Morris Mano, "Computer System Architecture", Prentice Hall of India Pvt. Ltd

REFERENCES:

1. M. Morris Mano, "Digital Logic and Computer Design", Prentice Hall of India Pvt. Ltd
2. M. Morris Mano, "Computer Engineering Hardware Design", Prentice Hall, Inc
3. P. Pal Choudhuri, "Computer Organization and Design", Prentice Hall of India Pvt.

Course: CONCEPTS OF ALGORITHM AND PROGRAMMING (CAP)

Code: MCA502

Credits: 3

OBJECTIVES: The objective of this subject is to discuss the basic techniques and algorithms for attacking and solving various types of problems. The emphasis should be on writing algorithms and programs in C and understanding the object oriented paradigm.

UNIT-I

Definition of Algorithms- Writing algorithms- top down design – Program verification- The efficiency of algorithms- Concept of Recursion- some simple example to illustrate these concepts like finding the GCD of two numbers- Swapping two variables- Summation of n given numbers- generation of Fibonacci sequence- Reversing a given number-Base conversion.

UNIT-II

– go to statement - switch statement - nested switch statement - for statement
Introduction to- C character set- Delimiters-The C Keywords-Identifiers- Constants- Variables-Rules for Defining Variables-Data Types-Declaring Variables- Initializing Variables – Type Conversion-Priority of Operators and their Clubbing- Comma and Conditional Operator-Arithmetic Operators-Relational Operators –Logical Operators- Bitwise Operators-Input and Output in C-Formatted and Unformatted Functions - Library Functions; if statement- if...else statement-various forms of if- nested if -break statement-continue statement-while statement do while statement - arrays - working with string and standard functions.

UNIT-III

Introduction to pointers – pointer declaration – Arithmetic Operations with pointers – pointers and arrays – pointers and two-dimensional arrays – array of pointers – pointers to pointers – pointers and strings – void pointers – function definition and declaration – proto types - types of functions – call by value and reference – functions returning more values – function as an argument – function with operators – function and decision statements – function and loop statements – function with arrays and pointers – recursion – pointer to function – storage classes; preprocessor directives– structures and unions – bit wise operators – files – command line arguments – dynamic memory allocation – graphics in C .

UNIT-IV

Introduction to C++: Identifier, Keywords, Constants, data types, Modifiers, reference variables, Operators, Type conversion, Variable declaration, expressions, statements, manipulators Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements. Storage Classes: Automatic, Static, Extern, Register, Functions-Prototyping, Definition and Call, Scope Rules; Function overloading, Default Arguments, Const arguments; Pointer to functions, Inline functions; Classes and Objects-Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control, const data members, Const member functions, this pointer; Friend functions and Friend classes; Constructors- properties, types of constructors; Destructors- Properties, Destroying objects, rules for constructors and destructors.

UNIT-V

Inheritance-defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class; types of inheritance-Single, Multiple, Multilevel and Hybrid, types of base classes-Direct, Indirect, Virtual, Abstract, code reusability; Polymorphism: Methods of achieving polymorphic behaviour; Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading: early binding, Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class. Virtual destructors; Difference between function overloading, redefining, and overriding.

TEXTBOOKS:

1. E. Balagurusamy, "Programming in C", TMH Publications
2. Herbert Schildt, "The Complete Reference C++", Tata McGraw-Hill

REFERENCES:

1. Deitel and Deitel, "C++ How to Program", Pearson Education, 2001
2. Yashavant Kanetkar, "Let Us C", BPB publication

Course: CAP-PRACTICAL

Code: MCA503

Credits: 3

OBJECTIVES: To provide students the skill for programming and algorithms using C and C++.

LIST OF PROGRAMS:

1. WAP to find the roots of a quadratic equation using C language
2. WAP to find whether given number is prime or not using C language
3. WAP using C language to find the reverse of a given number
4. WAP using C language to find whether given number is palindrome or not
5. WAP using C language to find the value of sinx, using series expansion
6. WAP using C language to Sort the elements in a given array, using bubble sort

7. WAP to Sort the elements in a given array, using insertion sort using C language
8. WAP to find the product of two matrices of sizes 3 x 4 and 4 x 3 using C language
9. WAP to find the position of given element in the array, using binary search using C language
10. Print the elements in the reverse order of the given elements in the array using C language
11. WAP to find the number of vowels in a given string using C language
12. WAP to find the number of letters in the given string using C language
13. WAP to find the number of words in the given string using C language
14. Write a C++ program to implement flight class with data member as flight no,source, destination and fare. Write a copy constructor and a member function to display the flight information.
15. Write a C++ program to implement a string object. Include member functions to compare two strings and to concatenate two strings
16. Write a C++ program to implement a class to represent complex numbers. Include member functions to add and multiply to complex numbers. Overload assignment operator =
17. Write a C++ program to implement time class that has separate data members for hours, minutes and seconds. Overload + Operator to add two times (object) and ++ operator to increment the time by one second
18. Write a C++ program to implement a student class having roll no., name, rank, addresses as data members. Overload assignment operator =
19. Write a C++ program to implement user defined string class. Overload the constructor and a member function to concatenate two strings.
20. Write a C++ program implement Complex class with the member function Add, Subtract and Multiply two complex Numbers
21. Write a C++ program to implement a sphere class with appropriate members and member function to find the surface area and the volume ($\text{Surface} = 4 \pi r^2$ and $\text{Volume} = \frac{4}{3} \pi r^3$)
22. Write a C++ program to implements a string class. Overload + Operator to concatenate two strings
23. Write a C++ program to implement matrix class. Add member function to transpose the matrix
24. Write a C++ program to find the number of characters, word and lines in the given text as input
25. Write a C++ program to implement a telephone bill class with Name, Address, Tel. No., No. of calls as data members. Compute the amount to be paid if the charges per call is Rs. 2/-
26. Write a C++ program to implement a class for complex numbers with add and multiply as member functions. Overload ++ operator to increment a complex number
27. Write a C++ program to implement a date class with member functions as next, previous which return next date and previous date objects

Course: WEB DESIGNING-PRACTICAL

Code: MCA504

Credits: 3

OBJECTIVES: The students will learn about the various web designing techniques and build their own websites using different tools.

CONTENTS:

1. Creating web page using basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image; different attributes like align, color, bgcolor, font face, border, size
2. Write HTML code to develop a Web page having the background in red and title "My First Page" in any other color
3. Create an HTML document giving details of your name, age, telephone number, address, TLC code & enrolment number aligned in proper order
4. Write an HTML code to design a page containing text, in form of paragraphs giving suitable heading style
5. Create a page to show different attributes of Font tag
6. Create a page to show different attributes: italics, bold, underline
7. Creating web page having navigation links using anchor tag, internal, external, mail and image links; lists-ordered, unordered
8. Creating web page having table tag; HTML Form controls-form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frame
9. Write an HTML code to create a Web page of blue color and display links in red colour
10. Create a Web page with appropriate content and insert an image towards the left hand side of the page. When user clicks on the image, it should open another Web page
11. Create a Web page, which should contain a table having two rows and two columns.
12. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows.
13. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows and then divide the second row into two equal columns.
14. Write an HTML code to develop a Web page having frames as described in the above question and then fill each frame with a different background color
15. Design a page with a text box called 'name' and a button with label 'Enter'. When you click on the button another page should open, with the message "Hello < name > ", where name should be equal to the name entered in the first page
16. Design a Web Page, which is like 'compose' page of e-mail 1. Design a Web Page, which is like 'compose' page of e-mail
17. Writing programs implementing cascading style Sheet (CSS), CSS syntax, comments, id and class, background color, background image- text - text color, text alignment, text decoration, text transformation, text indentation; CSS font - font families, font style, font size - setting text size , using pixels and em; CSS lists - different list item markers, unordered list, ordered list, an image as the list item marker
18. Writing programs implementing CSS tables - table borders, collapse borders, table width and height, table text alignment, table padding, table color; CSS positioning - static

- positioning, fixed positioning, relative positioning, absolute positioning, overlapping elements, float, horizontal align, image gallery, image opacity/transparency
19. Writing program using Javascript tag, comments, variables, document methods-write and writeln methods, alert; operators-arithmetic, assignment, relational, logical, javascript functions, conditional Statements, loops, break and continue; events familiarization-onLoad, onClick, onBlur, onSubmit, onChange
 20. Write a JavaScript code to create a pull down menu box.
 21. Write a program to move a text with mouse pointer and to change colour of text randomly
 22. Create a Web page using two image files, which switch b/w one another as the mouse pointer moves over the image. Use the On Mouse over and On Mouse out event handler
 23. Create an HTML form that has a number of text boxes. The user fills the textboxes with data. Write a script that verifies that all textboxes have been filled. If a text box has been left empty pop up an alert message indicating the box that has been left empty. When OK button is clicked, set focus to that specific textbox. If all the textboxes are filled, display thank you.
 24. Working HTML 5 events using javascript-offline,onabort, onafterprint, onbeforeunload, onbeforeprint, onblur, oncanplay, oncanplaythrough, onclick, oncontextmenu, ondblclick, ondrag,ondragend,ondragcenter,ondragleave,ondragover,ondragstart,ondrop,ondurationchange,onemptied,onended,onerror,onfocus,oninput,oninvalid,onload,onmouseover,onmouseout,onmousewheel,onpagehide,onpageshow,onplaying,onprogress,onratechange,onredo,onresize,onscroll,onseeked,onseeking,onselect,onsubmit, onsuspend, onundo, onunload, onvolumchange, onwaiting
 25. Working with scalable vector graphics-embedding SVG,SVG line, circle, rectangle, ellipse, polygon, gradients; Canvas element-using canvas to draw polygon, path, text, transformation
 26. Working with web storage-session storage, local storage, delete web storage; web socket events-open, message, error, close; web socket methods-socket.send(),socket.close()
 27. Working with Joomla 3.4 CMS-installation, work areas, control panel, -toolbar; menu-content, component, extensions, help menu
 28. Creating menus, adding menus items, modifying menu items, submenus
 29. Working with Joomla modules-create module, breadcrumb module, feed display module, footer module, search module, random image module, whos is online module, syndicate module
 30. Working with Joomla global setting-system setting, media setting, language manager, private messages, mass emailing, cache management, users setting
 31. Working with Joomla template-template manager, customize template, adding template, creating, adding, customize logo, category management, adding content, formatting content, article metadata, adding banners, contacts adding news feed, adding forum, web links
 32. Working with joomla plugins-plugin managers, authentication plugins, content plugins, editor plugins, search plugins, users plugins, extension, system plugins
 33. Working on Site Management-global configuration- site online and offline, metadata setting, change site url ,updating web site, updating extension, disabling and uninstalling extensions, back up site
 34. Web hosting-www, web server, internet service provider, web hosting providers, domain names, web hosting email servers, web hosting technologies and types

35. Working with Cpanel-using file section tools, manage domains, manage email, manage security section, manage databases, manage software section tools

TEXTBOOKS:

1. Hogan Brian P, "HTML5 and CSS3: Develop with Tomorrow's Standards Today", Springer India Private Limited
2. Matt West, "HTML 5 Foundations", Wiley India Pvt Ltd
3. Ron Severdia Kenneth Crowder, "Using Joomla", Shroff Publications

REFERENCES:

1. Hogan Brian P., "Responsive Web Design with HTML5 and CSS3", Shroff Publishers & Distributers Private Limited - Mumbai
2. Ivan Bayross, "HTML 5 and CSS 3 Made Simple", BPB
3. Joshue O Conner, "Joomla Accessibility", Shroff Publications

Course: PC SOFTWARE AND HARDWARE-PRACTICAL

Code: MCA505

Credits: 3

OBJECTIVES: To enable students to work with computer hardware and software like MS Office and its applications in the relevant fields.

CONTENTS:

1. Introduction to MS Word and its area of use
2. Identify the different components of the document window and their functions
3. Creating and saving a document, open an existing file and saving a file using a new name
4. Protecting the document window using a password
5. Document creation- text selection and editing, cut, copy, paste, finding and replacing text
6. Formatting the text- font and size selection, alignment and spacing of text, paragraph indenting, bullets & numbering, headers & footers and changing case
7. Working with themes, table of contents, watermark, margins, size and orientation of page
8. Working with hyperlink, columns, drop cap, page setup, print preview and printing of documents
9. Working with tables- insert table, changing cell width & height, alignment of text in cell, insert / delete rows and columns, merging & splitting of cells
10. Working with pictures- picture style, aligning, text wrapping & cropping
11. Working with mail merge
12. Introduction to MS PowerPoint and its area of use
13. Identify the different components of the PowerPoint window and their functions
14. Creating and saving a presentation, open an existing presentation and saving it using a new name and Protecting the presentation using a password and working with slides- insert, delete and copying of slides
15. Working with themes- color, fonts & effects, slide design, background styles, animation and transition effects, setting the slide timer

16. Working with tables, hyperlinks, insert textbox, slide number, header & footer, wordart
17. Creating a photo album, picture and clipart and working with media clips- insert movie and sound clip
18. Changing page setup, slide orientation, printing a presentation and running the presentation using the slide show and function key
19. Introduction to MS Excel and its area of use and
20. Identify the different components of the excel window and their functions
21. Understanding what is a workbook, worksheet, cells, range and auto fill handle Open, save, close & renaming a workbook and Protecting the workbook using a password
22. Inserting worksheets, copying & renaming sheets, deleting sheets, editing text, selecting cells, rearranging & merging of cell contents and working with cell formatting using auto row format, row and column formatting, cell border, hyperlink
23. Working with formula using addressing method, auto sum and functions, merging from excel workbook to word document
24. Managing data-sorting data, filtering data, freezing rows & columns, cell contents, working subtotals and data form and working with charts
25. Understanding the different components of a desktop computer
26. Understanding the different brands of the components
27. Assembling a computer
28. Partitioning and Installing operating system and drivers
29. Installing application soft wares
30. Troubleshooting RAM, hard drive, SMPS problems

Course: DISCRETE MATHEMATICS

Code: MATH501

Credits: 3

OBJECTIVES: To introduce the discrete mathematical structures which are used in developing problem solving program in computer sciences.

UNIT-I

Fundamentals-Sets, Relation and Functions, Fundamental of logic Logical inferences, First order logic, Quantified propositions, Mathematical induction.

UNIT-II

Elementary combinatorics-combinations and Permutations, Enumeration with repetitions with constrained repetitions.

UNIT-III

Recurrence relations-Generating functions, Coefficients of generating functions, Recurrence relations, Inhomogeneous recurrence relations.

UNIT-IV

Relations and digraphs-Relations and Digraphs, Binary relations Equivalence relations Ordering relations, Lattices Paths and Closures Directed graphs Adjacency matrices.

UNIT-V

Graphs-Graphs Isomorphism, Trees, Spanning trees, Binary trees, Planar graphs Euler circuits Hamiltonian graphs, Chromatic numbers, Four color problem.

TEXTBOOK:

1. J. L. Mott, A. Kandel & T. P. Baker, "Discrete Mathematics for Computer Scientists", PHI

REFERENCE:

1. Kenneth H Rosen, "Discrete Mathematics and its applications", McGraw Hill Education

Course: OPERATING SYSTEMS

Code: MCA511

Credits: 4

OBJECTIVE: To describe the major components of an operating system, their functions and purpose to achieve the various case studies of different types of Operating System.

UNIT-I

Introduction – Definition, Types of Operating System, Functions of the Operating System, Operating Systems Services, System Components, System Calls, Single User, Multi User and Multitasking Operating System.

UNIT-II

Process Management – Process, Scheduling, CPU Scheduling Concepts, Process Synchronization, Semaphore, Classical Problems of Synchronization, Deadlocks, Deadlock Detection, Deadlock Recovery.

UNIT-III

Memory Management – Introduction, Logical address V/s Physical address, Swapping, Contiguous Allocation, Partitioned Memory Allocation, Fragmentation, Paging, Segmentation, Virtual Memory, Page Replacement, Page Replacement Algorithms, Frame Allocation Algorithm.

UNIT-IV

File Management – File concepts, Access Methods, Directory Structure, Allocation Methods, Free Space Management, Secondary Storage Structure, Disk Scheduling, FCFS Scheduling, Disk Management.

UNIT-V

Distributed System and Security – Client/Server Computing, Remote Procedure Calls, Clusters, Threats and its Goals, Types of threats, Protection Mechanism, Digital Signature, Case Study on MS-DOS, Windows NT, Windows XP, Windows 7, Windows Ultimate, Android, Jelly Beans.

TEXTBOOKS:

1. Stallings, W., “Operating System,” Sixth Edition, Prentice Hall (India)
2. Sibsankar Halder and Alex A. Aravind, “Operating Systems”, Pearson Education.

REFERENCE:

1. Abraham Silberschatz and Peter Baer Galvin, “Operating System Principles”, Seventh Edition, Wiley-India Publication

Course: FUNDAMENTALS OF NETWORKING

Code: MCA512

Credits: 4

OBJECTIVE: This course aims to provide the student with a basic knowledge necessary to understand the fundamental building blocks that form a modern network, such as protocols, topologies, hardware, and network operating systems. It then provides in-depth coverage of the most important concepts in contemporary networking, such as TCP/IP, Ethernet, wireless transmission, and security.

UNIT-I

Introduction to Networking-Overview, Objectives, Introduction, Networking Connectivity, Network Extension, Network Topologies, Protocols, Programs and Processes, Protocol Layering Concepts, Encapsulation and Decapsulation.

UNIT-II

The OSI Model Layers 1 - 4-Overview, Objectives, Introduction, The Physical Layer, The Data Link Layer, The Network Layer, The Transport Layer.

UNIT-III

The OSI Model Layers 5 - 7-Overview, Objectives, Introduction, The Session Layer, The Presentation Layer, The Application Layer.

UNIT-IV

LAN Architecture-Overview, Objectives, Introduction, History of LANs Transmission, Methods and Media, LAN Protocols, Introduction, Ethernet, Token Ring, Token Bus, Fiber Distributed Data Interface (FDDI), Wireless LANs, LAN Protocols.

UNIT-V

Networking devices- Introduction, Goal of networking devices, Objectives, Repeaters, Hubs, Switches, Bridges, Routers, Gateways.

TEXTBOOKS:

1. Andrew S. Tanenbaum, David Wetherall, “Computer Networks”
2. Dr. Madhulika Jain and Satish Jain, “Data Communication And Computer Networks”

REFERENCES:

1. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”
2. Natalia Olifer , Victor Olifer, “Computer networks: Principles, technologies and protocols”
3. Andrew Tanenbaum, “Computer Network”, Third Edition, PHI
4. Andrew Tanenbaum, “Computer Network”, Fourth Edition, PHI
5. William Stalling, “Data Communication and Computer Networks”

Course: DATA STRUCTURE USING C++

Code: MCA514

Credits: 3

OBJECTIVE: To understand the different methods of the algorithm, its efficiency and the fundamental component of problem solving for organizing large amounts of data to be efficiently implemented to solve a specific problems.

UNIT-I

Introduction – The concept of data structure, Abstract data type, Concept of list & array, Recursion Functions and its implementation; Introduction to Stack – Stack as an abstract data type, primitive operation on stack, Stacks application: Infix, post fix, prefix and recursion, multiple stack.

UNIT-II

Introduction to the linked list – Basic operations on linked list, Stacks and queues linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks and queues as a circular linked list, application of linked list; Introduction to queues – Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue.

UNIT-III

TREES – Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree; Traversal of binary trees – Inorder, Preorder & Post order, Application of Binary tree, Threaded binary tree, B-tree & Height balanced tree, Binary tree representation of trees.

UNIT-IV

Sorting – Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods, Hash Table, Collision resolution Techniques.

UNIT-V

Introduction to graphs – Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal- Depth first & Breadth first search, Spanning Trees minimum spanning Tree, Shortest path algorithm.

TEXTBOOKS:

1. A.A Puntambekar, “ Data Structures Using 'C' “, Technical Publications
2. E. Balagurusamy, “ Data Structures Using C “, TATA McGraw-Hill

REFERENCES:

1. Yashavant Kanetka, “Data Structures Through C”,BPB Publication
2. Aaron M. Tenenbaum, Yedidiah Langsam, Moshe J. Augenstein, “Data Structures Using C”, Pearson Education India
3. Kruse, Tondo & Leung, “Data Structures and Program Design”, PHI publications

Course: DATA STRUCTURE USING C++ -PRACTICAL

Code: MCA515

Credits: 3

OBJECTIVE: To understand the different methods of the algorithm, its efficiency and the fundamental component of problem solving for organizing large amounts of data to be efficiently implemented to solve a specific problems.

LIST OF PROGRAMS:

- 1 Implementation of Concatenation & length using for loop statement
- 2 Implementation of Comparison & length using for loop statement
- 3 WAP to Access substring
- 4 WAP to find the Factorial using recursion
- 5 WAP to find the GCD of a number using recursion
- 6 WAP to find the Tower of Hanoi using recursion
- 7 WAP to find the Fibonacci Series using recursion
- 8 WAP to implement Insertion in an Array
- 9 WAP to implement Deletion in an Array
- 10 WAP to perform Binary output
- 11 WAP to implement Linear Binary & Sort
- 12 WAP to implement Bubble sort
- 13 WAP to implement Insertion
- 14 WAP to implement Select
- 15 WAP to implement Merge
- 16 WAP to implement Quick
- 17 WAP to implement BST & Tracing
- 18 WAP to Create a Linked list
- 19 WAP to implement Insertion in a linked list
- 20 WAP to implement Deletion in a linked list
- 21 WAP to implement Searching in a linked list
- 22 WAP to implement Double Linked list
- 23 WAP to implement Circular Linked list
- 24 WAP to implement Stack push and pop array
- 25 WAP to implement Stack Linked list
- 26 WAP to implement Queue Array
- 27 WAP to implement Queue Linked list

- 28 WAP to implement Double Queue
- 29 WAP to implement Circular Queue
- 30 WAP to implement Circular Stack

TEXTBOOKS:

- 1. A.A Puntambekar, “ Data structures Using 'C' “, Technical Publications
- 2. E. Balagurusamy, “ Data Structures Using C “, TATA McGraw-Hill

REFERENCES:

- 1. Yashavant Kanetka, “Data Structures Through C”,BPB Publication
- 2. Aaron M. Tenenbaum, Yedidiah Langsam, Moshe J. Augenstein, “Data Structures Using C”, Pearson Education India
- 3. Kruse, Tondo & Leung, “Data Structures and Program Design”, PHI publication.

Course: STATISTICS AND PROBABILITY

Code: MATH511

Credits: 3

OBJECTIVE: To help students meet the requirements of preparing for career in fields where statistical techniques is applied.

UNIT-I

Definition of statistics, importance, scope and limitations; Primary and secondary data; classification and tabulation; Graphical presentation-Histogram, Frequency polygon, frequency curve, cumulative frequency curve; Diagrammatic presentation-Bar diagram, duo-directional bar diagram, two dimensional bar diagram; pie diagram; Measure of central tendency - requisites of ideal measure, arithmetic means, geometric mean and harmonic mean and their merits, demerits; Median, Mode and their merits, demerits; Other partition values; Determination of median and mode by graphical method.

UNIT-II

Measure of dispersion, Skewness and kurtosis; Requisites of ideal measure, Range, quartile deviation, mean deviation, standard deviation and their merits, demerits; Root mean square deviations and relation with standard deviation; Various formulae for calculating variance, variance of composite series, coefficient of variation, moment , moments about mean in terms of moments about any point and vice-versa. Properties of moment pearson's Beta and Gamma coefficients, Sheppard's correction; Skewness, kurtosis and their measures.

UNIT-III

Bivariate distribution-Scatter diagram, Karl Pearsons' coefficient of correlation; Determination of correlation coefficient for grouped data; Spearman's rank correlation coefficient (Repeated rank also); Curve fitting-Legendre's principle of least squares, fitting of straight line, parabola, power curve and exponential curve; Regression, line of regression and their properties.

UNIT-IV

Probability-definitions: Trial, event and sample space. Exhaustive events, favorable events, equally likely events, Independent events and dependent events; Mathematical and statistical definition of probability with their limitations; Axiomatic definition of probability, addition law of probability, conditional probability, multiplication law of probability, Bayes's theorem.

UNIT-V

Random variable - Discrete and continuous random variable, probability mass function, probability density function and their properties; Distribution function and their properties; Joint, Marginal and Conditional probability function; Stochastic independence; Mathematical expectation and their properties, addition and multiplication theorem of expectation; Mean and Variance of linear combination of random variables.

TEXTBOOK:

1. S. C. Gupta & V. K Kapoor, "Fundamentals of mathematical statistics", Chand Pubs

REFERENCE:

1. H. C Snxoner, "Finite differences and numerical analysis", S Chand Publisher

Course: ADVANCED JAVA PROGRAMMING

Code: MCA601

Credits: 3

OBJECTIVES: To enable students to acquire basic knowledge of fundamentals of object-oriented programming using Java. Course coverage includes the design and implementation of both graphical applets and standalone applications, and the use of visual components in graphical user interface design. Language elements covered include loops, arrays, input/output structures, events, exceptions, and threads.

UNIT-I

Java Overview: Genesis, Java Philosophy, Java & Internet, Object-Oriented Programming features, Java Applet and Application, Java Environment and Java Development Kit (JDK) & Java Standard Library (JSL), Java language fundamentals, The scope and lifetime of variable, Type conversion and casting, Control statements, Arrays classes and objects: The this keyword, Garbage collection, Overloading constructor, Using object as parameters, Argument passing, Returning objects, Recursion, Introducing Access control (public, private and protected), static, final, nested classes, String class, Command-line argument.

UNIT-II

Inheritance: Member access and inheritance, method overriding, dynamic method dispatch, using abstract classes, using final with inheritance, the Object class; Packages, Interface, classpath, Exception handling: Fundamentals, Exception types, Java's built-in exceptions, user defined exceptions; Networking: Socket overview, Stream Sockets, Datagram sockets, Manipulating URLs, Establishing a simple Server/Client using Stream Sockets, Connectionless Client/Server Interaction with Datagrams; Images: File formats, image fundamentals, creating, loading and displaying images, ImageObserver, MediaTracker.

UNIT-III

String handling: String constructors, methods for character extraction, string searching & comparison, data conversion using valueOf (), StringBuffer Exploring java.lang: Simple type wrappers, System class, class Class, Math functions; The utility classes: Vector, Stack, Hashtable, StringTokenizer, Bitset, Date, Calendar, GregorianCalendar, Random, Observable Input/Output-Exploring java.io: The java.io classes and interface, File class and methods for creating, renaming, listing and deleting files and directories, I/O stream classes (FileInputStream, FileOutputStream, BufferedInputStream, BufferedOutputStream, PushBackInputStream, InputStreamReader, BufferedReader, BufferedWriter, PrintStream, RandomAccessFile).

UNIT-IV

The Applet class: applet architecture, passing parameters to applets, getDocumentBase, getCodeBase, and showDocument, AppletContext and AudioClip interfaces, Graphics class and methods for drawing lines, rectangles, polygons and ovals; Swing: Component and Container classes, Layout managers (FlowLayout, GridLayout, BorderLayout), Handling events, Adapter classes, Anonymous inner classes

Swing GUI components (JLabel, JTextField, JTextArea, JButton, JCheckBox, JRadioButton, JList, JComboBox, JScrollBar, JScrollPane, JToolTip, JPanel, JFrame); Menus: JMenuBar, JMenu, JMenuItem, JSeparator; Multithreaded Programming: The Java thread model (thread priorities, synchronization and inter-thread communication); Deadlock, ThreadGroup.

UNIT-V

Java Beans: Introducing JavaBeans Concepts and Bean Development Kit (BDK), Using the Bean Box, Writing a simple Bean, Bean Properties (simple properties), Manipulating events in the Bean Box, Java database connectivity (JDBC): Introduction to JDBC, type of JDBC connectivity, Establishing database connections, Accessing relational database from Java programs; Java Servlets: Servlet overview and architecture, Servlet Interface and Servlet life cycle, HttpServlet Class, HttpServletRequest Interface, HttpServletResponse Interface, Handling HTTP get Requests, Setting up the Apache Tomcat Server, Deploying a web application, Handling HTTP get requests containing data, Handling HTTP post requests.

TEXTBOOK:

1. Deitel, H. M.; P. J. Deitel, "Java : How To Program (Sixth Edition)", New Delhi: Prentice-Hall India, 2005

REFERENCES:

1. Schildt, H., "The Complete Reference Java 2 (Fifth Edition)", New Delhi: Tata McGraw-Hill, 2005
2. Moss, K., "Java Servlets (Second Edition)", New Delhi: Tata McGraw-Hill

Course: ADVANCED JAVA PROGRAMMING-PRACTICAL

Code: MCA602

Credits: 3

OBJECTIVES: To enable students to acquire basic knowledge of fundamentals of object-oriented programming using Java. Course coverage includes the design and implementation of both graphical applets and standalone applications, and the use of visual components in graphical user interface design. Language elements covered include loops, arrays, input/output structures, events, exceptions, and threads.

LIST OF PROGRAMS:

1. To implement simple program based on operator loop decision statements
2. To implement Program to define Class and instantiate Objects
1. Program to implement constructor and Method overloading and Method overriding
2. Program to create components using Swing
3. Program to implement Wrapper Class and command line argument
4. Program to demonstrate packages and interfaces
5. Program to demonstrate Single level and Multi level inheritance
6. Program to demonstrate Exception Handling
7. Program to demonstrate Multithreading and Synchronization
8. WAP that import the user define package and access the Member variable of classes that Contained by Package.
9. Program that show the partial implementation of Interface.
10. Program to Handle the user define Exception using throw keyword.
11. Program to create a thread that Implement the Runnable interface.
12. Program to Implement Interthread communication.
13. Program to implement Server and client using networking
14. Program using Applet Class
15. Program to perform String Class and StringBuffer Class.
16. Program to implement all the Swing components
17. Designing an application using any IDE.
18. Creating a database Connection
19. Programs creating Simple Java Bean and Java Servlets.

Course: ANALYSIS AND DESIGN OF ALGORITHMS

Code: MCA603

Credits: 4

OBJECTIVE: To analyze the algorithm, its efficiency and the fundamental component of problem solving and to understand the importance of algorithm and finding its time and space complexity both theoretically and practically.

UNIT-I

Introduction – Fundamentals of Algorithmic Problem Solving, Statement of the Problem, Design of an Algorithm, Correctness of an Algorithm, Analyzing an Algorithm, Implementation of Algorithm; Problem Types – Searching, Sorting, Graph Related Problems; Graph Representations – Adjacency matrix, Adjacency List, Path Matrix, Spanning Tree; Graph Properties – Bipartite Graph; Analysis of Algorithm Efficiency – Space Complexity, Analysis of Space Complexity, How to calculate Space Complexity, time complexity; Asymptotic Notations – Big Oh Notation, Omega Notation, Theta Notation, Little Oh Notation, Comparison of Asymptotic Notations.

UNIT-II

Mathematical Analysis Recursive – Backward Substitution Method, Important Recurrence Type, Fibonacci Numbers ,Recursion Tree; Brute Force Method – Bubble Sort, Implementation of bubble sort, Selection Sort, Implementation of Selection Sort; Exhaustive Search – Travelling Salesman Problem, Knapsack Problem, and Assignment Problem; Divide and Conquer – Merge sort, Analysis and Implementation of Merge Sort, Quick Sort, Analysis and Implementation, Binary Search, Analysis and Implementation; Multiplication of Large Integers; Strassen's Matrix Multiplication.

UNIT-III

Decrease and Conquer – Insertion sort: analysis of Insertion Sort and its implementation; DFS and BFS –Depth First Search, Breadth First Search; Topological Sort; Transform and Conquer – Balanced Search Tree, AVL Trees; Heap sort – Heaps, Initial Heap Construction, Inserting a Key into a Max Heap, Deleting a key from Max Heap.

UNIT-IV

Space and Time Tradeoffs – Sorting by Counting; String Matching – Horspool Algorithm and its implementation; Hashing – hash Functions, Collision Resolution Techniques; Dynamic Programming – Warshall's Algorithm; Floyd's Algorithm; Knapsack problem.

UNIT-V

Greedy Technique – Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm, Huffman Codes and Tree; Backtracking & branch and bound, n – Queens Problem, Assignment Problem, Knapsack Problem, Travelling Salesman Problem; Limitation of Algorithm Power –P , NP and NP – Complete Problems – NP – Completeness, Polynomial Time, NP – completeness and reducibility.

TEXTBOOKS:

1. Puntambekar, “Analysis and Design Of Algorithms”, Technical Publications
2. Anany Levitin, “Introduction to Design of Analysis and Algorithm“, Addison Welsey Edition

REFERENCES:

1. Robert Sedgewick and Phillippe Flajojet, “An Introduction to the Analysis of Algorithm (2nd Edition) “, Welsey Publication.
2. Sara Baase and Allen Van Gelder, “Computer Algorithm: Introduction to Design and Analysis of Algorithm (3rd Edition)”.

Course: ADVANCED DATABASE MANAGEMENT SYSTEM (ADBMS)

Code: MCA604

Credits: 3

OBJECTIVE: To provide students with an understanding of the design, creation, maintenance and management of the open source relational database management system, MySQL.

UNIT-I

Overview of the database management system[1]- Database systems , Need for Database ,Advantages of using a database, Characteristics of data in a database , Functions of DBMS, Data abstraction, Data independence, Overall Architecture of DBMS, Three level architecture; Data Models[1]- Relational Data Models, ER Model, Hierarchical models, Networking models , Advantages and Disadvantages of each models.

UNIT-II

Relational Model[1]– Characteristics of Relational Database Model, CODD’s rules, Tables, Rows, Columns, Domains, Attributes, Candidate Key, Primary Key, Foreign Key, Super Keys, Unique Keys, Constraints; Normalization[1] -Purpose of Normalization, Functional Dependence, Relational database Design, Normal forms, 1NF, 2NF, 3NF, BCNF, 4NF and 5 NF.

UNIT-III

Introducing MySQL[2] –History, Role of MySQL in industry, Version of MySQL, Architecture, Engines; MySQL queries[2]- Data types, operators, functions; Working with Databases and Tables-Creating, Copying, Modifying Tables; MySQL Advance [2]-Show commands, Working with date and Time data types, Joins like Cross, Inner, Outer, Self, Unions, Subquery, Procedure, Triggers, Views, MySQL SQL Injection, MySQL database export and import.

UNIT-IV

MySQL Administration[2]- MySQL Access Control System,Create User, Grant Privileges to Account, Revoking Privileges from Users, Maintaining MySQL Database Tables, Backup ,Restoring Databases Using mysqldump Tool.

UNIT-IV

Introduction to Object-Oriented Databases, Distributed databases, Client-Server Architecture, Data Mining, Data Warehousing, Deductive databases, Databases on the World Wide Web, Multimedia Databases, Geographical Information Systems.

TEXTBOOKS:

1. Sai Sumathi, “Fundamentals of Relational Database Management Systems”, Springer (India) Pvt. Ltd
2. Vikram Vaswani, “MySQL(TM): The Complete Reference”, Mc Graw Hill Education Publication

REFERENCES:

1. Ramez Elmasri, SHamkant B.Navatha, “Fundamentals of Database Systems”, Pearson Education
2. Ivan Bayross, “Mastering Database Technologies”, BPB Publications
3. Baron Schwartz, “High Performance MySQL”, O'Reilly Publication
4. Luke Welling, Laura Thomson “MySQL Tutorial”, Pearson Education Publication

Course: ADVANCED DATABASE MANAGEMENT SYSTEM-PRACTICAL

Code: MCA605

Credits: 3

OBJECTIVE: To implement the different database designing techniques by using MySQL.
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LIST OF PROGRAMS:

1. To write queries of Data Manipulation Statements.
2. To write queries of Data Definition language Statements.
3. To write queries of SELECT command with different clauses.
4. To write queries of aggregate functions (avg, count, max, min, Sum).
5. To write queries of various type of Integrity Constraints.
6. To write queries on the concept of Sub-Query.
7. To write queries to manipulate DATE and TIME data types.
8. To write queries of various type of JOINS.
9. To write queries implementing Transaction.
10. To write queries managing Existing Tables and other Database Objects: The ALTER TABLE Statement, Adding a New Column in a Table, Modifying Existing Column, Dropping a Column, Renaming an Object, Truncating a Table, Dropping Views, Dropping Synonyms, Dropping Tables
11. Prepare case study explaining the the need for converting a large table to many smaller
12. tables using 1NF, 2NF, 3NF
13. Implement various triggers
14. Implement authorization, authentication, privileges on database

15. Create a table that contains at least one attribute of an audio. Add at least 10 tuples in the table and write query to invoke a particular audio

SPECIALIZATION-I

Course: PHP TECHNOLOGY

Code: MCAS611

Credits: 3

OBJECTIVE: PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. PHP code is interpreted by a web server with a PHP processor module which generates the resulting web page. PHP commands can be embedded directly into an HTML source document rather than calling an external file to process data. It has also evolved to include a command-line interface capability and can be used in standalone graphical applications.

UNIT-I

Essential PHP - Getting PHP, Creating your development Environment, Creating a first PHP Page, Mixing HTML and PHP, Printing some text, Printing some HTML, Echo power, Working with variables, Storing Data in variables, Interpolating Strings, Creating variable variables, Creating constant, Understanding PHP internal Data Types.

UNIT-II

Operators and Flow Controls – PHP Math operators, Working with the assignment operators, Incrementing and decrementing values, String operators, Operator precedence, Using If statement, PHP Comparison operators, PHP Logical operators, Else statement, Elseif statement, Switch statement, Using For loops, Using While loops, Using Do...While loops, Using foreach loop, Terminating loops early, PHP alternate syntax.

UNIT-III

Strings and Arrays – String functions, Converting to and from strings, Formatting Text strings, Building yourself some arrays, Modifying the Data in arrays, Deleting arrays with loops (for loop, print_r function, foreach loop, while loop), PHP array Functions, Extracting Data from arrays, Sorting arrays, Using PHP array operators, Comparing array with each other, Handling Multidimensional arrays in loops, Splitting and Merging arrays, other array functions.

UNIT-IV

Creating Functions – Creating functions in PHP, Passing functions some Data, Passing arrays to functions, Passing by reference, Passing variable numbers to arguments, Returning Data from arrays, Returning arrays, Returning List, returning reference, Introducing variable Scope in PHP, Accessing.

Course: .NET TECHNOLOGY

Code: MCAS613

Credits: 3

OBJECTIVE: To provide students with the knowledge and skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user interfaces, program structure, language syntax, working with database and other requirements to build a website.

UNIT-I

Getting started with asp.net - Understanding the ASP.NET Programming Model, ASP.Net page, application lifecycle, Creating Our First ASP.NET Web Page, Postback property; Global.asax file, web.config file.

UNIT-II

Web form and web controls - Web Form Basics, Using Hyper link, picture box, List box, Text Boxes, etc.; Collecting Input Using Drop-Down Lists, Text box, Radio Buttons, Check boxes, etc; Validating User Input with Validation Controls, Implement event handlers by using code-behind files.

UNIT-III

More web controls-File upload control, Hidden field, Calendar, Navigation controls: Menu, Treeview, sitemap; Adrotator with XML file.

UNIT-IV

Using Master Pages to Provide Site wide Page Templates; Themes; State Management: View state, session, Application state, cookies.

UNIT-V

Working with databases-An Introduction to Databases, Accessing Data with the Data Source Web Controls, Displaying Data with the Data Web Controls, Deleting, Inserting, and Editing Data; Working with Data-Bound controlsDatagridview, DropDownLists, RadioButtons, Checkboxes etc.; Exploring Data Binding and Other Data-Related Topics.

TEXTBOOKS:

1. Herbert Schildt, “C Sharp- The complete reference”, McGraw-Hill/Osborne
2. ASP.NET The complete reference, McDonald, McGraw-Hill

REFERENCE:

1. Matthew MacDonald, Adam Freeman, ”Pro ASP.NET 4 in C# 2010”, Apress

Course: J2EE TECHNOLOGY

Code: MCAS615

Credits: 3

OBJECTIVE: Java EE stands for Java Enterprise Edition. Java EE is used as a platform for performing server programming with the help of Java Programming Language. Java EE provides libraries that offer functionality to deploy distributed applications. Java EE is a combination of components such as JSP, Servlets and EJBs. Using Java EE, you can create web applications that can be hosted on any web server. Almost 80% of online web applications in the internet are developed using Java EE and its components.

UNIT-I

Introduction to J2EE-J2EE Overview-Why J2EE?-J2EE Architecture- Overview on the JavaEE Architecture -1 tier- 2 tier -3 tier - N tier - JavaEE Key StandardJ2EE APIs-J2EE Containers.

UNIT-II

Java Database Connectivity-JDBC Product -Types of Drivers - Two-Tier Client/Server Model - Three-Tier Client/Server Model - Basic Steps of JDBC-Creating and Executing SQL Statement -The Result Set Object - Working with Database MetaData – Interface.

UNIT-III

JavaServer Pages -Understanding the Client-Server Model - Understanding Web server software -Configuring the JSP Server - Handling JSP Errors - JSP Translation Time Errors - JSP Request Time Errors - Creating a JSP Error Page.

UNIT-IV

Servlet Interaction & Advanced Servlets - Life cycle of Servlet -Java Servlet Development Kit - javax.servlet package - Reading Servlet Parameters -Reading Initialization Parameters - The javax.servlet.http Package - Handling HTTP.

UNIT-V

RMI Architecture - Designing RMI application - Executing RMI application, EJB- Types of EnterpriseJava beans - Session Bean & Entity Bean - Features of Session Bean - Life-cycle of Stateful Seession Bean - Features of Entity Bean - Life-cycle of Entity Bean -Container-managed Transactions & Bean-managed Transactions o Implementing a container-manged Entity Bean, XML- XML- XML Syntax Rules.

TEXTBOOKS:

1. Schildt, H., “J2EE: The Complete Reference”
2. Moss, K., “Java Servlets (Second Edition)”, New Delhi: Tata McGraw-Hill
3. Marty Hall, “Core Servlets & JavaServer Pages”, 2nd Edition Vol 1

Course: PHP TECHNOLOGY-PRACTICAL

Code: MCAS612

Credits: 3

OBJECTIVE: To provide students with the basic skills of learning PHP, form, file handling and database connectivity using MySQL

LIST OF PROGRAMS:

1. Working with Basic PHP Syntax, Variables, PHP operators
2. Working on the different Control Structures (If else, switch , all loops), Arrays, For Each Loop, Functions, Strings.
3. Working with Form Handling, PHP \$_GET,PHP \$_POST,PHP \$_REQUEST,PHP date() Function, PHP include File
4. Working on File Handling, File Uploading, PHP Sessions, Sending Emails, PHP Cookies
5. Working on MySQL database connection, MySQL DataTypes, MySQL Insert, MySQL Select, MySQL where clause, MySQL Delete, MySQL UpdateMySQL Aggregate Functions(sum,avg,count etc), MySQL order by and group by clause, MySQL Subqueries, MySQL Joins,PHP Connectivity with MySQL, PROJECT.

REFERENCE:

1. Steven Holzner, “The Complete Reference” OOP PHP Tutorial Point

Course: .NET TECHNOLOGY-PRACTICAL

Code: MCAS614

Credits: 3

OBJECTIVE: To equip the student with the skills needed to be an application developer in Microsoft .NET framework environment, enable them to developed window application, console application, class library, etc. The Course focuses on building user interfaces, program structure, language syntax, event driven programming and implementation of various framework class libraries.

LIST OF PROGRAMS:

1. Short Story Game
2. Program implementing function and subroutine
3. Program implementing control flow statements,...
4. Program implementing overloading, overriding, etc
5. Mathematic Game
6. Age Calculator
7. Die roller using Random class
8. Program implementing timer, progress bar, etc.
9. Program implementing dialog boxes.
10. Program implementing menus, MDI.

11. Implementation of various Search algorithms, array, etc.
12. Working with data in database
13. Report generation program
14. Displaying data with data bound controls.

Course: J2EE TECHNOLOGY-PRACTICAL

Code: MCAS616

Credits: 3

OBJECTIVE: Java EE stands for Java Enterprise Edition. Java EE is used as a platform for performing server programming with the help of Java Programming Language. Java EE provides libraries that offer functionality to deploy distributed applications. Java EE is a combination of components such as JSP, Servlets and EJBs. Using Java EE, you can create web applications that can be hosted on any web server. Almost 80% of online web applications in the internet are developed using Java EE and its components.

PROGRAMS:

1. Programs implementing JSP interface
2. Programs implementing JSP connecting to the database
3. Programs implementing JSP handling request
4. Programs implementing the concept of JSP scripting elements.
5. Programs implementing the concept of JSP Actions, Custom Tag libraries, Directives and connecting pages.
6. Programs implementing the concept of Including and Forwarding from JSP Pages.
7. Programs implementing the concepts of Custom Actions.
8. Programs implementing the concept of servlets
9. Implementing a container-manged Entity Bean.

Course: ADVANCED COMPUTER NETWORKS

Code: MCA611

Credits: 4

OBJECTIVE: To understand state-of-the-art in advance network protocols, architectures, and applications, process of networking in a broader way.

UNIT-I

Introduction to Computer Network – Uses of Computer Network, Network hardware, Layered Architecture, function of the layers, Network standardization, OSI & TCP/IP Reference model, Physical layer services & hardware protocols;

UNIT-II

Data Link Control – Framing, Flow Control, Stop and wait Protocols, Sliding Window Protocols, Error Detection & Error Control, High Level Data Link Control (HDLC), Other Data Link Control Protocols, Pure ALOHA & Slotted ALOHA , Markov chain model for S-ALOHA and delay in S-ALOHA , IEEE, LAN Protocols, Ethernet, Ad Hoc network;

UNIT-III

Network Layer And Transport Layer – Network Layer Protocols, Design issues , Virtual Circuits and datagram's, Routing Algorithms, Optimality principle, Shortest path routing - Dijkstra's algorithms, Distance Vector routing, Link state routing, Flow and Congestion Control, packet discarding , Traffic shaping ,Choke packets, RSVP, IP fragment, RIP, OSPF, Inside router, Network layer performance model, Poisson model, M/M/1 Queue, Blocking probability, Little's formula, Transport Layer Protocols, Basic functions, Connection Management, Establishment and releases , Crash recovery, TCP & UDP, Reliability Models, AIMD Policy.

UNIT-IV

Upper Layers – Session Layer Protocols – Dialog Management, Synchronization; Presentation layer functions – translation, encryption, compression; Cryptography – substitution and Transposition Ciphers, Data Encryption standards (DES), DES Chaining, Breaking DES, Public Key cryptography, Authentication protocols, Different compression coding techniques; Application layer protocols & services – Email, World Wide Web, file transfer protocol, remote file server, internet telephony & chatting;

UNIT-V

Special & High Speed Networks & Network Devices – FDDI – access method, addressing, electrical specification, frame format, comparison of FDDI-I & FDDI-II, DQDB & WAN implementation. × .25 networks its features; Frame Relay – operation, congestion control & frame format; SONET / SDH – layers, frame & application; Internet & related software's NETSCAPE & MOSAIC;

TEXTBOOKS:

1. A.S. Tannenbaum, “Computer networks”, Second Ed., Prentice Hall India.
2. Halsall, “Data Communication, Computer Networks”, Pearson Education.

REFERENCES:

1. D. Bertsekas and R. Gallager, “Data Networks”, PHI Second Ed.

Course: THEORY OF COMPUTATION

Code: MCA612

Credits: 4

OBJECTIVE: To introduce students the basic concepts in theoretical computer science and the formal relationship among machines, languages and grammars

UNIT-I

Strings, Alphabet, Language, Operations, Finite state machine, definitions, Finite automation model, Acceptance of strings and languages, Non Deterministic Finite Automation, Deterministic Finite Automation, Equivalence between NFA and DFA. Conversion of NFA into DFA, Minimization of FSM, Equivalence between two FSM's. Moore and Melay machines

UNIT-II

Regular sets, Regular expressions, Identify rules, Manipulation of regular expressions. Equivalence between RE and FA, Inter conversion, Pumping lemma, Closure properties of regular sets (proofs not required), Regular grammars, Right linear and left linear grammars, Equivalence between regular linear grammar and F. A. inter conversion between RE and RG.

UNIT-III

Context free grammar, Derivation trees, Chomsky Normal Form, Greibach Normal Form, Push Down Automata, Definition, Model, acceptance of CFL, Equivalence of CFL and PDA, Interconversion, enumeration of properties of CFL(proofs omitted).

UNIT-IV

Turing Machine, Definition, Model, Design of TM, Computable functions, Recursive enumerable language, Church's hypothesis, Counter machine, Types of TM's (Proofs not required). Chomsky hierarchy of languages, Linear bounded automata and context sensitive language, Introduction of DCFL and DPDA, LR(0), grammar, Desidability of problems.

UNIT-V

Undecidability: Properties of recursive & non-recursive enumerable languages, Universal Turing Machine, Post-correspondence problem, Introduction to recursive function theory.

TEXTBOOKS:

1. Hopcraft H. E. & Ulman J, "Introduction to Automata Theory, Languages and Computation"
2. Peter Linz," An Introduction to formal Languages and Automata"

REFERENCES:

1. John C. Martin, "Introduction to Languages and the Theory of Automata"
2. Lewis H. P. and Papadimiton C. H, "Elements of Theory of Computation"
3. Mishra and Chandrashekharan, "Theory of Computation"

Course: LINUX SHELL PROGRAMMING-PRACTICAL

Code: MCA613

Credits: 3

OBJECTIVE: To enable students to acquire the knowledge for writing programs and scripts in a Linux environment.

UNIT-I

Introduction-what is linux, installing linux (any distros), looking into the linux kernel, The GNU utilities, linux desktop, environment linux distributions - core linux distributions, specialized linux distributions, the linux LiveCD

UNIT-II

Starting the shell, the shell prompt, the bash manual, file system navigation- the linux filesystem, traversing directories, file and directory listing - basic listing, modifying the information presented, the complete parameter list, filtering listing output, file handling - creating files, copying files, linking files, renaming files, deleting files, directory handling - creating directories, deleting directories, viewing file contents - viewing file statistics, viewing the file type, viewing the whole file, viewing parts of a file

UNIT-III

Using multiple commands, creating a script file, displaying messages, using variables - environment variables, user variables, the backtick, redirecting input and output - output redirection, input redirection, pipes, performing math - the expr command, using brackets, a floating-point solution, exiting the script - checking the exit status, the exit command

UNIT-IV

Working with the if-then statement, the if-then-else statement, nesting ifs, the test command - numeric comparisons, string comparisons, file comparisons, compound condition testing, advanced if-then features - using double parentheses, using double brackets, the case command, the for command - reading values in a list, reading complex values in a list, reading a list from a variable, reading values from a command, changing the field separator, reading a directory using wildcards, the c-style for command - the c language for command, using multiple variables, the while command - basic while format, using multiple test commands, the until command, nesting loops, looping on file data, controlling the loop - the break command, the continue command, processing the output of a loop

UNIT-V

Command line parameters - reading parameters, reading the program name, testing parameters, special parameter variables - counting parameters, grabbing all the data being shift, working with options - finding your options, using the getopt command, the more advanced getopts, standardizing options, getting user input - basic reading, timing out, silent reading, reading from a file, understanding input and output - standard file descriptors, redirecting error, removing a trap running scripts in background mode - running in the background, running multiple background jobs, exiting the terminal, running scripts without

a console, job control - viewing jobs, restarting stopped jobs, being nice - the nice command, the renice command, running like clockwork - scheduling a job using the at command, using the batch command, scheduling regular scripts, start at the beginning - starting your scripts at boot, starting with a new shell

TEXTBOOK:

1. Micheal Jang,"Linux Mastering Red Hat Linux 9", BPB Publications

REFERENCES:

1. John Goerzen,"Linux Programming Bible",IDG Books
2. Sumitabha Das,"Your Unix – The Ultimate Guide",TMH
3. Mathew,"Professional Linux Programming", Wrox-Shroff
4. Welsh & Kaufmann,"Running Linux", O'Reiley & Associates

Course: SOFTWARE PROJECT MANAGEMENT

Code: MCA701

Credits: 4

OBJECTIVE: To enable students to plan, manage a project and understand the different risk factor that may associate with a project.

UNIT-I

Introduction to Competencies - Product Development Techniques - Management Skills-The SEI CMM - International Organization for Standardization Formulation of a test case plan or test bed at the requirements stage: Ways to gather requirements and documentation.

UNIT-II

Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project - Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.

UNIT-III

Tasks and Activities - Software Size and Reuse Estimating: A Regression Model - COCOMO II - SLIM Organizational Planning - Project Roles and Skills Needed. Mode of good interface design-simple pleasant dialog boxes, non-interfering colors, non crowding of user controls on the interface panel.

UNIT-IV

Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling.

UNIT-V

Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software

TEXTBOOK:

1. Bob Hughes, Mikecoterrell, “Software Project Management”, Third Edition, Tata McGraw Hill

REFERENCES:

1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill
2. Royce, “Software Project Management”, Pearson Education
3. Jalote, “Software Project Management in Practice”, Pearson Education

ELECTIVE I

Course: DATA MINING AND DATA WAREHOUSING

Code: MCAE701

Credits: 4

<p>OBJECTIVE: To enable the student to interpret the different kinds of database and to make use of the different types of data mining and data warehousing.</p>

UNIT-I

Data warehousing Components–building a Data warehouse, Mapping the Data Warehouse to a Multiprocessor Architecture, DBMS Schemas for Decision Support, Data Extraction, Cleanup, and Transformation Tools, Metadata

UNIT-II

Business Analysis- reporting and query tools and applications, tool categories, the need for applications, Cognos Impromptu, Online Analytical Processing (OLAP), multidimensional data model, OLAP Guidelines, multidimensional versus multi-relational OLAP, categories of tools, OLAP Tools and the Internet

UNIT-III

Introduction to data mining-data, types of data, data mining functionalities, interestingness of patterns, classification of data mining systems, data mining task primitives, integration of a data Mining System with a data warehouse, issues, data preprocessing

UNIT-IV

Association rule mining and classification-Mining Frequent Patterns, Associations and Correlations, mining methods, mining, various kinds of association rules, correlation analysis and constraint based association mining, classification and prediction, basic concepts,

decision tree; Induction-Bayesian classification, rule based classification, classification by backpropagation, support Vector machines, Associative Classification

UNIT-V

Clustering and applications and trends in data mining-cluster analysis, types of data, categorization of Major Clustering Methods-K means, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid Based Methods, Model-Based Clustering Methods, Clustering High Dimensional Data, constraint, based cluster analysis, Outlier Analysis, Data Mining Applications

TEXTBOOKS:

1. Alex Berson and Stephen J. Smith, “Data Warehousing, Data Mining & OLAP”, Tata McGraw, Hill Edition
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Second Edition, Elsevier,

REFERENCES:

1. Pang Ning Tan, Michael Steinbach and Vipin Kumar, “Introduction To Data Mining”, Person Education
2. K.P. Soman, Shyam Diwakar & V. Ajay “, Insight into Data mining Theory and Practice”, Easter Economy Edition, Prentice Hall of India
3. G. K. Gupta, “Introduction to Data Mining with Case Studies”, Prentice Hall of India
4. Daniel T.Larose, “Data Mining Methods and Models”, Wile Interscience

Course: DISTRIBUTED DATABASE SYSTEM

Code: MCAE702

Credits: 4

OBJECTIVE: To introduce basic principles and implementation techniques of distributed database systems.

UNIT-I

Introduction to distributed data processing- what is a DDBS, advantages and disadvantages of DDBS, problem areas, overview of database and computer network concepts; distributed database management system architecture-transparencies in a distributed DBMS; distributed DBMS architecture; global directory issues

UNIT-II

Distributed database design-alternative design strategies, distributed design issues, fragmentation; data allocation, semantics data control, view management, data security, semantic integrity control; query processing issues, objectives of query processing, characterization of query processors, layers of query processing, query decomposition, localization of distributed data

UNIT-III

Distributed query optimization-factors governing query optimization; centralized query optimization; ordering of fragment queries; Distributed query optimization algorithms; transaction management-the transaction concept; goals of transaction management; characteristics of transactions; taxonomy of transaction models

UNIT-IV

Concurrency control in centralized database systems, concurrency control in DDBSs, distributed concurrency control algorithms, deadlock management; reliability-reliability issues in DDBSs; types of failures; reliability techniques; commit protocols; recovery protocols

UNIT-V

Parallel database systems-parallel architectures, parallel query processing and optimization; load balancing; mobile Databases, distributed Object Management, Multi-databases

TEXTBOOK:

1. M. Tamer Ozsu, “Principles of Distributed Database Systems”, Pearson Education

REFERENCE:

1. Stefano Ceri and Giuseppe Pelagatti, “Distributed Databases: Principles and Systems”, McGraw Hill Education

Course: CLOUD COMPUTING

Code: MCAE703

Credits: 4

OBJECTIVE: To provide the knowledge of techniques and services of cloud.

UNIT-I

Cloud Computing Fundamentals- what cloud computing, essential characteristics, history of cloud computing – cloud architecture – cloud storage – why cloud computing matters – advantages of cloud computing – disadvantages of cloud computing

UNIT-II

Developing cloud services-Web-Based Application, Pros and Cons of Cloud Service Development, Types of Cloud Service Development ,Software as a Service – Platform as a Service, Web Services – On Demand computing, Discovering Cloud Services Development Services and Tools – Amazon Ec2, Google App Engine , IBM Clouds

UNIT-III

Cloud computing for everyone-centralizing email communications – collaborating on schedules, collaborating on to-do lists, collaborating contact lists, cloud computing for the community, collaborating on group projects and events, cloud computing for the corporation

UNIT-IV

Using cloud services-collaborating on calendars, schedules and task management – exploring online scheduling applications ,exploring online planning and task management, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, collaborating on databases – storing and sharing files, evaluating web mail services, evaluating web conference tools – collaborating via social networks and groupware, collaborating via blogs and wikis.

UNIT-V

Cloud computing risk issues: privacy and compliance risks, threats to infrastructure, data, and access control, cloud service provider risks, cloud computing security challenges- security policy implementation, virtualization security management, vm security recommendations, vm-specific security techniques

TEXTBOOK:

1. Zaigham Mahmood , Thomas Erl , Ricardo Puttini , “Cloud Computing - Concepts, Technology & Architecture”, Pearson Education

REFERENCES:

1. Broberg J, “Cloud Computing: Principles And Paradigms”, Wiley India Pvt Ltd
2. Bloor Robin, Kaufman Marcia, Hurwit Judith ,“Cloud Computing For Dummies”, Wiley India Pvt Ltd

ELECTIVE II

Course: CLIENT SERVER ARCHITECTURE

Code: MCAE704

Credits: 4

OBJECTIVE: The objective of this course is to enable students to comprehend the importance of Client/Server Computing, its important aspects and current technology used for the subject matter. Important Components and Architecture of Client/Server Computing and the relationship between workstations and servers will also be covered in this course

UNIT-I

What is Client/Server Computing, Introduction to Client/Server, Types of Servers , Fat or Thin Server/Clients, Stateless or Statefull, Mainframe, Client/Server Functions, Client/Server Topologies, Characteristics of the Client And the Server, Merits and Demerits of the Client Server

UNIT-II

Classification of Client Server Systems, Advantage and Disadvantage of Client Server Computing, Client/Server Building Blocks, Development Tools and Development Phases
Client Server/Security, Improving Performance of Client Server Applications, Downsizing and Rightsizing

UNIT-III

Architectures of Client/Server Systems, Principle behind Client/ Server Systems, Client Components, Server Components, Architecture for Business Information, Distribution Pattern, Existing Client/Server Architecture

UNIT-IV

Client/Server and Databases, Storing Data and the Database, Client/Server in respect of databases, Client Server Database Architecture, Database Middle ware components, Access to multiple database, Distributed Database, Client/Server Application Components, Categories of Client/Server Application, Client Services , Server Services.

UNIT-V

Application development management issues, Training and Testing, Client/Server Testing Technologies, Client/Server Technology and Web Services, Future of the Client/Server Computing

TEXTBOOK:

1. Subhash Chandra Yadav , Sanjay Kumar Singh, "An Introduction to Client Server Computing", New Age International Limited Publishers

REFERENCES:

1. Doug Lowe , " Client/Server Computing For Dummies",3rd Edition, IDG books
2. Eric Johnson, "The Complete Guide to Client/Server Computing", Prentice Hall

Course: COMPUTER GRAPHICS

Code: MCAE705

Credits: 4

OBJECTIVE: To provide students with an understanding of the basic principles, techniques, and algorithms for generating and interacting with simple graphical objects on a display screen that form the basis of computer graphics and modeling.

UNIT-I

Introduction to computer Graphics – Advantages of computer graphics, Applications and graphics software, Classifications of computer graphics; Video display Technologies- Raster scan systems, Random scan systems, CRT, Flat Panel Displays, Video controller, Graphics software

UNIT-II

Scan Conversion– attributes of output primitives, line drawing algorithms like Digital Differential Analyzer, Bresenham's algorithm, Mid-point algorithm, Circle generating algorithms, scan converting ellipse; Filling Polygons-Boundary Fill algorithm, Flood Fill algorithm

UNIT-III

2D geometrical transforms-Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems; Windowing and Clipping-Viewing pipeline, Viewing transformations, 2-D Clipping algorithms

UNIT-IV

3D geometrical transforms- Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems; Windowing and Clipping-Viewing pipeline, Viewing transformations, Projections, 3D Clipping algorithms

UNIT-V

Visible Surface Detection- Back-Face Detection, Depth – Buffer Method, Scan Line Method – A-Buffer Method, Properties of Light, Infinite Color Concepts, RGB Color Models

TEXTBOOKS:

1. Donald Hearn and M Pauline Baker, "Computer Graphics C Version", Pearson Education
2. Foley, Vamdam, Feiner and Huges, "Computer Graphics: Principles and Practice", Pearson Education

REFERENCES:

1. William M. Newman, R.F. Sproull, "Principles of Interactive Computer Graphics", Tata McGraw Hill
2. Steven Harrington, "Computer Graphics: A Programming Approach", Tata McGraw Hill
3. David F. Rogers, "Procedural Elements for Computer Graphics", Tata McGraw Hill
4. David F. Rogers, J. Alan Adams, "Mathematical Elements of Computer Graphics", Tata McGraw Hill

Course: ARTIFICIAL INTELLIGENCE

Code: MCAE706

Credits: 4

OBJECTIVE: The aim of the course is to provide basic knowledge necessary to understand how to program machines to behave and act like humans.

UNIT-I

Introduction – Agents, Problem formulation, uninformed search strategies, heuristic, informed search Strategies, constraint satisfaction

UNIT-II

Logical Reasoning-Logical agents, propositional logic, inferences, first-order logic, inferences in firstorder logic, forward chaining, backward chaining, unification, resolution

UNIT-III

Planning-Planning with state-space search, partial-order planning, planning graphs, planning and acting in the real world

UNIT-IV

Uncertain knowledge and reasoning-Uncertainty, review of probability, probabilistic Reasoning, Bayesian networks, inferences in Bayesian networks,Temporal models, Hidden Markov models

UNIT-V

Learning-learning from observation, Inductive learning, Decision trees, Explanation based learning, Statistical Learning methods, Reinforcement Learning

TEXTBOOK:

1. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education

REFERENCES:

1. William David Poole, Alan Mackworth, Randy Goebel, ”Computational Intelligence : a logical approach”, Oxford University Press
2. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem solving”, Fourth Edition, Pearson Education

SPECIALIZATION-II

Course: ADVANCED PHP TECHNOLOGY

Code: MCAS701

Credits: 3

OBJECTIVES: PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. PHP code is interpreted by a web server with a PHP processor module which generates the resulting web page. PHP commands can be embedded directly into an HTML source document rather than calling an external file to process data. It has also evolved to include a command-line interface capability and can be used in standalone graphical applications.

UNIT-I

Setting up web pages to communicate with PHP, Handling Text fields, Handling Text areas, Handling Check boxes, Handling radio buttons, Handling List boxes, Handling Password controls, Handling Hidden controls, Handling image Maps, Handling Buttons(Making Button data Persist, using Submit Buttons as HTML buttons)

UNIT-II

PHP browser-Handling Power – Using PHP's Server variables, Using HTTP Headers, Getting the User's browser type, Dumping form's Data all at once, Handling form data with custom arrays, Putting it all in One Pages, Performing data Validation.

UNIT-III

Object-oriented programming-creating Classes, Creating objects, Setting Access to Properties and Methods(Public access, Private access), Using Constructors, Using Destructors, Basing one class on another with Inheritance(Protected access, Constructors and Inheritance, Calling Base class methods), Overriding methods, Overloading methods, Autoloading classes.

UNIT-IV

Advanced object-oriented programming-Creating static methods (creating static methods, Passing data to a static method, Using properties in static methods), Static members and Inheritance, Creating Abstract classes, Creating Interfaces.

UNIT-V

Opening Files using fopen, Looping over File's contents with feof, Reading Text from a file using fgets, Closing File, Reading from a File Character by Character with fgetc, Reading a whole File at Once with file_get_contents, Reading a File into an array with File.

TEXTBOOK:

1. Steven Holzner, "The Complete Reference PHP"

Course: ADVANCED .Net TECHNOLOGY

Code: MCAS703

Credits: 3

OBJECTIVES: To provide students with the skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user management, event driven programming, state management, page validation, website navigation, state management, user profile, working with database and dataset.

UNIT-I

ASP.NET essentials-Overview of .Net Framework, What's new in ASP.Net, Introduction to Visual Web Developer; Introducing ASP.Net Pages, application lifecycle;Provider Models ,Coding Models, Code Sharing Compiling Application,Global. asax file, Web.config file; State management.

UNIT-II

Standard Controls-The Control Class, Web Control Class: Buttons, Labels, Literal, Place Holders, Hidden field control, File Upload Control, List Boxes etc. and studying their classes; Image: Image Control, Image Button ,Image Map and studying their classes.

UNIT-III

Navigation Control: Tree View Control, Menu Control, Site Map Control; Wizard Control and studying their classes; Validation Controls, Validation Group; Calendar and Ad Rotators; Master Pages and Themes.

UNIT-IV

Authorization and authentication: User management- Login Controls: Login Control,Login View,Login Status,Logon Name,Password Recovery,Create User control Wizard, Change Password control; User Profiles: Using Profiles,Anonymous Profiles,Authenticated Profiles.

UNIT-V

Working With Database - Server Explorer; Working with ADO.Net: connection object, Command object, datareader class, dataadapter class, Dataset: datatable class, datarow etc.;Data provider: OLEDB, SQLClient, Mysql and others; Access data source: using Object Data Source;Base Data List Class, list view, form view,Grid View,Details View Class,DataList Class,Repeater Class.

TEXTBOOKS:

1. ASP.Net, “Black Book”, Dream Tech Press Publications.
2. ASP.NET “The complete reference”, McDonald, McGraw-Hill

REFERENCES:

1. Beginning ASP.NET 2.0, Chris Hart, John Kauffman and Chris Ullman, Wiley Publications.
2. Matthew MacDonald, Adam Freeman,”Pro ASP.NET 4 in C# 2010”, Apress

3. ASP.NET Bible MridulaParihareet al., Published by Hungry Minds, Inc.

Course: ADVANCED J2EE TECHNOLOGY

Code: MCAS705

Credits: 3

OBJECTIVES: Java EE stands for Java Enterprise Edition. Java EE is used as a platform for performing server programming with the help of Java Programming Language. Java EE provides libraries that offer functionality to deploy distributed applications. Java EE is a combination of components such as JSP, Servlets and EJBs. Using Java EE, you can create web applications that can be hosted on any web server. Almost 80% of online web applications in the internet are developed using Java EE and its components.

UNIT-I

JDBC Product -Types of Drivers - Two-Tier Client/Server Model - Three-Tier Client/Server Model - Basic Steps of JDBC -Creating and Executing SQL Statement -The Result Set Object - Working with Database MetaData - Interface

UNIT-II

Servlet Interaction & Advanced Servlets - Life cycle of Servlet -Java Servlet Development Kit - javax.servlet package - Reading Servlet Parameters -Reading Initialization Parameters - The javax.servlet.http Package - Handling HTTP

UNIT-III

JSP Technologies -Understanding the Client-Server Model - Understanding Web server software -Configuring the JSP Server - Handling JSP Errors - JSP Translation Time Errors - JSP Request Time Errors - Creating a JSP Error Page

UNIT-IV

RMI Architecture - Designing RMI application - Executing RMI application

EJB-Types of EnterpriseJava beans - Session Bean & Entity Bean - Features of Session Bean - Life-cycle of Stateful Session Bean - Features of Entity Bean - Life-cycle of Entity Bean - Container-managed Transactions & Bean-managed Transactions o Implementing a container-manged Entity Bean.

XML-XML- XML Syntax Rules

UNIT-V

Introduction to the Apache Struts -MVC Architecture o Struts Architecture - How Struts Works? -Introduction to the Struts Controller - Introduction to the Struts Action Class - Using Struts ActionFrom Class - Using Struts HTML Tags - Introduction to Struts Validator Framework - Client Side Address Validation in Struts - Custom Validators Example - Developing Application with Struts Tiles,

Hibernate- Introduction to Hibernate 3.0 - Hibernate Architecture - First Hibernate Application

TEXTBOOKS:

1. Schildt, H., “J2ee: The Complete Reference”
2. Moss, K., “Java Servlets (Second Edition)”, New Delhi: Tata McGraw-Hill
3. Marty Hall, “Core Servlets & JavaServer Pages”, 2nd Edition Vol 1

Course: ADVANCED PHP TECHNOLOGY PRACTICAL

Code: MCAS702

Credits: 3

OBJECTIVE: To Design, Debug and deploy feature – rich Web Applications

LIST OF PROGRAMS:

1. WAP for handling Check Boxes
2. WAP for handling Radio Buttons
3. WAP for handling List Boxes
4. WAP for handling Password Controls
5. WAP for handling Images
6. WAP for handling Buttons(Using JavaScript, HTML)
7. WAP for Dumping Form’s Data
8. WAP for handling Form Data with Customs Arrays
9. WAP using Constructors to initialize Objects
10. WAP using Destructors to Clean Up after Objects
11. WAP using Constructors and Inheritance
12. WAP using (Overriding, Overloading and Autoloading) methods
13. WAP for passing data to a Static method
14. WAP for using Static members and Inheritance
15. WAP for reading Text from a file using fgets
16. WAP for reading a file Character by Character with fgetc
17. WAP for copying a file with copy
18. WAP for deleting a files
19. WAP for writing to a file with fwrite

Course: ADVANCED .Net TECHNOLOGY-PRACTICAL

Code: MCAS704

Credits: 3

OBJECTIVES: To provide students with the skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user interfaces, on user management, event driven programming, state management, page validation, website navigation, state management, user profile, working with database, dataset and other requirements to build a web application.

LIST OF PROGRAMS:

1. Implementing user authentication and authorization.

2. Web page validation.
3. Implement event handlers with various controls
4. Program implementing image map control.
5. Program demonstrating file upload, adrotator.
6. Program implementing wizard control.
7. Program implementing Login control.
8. Program implementing Master page and theme.
9. Implementation of session, cookies, etc.
10. Program implementing database connection and data manipulation.
11. Working data list class.
12. Working with dataset and data adapter

Course: ADVANCED J2EE TECHNOLOGY-PRACTICAL

Code: MCAS706

Credits: 3

OBJECTIVES: Java EE stands for Java Enterprise Edition. Java EE is used as a platform for performing server programming with the help of Java Programming Language. Java EE provides libraries that offer functionality to deploy distributed applications. Java EE is a combination of components such as JSP, Servlets and EJBs. Using Java EE, you can create web applications that can be hosted on any web server. Almost 80% of online web applications in the internet are developed using Java EE and its components.

LIST OF PROGRAMS:

1. Programs implementing the concept of JSP scripting elements.
2. Programs implementing the concept of JSP Actions, Custom Tag libraries, Directives and connecting pages.
3. Programs implementing the concept of Including and Forwarding from JSP Pages.
4. Programs implementing the concepts of Custom Actions.
5. Programs implementing the concept of servlets
6. Implementing a container-manged Entity Bean.
7. Programs implementing the Struts Action Class
8. Programs implementing the Using Struts HTML Tags.
9. Developing Application with Struts Tiles.
10. Programs implementing the Hibernate Application.

Course: VISUAL PROGRAMMING

Code: MCA513

Credits: 3

OBJECTIVE: To provide students with the knowledge and skills needed to develop applications in Microsoft Visual Basic .NET for the Microsoft .NET platform. The paper focuses on user interfaces, program structure, language syntax, and implementation details.

UNIT-I

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.

UNIT-II

The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function. Control flow statements: conditional statement, loop statement. MsgBox & Inputbox.

UNIT – III

Working with Forms: Loading, showing and hiding forms, controlling One form within another. GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar. Their Properties, Methods and events. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label. Designing menus: ContextMenu, access & shortcut keys.

UNIT-IV

Object oriented Programming: Classes & objects, fields Properties, Methods & Events, constructor, inheritance. Access Specifiers: Public Private, Protected. Overloading, My Base & My class keywords. Overview of OLE, Accessing the WIN32 API from VB.NET & Interfacing with office97, COM technology, advantages of COM+, COM & .NET, Create User control, register User Control, access com components in .net application.

UNIT-V

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid. Generate Reports Using CrystalReportViewer.

TEXTBOOKS:

1. Steven Holzner, “VB.NET Programming Black Book”, Dreamtech publications
2. Evangelos Petroustos, “Mastering VB.NET” - BPB publications

REFERENCES:

1. Introduction to .NET framework-Worx publication
2. msdn.microsoft.com/net/
3. www.gotdotnet.com

Master of Science (Information Technology)

Course: COMPUTER ORGANIZATION & ARCHITECTURE

Code: MST501

Credits: 4

OBJECTIVE: This course aims to provide the student with in depth understanding of the structures and behavior of the various functional modules of the computer and how hardware components are organized forming a Computer.

UNIT-I

Digital Components Combinational; Flip flops; Sequential Circuits; Integrated Circuits; Decoders; Multiplexes; Demultiplexer; Code Converter; Registers; Shift Registers; Binary Counters; Memory Unit; Register Transfers, Microoperations, Basic Computer Organization & Design Register Transfer; Control Function; Bus and Memory Transfers; Arithmetic Microoperations Logic Microoperations; Shift Microoperations; Arithmetic Logic Shift Unit

UNIT-II

Instruction Codes; Computer Registers; Common Bus Systems; Computer Instructions; Timing and Control; Instruction Cycle; Memory-Reference Instructions; Input-Output and Interrupt; Computer Description; Design of Basic Computer; Design of Accumulator Logic Programming the Basic Computer, Computer Arithmetic Introduction; Programming Arithmetic and Logic Operations; Input Output Programming; Addition and Subtraction; Multiplication Algorithms; Division Algorithms; Floating-Point Arithmetic Operations

UNIT-III

Introduction to Major Components of a CPU; General Register Organization; Stack Organization; Instruction Formats; Addressing Modes ;Data Transfer and Manipulation; Program Control; Reduced Instruction Set Computer; Control Memory ;Address Sequencing ; Microprogram Example ;Design of Control Unit

UNIT-IV

Characteristics of Multiprocessors; Flynn's Classification; Interconnection Structures; Interprocessor Arbitration; Interprocessor Communication, Synchronization and Mutual Exclusion with a Semaphore; Cache Coherence; Parallel Processing; Pipelining; Arithmetic Pipeline; Instruction Pipeline; RISC Pipeline; Vector Processing; Array Processors

UNIT-V

Peripheral Devices; Input Output Interface; Asynchronous Data Transfer; Modes of Transfer; Priority Interrupt; Direct Memory Access; Input-Output Processor; Memory Hierarchy; Main Memory; Auxiliary Memory; Associative Memory; Cache Memory; Virtual Memory; Memory Management

TEXTBOOKS:

1. M. Morris Mano, “Computer System Architecture”, Prentice Hall of India Pvt. Ltd

REFERENCES:

1. M. Morris Mano, “Digital Logic and Computer Design”, Prentice Hall of India Pvt. Ltd
2. M. Morris Mano, “Computer Engineering Hardware Design”, Prentice Hall, Inc
3. P. Pal Choudhuri, “Computer Organization and Design”, Prentice Hall of India Pvt.

Course: CONCEPTS OF ALGORITHM AND PROGRAMMING (CAP)

Code: MST502

Credits: 3

OBJECTIVE: The objective of this subject is to discuss the basic techniques and algorithms for attacking and solving various types of problems. The emphasis should be on writing algorithms and programs in C and understanding the object oriented paradigm

UNIT-I

Definition of Algorithms- Writing algorithms- top down design – Program verification- The efficiency of algorithms- Concept of Recursion- some simple example to illustrate these concepts like finding the GCD of two numbers- Swapping two variables- Summation of n given numbers- generation of Fibonacci sequence- Reversing a given number-Base conversion.

UNIT-II

Introduction to- C character set- Delimiters-The C Keywords-Identifiers- Constants- Variables-Rules for Defining Variables-Data Types-Declaring Variables- Initializing Variables – Type Conversion-Priority of Operators and their Clubbing- Comma and Conditional Operator-Arithmetic Operators-Relational Operators –Logical Operators- Bitwise Operators-Input and Output in C-Formatted and Unformatted Functions - Library Functions; if statement- if...else statement-various forms of if- nested if -break statement-continue statement – go to statement - switch statement - nested switch statement - for statement -while statement do while statement - arrays - working with string and standard functions.

UNIT-III

Introduction to pointers – pointer declaration – Arithmetic Operations with pointers – pointers and arrays – pointers and two-dimensional arrays – array of pointers – pointers to pointers – pointers and strings – void pointers – function definition and declaration – proto types - types of functions – call by value and reference – functions returning more values – function as an argument – function with operators – function and decision statements – function and loop statements – function with arrays and pointers – recursion – pointer to function – storage classes; preprocessor directives– structures and unions – bit wise operators – files – command line arguments – dynamic memory allocation – graphics in C .

UNIT-IV

Introduction to C++: Identifier, Keywords, Constants, data types, Modifiers, reference variables, Operators, Type conversion, Variable declaration, expressions, statements, manipulators Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements. Storage Classes: Automatic, Static, Extern, Register, Functions-Prototyping, Definition and Call, Scope Rules; Function overloading, Default Arguments, Const arguments; Pointer to functions, Inline functions; Classes and Objects-Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control, const data members, Const member functions, this pointer; Friend functions and Friend classes; Constructors- properties, types of constructors; Destructors- Properties, Destroying objects, rules for constructors and destructors

UNIT-V

Inheritance-defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class; types of inheritance-Single, Multiple, Multilevel and Hybrid, types of base classes-Direct, Indirect, Virtual, Abstract, code reusability; Polymorphism: Methods of achieving polymorphic behaviour; Operator overloading: overloading binary operator, overloading unary operators, rules for operator overloading, operator overloading using friend function. Function overloading: early binding, Polymorphism with pointers, virtual functions, late binding, pure virtual functions and abstract base class. Virtual destructors; Difference between function overloading, redefining, and overriding

TEXTBOOKS:

1. E. Balagurusamy, "Programming in C", TMH Publications
2. Herbert Schildt, "The Complete Reference C++", Tata McGraw-Hill

REFERENCES:

1. Deitel and Deitel, "C++ How to Program", Pearson Education, 2001
2. Yashavant Kanetkar, "Let Us C", BPB publication

Course: CAP-PRACTICAL

Code: MST503

Credits: 3

OBJECTIVE: To provide students the skill for programming and algorithms using C and C++

LIST OF PROGRAMS:

1. WAP to find the roots of a quadratic equation using C language
2. WAP to find whether given number is prime or not using C language
3. WAP using C language to find the reverse of a given number
4. WAP using C language to find whether given number is palindrome or not
5. WAP using C language to find the value of sinx, using series expansion

6. WAP using C language to Sort the elements in a given array, using bubble sort
7. WAP to Sort the elements in a given array, using insertion sort using C language
8. WAP to find the product of two matrices of sizes 3 x 4 and 4 x 3 using C language
9. WAP to find the position of given element in the array, using binary search using C language
10. Print the elements in the reverse order of the given elements in the array using C language
11. WAP to find the number of vowels in a given string using C language
12. WAP to find the number of letters in the given string using C language
13. WAP to find the number of words in the given string using C language
14. Write a C++ program to implement flight class with data member as flight no,source, destination and fare. Write a copy constructor and a member function to display the flight information.
15. Write a C++ program to implement a string object. Include member functions to compare two strings and to concatenate two strings
16. Write a C++ program to implement a class to represent complex numbers. Include member functions to add and multiply to complex numbers. Overload assignment operator =
17. Write a C++ program to implement time class that has separate data members for hours, minutes and seconds. Overload + Operator to add two times (object) and ++ operator to increment the time by one second
18. Write a C++ program to implement a student class having roll no., name, rank, addresses as data members. Overload assignment operator =
19. Write a C++ program to implement user defined string class. Overload the constructor and a member function to concatenate two strings.
20. Write a C++ program implement Complex class with the member function Add, Subtract and Multiply two complex Numbers
21. Write a C++ Program to implement a sphere class with appropriate members and member function to find the surface area and the volume ($\text{Surface} = 4 \pi r^2$ and $\text{Volume} = \frac{4}{3} \pi r^3$)
22. Write a C++ program to implements a string class. Overload + Operator to concatenate two strings
23. Write a C ++ program to implement matrix class. Add member function to transpose the matrix
24. Write a C++ program to find the number of characters, word and lines in the given text as input
25. Write a C++ program to implement a telephone bill class with Name, Address, Tel. No., No. of calls as data members. Compute the amount to be paid if the charges per call is Rs. 2/-
26. Write a C ++ program to implement a class for complex numbers with add and multiply as member functions. Overload ++ operator to increment a complex number
27. Write a C ++ program to implement a date class with member functions as next, previous which return next date and previous date objects

Course: WEB DESIGNING- PRACTICAL

Code: MST504

Credits: 3

OBJECTIVE: The students will learn about the various web designing techniques and build their own websites using different tools

CONTENTS:

1. Creating web page using basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image; different attributes like align, color, bgcolor, font face, border, size
2. Write HTML code to develop a Web page having the background in red and title "My First Page" in any other color
3. Create an HTML document giving details of your name, age, telephone number, address, TLC code & enrolment number aligned in proper order
4. Write an HTML code to design a page containing text, in form of paragraphs giving suitable heading style
5. Create a page to show different attributes of Font tag
6. Create a page to show different attributes: italics, bold, underline
7. Creating web page having navigation links using anchor tag, internal, external, mail and image links; lists-ordered, unordered
8. Creating web page having table tag; HTML Form controls-form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frame
9. Write an HTML code to create a Web page of blue color and display links in red colour
10. Create a Web page with appropriate content and insert an image towards the left hand side of the page. When user clicks on the image, it should open another Web page
11. Create a Web page, which should contain a table having two rows and two columns.
12. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows.
13. Write an HTML code to develop a Web page having two frames that divide the Web page into two equal rows and then divide the second row into two equal columns.
14. Write an HTML code to develop a Web page having frames as described in the above question and then fill each frame with a different background color
15. Design a page with a text box called 'name' and a button with label 'Enter. When you click on the button another page should open, with the message "Hello < name > ", where name should be equal to the name entered in the first page
16. Design a Web Page, which is like 'compose' page of e-mail 1. Design a Web Page, which is like 'compose' page of e-mail
17. Writing programs implementing cascading style Sheet (CSS), CSS syntax, comments, id and class, background color, background image- text - text color, text alignment, text decoration, text transformation, text indentation; CSS font - font families, font style, font size - setting text size , using pixels and em; CSS lists - different list item markers, unordered list, ordered list, an image as the list item marker
18. Writing programs implementing CSS tables - table borders, collapse borders, table width and height, table text alignment, table padding, table color; CSS positioning - static

- positioning, fixed positioning, relative positioning, absolute positioning, overlapping elements, float, horizontal align, image gallery, image opacity/transparency
19. Writing program using Javascript tag, comments, variables, document methods-write and writeln methods, alert; operators-arithmetic, assignment, relational, logical, javascript functions, conditional Statements, loops, break and continue; events familiarization-onLoad, onClick, onBlur, onSubmit, onChange
 20. Write a JavaScript code to create a pull down menu box.
 21. Write a program to move a text with mouse pointer and to change colour of text randomly
 22. Create a Web page using two image files, which switch b/w one another as the mouse pointer moves over the image. Use the On Mouse over and On Mouse out event handler
 23. Create an HTML form that has a number of text boxes. The user fills the textboxes with data. Write a script that verifies that all textboxes have been filled. If a text box has been left empty pop up an alert message indicating the box that has been left empty. When OK button is clicked, set focus to that specific textbox. If all the textboxes are filled, display thank you.
 24. Working HTML 5 events using javascript-offline,onabort, onafterprint, onbeforeunload, onbeforeprint, onblur, oncanplay, oncanplaythrough, onclick, oncontextmenu, ondblclick,ondrag,ondragend,ondragcenter,ondragleave,ondragover,ondragstart,ondrop,ondurationchange,onemptied,onended,onerror,onfocus,oninput,oninvalid,onload,onmouseover,onmouseup,onmousewheel,onpagehide,onpageshow,onplaying,onprogress,onratechange,onredo,onresize,onscroll,onseeked,onseeking,onselect,onsubmit, onsuspend, onundo, onunload,onvolumchange,onwaiting
 25. Working with scalable vector graphics-embedding SVG,SVG line, circle,rectangle, ellipse, polygon, gradients; Canvas element-using canvas to draw polygon,path, text, transformation
 26. Working with web storage-session storage, local storage, delete web storage; web socket events-open, message, error, close;web socket methods-socket.send(),socket.close()
 27. Working with Joomla 3.4 CMS-installation, work areas, control panel, -toolbar;menu-content, component, extensions, help menu
 28. Creating menus, adding menus items, modifying menu items, submenus
 29. Working with Joomla modules-create module, breadcrumb module, feed display module, footer module, search module, random image module, whos is online module, syndicate module
 30. Working with Joomla global setting-system setting, media setting, language manager, private messages, mass emailing, cache management, users setting
 31. Working with Joomla template-template manager, customize template, adding template, creating, adding,customize logo, category management, adding content, formatting content, article metadata, adding banners, contacts adding news feed, adding forum, web links
 32. Working with joomla plugins-plugin managers, authentication plugins, content plugins, editor plugins, search plugins, users plugins, extension, system plugins
 33. Working on Site Management-global configuration- site online and offline, metadata setting, change site url ,updating web site, updating extension, disabling and uninstalling extensions, back up site
 34. Web hosting-www, web server, internet service provider, web hosting providers,domain names, web hosting email servers,web hosting technologies and types

35. Working with Cpanel-using file section tools, manage domains, manage email, manage security section, manage databases, manage software section tools

TEXTBOOKS:

1. HTML5 and CSS3: Develop with Tomorrow's Standards Today, Hogan Brian P, Springer India Private Limited
2. HTML 5 Foundations, Matt West, Wiley India Pvt Ltd
3. Using Joomla, Ron Severdia Kenneth Crowder, Shroff Publications

REFERENCES:

1. Responsive Web Design with HTML5 and CSS3, Hogan Brian P., Shroff Publishers & Distributers Private Limited - Mumbai
2. HTML 5 and CSS 3 Made Simple, Ivan Bayross, BPB
3. Joomla Accessibility, Joshue O Conner, Shroff Publications

Course: PC SOFTWARE AND HARDWARE-PRACTICAL

Code: MST505

Credits: 3

OBJECTIVE: To enable students to work with computer hardware and software like MS Office and its applications in the relevant fields

CONTENTS:

1. Introduction to MS Word and its area of use
2. Identify the different components of the document window and their functions
3. Creating and saving a document, open an existing file and saving a file using a new name
4. Protecting the document window using a password
5. Document creation- text selection and editing, cut, copy, paste, finding and replacing text
6. Formatting the text- font and size selection, alignment and spacing of text, paragraph indenting, bullets & numbering, headers & footers and changing case
7. Working with themes, table of contents, watermark, margins, size and orientation of page
8. Working with hyperlink, columns, drop cap, page setup, print preview and printing of documents
9. Working with tables- insert table, changing cell width & height, alignment of text in cell, insert / delete rows and columns, merging & splitting of cells
10. Working with pictures- picture style, aligning, text wrapping & cropping
11. Working with mail merge
12. Introduction to MS PowerPoint and its area of use
13. Identify the different components of the PowerPoint window and their functions
14. Creating and saving a presentation, open an existing presentation and saving it using a new name and Protecting the presentation using a password and working with slides- insert, delete and copying of slides
15. Working with themes- color, fonts & effects, slide design, background styles, animation and transition effects, setting the slide timer

16. Working with tables, hyperlinks, insert textbox, slide number, header & footer, wordart
17. Creating a photo album, picture and clipart and working with media clips- insert movie and sound clip
18. Changing page setup, slide orientation, printing a presentation and running the presentation using the slide show and function key
19. Introduction to MS Excel and its area of use and
20. Identify the different components of the excel window and their functions
21. Understanding what is a workbook, worksheet, cells, range and auto fill handle Open, save, close & renaming a workbook and Protecting the workbook using a password
22. Inserting worksheets, copying & renaming sheets, deleting sheets, editing text, selecting cells, rearranging & merging of cell contents and working with cell formatting using auto row format, row and column formatting, cell border, hyperlink
23. Working with formula using addressing method, auto sum and functions, merging from excel workbook to word document
24. Managing data-sorting data, filtering data, freezing rows & columns, cell contents, working subtotals and data form and working with charts
25. Understanding the different components of a desktop computer
26. Understanding the different brands of the components
27. Assembling a computer
28. Partitioning and Installing operating system and drivers
29. Installing application soft wares
30. Troubleshooting RAM, hard drive, SMPS problems

Course: OPERATING SYSTEMS

Code: MST511

Credits: 4

OBJECTIVE: To describe the major components of an operating system, their functions and purpose to achieve the various case studies of different types of Operating System.

UNIT-I

Introduction – Definition, Types of Operating System, Functions of the Operating System, Operating Systems Services, System Components, System Calls, Single User, Multi User and Multitasking Operating System;

UNIT-II

Process Management – Process, Scheduling, CPU Scheduling Concepts, Process Synchronization, Semaphore, Classical Problems of Synchronization, Deadlocks, Deadlock Detection, Deadlock Recovery;

UNIT-III

Memory Management – Introduction, Logical address V/s Physical address, Swapping, Contiguous Allocation, Partitioned Memory Allocation, Fragmentation, Paging, Segmentation, Virtual Memory, Page Replacement, Page Replacement Algorithms, Frame Allocation Algorithm;

UNIT-IV

File Management – File concepts, Access Methods, Directory Structure, Allocation Methods, Free Space Management, Secondary Storage Structure, Disk Scheduling, FCFS Scheduling, Disk Management;

UNIT-V

Distributed System and Security – Client/Server Computing, Remote Procedure Calls, Clusters, Threats and its Goals, Types of threats, Protection Mechanism, Digital Signature, Case Study on MS-DOS, Windows NT, Windows XP, Windows 7, Windows Ultimate, Android, Jelly Beans.

TEXTBOOKS:

1. Stallings, W., “Operating system ,” Sixth Edition, Prentice Hall (India)
2. Sibsankar Haldar and Alex A. Aravind , “Operating Systems”, Pearson Education.

REFERENCE:

1. Abraham Silberschatz and Peter Baer Galvin, “Operating System Principles”, Seventh Edition, Wiley-India Publication

Course: ADVANCED COMPUTER NETWORKS

Code: MST512

Credits: 4

OBJECTIVE: To acquaint the students with the application of networking with emphasis on various TCP/IP protocols and the working of ATM and its performance, Network security and authentication

UNIT-I

Layered protocols, internet Addressing, mapping internet address to physical address, internet protocol, OSPF, RIP,RARP, BOOTP, DHCP, BGP, ARP, IP, Ipv6, ICMPTransport protocols: UDP, TCP and SNMP

UNIT-II

Frame relay, B-ISDN, ATM protocol stack, ATM switching, internetworking with ATM Networks, traffic management in ATM

UNIT-III

High Speed LAN-LAN Ethernet, fast Ethernet, gigabit Ethernet, FDDI, DSL, ADSL

UNIT-IV

Wireless communication- wireless networks, wireless channels, channel access, network architecture, IEEE 802.11, Bluetooth

UNIT-V

Network Analysis and Modeling- Queuing theory, modeling network as a graph, network management system and standard

TEXTBOOK:

1. Dayanand Ambawade, Dr. Deven shah, Prof. Mahendra Mehra,” Advance Computer Network”, Wiley India

REFERENCE:

1. William Stallings, “High-Speed Networks and Internets, Performance and Quality of Service”, Pearson

Course: RELATIONAL DATABASE MANAGEMENT SYSTEM-PRACTICAL

Code: MST513

Credits: 3

OBJECTIVE: The objective of this Course is to introduce to the students the fundamental concepts necessary for designing, using and implementing database systems and applications

CONTENTS:

1. Working with MySQL Data Definition, Table Creation, Constraints
2. Working with Insert, Select Commands, Update & Delete Commands
3. Study of SELECT command with different clauses
4. Study of GROUP functions (avg, count, max, min, sum)
5. Study of various type of SET OPERATORS (Union, Intersect, Minus)
6. Write the query to implement the concept of Intergrity constrains
7. Writing Nested Queries & Join Queries
8. Working with MySQL date and time format-extracting year, month, calculating present age from date of birth
9. Implementing Views
10. Working with Transaction
11. Perform the queries for triggers
12. Write the query for creating the users and their role.

TEXTBOOKS:

1. Abraham Silberschatz- Henry K. Korth- S. Sudarshan, “Database System Concepts”, 4th edition, McGraw Hill International Edition
2. Vikram Vaswani,” MySQL(TM): The Complete Reference”, Mc Graw Hill Education Publication

REFERENCES:

1. Madhilika Jain- Vineeta Pillai- Shashi Singh- Satish Jain, “A Level- Introduction to Database Management Systems”, BPB Publications
2. R S Gill, “Database Management System”, I K International

3. R Elmasri and S B Navathe, "Fundamentals of Database Systems", Pearson Publication
4. G. K. Gupta, "Database Management System", Tata McGraw Hill Publication

Course: DATA STRUCTURE USING C++

Code: MST514

Credits: 3

OBJECTIVE: To understand the different methods of the algorithm, its efficiency and the fundamental component of problem solving for organizing large amounts of data to be efficiently implemented to solve a specific problems

UNIT-I

Introduction – The concept of data structure, Abstract data type, Concept of list & array, Recursion Functions and its implementation; Introduction to Stack – Stack as an abstract data type, primitive operation on stack, Stacks application: Infix, post fix, prefix and recursion, multiple stack;

UNIT-II

Introduction to the linked list – Basic operations on linked list, Stacks and queues linked list, Header nodes, Doubly Linked List, Circular Linked List, Stacks and queues as a circular linked list, application of linked list; Introduction to queues – Primitive Operations on the Queues, Queue as an abstract data type, Circular queue, Dequeue, Priority queue, Applications of queue;

UNIT-III

Trees–basic terminology, binary trees, tree representations using array & linked list, basic operation on binary tree; traversal of binary trees – inorder, preorder & post order, application of binary tree, threaded binary tree, b-tree & height balanced tree, binary tree representation of trees;

UNIT-IV

Sorting–Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods, Hash Table, Collision resolution Techniques; Introduction to graphs – Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal- Depth first & Breadth first search, Spanning Trees minimum spanning Tree, Shortest path algorithm;

TEXTBOOKS:

1. A.A Puntambekar, "Data structures Using 'C++' ", Technical Publications
2. E. Balagurusamy, "Data Structures Using C ++",TATA McGraw-Hill

REFERENCES:

1. Yashavant Kanetka, "Data Structures Through C",BPB Publication

2. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, “Data Structures Using C”, Pearson Education India
3. Kruse, Tondo & Leung, “Data Structures and Program Design”, PHI publications

Course: DATA STRUCTURE USING C++ -PRACTICAL

Code: MST515

Credits: 3

OBJECTIVE: To understand the different methods of the algorithm, its efficiency and the fundamental component of problem solving for organizing large amounts of data to be efficiently implemented to solve a specific problems

LIST OF PROGRAMS:

- 1 Implementation of Concatenation & length using for loop statement
- 2 Implementation of Comparison & length using for loop statement
- 3 WAP to Access substring
- 4 WAP to find the Factorial using recursion
- 5 WAP to find the GCD of a number using recursion
- 6 WAP to find the Tower of Hanoi using recursion
- 7 WAP to find the Fibonacci Series using recursion
- 8 WAP to implement Insertion in an Array
- 9 WAP to implement Deletion in an Array
- 10 WAP to perform Binary output
- 11 WAP to implement Linear Binary & Sort
- 12 WAP to implement Bubble sort
- 13 WAP to implement Insertion
- 14 WAP to implement Select
- 15 WAP to implement Merge
- 16 WAP to implement Quick
- 17 WAP to implement BST & Tracing
- 18 WAP to Create a Linked list
- 19 WAP to implement Insertion in a linked list
- 20 WAP to implement Deletion in a linked list
- 21 WAP to implement Searching in a linked list
- 22 WAP to implement Double Linked list
- 23 WAP to implement Circular Linked list
- 24 WAP to implement Stack push and pop array
- 25 WAP to implement Stack Linked list
- 26 WAP to implement Queue Array
- 27 WAP to implement Queue Linked list
- 28 WAP to implement Double Queue
- 29 WAP to implement Circular Queue
- 30 WAP to implement Circular Stack

TEXTBOOKS:

1. A.A Puntambekar, “ Data structures Using 'C++' “, Technical Publications
2. E. Balagurusamy, “ Data Structures Using C++ “,TATA McGraw-Hill

REFERENCES:

1. Yashavant Kanetka, “Data Structures Through C++”,BPB Publication
2. Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J. Augenstein, “Data Structures Using C”, Pearson Education India
3. Kruse, Tondo & Leung, “Data Structures and Program Design”, PHI publication.

Course: LINUX SHELL PROGRAMMING-PRACTICAL

Code: MST516

Credits: 3

OBJECTIVE: To provide a comprehensive introduction to Shell Programming and enable to write simple and complex Shell scripts to automate processes in the Unix environment

UNIT-I

Introduction-what is linux, installing linux (any distros), looking into the linux kernel, The GNU utilities, linux desktop, environment linux distributions - core linux distributions, specialized linux distributions, the linux LiveCD

UNIT-II

Starting the shell, the shell prompt, the bash manual, file system navigation- the linux filesystem, traversing directories, file and directory listing - basic listing, modifying the information presented, the complete parameter list, filtering listing output, file handling - creating files, copying files, linking files, renaming files, deleting files, directory handling - creating directories, deleting directories, viewing file contents - viewing file statistics, viewing the file type, viewing the whole file, viewing parts of a file

UNIT-III

Using multiple commands, creating a script file, displaying messages, using variables - environment variables, user variables, the backtick, redirecting input and output - output redirection, input redirection, pipes, performing math - the expr command, using brackets, a floating-point solution, exiting the script - checking the exit status, the exit command

UNIT-IV

Working with the if-then statement, the if-then-else statement, nesting ifs,the test command - numeric comparisons, string comparisons, file comparisons, compound condition testing, advanced if-then features - using double parentheses, using double brackets, the case command, the for command - reading values in a list, reading complex values in a list, reading a list from a variable, reading values from a command, changing the field separator, reading a directory using wildcards, the c-style for command - the c language for command, using multiple variables, the while command - basic while format, using multiple test

commands, the until command, nesting loops, looping on file data, controlling the loop - the break command, the continue command, processing the output of a loop

UNIT-V

Command line parameters - reading parameters, reading the program name, testing parameters, special parameter variables - counting parameters, grabbing all the data being shift, working with options - finding your options, using the getopt command, the more advanced getopt, standardizing options, getting user input - basic reading, timing out, silent reading, reading from a file, understanding input and output - standard file descriptors, redirecting error, removing a trap running scripts in background mode - running in the background, running multiple background jobs, exiting the terminal, running scripts without a console, job control - viewing jobs, restarting stopped jobs, being nice - the nice command, the renice command, running like clockwork - scheduling a job using the at command, using the batch command, scheduling regular scripts, start at the beginning - starting your scripts at boot, starting with a new shell

TEXTBOOK:

1. Micheal Jang,"Linux Mastering Red Hat Linux 9", BPB Publications

REFERENCES:

1. John Goerzen,"Linux Programming Bible",IDG Books
2. Sumitabha Das,"Your Unix – The Ultimate Guide",TMH
3. Mathew,"Professional Linux Programming", Wrox-Shroff
4. Welsh & Kaufmann,"Running Linux", O'Reiley & Associates

Course: ADVANCED JAVA PROGRAMMING

Code: MST601

Credits: 3

OBJECTIVE: To enable students to acquire basic knowledge of fundamentals of object-oriented programming using Java. Course coverage includes the design and implementation of both graphical applets and standalone applications, and the use of visual components in graphical user interface design. Language elements covered include loops, arrays, input/output structures, events, exceptions, and threads.

UNIT- I

Java Overview: Genesis, Java Philosophy, Java & Internet, Object-Oriented Programming features, Java Applet and Application, Java Environment and Java Development Kit (JDK) & Java Standard Library (JSL), Java language fundamentals, The scope and lifetime of variable, Type conversion and casting, Control statements, Arrays classes and objects: The this keyword, Garbage collection, Overloading constructor, Using object as parameters, Argument passing, Returning objects, Recursion, Introducing Access control (public, private and protected), static, final, nested classes, String class, Command-line argument.

UNIT- II

Inheritance: Member access and inheritance, method overriding, dynamic method dispatch, using abstract classes, using final with inheritance, the Object class; Packages, Interface, classpath, Exception handling: Fundamentals, Exception types, Java's built-in exceptions, user defined exceptions; Networking: Socket overview, Stream Sockets, Datagram sockets, Manipulating URLs, Establishing a simple Server/Client using Stream Sockets, Connectionless Client/Server Interaction with Datagrams; Images: File formats, image fundamentals, creating, loading and displaying images, ImageObserver, MediaTracker

UNIT- III

String handling: String constructors, methods for character extraction, string searching & comparison, data conversion using valueOf (), StringBuffer Exploring java.lang: Simple type wrappers, System class, class Class, Math functions; The utility classes: Vector, Stack , HashTable, StringTokenizer, Bitset, Date, Calendar, GregorianCalendar, Random, Observable Input/Output-Exploring java.io: The java.io classes and interface, File class and methods for creating, renaming, listing and deleting files and directories, I/O stream classes (FileInputStream, FileOutputStream, BufferedInputStream, BufferedOutputStream, PushBackInputStream, InputStreamReader, BufferedReader, BufferedWriter, PrintStream, RandomAccessFile)

UNIT- IV

The Applet class: applet architecture, passing parameters to applets, getDocumentBase, getCodeBase, and showDocument, AppletContext and AudioClip interfaces, Graphics class and methods for drawing lines, rectangles, polygons and ovals; Swing: Component and Container classes, Layout managers (FlowLayout, GridLayout, BorderLayout), Handling events, Adapter classes, Anonymous inner classes

Swing GUI components (JLabel, JTextField, JTextArea, JButton, JCheckBox, JRadioButton, JList, JComboBox, JScrollBar, JScrollPane, JToolTip, JPanel, JFrame); Menus: JMenuBar, JMenu, JMenuItem, JSeparator; Multithreaded Programming: The Java thread model (thread priorities, synchronization and inter-thread communication); Deadlock, ThreadGroup.

UNIT- V

Java Beans: Introducing JavaBeans Concepts and Bean Development Kit (BDK), Using the Bean Box, Writing a simple Bean, Bean Properties (simple properties), Manipulating events in the Bean Box

Java database connectivity (JDBC): Introduction to JDBC, type of JDBC connectivity, Establishing database connections, Accessing relational database from Java programs; Java Servlets: Servlet overview and architecture, Servlet Interface and Servlet life cycle, HttpServlet Class, HttpServletRequest Interface, HttpServletResponse Interface, Handling HTTP get Requests, Setting up the Apache Tomcat Server, Deploying a web application, Handling HTTP get requests containing data, Handling HTTP post requests.

TEXTBOOK:

1. Deitel, H. M.; P. J. Deitel, Java : How To Program (Sixth Edition), New Delhi: Prentice-Hall India, 2005

REFERENCES:

1. Schildt, H., The Complete Reference Java 2 (Fifth Edition), New Delhi: Tata McGraw-Hill, 2005
2. Moss, K., Java Servlets (Second Edition), New Delhi: Tata McGraw-Hill

Course: ADVANCED JAVA PROGRAMMING-PRACTICAL

Code: MST602

Credits: 3

OBJECTIVE: To enable students to acquire basic knowledge of fundamentals of object-oriented programming using Java. Course coverage includes the design and implementation of both graphical applets and standalone applications, and the use of visual components in graphical user interface design. Language elements covered include loops, arrays, input/output structures, events, exceptions, and threads.

LIST OF PROGRAMS:

1. To implement simple program based on operator loop decision statements
2. To implement Program to define Class and instantiate Objects
1. Program to implement constructor and Method overloading and Method overriding
2. Program to create components using Swing
3. Program to implement Wrapper Class and command line argument
4. Program to demonstrate packages and interfaces
5. Program to demonstrate Single level and Multi level inheritance
6. Program to demonstrate Exception Handling
7. Program to demonstrate Multithreading and Synchronization
8. WAP that import the user define package and access the Member variable of classes that Contained by Package.
9. Program that show the partial implementation of Interface.
10. Program to Handle the user define Exception using throw keyword.
11. Program to create a thread that Implement the Runnable interface.
12. Program to Implement Interthread communication.
13. Program to implement Server and client using networking
14. Program using Applet Class
15. Program to perform String Class and StringBuffer Class.
16. Program to implement all the Swing components
17. Designing an application using any IDE.
18. Creating a database Connection
19. Programs creating Simple Java Bean and Java Servlets.

Course: ANALYSIS AND DESIGN OF ALGORITHM

Code: MST603

Credits: 4

OBJECTIVE: To analyze the algorithm, its efficiency and the fundamental component of problem solving and to understand the importance of algorithm and finding its time and space complexity both theoretically and practically

UNIT-I

Introduction – Fundamentals of Algorithmic Problem Solving, Statement of the Problem, Design of an Algorithm, Correctness of an Algorithm, Analyzing an Algorithm, Implementation of Algorithm; Problem Types – Searching, Sorting, Graph Related Problems; Graph Representations – Adjacency matrix, Adjacency List, Path Matrix, Spanning Tree; Graph Properties – Bipartite Graph; Analysis of Algorithm Efficiency – Space Complexity, Analysis of Space Complexity, How to calculate Space Complexity, time complexity; Asymptotic Notations – Big Oh Notation, Omega Notation, Theta Notation, Little Oh Notation, Comparison of Asymptotic Notations

UNIT-II

Mathematical Analysis Recursive – Backward Substitution Method, Important Recurrence Type, Fibonacci Numbers ,Recursion Tree; Brute Force Method – Bubble Sort, Implementation of bubble sort, Selection Sort, Implementation of Selection Sort; Exhaustive Search – Travelling Salesman Problem, Knapsack Problem, and Assignment Problem; Divide and Conquer – Merge sort, Analysis and Implementation of Merge Sort, Quick Sort, Analysis and Implementation, Binary Search, Analysis and Implementation; Multiplication of Large Integers; Strassen's Matrix Multiplication;

UNIT-III

Decrease and Conquer – Insertion sort: analysis of Insertion Sort and its implementation; DFS and BFS –Depth First Search, Breadth First Search; Topological Sort; Transform and Conquer – Balanced Search Tree, AVL Trees; Heap sort – Heaps, Initial Heap Construction, Inserting a Key into a Max Heap, Deleting a key from Max Heap;

UNIT-IV

Space and Time Tradeoffs – Sorting by Counting; String Matching – Horspool Algorithm and its implementation; Hashing – hash Functions, Collision Resolution Techniques; Dynamic Programming – Warshall's Algorithm; Floyd's Algorithm; Knapsack problem;

UNIT-V

Greedy Technique – Prim's Algorithm, Kruskal's Algorithm, Dijkstra's Algorithm, Huffman Codes and Tree; Backtracking & branch and bound, n – Queens Problem, Assignment Problem, Knapsack Problem, Travelling Salesman Problem; Limitation of Algorithm Power –P, NP and NP – Complete Problems – NP – Completeness, Polynomial Time, NP – completeness and reducibility;

TEXTBOOKS:

1. Puntambekar, “Analysis and Design Of Algorithms”, Technical Publications
2. Anany Levitin, “Introduction to Design of Analysis and Algorithm “, Addison Welsey Edition

REFERENCES:

1. Robert Sedgewick and Phillippe Flajojet , “ An Introduction to the Analysis of Algorithm (2nd Edition) “, Welsey Publication .
2. Sara Baase and Allen Van Gelder, “Computer Algorithm: Introduction to Design and Analysis of Algorithm (3rd Edition)”.

Course: SOFTWARE PROJECT MANAGEMENT

Code: MST604

Credits: 4

OBJECTIVE: To enable students to plan, manage a project and understand the different risk factor that may associate with a project.

UNIT-I

Introduction to Competencies - Product Development Techniques - Management Skills-The SEI CMM - International Organization for Standardization Formulation of a test case plan or test bed at the requirements stage: Ways to gather requirements and documentation.

UNIT-II

Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project - Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.

UNIT-III

Tasks and Activities - Software Size and Reuse Estimating: A Regression Model - COCOMO II - SLIM Organizational Planning - Project Roles and Skills Needed. Mode of good interface design-simple pleasant dialog boxes, non-interfering colors, non crowding of user controls on the interface panel.

UNIT-IV

Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling.; Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment.

UNIT-V

IEEE-CS/ACM - Software Engineering Code of Ethics-Introduction, purpose, preamble, principles- public, client and employer, product, judgment, management, profession,

colleagues, self; Plagiarism – What is it, types, Five levels or degrees of plagiarism, prevention, MLCU policy, IEEE plagiarism guidelines, citation-APA, IEEE.

TEXTBOOK:

1. Bob Hughes, Mikecotterell, “Software Project Management”, Third Edition, Tata McGraw Hill

REFERENCES:

1. Ramesh, Gopalswamy, "Managing Global Projects", Tata McGraw Hill
2. Royce, “Software Project Management”, Pearson Education
3. IEEE-CS/ACM - Software Engineering Code of Ethics - Don Gotterbarn, Keith Miller, Simon Rogerson Executive Committee, IEEE-CS/ACM Joint Task Force on Software Engineering Ethics and Professional Practices
4. Jalote, “Software Project Management in Practice”, Pearson Education

ELECTIVE I

Course: DATA MINING AND DATAWAREHOUSING

Code: MSTE601

Credits: 4

OBJECTIVE: To enable the student to interpret the different kinds of database and to make use of the different types of data mining and data warehousing.

UNIT-I

Data warehousing Components–building a Data warehouse, Mapping the Data Warehouse to a Multiprocessor Architecture, DBMS Schemas for Decision Support, Data Extraction, Cleanup, and Transformation Tools, Metadata

UNIT-II

Business Analysis- reporting and query tools and applications, tool categories, the need for applications, Cognos Impromptu, Online Analytical Processing (OLAP), multidimensional data model, OLAP Guidelines, multidimensional versus multi-relational OLAP, categories of tools, OLAP Tools and the Internet

UNIT-III

Introduction to data mining-data, types of data, data mining functionalities, interestingness of patterns, classification of data mining systems, data mining task primitives, integration of a data Mining System with a data warehouse, issues, data preprocessing

UNIT-IV

Association rule mining and classification-Mining Frequent Patterns, Associations and Correlations, mining methods, mining, various kinds of association rules, correlation analysis and constraint based association mining, classification and prediction, basic concepts,

decision tree; Induction-Bayesian classification, rule based classification, classification by back propagation, support Vector machines, Associative Classification

UNIT-V

Clustering and applications and trends in data mining-cluster analysis, types of data, categorization of Major Clustering Methods-K means, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid Based Methods, Model-Based Clustering Methods, Clustering High Dimensional Data, constraint, based cluster analysis, Outlier Analysis, Data Mining Applications

TEXTBOOKS:

1. Alex Berson and Stephen J. Smith, “Data Warehousing, Data Mining & OLAP”, Tata McGraw, Hill Edition
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Second Edition, Elsevier,

REFERENCES:

1. Pang Ning Tan, Michael Steinbach and Vipin Kumar, “Introduction To Data Mining”, Person Education
2. K.P. Soman, Shyam Diwakar & V. Ajay “, Insight into Data mining Theory and Practice”, Easter Economy Edition, Prentice Hall of India
3. G. K. Gupta, “Introduction to Data Mining with Case Studies”, Prentice Hall of India
4. Daniel T.Larose, “Data Mining Methods and Models”, Wile Interscience

Course: COMPUTER GRAPHICS

Code: MSTE602

Credits: 4

OBJECTIVE: To provide students with an understanding of the basic principles, techniques, and algorithms for generating and interacting with simple graphical objects on a display screen that form the basis of computer graphics and modeling.

UNIT-I

Introduction to computer Graphics – Advantages of computer graphics, Applications and graphics software, Classifications of computer graphics; Video display Technologies- Raster scan systems, Random scan systems, CRT, Flat Panel Displays, Video controller, Graphics software

UNIT-II

Scan Conversion– attributes of output primitives, line drawing algorithms like Digital Differential Analyzer, Bresenham’s algorithm, Mid-point algorithm , Circle generating algorithms, scan converting ellipse; Filling Polygons-Boundary Fill algorithm, Flood Fill algorithm

UNIT-III

2D geometrical transforms-Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems; Windowing and Clipping-Viewing pipeline, Viewing transformations, 2-D Clipping algorithms

UNIT-IV

3D geometrical transforms- Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems; Windowing and Clipping-Viewing pipeline, Viewing transformations, Projections, 3D Clipping algorithms

UNIT-V

Visible Surface Detection- Back-Face Detection, Depth – Buffer Method, Scan Line Method – A-Buffer Method, Properties of Light, Infinite Color Concepts, RGB Color Models

TEXTBOOKS:

1. Donald Hearn and M Pauline Baker, “Computer Graphics C Version”, Pearson Education
2. Foley, Vamdam, Feiner and Huges, “Computer Graphics: Principles and Practice”, Pearson Education

REFERENCES:

1. William M. Newman, R.F. Sproull, “Principles of Interactive Computer Graphics”, Tata McGraw Hill
2. Steven Harrington, “Computer Graphics: A Programming Approach”, Tata McGraw Hill
3. David F. Rogers, “Procedural Elements for Computer Graphics”, Tata McGraw Hill
4. David F. Rogers, J. Alan Adams, "Mathematical Elements of Computer Graphics", Tata McGraw Hill

Course: INFORMATION SECURITY

Code: MSTE603

Credits: 4

OBJECTIVE: To provide an understanding of the principal concepts, major issues, technologies, and basic approaches in information security.

UNIT- I

Introduction-Security problem in computing, elementary cryptography – DES – AES – Public key encryption, uses of encryption software

UNIT-II

Program security-security programs – non-malicious program errors – virus and other malicious code, targeted malicious code, control against program threats

UNIT-III

Security in operating systems-protected objects and methods of protection, memory and address protection, control of access generated objects, file protection mechanisms, user authentication, trusted operating systems, models of security

UNIT- IV

Database and network security- database security requirements, reliability and integrity – sensitive data, inference ,multilevel databases and multilevel security, threats in networks – network security controls, firewalls, intrusion detection systems, secure email

UNIT- V

Administering security and ethical issues-security planning – risk analysis – organizational security policies – physical security – protecting programs and data – information and the law – software failures – computer crime – privacy – ethical issues

TEXT BOOK:

1. Charles B. Pfleeger, and Shari Lawrence Pfleeger, “Security in Computing”, Pearson Education

REFERENCES:

1. Matt Bishop, “Computer Security – Art and Science”, Pearson Education.
2. William Stallings, “Cryptography and Network Security – Principles and Practices”, Prentice-Hall of India.
3. Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill

Course: CLOUD COMPUTING

Code: MSTE604

Credits: 4

OBJECTIVE: To provide the knowledge of techniques and services of cloud.

UNIT-I

Cloud Computing Fundamentals- what cloud computing, essential characteristics, history of cloud computing – cloud architecture – cloud storage – why cloud computing matters – advantages of cloud computing – disadvantages of cloud computing

UNIT-II

Developing cloud services-Web-Based Application, Pros and Cons of Cloud Service Development, Types of Cloud Service Development ,Software as a Service – Platform as a Service, Web Services – On Demand computing, Discovering Cloud Services Development Services and Tools – Amazon Ec2, Google App Engine , IBM Clouds

UNIT-III

Cloud computing for everyone-centralizing email communications – collaborating on schedules, collaborating on to-do lists, collaborating contact lists, cloud computing for the community, collaborating on group projects and events, cloud computing for the corporation

UNIT-IV

Using cloud services-collaborating on calendars, schedules and task management – exploring online scheduling applications ,exploring online planning and task management, collaborating on event management, collaborating on contact management, collaborating on project management, collaborating on word processing, collaborating on databases – storing and sharing files, evaluating web mail services, evaluating web conference tools – collaborating via social networks and groupware, collaborating via blogs and wikis.

UNIT-V

Cloud computing risk issues: privacy and compliance risks, threats to infrastructure, data, and access control, cloud service provider risks, cloud computing security challenges- security policy implementation, virtualization security management, vm security recommendations, vm-specific security techniques

TEXTBOOK:

1. Zaigham Mahmood , Thomas Erl , Ricardo Puttini , “Cloud Computing - Concepts, Technology & Architectur”, Pearson Education

REFERENCES:

1. Broberg J, “Cloud Computing: Principles And Paradigms”, Wiley India Pvt Ltd
2. Bloor Robin, Kaufman Marcia , Hurwit Judith , “Cloud Computing For Dummies”, Wiley India Pvt Ltd

ELECTIVE II

Course: PHP TECHNOLOGY

Code: MSTE611

Credits: 3

OBJECTIVE: PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. PHP code is interpreted by a web server with a PHP processor module which generates the resulting web page. PHP commands can be embedded directly into an HTML source document rather than calling an external file to process data. It has also evolved to include a command-line interface capability and can be used in standalone graphical applications.

UNIT-I

Introduction to PHP as a programming language - advantages of php, the server side architecture decomposed, overview of PHP, history, object oriented support, benefits in running PHP as a server side script. Installing a web server, internet information server, and IIS installation, testing web server setup

UNIT-II

The basics of PHP- data types, variables, constants, operators, arrays, conditional statements (if statement, executing multiple statements, else if clause and switch statement), iterations (for loop, while loop, controlling an array using a while loop, do while statement, foreach loop and special loop key words)

UNIT-III

Functions, user defined functions, functions with arguments, built in functions(print(), includer(), header(), phpinfo()), PHP server variables, working with date and time, performing mathematical operations , working with string functions, system variable (GET, POST, cookies& Session, Forums)

UNIT-IV

Working with forms, form elements (text box, text area, password, radio button, checkbox, the combo box, hidden field and image), adding elements to a form, uploading files to the web server using PHP, building a challenge and response subsystem and understanding the functionality of the FORM attribute Method Regular Expressions-engine, types of regular expressions, symbols used in regular expressions. error handling in PHP- displaying errors, warnings, types of errors, error levels in php, logging errors and ignoring errors

UNIT-V

Data base connectivity using PHP –MySQL-performing, executing commands, different types of data base operations like Insertion, deletion, update and query on data

TEXTBOOKS:

1. Peter MacIntyre , Rasmus Lerdorf , Kevin,"Programming PHP",O'Reilly
2. G Steven Holzner,"Php: The Complete Reference",Mcgraw Hill Education

REFERENCES:

1. Vikram Vaswani,"PHP 5.3: A Beginner's Guide : A Beginner's Guide ",Mcgraw Hill Education
2. Janet Valade,"PHP and MySQL For Dummies, 4th Edition ",John Wiley & Sons Inc

Course: .NET TECHNOLOGY

Code: MSTe613

Credits: 3

OBJECTIVE: To provide students with the skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user management, event driven programming, state management, page validation, website navigation, state management, user profile, working with database and dataset.

UNIT-I

ASP.NET essentials-Overview of .Net framework, what's new in ASP.Net, Introduction to visual web developer; introducing asp.net pages, application lifecycle; provider models,

coding models, code sharing compiling application, global.asax file, web.config file; state management.

UNIT-II

Standard Controls-The Control Class, Web Control Class: Buttons, Labels, Literal, Place Holders, Hidden field control, File Upload Control, List Boxes etc. and studying their classes; Image: Image Control, Image Button ,Image Map and studying their classes.

UNIT-III

Navigation Control: Tree View Control, Menu Control, Site Map Control; Wizard Control and studying their classes; Validation Controls, Validation Group; Calendar and Ad Rotators; Master Pages and Themes.

UNIT-IV

Authorization and authentication: user management- login controls: login control, login view, login status, logon name, password recovery, create user control wizard, change password control; user profiles: using profiles, anonymous profiles, authenticated profiles.

UNIT-V

Working With Database - Server Explorer; Working with ADO.Net: connection object, Command object, datareader class, dataadapter class, Dataset: datatable class, datarow etc.;Data provider: OLEDB, SQLClient, Mysql and others; Access data source: using Object Data Source; Base Data List Class, list view, form view, Grid View,Details View Class, DataList Class,Repeater Class.

TEXTBOOKS:

1. ASP.Net, “Black Book” , Dream Tech Press Publications.
2. ASP.NET ,“The complete reference”, McDonald, McGraw-Hill

REFERENCES:

1. Chris Hart, John Kauffman,Chris Ullman,”Beginning ASP.NET 2.0”, Wiley Publications.
2. Matthew MacDonald, Adam Freeman, ”Pro ASP.NET 4 in C# 2010”, Apress
3. MridulaParihare et al ,”ASP.NET Bible”,by Hungry Minds, Inc.

Course: J2EE TECHNOLOGY

Code: MSTE615

Credits: 3

OBJECTIVE: Java EE stands for Java Enterprise Edition. Java EE is used as a platform for performing server programming with the help of Java Programming Language. Java EE provides libraries that offer functionality to deploy distributed applications. Java EE is a combination of components such as JSP, Servlets and EJBs. Using Java EE, you can create web applications that can be hosted on any web server. Almost 80% of online web applications in the internet are developed using Java EE and its components.

UNIT-I

Introduction to JavaEE-Introduction to J2EE-J2EE overview-why J2EE?-J2EE architecture-overview on the JavaEE architecture -1 tier- 2 tier -3 tier - n tier - JavaEE key standard J2EE APIs-J2EE containers

UNIT-II

Java database connectivity- JDBC product -types of drivers - two-tier client/server model - three-tier client/server model - basic steps of JDBC -creating and executing SQL statement - the result set object - working with database metadata - interface

UNIT-III

JavaServer Pages-JSP technologies -understanding the client-server model - understanding web server software -configuring the JSP server - handling JSP Errors - JSP translation time errors -JSP request time errors - creating a JSP Error Page

UNIT-IV

Servlets-Servlet Interaction & Advanced Servlets - Life cycle of Servlet -Java Servlet Development Kit - javax.servlet package - reading servlet parameters -reading initialization parameters - the javax.servlet.http package - handling HTTP

UNIT-V

RMI-RMI Architecture - Designing RMI application - Executing RMI application, EJB,types of enterprise java beans - session bean & entity bean - features of session bean - life-cycle of stateful session bean - features of entity bean - life-cycle of entity bean -container-managed transactions & bean-managed transactions o implementing a container-manged entity bean, XML- XML syntax rules

TEXTBOOKS:

1. Schildt, H., "J2ee: The Complete Reference", Tata McGraw Hills

REFERENCES:

1. Moss, K., "Java Servlets (Second Edition)", Tata McGraw-Hill
2. Marty Hall,"Core Servlets & JavaServer Pages", Pearson India

ELECTIVE II-PRACTICAL

Course: PHP TECHNOLOGY-PRACTICAL

Code: MSTE612

Credits: 3

OBJECTIVE: To practice writing program using PHP on notepad++
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1. WAP in PHP to print some text
2. WAP in PHP to store data in variables, Interpolating Strings, Creating variable variables, Creating constant.
3. WAP in PHP using math operators, for Incrementing and decrementing values, String operators, Operator precedence.
4. WAP in PHP using If statement, PHP Comparison operators, PHP Logical operators, Else statement, Elseif statement, Switch statement, Using For loops, Using While loops, Using Do...While loops, Using foreach loop, Terminating loops early, PHP alternate syntax.
5. WAP in PHP using String functions, Modifying the Data in arrays, Deleting arrays with loops(for loop, print_r function, foreach loop, while loop), PHP array Functions, Extracting Data from arrays, Sorting arrays, Using PHP array operators, Comparing array with each other, Handling Multidimensional arrays in loops, Splitting and Merging arrays, other array functions
6. WAP in PHP using Creating functions in PHP, Passing functions some Data, Passing arrays to functions, Passing by reference, Passing variable numbers to arguments, Returning Data from arrays, Returning arrays, Returning List, returning reference, Introducing variable Scope in PHP, Accessing Global Data, Working with Static variables, PHP conditional functions, PHP variable functions.
7. WAP in PHP using Handling Text fields, Handling Text areas, Handling Check boxes, Handling radio buttons, Handling List boxes, Handling Password controls, Handling Hidden controls, Handling image Maps, Handling Buttons(Making Button data Persist, using Submit Buttons as HTML buttons)
8. WAP in PHP to display the size of array, swap the keys and value of arrays, reverse the array, delete elements from an array using associative array
9. Write a PHP Program to display the today's date.
10. Write a PHP Program to read the employee details.
11. Write a PHP program to prepare the student marks list.
12. Write a PHP program to generate the multiplication of two matrices.
13. Write a PHP application to add new Rows in a Table.
14. Write a PHP application to modify the Rows in a Table.
15. Write a PHP application to delete the Rows from a Table.
16. Write a PHP application to fetch the Rows in a Table.
17. Develop an PHP application to make following Operations

- a.Registration of Users.
- b.Insert the details of the Users.
- c.Modify the Details.
- d.Transaction Maintenance.
 - i. No of times Logged in
 - ii. Time Spent on each login.
 - iii. Restrict the user for three trials only.
 - iv. Delete the user if he spent more than 100 Hrs of transaction.

Course: .NET TECHNOLOGY-PRACTICAL

Code: MSTE614

Credits: 3

OBJECTIVE: To provide students with the skills needed to develop web – based applications in ASP .NET for the Microsoft .NET platform. The Course focuses on user interfaces, on user management, event driven programming, state management, page validation, website navigation, state management, user profile, working with database, dataset and other requirements to build a web application.

LIST OF PROGRAMS:

1. Implementing user authentication and authorization.
2. Web page validation.
3. Implement event handlers with various controls
4. Program implementing image map control.
5. Program demonstrating file upload, adrotator.
6. Program implementing wizard control.
7. Website navigation.
8. Program implementing Login control.
9. Program implementing Master page and theme.
10. Implementation of session, cookies, etc.
11. Program implementing database connection and data manipulation.
12. Working data list class.
13. Working with dataset and data adapter

Course: J2EE TECHNOLOGY-PRACTICAL

Code: MSTE616

Credits: 3

OBJECTIVE: To implement the programming techniques of J2EE.

LIST OF PROGRAMS:

1. Programs implementing JSP interface
2. Programs implementing JSP connecting to the database

3. Programs implementing JSP handling request
4. Programs implementing the concept of JSP scripting elements.
5. Programs implementing the concept of JSP Actions, Custom Tag libraries, Directives and connecting pages.
6. Programs implementing the concept of including and forwarding from JSP Pages.
7. Programs implementing the concepts of Custom Actions.
8. Programs implementing the concept of servlets.
9. Implementing a container-manged Entity Bean.

MARTIN LUTHER CHRISTIAN UNIVERSITY



PROJECT GUIDELINES (MCA COURSE)

DEPARTMENT OF COMPUTER SCIENCES
BLOCK-1, DONGKTIEH, NONGRAH
SHILLONG-793006

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I. Introduction:

These guidelines are intended to give both students and faculty members at the Department of Computer Sciences a set of procedures and expectations that will make the project evaluation process easier, more predictable, and more successful. These guidelines should also be interpreted as the minimum requirements of MCA degree awarded by Martin Luther Christian University.

The Real time application (Project Work) will give an opportunity to the students to get a hand on experience in developing quality software applications. During the development of the project a student should involve himself in all the stages of the software development life cycle (SDLC) like requirements analysis, systems design, software development/coding, testing and documentation, with an overall emphasis on the development of reliable software systems. Students are encouraged to take up projects from the organizations in their locality that are unable to implement, develop and introduce software/automated system in daily functioning of the organization. Students should take the project work seriously and must choose projects which can be justified as MCA project. The project should be genuine and original in nature and should avoid any kind of plagiarism.

II. Paper Name, Code, Credit and Duration:

The major project of MCA program will be called as “Real Time Implementation Project” bearing the subject code MCA711. It will carry 12 credits. The major project duration will be from Feb to June every year.

III. Objective:

The objective of the major project work is to enable the students to apply the theoretical and practical techniques that they learnt during in the University to solve real time problem related to computer science and technology.

IV. Eligibility:

Students who have completed fifth semester of MCA course of the Department of Computer Sciences can submission the proposal for undertaking the major project during the month of February. Students are encouraged to take up the project *individually* however depending on the complexity and time constraint they may take up in a group subjected to the approval of the Project In-charge.

V. Selection of Organization and Project criteria:

1. The students are mandatory to work on a real life project of some industry/ Organisation /Educational Institution/Software Company etc
2. The project work should be a major project.
3. The Project work may be paid or unpaid. Irrespective of payment, the project should provide the opportunity to experience the full breadth of work experience.

4. Students are allotted by the department or university or are given the choice to approach the organisation they want to undertake project of their area of interests followed by HOD verbal confirmation on acceptance.
5. Formal letter of seeking permission to take up project from the organization by the student will be issued by Registrar. The letter will be known as Project Trainee Letter.
6. Acceptance letter from the organization should be submitted to Computer Sciences Dept to confirm undertaking of project.
7. Any expenses incurred will be borne by the student concerned.

VI. People Involved:

1. Project In-charge assigned by HOD
2. Organization Supervisor assigned by host organization
3. Department Guide assigned by HOD/Project In-charge
4. Student

VII. Roles and responsibilities of the host organisation:

1. The organisation will provide necessary information, technology that may be required for the project.
2. The organisation will appoint a supervisor for the project. The supervisor may be referred as Organization Supervisor.
3. The organisation may appoint additional guide to help the student in completing the project.

VIII. Responsibilities of the people involved:

1. Head of the Department of Computer Sciences may assign one faculty as Project In-charge or himself act as Project In-charge. The project in-charge will be responsible for
 - i. Assigning Dept guide for the student
 - ii. Conducting project reviews
 - iii. Evaluating the project and the progress of the project
 - iv. Maintaining record of the project review
 - v. Coordinate with the Organization Supervisor and the Department Guide
 - vi. Collection of log book and feedback from the Organization
 - vii. Maintaining periodic contact with the organization regarding the performance and conduct of the student and the project
 - viii. Reporting to HOD regarding the Project
2. The Organization Supervisor will have the following functions and responsibilities:
 - i. General coordination and supervision of the project.
 - ii. Provide in formations that are required by the student for the completion of the project.
 - iii. Sign the logbook and other reports of the project work.

- iv. Maintain the attendance and leave records and discipline of the student.
 - v. Maintain liaison with MLCU.
 - vi. Arrange financial support or stipends from the organisation (if applicable) for the students
 - vii. Evaluate and supervise the student in compiling the Project Report
 - viii. Arrangement for the Project completion Certificate at the end of the project.
 - ix. To give feedback of the student at the end of the project.
3. The following are the responsibilities of the Department guide:
- i. The main responsibility of the Department Guide is to give technical help to the student
 - ii. Coordinate with the Organization Supervisor related to the technical issues
 - iii. Help in documenting the project work
4. Responsibilities of the student:
- i. Collecting Project acceptance letter from the organization
 - ii. Submitting the project acceptance letter to the Department
 - iii. Student is responsible for complying with assigned work and work schedule as prescribed by the host organisation. They are expected to maintain professional decorum and approach to their work, adhering to the professional work standards and behaviour expected by the host organisation.
 - iv. Students are responsible for to get the log book signed by the organization Supervisor
 - v. Attending the project reviews and submission of required documents
 - vi. During the period of the project, any leave of absence should be notified to the in-charge of the organisation as well as to the Department Project In-Charge or to the Head of Computer Sciences Department
 - vii. Students should submit their logbook along with their final project documentation.
 - viii. Should attach a copy of the CD containing the executable file(s) of the complete project

IX. Calendar for the Project

1 st Week Feb	Issuing of Project Trainee Letter
2 nd Week Feb	Submission of Project Acceptance Letter
3 rd Week Feb	Project Review-I (Project Title, Synopsis, Requirement Analysis/SDLC Model)
2 nd Week March	Project Review-II (System Design/Architectural Design/Module Design)
1 st Week April	Project Review-III (Coding, Implementation)
1 st Week May	Project Review-IV (Coding, Implementation)
1 st Week June	Project Review-V (Coding, Implementation)
2 nd Week June	Verification and Submission of Documentation (3 Hard Copies)
3 rd Week June	Project Demonstration

X. Ethics and Plagiarism Policy

1. Scientific fraud and misconduct are not condoned at any project which includes plagiarism, forgery, use or presentation or documentation of other student's work as one's own and fabrication of data.
2. Students should ensure proper and achievable goals and objectives for any project on which they work. Fraudulent projects will be disqualified and rejected.
3. Students should follow professional standards, when available, that are most appropriate for the task at hand, departing from these only when ethically or technically justified.
4. Ensure that specifications for software on which they work have been well documented, satisfy the user's requirements, and have the appropriate approvals.
5. Students should comply with the Plagiarism policy of the university.

XI. Points to remember while preparing the project proposal

1. Students are encouraged to consult the Organization Supervisor and the Guide while preparing the project proposal. The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. **The project work should compulsorily include the specialization area opted by the student**
2. The project proposal should contain Organization name from whom the project is undertaking and the name and designation of the Supervisor

3. Synopsis of the project proposal (15-20 pages) covering the following aspects:
 - i. Title of the Project
 - ii. Objectives of the Project
 - iii. Tools/Platform, Hardware and Software Requirement specifications.
 - iv. Problem Definition, Requirement Specifications (Detailed functional Requirements and Technical Specifications)
 - v. Project Planning and Scheduling (Gantt chart and PERT chart)
4. A project proposal, once approved, **is valid for one year**. However the project submission is allowed only in the month May and November. In case, a student is unable to submit her/his project report within one year, a fresh synopsis approval is needed

XII. Points to remember while preparing the project report

The project report **should** contain the following:

- i. Certificate signed by Head of Department/ Project In-charge
- ii. Project Completion Certificate from the Organization/Institute
- iii. Self Declaration certificate of originality
- iv. Project documentation.
- v. A CD consisting of the executable file(s) of the complete project should be attached on the last page of the project report. If the executable file is unable to submit due to copyright or confidentiality of the organization or any other reason, an approval from the Project In charge/Head of the Department should be obtained. The student needs to retain the identical copy of the CD that should be carried while appearing for the final Project Demonstration along with the project report.

XIII. Project Report Specification

The project report may be about 80 to 100 pages in the following specifications:

1. The report should be of the format with 1.5 line spacing, 1.25 inches margin on either side, printed on A4 size papers, alignment - justify
2. Font type- Times New Roman, Font size- Heading-16 pts Bold, sub heading-14 pts bold and content-12 pts.
3. Margin- top- 1 inch, bottom- 1 inch
4. It must contain the following certificates/document :
 - a) Certificate (HOD or In-charge, Examiner Name and Signature)
 - b) University Certificate (collect from the department)
 - c) Completion Certificate from respective Organization/Company
 - d) Self-declaration certificate
 - e) Acknowledgement
 - f) Content index
 - g) Header containing name of the project & a footer containing the page number right aligned
 - h) Project Outline

- i. Introduction
- ii. Abstract
- iii. Title of Project
- iv. Aim of the Project
- v. Drawbacks of the existing system
- i) Feasibility study
 - i. Introduction
 - ii. Technical Feasibility
 - iii. Economic Feasibility
 - iv. Behavioural Feasibility
- j) Project Planning and Schedule
 - i. Software Process Model (e.g. Waterfall, spiral, prototype, iterative, evolutionary, etc.)
 - ii. Gantt Chart, PERT
- k) Software Requirements Specifications (SRS) Specific requirements
 - i. Hardware requirements
 - ii. Software requirements
- l) Software Design Description (SDD)
 - i. System architecture Design-Data Flow Diagram or Universal Modeling Language
 - ii. Database Design - ER Diagram (Entity Relationship), Table Structure and Dictionary
 - iii. User interface design- Description of the user interface - Screen images
- m) Software Test Documentation
 - i. Test approach -Unit testing, System or integration Testing
 - ii. Test Cases
- l) Source Code snippets of two modules
- m) Conclusion
- n) References
- o) Appendices (if any)
- p) Glossary

XIV. Project Assessment guidelines

1. Project Review should be conducted by a panel of minimum 2 faculty members The panel can be constituted by Project In-charge or Head, Department of Computer Sciences

2. Each project review will require the following and allocate marks accordingly

Review	Requirement	Marks(300)
First	Title, Synopsis, Requirement analysis, SDLC, Tools to be used, Project Planning & Schedule	40
Second	System design/Architectural Design/Module Design (ER diagram, Table/Database schema)	40
Third	Module Analysis I (GUI design, Coding)	30
Fourth	Module Analysis II (GUI design, Coding, Testing)	30
Fifth	Module Analysis III (GUI design, Coding, Testing)	30
Final	(i)Presentation skill and Conduct	30
	(ii)Implementation	50
	(iii)Documentation	50

- Student has to bring the project log book signed by the Organization Supervisor on every Project review. Marks should be deducted for not bringing or not getting the Supervisor signature
- A photocopy of the project report is not acceptable for submission. Photocopied report will be rejected
- If more than one student have been allowed to work on a project, the project synopsis and project reports by them must include only different modules undertaken/worked upon individually. Each student must submit a separate project proposal and a separate project reports related to her/his modules. Completely identical project synopsis and/or project reports are not allowed. Only introductory and possibly concluding remarks may be similar or common. Each student has to undergo all the phases/stages of the software project development life cycle. A single copy of the project synopsis and/or project report comprising of work of two or more students shall not be entertained. Violation of these project guidelines may lead to the rejection of the project
- Student should be involved in each and every phase of Project Development. If it is found that student is not involved in any phase for example coding phase, it may lead to the rejection/disqualifying of the project at any stage.
- Project may be rejected if it violates Plagiarism policy of the MLCU which will be informed to the students from time to time. Department of Computer Sciences will also evaluate the projects using anti-plagiarism software and minimum allowable plagiarism will be informed from time to time.
- Students are not encouraged to change the project title. Project Title can NOT be changed after the Third Project Review.
- Student has to submit in three copies (one copy for the host organisation, one copy for the Department and one copy for the University Library) of duly signed report and marks can be awarded for every copy.

PROJECT TRAINEE LETTER

To Whom It May Concern

This is to certify that **Ms/Mr** _____ bearing registration no. _____ is a final year student of Master of Computer Applications (MCA) in the Department of Computer Sciences, Martin Luther Christian University, and is required to undertake a five months MCA project work in her/his final year starting from February session. Her/His project must be undertaken in an Organization under the supervision of a guide, preferably from the same organization. During her/his course of study, the student has studied and gained knowledge on various Computer Science papers. She/He may please be given a chance to work in your esteemed organization and complete her/his project work. The experience gained by this project work, not only benefit the student to partially fulfill the requirements of the MCA course of Martin Luther Christian University, but also lay a foundation for her/his future career.

Looking forward to your positive response, support and cooperation

Date:

Signature

Informed Consent

Project Title: A study on the analysis and design of Student Transcript for MLCU

Project Developer: Name of the student/s

Course: Master of Computer Applications, Department of Computer Sciences, Martin Luther Christian University, Shillong, East Khasi Hills, Meghalaya

Project Purpose and Procedures:

/*This project.....The data collected will in return be used by the researchers for analysis, evaluation and gathering findings.*/

Risk and Confidentiality:

/* There will be no anticipated risks for your participation and the benefit of your participation will only contribute to the better understanding of the study on a broader perspective. The information gathered during the development of the project will remain confidential. Only the project developer will have access to the study data and information. The knowledge gathered from this study would provide great value for further possible studies.

Your participation is however voluntary. You may withdraw your consent from the study at your own will, at any time. You are also entirely free to not answer questions that we ask during the interview. At any time of the interview, you are welcome to ask the researchers any questions that you might have in mind. */

Consent:

I, _____, have read the above information. I understand freely and voluntarily agree to participate in this study. I understand confidentiality will be maintained, I understand that I am free to withdraw my consent from the study at any time. I understand that I am free to refuse to answer any questions and that my responses will be kept anonymous.

Participant Signature

Date: _____

MARTIN LUTHER CHRISTIAN UNIVERSITY

NONGRAH, DONGKTIEH, BLOCK-1, SHILLONG, MEGHALAYA
DEPARTMENT OF COMPUTER SCIENCES



CERTIFICATE

This is to certify that the project entitled
“Project Title”

Submitted in partial fulfilment of the requirement for the award of the degree
of
MASTER OF COMPUTER APPLICATIONS
Of
MARTIN LUTHER CHRISTIAN UNIVERSITY
is a result of benefited work carried out by

Name
Regd No:

During the academic year (201_-201_)

Examiners:

1. Signature
(Name of the examiner)

(Signature)
Head,
Computer Sciences Department

2. Signature
(Name of the examiner)

MARTIN LUTHER CHRISTIAN UNIVERSITY



TITLE OF THE PROJECT

By

Student's Full Name
Enrolment No:

Project work submitted to the
Computer Sciences Department, MLCU
in partial fulfilment of the requirements
for the award of the degree
Master of Computer Applications (MCA)
Year of Submission

MARTIN LUTHER CHRISTIAN UNIVERSITY
NONGRAH, DONGKOTIEH, BLOCK-1, SHILLONG, MEGHALAYA