Where talent meets opportunity

SRI SATYA SAI UNIVERSITY
OF TECHNOLOGY AND MEDICAL SCIENCES

SYLLABUS REVISION

Name of School-School of Computer Application

Department/Program- Computer Application/(PGDCA-BCA-MCA)

2017-18 TO 2021-22

www.sssutms.co.in

Opp.Oilfed Plant, Bhopal-Indore Road,Sehore (M.P), Pin - 466001

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Sri Satya Sai
University of Technology and Medical Sciences

(Established under Govt. of M.P. Registered under UGC 2(F) 1956)
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MINUTES OF BOARD OF STUDIES MEETING

Name of Department: COMPUTER SCEINCE

Minutes of Board of Studies Committee Meeting Held on Dates **14/06/2017**

The Board of Studies Committee Meeting was held in the room of Department of Computer Science at 11:00 AM. On **14/06/2017**, Following members were present.

1. Dr. Jitendra Shitlani — Dept. of Computer Science - Chairman
2. Mr.Ankit Joshi — Dept. of Computer Science -Member
3. Mr.Abhishek Kuroliya — Dept. of Computer Science- member
4. Mr.Rajkumar Mishra — Dept. of Computer Science -member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up the faculty for Progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda 1... The scheme and syllabus of the **PGDCA** (Diploma course) .

Discussion: -- The scheme and syllabus of **PGDCA I semester and II Semester No Change.**

Resolution:-

It is resolved that the syllabus and scheme were No Change academic session 2017-18.for the student admitted in session 2017-18.

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairperson)

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PGDCA

FIRST SEMESTER

Code	Subject	CCE/INTERNAL		Theory		Practical		Total
		Max	Min	Max	Min	Max	Min	
PGDCA-101(T)	Fundamentals of Computers & Information Technology	30	18	70	28	-	-	100
PGDCA-102(T)	Introduction to Operating System (DOS, Windows, Linux)	30	18	70	28	-	-	100
PGDCA-103(T)	PC Packages	30	18	70	28	-	-	100
	Choose any one from code 104							
PGDCA-104(A)	(A)Foxpro (Elective - 1)	30	18	70	28	-	-	100
PGDCA-104(B)	(B) MS-Access (Elective - 1)							
PGDCA-105(P)	Practical (Operating system + PC packages)	-	-	-	-	100	50	100

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Fundamentals of Computers & Information Technology

PGDCA-101

UNIT–I

Brief History of Development of Computers, Computer System Concepts, Computer System Characteristics, Capabilities And Limitations, Types of Computers, Basic Components of A Computer System - Control Unit, ALU, Input/output Functions and Characteristics, Memory RAM, ROM, EPROM, PROM and other types of Memory.

UNIT–II

Input / Output & Storage Units-: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, canners, Digital Camera, MICR, OCR, OMR, Barcode Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc,

UNIT–III

Printers And Its Types -Dot Matrix, Inkjet, Laser, Plotter, Sound Card And Speakers, Storage Fundamentals - Primary Vs Secondary Data Storage And Retrieval Methods - Sequential, Direct And Index Sequential, Various Storage Devices - Magnetic Tape, Magnetic Disks, Hard Disk Drives, Floppy Disks ,Optical Disks, Flash Drives Video Disk, MMC Memory Cards, Physical Structure of Floppy & Hard Disk, Drive Naming Conventions In PC.

UNIT–IV

Use of Communication and IT, Communication Process, Communication Types- Simplex, Half Duplex, Full Duplex, Serial And Parallel Communication, Types Of Network - LAN, W AN, MAN ,Internet, Topologies of LAN - Ring, Bus, Star, Mesh And Tree Topologies, Components of LAN -Media, , World Wide Web and Applications and Internet Services.

UNIT–V

Software and Its Need, Types of Software - System Software, Application Software, System Software - Operating System, Utility Program, Programming Languages, Assemblers, Compilers And Interpreter, Programming Languages- Machine, Assembly, High Level, 4GL, Their Merits And Demerits, Application Software and its Types - Word-Processing, Spreadsheet, Presentation Graphics, Data Base Management Software, Characteristics, Virus-Working Principles, Types of Viruses, Virus Detection Prevention Methods .

TEXT & REFERENCE BOOKS:

COMPUTERS TODAY, BY S.K BASANDRA, GALGOTIA PUBLICATIONS.
FUNDAMENTALS OF INFORMATION TECHNOLOGY ALEXIS LEON & MATHEWS LEON, , VIKAS PUBLISHING
DOS QUICK REFERENCE RAJEEV MATHUR, , GALGOTIA PUBLICATIONS

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Introduction to Operating Systems (DOS, Windows, Linux)

PGDCA-102

UNIT–I

DISK OPERATING SYSTEM (DOS): Introduction, History & Versions of DOS, DOS Basics - Physical Structure of Disk, Drive Name, FAT, File and Directory Structure and Naming Rules, Booting Process, DOS System Files. DOS Commands: Internal - DIR, MD, CD, RD, COPY, COPY CON, DEL,REN VOL, DATE, TIME, CLS, PATH, TYPE, VER etc. External - CHKDSK, XCOPY, PRINT, DISKCOPY, DOSKEY, TREE, MOVE, LABEL, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTIRIB, HELP, SYS etc, Executable V/s Non Executable Files in DOS

UNIT–II

WINDOWS XP: Introduction to Windows XP and its Features, Hardware Requirements of Windows. Windows Concepts, Windows Structure, Desktop,Taskbar, Start Menu, My Pictures, My Music, My Documents, Working with Recycle Bin - Restoring a deleted file, Emptying the Recycle Bin. Managing Files, Folders and Disk - Navigating between Folders, Manipulating Files and Folders, Creating New Folder, Searching Files and Folders. My Computer – Exploring Hard Disk, Copying and Moving Files and Folder from One Drive to Another, Formatting Floppy Drive, Windows Explorer and its Facilities, Using Floppy, CD, DVD, Pen Drive, Burning CD. Windows Accessories - Calculator, Notepad, Paint, WordPad, Command Prompt. Entertainment- Media Players, Sound Recorder, Volume Control, Movie Maker.

UNIT–III

ADVANCED FEATURES OF WINDOWS XP:

Managing Hardware & Software - Installation of Hardware & Software, Using Scanner Web Camera, Printers. System Tools - Backup, Character Map, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information, System Monitor, Disk Cleanup, Using Windows Update. Browsing the Web with Internet Explorer, Multiple User Features of Windows, Creating and Deleting User, Changing User Password, etc. Accessibility Features of Windows - Sharing Folders and Drives, Browsing the Entire Network, Using Shared Printers. OLE - Embed/Link Using Cut and Paste an Embed/ Link, Using Insert Object Manage Embedded/Linked Object

UNIT–IV

LINUX: History & Features of Linux, Linux Architecture, File System of Linux, Hardware Requirements of Linux, Various flavors of Linux, Linux Standard Directories, Functions of Profile and Login Files in Linux, Linux Kernel.

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UNIT–V

WORKING WITH LINUX: KDE & Gnome Graphical Interfaces, Various Types of Shell Available in Linux, Multi-User Features of Linux, Login and Logout fromLinux System, Linux commands - bc, cal, cat, cd, clear, cmp, cp, mv, date, find, ls, pwd, mkdir, more, rm, rmdir, chgrp, chmod, chown, tty, wc, who, whois, grep, telnet, vi editor, Using Floppy, CD-ROMand Pen Drive in Linux, Permissions and Ownerships.

TEXT & REFERENCE BOOKS:

DOS QUICK REFERENCE BY RAJEEV MATHUR, GALGOTIA PUBLICATIONS
LINUX COMPLETE BY BPB PUBLICATIONS
PETER NORTON COMPLETE GUIDE TO LINUX BY PETER NORTON, TECHMEDIAPUBLICATIONS LEVEL MODULE M 1.1 INFORMATION TECHNOLOGY BY KHANNA BOOK
PUBLICATIONS, NEW DELHI
WINDOWS XP COMPLETE REFERENCE, BPB PUBLICATION

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PC Packages

PGDCA103

UNIT–I

Office Packages: Office activates and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MS-Office, Lotus-Office, Star-Office,Open-Office etc.

MS Word Basics: Introduction to MS Office, Introduction to MS Word, Features & area of use. Working with MS Word, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Wizards & Templates, Creating a New Document, Different Page Views and layouts, Applying various Text Enhancements, Working with -Styles, Text Attributes, Paragraph and Page Formatting, Text Editing using various features ; Bullets, Numbering.

UNIT–II

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers, Inserting – Page Numbers, Pictures, Files, Autotexts, Symbols etc., Working with Columns, Tabs & Indents, Creation & Working with Tables including conversion to and from text, Margins & Space management in Document, Adding References and Graphics, Mail Merge, Envelops & Mailing Labels. Importing and exporting to and from various formats.

UNIT–III

MS Excel: Introduction and area of use, Working with MS Excel, Toolbars, Menus and Keyboard Shortcuts, concepts of Workbook & Worksheets, Using Wizards, Various Data Types, Using different features with Data, Cell and Texts, Inserting, Removing & Resizing of Columns & Rows, Working with Data & Ranges, Different Views of Worksheets, Column Freezing, Labels, Hiding, Splitting etc., Using different features with Data and Text, Cell Formatting including Borders & Shading,

UNIT–IV

Advanced Features of MS Excel: Multiple Worksheets: Concept, Creating and Using Multiple Worksheets; Use of Formulas, Calculations & Functions, Various types of Functions, Cell Referencing, Absolute and Relative Addressing, Working with Different Chart Types, Chart Wizard, Printing of Workbook & Worksheets with various options, Database: Creation, Sorting, Query and Filtering a Database; Creating and Using Macros;

UNIT–V

MS PowerPoint: Introduction & area of use, Working with MS PowerPoint, Creating a New Presentation, Working
with Presentation, Using Wizards; Slides & its different views, Inserting, Deleting and Copying of Slides; Working

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with Notes, Handouts, Columns & Lists, Adding Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects, Designing & Presentation of a Slide Show, Printing Presentations, Notes, Handouts with print options.

TEXT & REFERENCE BOOKS:

WINDOWS XP COMPLETE REFERENCE. BPB PUBLICATIONS
MS OFFICE XP COMPLETE BPB PUBLICATION
MS WINDOWS XP HOME EDITION COMPLETE, BPB PUBLICATION.
JOE HABRAKEN, MICROSOFT OFFICE 2000, 8 IN 1, BY, PRENTICE HALL OF INDIA
I.T .TOOLS AND APPLICATIONS, BY A. MANSOOR, PRAGYA PUBLICATIONS, MATURA

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Foxpro (Elective - 1)

PGDCA-104(A)

UNIT–I

FoxPro - The RDBMS for PC, Concept of database, FoxPro - Versions, features, requirement of Hardware and Software FoxPro - Menu System, Working with FoxPro Creating Database File Some common operations on data-CREATE, LIST, APPEND, CLOSE, QUIT , FoxPro - Data Types Viewing and Editing Data ,Data Displaying Commands - LIST, DISPLAY, LOCATE, EDIT, CHANGE, BROWSE, REPLACE, DELETE, RECALL, PACK (All Commands with various Options)

UNIT–II

File utilities in FoxPro MODIFY STRUCTURE, MEMO FIELD AND FILE UTILITIES – DISPLAY DIRECTORY, COPY, DELETE, RENAME. Sorting And Indexing of Database Files Sorting & Indexing Concept Sort Commands - Single & Multiple Key Advantage & Disadvantages of Sort ,Indexing Vs Sorting, Single & Multiple Key ,Indexing, FIND, SEEK, FoxPro Report - its creation, features & Utilities, Preview, Printing Custom Report, grouping & Sub grouping. ,FoxPro Label - Designing & Printing

UNIT–III

Memory Variables, Date & Time Functions and, Keyboard Macros ,Memory Variables - Creation and Uses, Simple Vs Array Saving and Restoring Memory Variables, ?/??/??? Commands Time & Date Functions and Commands, Date Arithmetic , Converting Defining Function Keys ,Keyboard Macros - Creating and Using Mathematical Commands ,Functions ,Arithmetic Operations, Mathematical Functions, Mathematical ,Commands, Statistical Functions.

UNIT–IV

Programming with Foxpro Concepts of FoxPro commands file, Modify Commands Conditioning, Branching and Looping within Program files with ,Do- While Enddo, If - Endif, Scan-Endscan, For - Endfor, Docase Endcase, Text - Endtext, Executing Commands from other command files, Macro Substitution ,Common Error Massages ,Debugging techniques and commands .

UNIT–V

Concept of Multiple Database Files - Using multiple database files ,Relationing the database – SET RELATION, UPDATE, APPEND ,FROM, COPY TO, JOIN, Relation Query by Example and SQL CUSTOM SCREENS & USER DEFINE FUNCTIONS & OTHER TOOLS ,Create Custom Screen with @, @_GET, @LEDIT, @_SAY_GET_READ, Creating Box & Lines, User Define Functions, Custom Screen Designing and their Use, FoxDoc for documentation.

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TEXT & REFERENCE BOOKS:

FOXPRO MADE SIMPLE BY R.K T AXALI, BPB PUBLICATIONS
MASTERING FOXPRO 2.5 BPB PUBLICATIONS
FOXPRO 2. 6 FOR DUMMIES - PUSTAK MAHAL

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MS-Access (Elective - 1)

PGDCA-104(B)

UNIT–I

Basics of RDBMS

Introduction to database -What is a Database, Why use a Relational Database, Overview of Database Design –Data Normalization (Determining tables, Determining Fields, Determining Relationships) Integrity Rules (Primary/Foreign Key, One-to-Many, Many-to-Many, One-to-One) Introduction to MS Access (Objects, Navigation).

UNIT–II

Tables in Database

Create a Table in MS Access -Data Types, Field Properties, Fields: names, types, properties--default values, format, caption, validation rules Data Entry, Add record delete record and edit text, Sort, find/replace, filter/ select, rearrange columns, freeze columns. Edit a Tables- copy, delete, import, modify table structure, find, replace.

UNIT–III

Working with Query

Setting up Relationships- Define relationships, add a relationship, set a rule for Referential Integrity, change the join type, delete a relationship, save relationship Queries & Filter - difference between queries and filter, filter using multiple fields AND, OR , advance filter Queries, create Query with one table, find record with select query, find duplicate record with query, find unmatched record with query, run query, save and change query.

UNIT–IV

Working with Forms

Introduction to Forms Types of Basic Forms: Columnar, Tabular, Datasheet, Main/Subforms, add headers and footers, add fields to form,add text to form use label option button, check box, combo box, list box Forms Wizard, Create Template.

UNIT–V

Working with Reports

Introduction to Reports , Types of Basic Reports: Single Column, Tabular Report Groups/Total, single table report, multi table report preview report print report, Creating Reports and Labels, Wizard.

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TEXT & REFERENCE BOOKS:

MS OFFICE XP COMPLETE BPB PUBLICATION ISBN 8 1-7656-564-4
MS ACCESS FAST & EASY BY FAITHE WEMPEN PHI . ISBN 81- 203-1893-5
MICROSOFT® ACCESS® STEP BY STEP BY COX & LAMBERT PHI LEARNING ISBN PB 9788120342019

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PGDCA
SECOND SEMESTER

SUBJECT CODE	SUBJECT NAME	THEORY		CCE / INTERNAL		PRACTICAL		Total
		MAX	MIN	MAX	MIN	MAX	MIN	
PGDCA201	SYSTEM ANALYSIS AND DESIGN	70	28	30	18	-	-	100
PGDCA202	PROFRAMMING WITH VISUAL BASIC .NET	70	28	30	18	50	25	150
PGDCA203	INTERNET & E-COMMERCE	70	28	30	18	-	-	100
	Choose any one from code 204							
PGDCA204A	OOPs & PROGRAMMING WITH C++	70	28	30	18	50	25	150
PGDCA204B	FINANCIAL ACCOUNTING WITH TALLY							
PGDCA205	PROJECT	-	-	-	-	100	50	100

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System Analysis and Design
PGDCA-201

Unit-I

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, ,System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success. System Planning.

Unit-II

Initial Investigation: Determining Users Requirements and Analysis, Fact Finding Process and Techniques. Feasibility Study: etermination of Feasibility Study, Technical, Operational & Economic Feasibilities, Data Analysis, Cost and Benefit Analysis.

Unit-III

Tools of Structured Analysis: Data Dictionary, Form, Gantt Charts, System Model, Pseudo Codes, Flow Chart System Flow Chart, Decision Tree, Decision Tables, Input/ Output and Form Design: Input and Output Form Design Methodologies, Menu, Screen Design, Layout Consideration.

Unit-IV

User Manual, Programming Manual, Programming Specifications, Operator Manual. System Testing & Quality: System Testing and Quality Assurance, Software Maintenance. System Security: Data Security, Disaster/ Recovery Threat and Risk Analysis.

Unit-V

Organization of EDP: Introduction. Job Responsibilities & duties of EDP Personnel's-EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP.

TEXT & REFERENCE BOOKS:

SYSTEM ANALYSIS & DESIGN BY V K JAM, DREAMTECH PRESS
MODERN SYSTEM ANALYSIS &DESIGN BY A HOFFER, F GEORGE, S VALACIAH LOW PRICED EDN. PEARSON EDUCATION.
INFORMATION T ECHNOLOGY & COMPUTER APPLICATIONS BY VK.KAPOOR SULTAN CHAND& SONS, NEW DELHI.

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Programming with Visual Basic.Net
PGDCA-202

Unit-I

Introduction to .NET, NET Framework features & rchitecture, 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 driven 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, ontrolling One form within another.GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, Radio Button, Panel, Scroll bar, Timer, List View, Tree View, Toolbar, Status Bar. Their Properties, Methods and Events. OpenFile Dilog, SaveFileDialog, FontDialog, ColorDialog, Print Dialog. LinkLabel. Designing menus : Context Menu, access & shortcut keys.

Unit-IV

Object Oriented Programming: Classes & objects, fields properties Methods & Events, constructor, inheritance. Access Specifiers: Public, Private, rotected. Overloading, My Base & My class keywords. Overview of OLE.

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.

TEXT & REFERENCE BOOKS:

1. *VB.NET PROGRAMMING BLACK BOOK BY STEVEN HOLZNER*
2. *DREAMTECH PUBLICATIONS*
3. *MASTERING VB.NET BY EVANGELOS PETROUTSOS - BPB PUBLICATIONS*
4. *INTRODUCTION TO.NET FRAMEWORK -WORX PUBLICATION*

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Internet & E-Commerce
PGDCA-203

Unit-I
Internet - Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP, Connectivity - Dialup, Leased line, VSAT etc., URLs, Domain names, Portals, Application. E-MAIL - Basics of Sending & Receiving, Free Email services. FTP & its usages. Telnet Concept, Internet chatting - Voice chat, Text chat.

Unit-II
Word Wide Web (www) - History, Working, Web Browsers, Its functions, Concept of Search Engines, Searching the Web, HTTP, URLs, Web Servers, Web Protocols. Space on Host Server for Website, HTML, Design tools, HTML editors , Image editors.

Unit-III
HTML - Concepts Of Hypertext, Versions of HTML, Elements of HTML, Syntax, Head & Body Sections, Building HTML Documents. Inserting Texts, Images, Hyperlinks, Backgrounds And Color Controls, Different HTML Tags, Table Layout and Presentation, Use of Font Size & Attributes, List Types and Its Tags, Use of Frames and Forms in Web Pages.

Unit-IV
JavaScript Overview, syntax & conventions. Variables, Expressions, Branching & Looping statements, Functions, Arrays Objects, Events & Document Object Model - onClick, onMouseOver, on Submit, on Focus, on Change, onBlur. onLoad, onUnload. Alerts, Prompts & Confirms.

Unit-V
E - Commerce an Introductions, Concepts, Advantages and Disadvantages, Internet & E-Business, Applications, Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, , Smart Cards and Credit Card-
Based Payment Systems, Introduction E-Governance and its applications , Various Sites .

TEXT & REFERENCE BOOKS:
1. LEVEL MODULE - M 1.2 - INTERNET & WEB PAGE DESIGNING BY V.K.JAIN – BPB PUBLICATIONS.
2. E-COMMERCE AN INDIAN PERSPECTIVE (SECOND EDITION) - BY P. T. JOSEPH, S.J. PRESENTICE-HALL OF INDIA
3. INTERNET FOR DUMMIES - PUSTAK MAHAL, NEW DELHI

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OOPs & Programming with C++ (Elective - 2)
PGDCA-204A

Unit-I Principles of Object-oriented Programming, Object-Oriented rogramming Paradigm, Basic Concepts of Object Oriented Programming, Benefits of OOPs, Object-Oriented Languages, Applications of OOP, C++ Statements, Class, Structure of C++ Program, Creating the Source File, Compiling and Linking.

Unit-II Tokens, Expressions And Control Structures,Introduction, Tokens, Keywords, Identifiers, Basic Data types, User Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialisation of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator Precedence, ControlStructures.

Unit-III Specifying a Class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Function, Arrays within a Class, Memory Allocation for Objects, Static Data Member, Static Member Functions, Arrays of Objects, Object as Function ,Arguments. Constructors And Destructors Introduction, Constructors, Parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialisation of Objects, Copy Constructors, Dynamic Constructors, Destructor.

Unit-IV Functions in C++, The Main Function, Function Prototyping, Call by Reference, Return by Reference, Inline Functions, Default Argument, Const. Arguments, Function Overloading, Friend and Virtual Function. Operator Overloading - introduction, methods, binary versus unary operators Inheritance: Extending Classes Introduction, Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance, ierarchical Inheritance, Hybrid Inheritance.

Unit-V Pointers, Virtual Functions and Polymorphism Compile time Polymorphism, run time polymorphism, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.\

TEXT & REFERENCE BOOKS:

- *OBJECT ORIENTED PROGRAMMING WITH C++ BY E.BALAGURUSWAMI*
- *OBJECT ORIENTED PROGRAMMING IN C++ BY R.K. SHUKLA, WILLEY*
- *SAMS RHI PVT. LTD*

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Financial Accounting with Tally (Elective - 2)
PGDCA-204B

Unit-I

1. Basic Concepts of Accounting, Financial Statements, FinancialStatement Analysis, Cost Centre, Basic concepts of Inventory.

2. Tally Configuration & INI setup, Data Directory & Folders configuration, Single & Multiple User, Tally Screen Components, Mouse / Keyboard Conventions & Key, Combinations, Switching between screen areas, Quitting Tally. Maintaining Company Data, Basic Company Details, Create/Alter/Select/Load/Close a Company, Chart of Accounts, Company Features, and Configuration.

Unit-II

1. Create, Alter & Display

a. Groups and Ledgers

b. All accounting voucher types

2. Accounting Voucher transactions, Account Invoice transactions, Excise Invoice, Export Invoice, Transactions using Bill-wise details.

3. Bank Reconciliation, Interest calculations using simple & advance parameters, Interest calculations on outstanding balances & on invoices, Use of voucher class, adjustment of interest, Creation of voucher class, Invoice entry in a class situation.

4. Create, Alter & Delete Budgets for groups, ledgers & cost centre, Defining credit limit & credit period, Display Budgets& variances,Create, Alter & Delete a scenario.

5. Journal Transactions, payment voucher, Godown summary

Unit-III

1. Reports like balance sheet, Profit & Loss account, Ratio analysis Trial Balance.

2. Accounts books like cash / bank book, All Led g e r s Group summary & vouchers, Sales, purchase & journal registers.

3. Cost centre & category summary, Cost centre breakup ledger & group breakup, outstanding receivables & payables, interest receivable & payable, Statistics, Cash & Fund flow, Day book List of Accounts, Reversing journals, optional vouchers, post-dated vouchers.

Unit-IV

1. Create, Alter & Display Stock Groups and Stock Items,

2. All inventory voucher types and transactions Inventory details in accounting vouchers.

3. Reports like Stock summary, Inventory books like Stock item, Group summary, Stock transfers, Physical stock register, Movement analysis, Stock group & item analysis, stock category analysis Ageing analysis, Sales order & Purchase order book, Statement of inventory related to Godowns, categories, stock query, Reorder status, Purchase & Sales order summary, Purchase & Sales bill pending, Exception reports like negative stock &

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ledger, overdue receivables & payables, memorandum vouchers, optional vouchers, post-dated vouchers, reversing journal

Unit – V

1. Cheque Printing, Common printing options, Different printing formats, Multi-Account printing, Dynamic- Report specific options.

2. Creating Group Company, Use of Tally vault, Using Security control & defining different security levels, Use of Tally Audit.

3. Back-up & Restore, Splitting company data, Export & import of Data, ODBC compliance, use of E-mail, Internet publishing, Upload, web browser & online help, Re-write data.

TEXT & REFERENCE BOOKS:

- IMPLEMENTING TALLY 6.3 BY NADHANI; ISBN: 81 7656494X BPB PUBLICATIONS, BPB TALLY 6.3 BY BPB EDITORIAL BOARD (HINDI) BPB PUBLICATIONS ISBN81 - 7656-594-6

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MINUTES OF BOARD OF STUDIES MEETING

Name of Department:- Department of Science

Minutes of Board of Studies Committee Meeting, held on Date ..12/06/2017.....

The Board of Studies Committee Meeting was held in the room of Dr. Kanchan Shrivastava Dean,Faculty of Education SSSTMS following members were present.

1. Dr.Kanchan Shrivastava ,Prof. Department of Economics
2. Dr. Deepak Mittal,Asst.Prof. Department of Science
3. Dr.Neelam Tripathi, Asst.Prof. Department of Science
4. Dr.Gajraj Singh, Asst.Prof. Department of Commerce
5. Dr. Reshma Arya, Asst.Prof. Department of History
6. Dr.Abhilasha Pathak, Asst.Prof. Department of Sociology
7. Mr. Abhishek Kuroliya, Asst.Prof. Department of Computer Science
8. Mr.Zuber Khan , Asst.Prof. Department of Maths
9. Mrs.Shobha Vyash Asst.Prof. Department of Hindi
10. Dr. Tabassum Khan ,Professor , Hindi
11. Ms.Khushboo Vaidya, Asst.Prof. Department of Microbiology

The chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:1 Discussion of all UG yearly and all PG semester wise Scheme & syllabus UG Ist to IIIrd Year and PG Ist to IVth Semester.

Discussion: In The BOS Meeting,the proposed All PG and UG course was discussed for academic session 2017-18.

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Resolution: It is resolved that the new syllabus and scheme of all UG yearly and all PG semester wise Scheme & syllabus UG Ist to IIIrd Year and PG Ist to IVth Semester approved .

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairperson)

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SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCE, SEHORE.

BCA (BACHELOR OFCOMPUTER APPLICATION) Ist YEAR 2017-18

ANNUAL SCHEME

SUBJECT CODE	GROUP	SUBJECT NAME	THEORY		CCE / INTERNAL		TOTAL MARKS		PRACTICAL/LAB		TOTAL	
			MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
BCA (Y-101)	-	Fundamentals of Computers	40	16	10	4	50	20	0	0	50	20
BCA (Y-102)	-	English Language and Communication	40	16	10	4	50	20	0	0	50	20
BCA (Y-103)	-	Office Automation Packages and tools	40	16	10	4	50	20	50	20	100	40
BCA (Y-104)	-	Problem solving & Programming through C	40	16	10	4	50	20	50	20	100	40
BCA (Y-105)	-	Business Mathematics	40	16	10	4	50	20	0	0	50	20
BCA (Y-106)	-	Digital Computer Organization	40	16	10	4	50	20	0	0	50	20
BCA (Y-107)	-	Accounting & Financial Management	40	16	10	4	50	20	0	0	50	20
FC (Y-104A)	-	Moral Value & Languages	80	32	20	8	100	40	0	0	100	40
FC (Y-104B)	-	Development of Entrepreneurship	80	32	20	8	100	40	0	0	100	40
Total			440		110		550		100		650	

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Faculty of Computer application

Paper Code: BCA (Y-101)

Subject - FUNDAMENTALS OF COMPUTERS

UNIT I

Computer System: Definition, Characteristics, capabilities and limitations, Types of Computers: Analog, Digital, Micro, Mini, Mainframe & Super Computers, Generations of Computers, Server.

Smart Systems: definition, characteristics and applications. Definition of Embedded system, GIS, GPS, Cloud Computing, Concept of hardware, software and firmware.Use of computers in e-governance and various public domains and services.

UNIT II

Computer organization: block diagram of computer and its functional units. Input devices - keyboard, scanner, mouse, light pen, bar code reader, OMR, OCR, MICR, track ball, joystick, touch screen camera, micetc.Output devices: monitors – classification of monitors based on technology -CRT & flat panel, LCD ,LED monitors, speakers, printers – dot matrix printer, ink jet printer, laser printer, 3D Printers, Wi-Fi enabled printers, plotters and their types , LCD/LED projectors. Computer memory and its types,Storage devices: Magnetic tapes, Floppy Disks, Hard Disks, Compact Disc – CD-ROM, CD-RW, VCD, DVD, DVD-RW, usb drives,Blue Ray Disc, SD/MMC Memory cards.

UNIT III

Programming Concept and its planning: Purpose of writing a program, Steps in Program Development, Characteristics of a Good Program, development of an Algorithm, Flow Charts through examples.

PROGRAMMING LANGUAGES: History, Classifications, Low Level, Assembly, High Level languages and 4GL, Advantages & Disadvantages of Programming Languages.

TYPES OF SOFTWARE: System Software, Translators, Compilers, Interpreters, Assemblers, Operating System, Linkers, Libraries & Utilities, Application Software, Packaged & Tailored Softwares.Examples of word-processing, spreadsheets, presentation, multimedia, graphics, accounting, statistical analysis, MIS software and other utility software available.

UNIT IV

OPERATING SYSTEMS: Introduction, Types of O.S.: Single User, Multi User, Multi Programming, Multi-Tasking, Real Time, Time Sharing, Batch Processing, Parallel Processing, Distributed Processing. File Allocation Table (FAT & FAT 32), NTFS, Drives, files & directory structure and its naming rules, booting process details of DOS and Windows, system files.

Examples of Operating systems prevalent around the world, Windows, Linux, iOS, Android and others. The concept of Open source, its advantages and limitations.

Virus- working principles, Types of viruses, virus detection and prevention, viruses on network, Antivirus software.

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UNIT V

WWW, Browser, Search Engine, Uses of the Internet, Basic Services of Internet, Difference between website and portal.

Use of computers in communication : Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modulation andDemodulation, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broadband ,Types of Network - LAN, WAN, MAN ,Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, Adaptors, HUB, Routers, Routers, Repeater and Gateways.

Text books &Reference books:

1. Computer Today By *S.K. Basandra*
2. Computer Fundamentals By *P.K. Sinha*
3. Operating System By *Peterson*
4. *E*asy Approach To Computer Course By *G.K. Iyer*
5. Operating System ByS. Galvin
6. Fundamentals of Information technology, Alexis Leon & Mathews Leon, Vikas Publishing House, New Delhi.

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Faculty of Computer application

Paper Code:- BCA (Y-102)

Subject : English Language and Communication

Unit I

Grammar: Parts of speech, Determiners, Tenses, Sentence: Simple, Compound and complex, Voice-Active and Passive, Narration Common Errors.

Unit II

Lexis: Use of dictionary and thesaurus, Vocabulary: word formation, synonyms, Antonyms, words with similar and dissimilar meanings, Homophony, Prefixes and suffixes, Phrases: Noun phrase, Verb phrase, adjective phrase, adverb phrase and prepositional phrase.

Unit III

Communication and Language Skills: Importance of communication, Elements of communication, skills of communication listening, reading writing and speaking Verbal and non-Verbal communication.,

Comprehension, paragraph writing-its methods and types, Précis writing, Summary writing, Note- Making and note- taking, writing minutes & Memos.

Importance of feedback and reporting in business/corporate environment. Business Etiquettes and mannerisms.

Unit IV

Oral Business communication

The oral channel and its use in business transactions, principles of effective communication, Preparing for A speech- Informal and formal speech, writing A speech on A given topic or for an occasion, writing the chairman's speech preparing for interviews, group discussion and conferences.

Reports and proposal: Classification, importance of reports, preparing to write a report, features of effective report, types of business reports, reports of committees, sample reports. Preparing a proposal. Business correspondences- offer, enquiry, Quotation, order, Executions, Claim, Complaint and adjustment.

Unit V

Written Business Communication

Importance, concept, advantages and disadvantages of written business communication. Need of business latter. Layout/Structure of a business letter, Kinds of business letters. Essentials of an effective business letter, enquiries, replies, orders, credit and reference letters. Supply letters, Dunning letters, sales letters circular letters.

Drafting official letters – rules to be observed for drafting of official letters, writing application for jobs. Preparing CV for job.

Modern forms of communication – fax, E-Mail, video conferencing, International communication, Adapting to global business.

Text Books & reference books:

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1. Wren and Martin high school grammar, S. Chand Publication
2. Essential Grammer in use – Raymond Murphy
3. Practical English Usage- Micheal swan
4. Business communication – Rai & Rai, Himalaya Publication.
5. Speaking and writing for effective business communication. Francis sunderaraj, Macmillan India Ltd.
6. Business communication essentials – Courtland L Bovee
7. Foundations of business communication : An integrative approach Dona Young
8. Business communication – Sangeeta Magan
9. Professional communication skills – AK Jain pravin Sr Bhatia, A M Sheikh, S. Chand Publication.

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Faculty of Computer application

Paper Code: BCA (Y-103)

Subject: OFFICE AUTOMATION PACKAGES AND TOOLS

UNIT I

MS Windows: Introduction to MS-Windows; Features of Windows; Various versions of Windows & its use; Working with Windows; My Computer ,Accessories & Recycle bin ; Desktop, Icons and Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Volume Control, Working with Files & Folders; simple operations like copy,delete,moving of files and folders from one drive to another, Shortcuts &Auto start, Accessories, Windows Settings using Control Panel- setting up common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hardware & Software program on your computer, maintaining user accounts, setting up system date and time.

Office Packages-Office activities and their software requirements, Word-processing, Spreadsheet, Presentation graphics, Database, introduction and comparison of various office suites like MSOffice, Lotus Notes, Star Office, Open Office etc.

UNIT II

MS Word : Introduction , Features & area of use. Working with MS Word :Ribbon tabs-Home, Insert, Page Layout, References, Mailings, Review, View.Creating a New Document; Different Page Views and layouts; Applying various Text Enhancements; Working with – Styles, Text Attributes; Paragraph and Page Formatting; Text Editing using various features ; Bullets, Numbering, Auto correct, change case, sorting,Printing & various print options.

Advanced Features of MS-Word: Spell Check, Thesaurus, Find & Replace; Headers & Footers ; Inserting – Page Numbers, Pictures, Files, Auto text, Symbols ,formula etc.; Working with Columns, Tabs & Indents; Creation & Working with Tables including conversion to and from text; Margins & Space management in Document; Adding References and Graphics; Mail Merge, printing Envelops & Mailing Labels. Importing and exporting to and from various formats. Working with OPTIONS in MS-WORD.

UNITIII

MS Excel: Introduction ,features and area of use; Working with MS Excel.; concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

UNITIV

MS PowerPoint: Introduction & area of use; Working with MS PowerPoint: Creating a New Presentation; Working with Presentation; Using Wizards; Slides & its different views; Inserting, Deleting and Copying of Slides; Design slides using themes, colors, and special effects.Adding special effects to slide transitions. Working with Notes, Handouts, Columns & Lists; Adding

Graphics, Sounds and Movies to a Slide; Working with PowerPoint Objects; Designing & Presentation of a Slide Show; Printing Presentations, Notes, Handouts with print options. Working with master slides.

UNIT V

MS Access : Introduction to database, Relational Database, Database Elements,
Tables, Query ,Opening and Closing Access Interface Window, Different tabs and icons on ribbon, creating a New database in Access, save and open database, Table creation, Database view and Design View. Data Types, Field Properties, Fields: names, types, properties, Data Entry, Add record, delete record, edit text, Sort, find/replace, filter/ select, rearrange Columns.

Textbooks and Reference books :

1. Learn Microsoft Office – Russell A. Shultz – BPB Publication
2. Microsoft Office – Complete Reference – BPB Publication

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Faculty of Computer application

Paper Code: BCA (Y-104)

Subject: PROBLEM SOLVING AND PROGRAMMING THROUGH C

UNIT I

Use of Algorithm for problem solving. Flow Charts - Symbols, Rules for making flow chart. Program Concept and logic development, Algorithm and flowcharts as programming aids, Characteristics of Programs, Various stages in Program Development , Programming Techniques – Top down, Bottom up, Modular, Structured - Features, Merits, Demerits, and their comparative study.

Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling, Program Testing & Debugging & their Tools.

UNIT II

Introduction to C language, standard features of C, Structure of a C program. Introduction to C compilers, Creating and compiling C Programs, IDE features of Turbo C compiler, Command line options to compile C program in TC.

Keywords, Identifiers, Variables, constants, Scope and life of variables - local and global variable. Data types, Expressions, Operators : Arithmetic, Logical, Relational, Conditional and Bit wise Operators. Precedence and Associativity of Operators, Type conversion. Basic input/output library functions: Single character input/output i.e. getch(), getchar(),putch(), putchar(). Formatted input/output -scanf() and printf() . Library functions : Mathematical & Character functions, Storage classes.

UNIT III

Declaration statement, conditional statement : If statement, If.....Else statement, Nesting of If....Else Statement, else if ladder, The ?: operator, Switch statement. Iteration statements: for loop, while loop, do-while loop. Jump statements: break, continue, goto, exit().

ARRAYS : concept of Single and Multi Dimensional arrays, Array declaration and initialization of arrays. Strings : declaration, initialization, string functions.

UNIT IV

The need for C functions, User defined and library functions, prototype of functions, prototype of main() function, Calling of functions, Function arguments, argument passing: call by value and call by reference, Return values. Nesting of functions, Recursion, Array as function argument, Command line arguments.Storage class specifiers - auto, extern, static, register.

UNIT V

Defining structure, Declaration of structure variable, typedef, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Functions that return structure, uses of structure, Union.

Pointers- Fundamentals, Pointer declarations, Passing pointers to the functions, pointers and one dimensional array, dynamic memory allocation, Operations on pointers, arrays of pointers.

Concept of debugging. Finding Errors in the programs, error codes and their meanings, Various debugging options in Turbo C compiler. (Debug and Options Menu of the TCC IDE)

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File Handling - Defining, opening & closing a file, Functions for processing and creation of files- Reading, Writing, Accessing(tell()) &Seeking(seek()). Access modes-read, write and append.

Textbooks&Reference books :

1. "Programming In C ", by E. Balaguruswamy ,TMH Publications
2. Schaums Outline Series, by Gottfried
3. The C programming Language by Brain W Kernigham and Dennis M Ritchie
4. Y. Kanetkar, "Let us C" by Y Kanetkar, BPB Publications
5. "C The Complete Reference", H. Schildt, Tata McGraw Hill
6. Problem solving and program design with 'C' by Elliot Koffman
7. Problem solving and programming by Kenneth A Barclay

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Faculty of Computer application

Paper Code: BCA (Y-105)

Subject: BUSINESS MATHEMATICS

UNIT I

Trigonometry: Angles & their Measurement, Values of Trigonometric Ratios and their Graphical Representations, Height and Distances.

UNIT II

Theory of Indices, Definition & Types of Matrices, Elementary Transformation of Matrices, Determinant and Matrices, Special Matrices, Inverse of a Matrix.

UNIT III

Frequency Distribution, Histogram, Measure of Central Tendency, Mean, Mode, Median, Standard Deviation.

UNIT IV

Ratio And Proportion, Percentage, Commission & Brokerage, Discount, Profit & Loss.

UNIT V

Limits & Continuity, Limits of Functions, Infinite Limits, Limits at Infinity, Continuous Function, Differentiation of 1st and 2nd Order, Integration – finite, infinite, addition, subtraction & multiplication.

Text Books and Reference Books:

1. Business Mathematics BY *S.M.SHUKLA*.
2. Fundamental of Statistics BY *ELHANCE & ELHANCE*.
3. Mathematical Statistics BY H.S.SHARMA
4. Differential & Integral Calculus BY RAY & SETH
5. Matrices BY RAY & SETH.

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Paper Code: BCA (Y-106)

Subject: DIGITAL COMPUTER ORGANIZATION

UNIT I

Data Representation: Number System: Binary, Octal, Hexadecimal, Conversions from one base to another, Binary Arithmetic, Unsigned binary number, signed magnitude number,Fixed-point and Floatingpoint representation of numbers, BCD Codes, ASCII code, EBCDIC, Unicode,excess-3 code and gray code, 2's complement arithmetic.

UNIT II

Binary Logic: Boolean algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions, SOP and POS form, Karnaugh Maps.

Digital Logic gates: Basic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates–XOR, XNOR, NAND, NOR, Multilevel NAND and NOR circuits.

Combinational Circuits: Half-Adder, Full-Adder, Subtractor, Encoders, Decoders, Multiplexers, De-multiplexers, Sequential Circuits: Flip-flops-RS, D, JK, T & Master-Slave flip-flops, Registers, Counters.

UnitIII

Memory: Memory cells - SRAM and DRAM cells, Primary memory-RAM, ROM, PROM, EPROM, PLA programmable logic array, Secondary memory and its types, Internal Organization of a memory chip, Organization of a memory unit, Concept of cache memory, Organization and levels of cache memory, Concept of virtual memory, memory accessing methods: serial and random access.

Hardware support for memory management.

UNIT IV

Bus, word length, processing speed, microprocessor, General architecture of CPU, Instruction format, Instruction set: data transfer instructions, Data manipulation instructions, program control instructions.Von Neumann model.

Types of CPU organization: Accumulator based, stack based and general based machine, Addressing modes. Basic introduction to CISC/RISC

UnitV

Data transfer modes : Serial, Parallel, Ethernet, USB, Wi-Fi, Bluetooth;

Data transfer scheme (1) programmed data transfer-Synchronous, Asynchronous and Interrupt driven data transfer scheme, (2) Direct memory access data transfer.

Text books &Reference books:

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
2. W. Stallings, "Computer Organization and Architecture - Designing for Performance
3. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
4. J .P. Hayes, "Computer Architecture and Organization", McGraw-Hill,
5. Computer Fundamentals and Architecture by B.Ram

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Faculty of Computer application

Paper Code: BCA (Y-107)

Subject : Accounting and Financial Management

UNITI

Purpose of Accounting and Uses of Accounting Information ,The basic Financial Accounts, types of accounts, Rules of Entries of transaction, Journal.Cash Book – Types, Format of Cash book, Balancing of Cash Book, Subsidiary books – Purchase, Sales, Purchase return and sales return. Ledger, posting of entries. Double Entry book-keeping.

UNIT II

Trial Balance, Rectification of errors, adjustment entries.Depreciation and Inflation.Valuation of Assets and Depreciation Methods: Straight Line Method, Diminishing Balance Method, Sinking Fund Method, Insurance Method and Annuity Method.

UNIT III

Preparation of Financial Account: Trading Account, Profit and Loss Account and Balance Sheet.

UNIT IV

Finance function and its objectives, tools for financial analysis, capitalization, over capitalization analysis under capitalization.

UNIT V

Ratio analysis, funds flow and cash flow analysis, Meaning Interpretations of ratio, classification of ratio.

Textbooks &Reference books

1. Dr. S P Gupta, Management Accounting
2. I.M.Pandey, Financial Management
3. Financial Management by Khan and Jain
4. Management Accounting by Shashi K Gupta
5. Financial Accounts by S M Shukla
6. Financial Decision Making by Van Horne & James C
7. Financial Management and Policy by V. K. Bhalla
8. Double entry Book Keeping Accountancy Principles by T. S. Grewal
9. Advanced Accounting by R L Gupta
10. Accounting Principles by R N Anthony and Reece

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Faculty of Computer application

Paper Code: BCA (Y-108P)

Suggested List of Practicals for BCA I Year

Office Automation Packages and Tools

Using MSWord

1. Create a document and apply different Editing options.
2. Create Banner for your college.
3. Design a Greeting Card using Word Art for different festivals.
4. Create your Biodata and use page borders and shading.
5. Create a document and insert header and footer, page title etc.
6. Implement Mail Merge.
7. Insert a table into a document.
8. Create a document and apply different formatting options.

Using MS Excel

1. Design your class Time Table.
2. Prepare a Mark Sheet of your class result.
3. Prepare a Salary Slip of an employee of an organisation.
4. Prepare a bar chart & pie chart for analysis of Election Results.
5. Prepare a generic Bill of a Super Market.
6. Work on the following exercises on a Workbook:

a. Copy an existing Sheet
b. Rename the old Sheet
c. Insert a new Sheet into an existing Workbook
d. Delete the renamed Sheet.

7. Prepare an Attendance sheet of 10 students for any 6 subjects of your syllabus.Calculate

their total attendance, total percentage of attendance of each student &average of attendance.

8. Create a worksheet of Students list of any 4 faculties and perform following database functions on it.

a. Sort data by Name
b. Filter data by Class
c. Subtotal of no. of students by Class.

Using MS PowerPoint

1. Design a presentation of your institute using auto content wizard, design templateand blank presentation.
2. Design a presentation illustrating insertion of pictures, Word Art and ClipArt.
3. Design a presentation, learn how to save it in different formats, copying and opening an existing presentation.
4. Design a presentation illustrating insertion of movie, animation and sound.
5. Illustrate use of custom animation and slide transition (using different effects).

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6. Design a presentation using charts and tables of the marks obtained in class.
7. Illustrate use of macro in text formatting in your presentation.

Using MS Access

1. Create a table "Student" for storing records of 5 students under following columns. Scode, Sname, Result, Sclass.
2. Create a table for storing records of 5 employees for an organization- ECode, EmpName, EmpDesig, EmpDept, EmpSal.
3. Display records of employee of Comp. Dept.
4. Write a query to select records of student table of class B.Com. II.
5. Write a query to display student name and result of pass student.
6. Display record of employee whose salary is greater than 30,000.
7. Create a table in MS Access under these columns:- BookID, BookName, Author, Publication.
8. Delete a record from book table whose BookId = "1001".

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Faculty of Computer application

Paper Code: BCA (Y-109P)

Suggested List of Practicals for BCA I Year

Programming in C

1. Write a program to print digits of entered number in reverse order.
2. Write a program to print sum of two matrices.
3. Write a program to print subtraction of two matrices.
4. Write a program to print multiplication of two matrices.
5. Write a program to demonstrate concept of structure.
6. Write a program for finding the root of a Quadratic Equation .
7. Write a program for generating Mark sheet.
8. Write a programme for finding the sum of given matrices of order m x n
9. Write a programme for finding the multiplication of given matrices of order m x n
10. Write a program to generate even/odd series from 1 to 100.
11. Write a program to find area of a circle, rectangle, square using case.
12. Write a program to check whether a given number is even or odd.
13. Write a program whether a given number is prime or not.
14. Write a program for call by value and call by reference.
15. Write a recursive program to calculate factorial of a given number.
16. Write a program to generate a series
    1+1/1!+2/2!+3/3!+----------+n/n!
17. Write a program to create a pyramid structure

```
*
**
***
****
```

18. Write a program to create a pyramid structure

```
1
12
123
1234
```

19. Write a program to create a pyramid structure

```
1
22
333
4444
```

20. Write a program to reverse a string.
21. Write a program to find whether a given string is PALINDROME or not.
22. Write a program to input 10 numbers add it and find it's average.
23. Write a program to generate series
    1+1/2!+1/3!+----------+1/n!
24. Write a program to print table of any number.
25. Write a program to print Fibonacci series.

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26. Write a program to find length of string without using function.
27. Write a program to perform all arithmetic operations using case statement.
28. Write a program to check entered number is Armstrong or not.

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GROUP-FOUNDATION COURSE

Moral Value& Language

नैतिक मूल्य और भाषा

Paper – I

Paper Code: FC(Y-104A)

UNIT I

हिन्दी भाषा

1. स्वतंत्रता पुकारती (कविता) -जयशंकर प्रसाद
2. पुष्प की अभिलाषा (कविता) - माखनलाल चतुर्वेदी
3. वाक्य संरचना और अशुद्धियां (संकलित)

UNIT II

हिन्दी भाषा

1. नमक का दरोगा (कहानी)- प्रेमचंद
2. एक थे राजा भोज (निबंध) - डॉ. विभुवननाथ शुक्ल
3. पर्यायवाची, विलोम, एकार्थी अनेकार्थी, एवं शब्दयुग्म शब्द (संकलित)

UNIT III

नैतिक मूल्य

1. नैतिक मूल्य परिचय एवं वर्गीकरण (आलेख) -डॉ. शशि राय
2. आचरण की सभ्यता (निबंध -सरदार पूर्णसिंह
3. अंतर्ज्ञान और नैतिक जीवन (लेख) -डॉ. सर्वपल्ली राधाकृष्णन
4. अप्प दीपो भव (लेख) - स्वाम श्रद्धानंद

UNIT IV

1. Where the minis with out fear: Rabindranath Tagore
2. The Hero: R.K.Narayan
3. Tryst with Destiny: Jawaharlal Nehru
4. Indian weavers : Sarjini Naidu
5. The Portra it of alady : Khushwani Singh
6. The Solitary Reaper : WilliamWordsworth

UNIT V

1. Basic Language Skills: Vocabulary,Synonyms,Antonyms,Word formation, Prefixes,Suffixes.
2. Basic Language Skills: Uncountable Noun,Verbs,Tenses,Adverbs.
3. Comprehension/Unseen Passage.
4. Compositionand Paragraph Writing
5.

Suggested Readings:

मध्यप्रदेश हिन्दी ग्रंथ आकादमी द्वारा प्रकाशित पुस्तकें

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Faculty of Computer application

GROUP-FOUNDATION COURSE

SUBJECT –Development of Entrepreneurship

Paper – II

Paper Code: FC(Y-104B)

UNIT I

Entrepreneurship Development- Concept and importance, function of Enterpriser, Goal determination – Problems Challenges and Solutions.

UNIT II

Project Proposal – need and objects- Nature of organization, Production Management, Financial Management, Marketing Management, Consumer Management.

UNIT III

Role of regulatory Institutions, Role of development Organization, and self employment oriented schemes, various growth schemes.

UNIT IV

Financial Management for Project- Financial Institution and their role, Capital estimation and arrangement, cost and price determination, accounting management.

UNIT V

Problem of entrepreneur- Problem relating Capital, Problem relating Registration, administration problem and how to overcome from above problems.

Suggested Readings:

मध्यप्रदेश हिन्दी ग्रंथ आकादमी द्वारा प्रकाशित पुस्तकें

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SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCE, SEHORE.

BCA (BACHELOR OFCOMPUTER APPLICATION) IInd YEAR 2018-19

ANNUAL SCHEME

SUBJECT CODE	GROUP	SUBJECT NAME	THEORY		CCE / INTERNAL		TOTAL MARKS		PRACTICAL/LAB		TOT
			MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
BCA (Y-201)	-	Programming with C++ and Data Structures	40	16	10	4	50	20	0	0	50
BCA (Y-202)	-	Computer based Numerical and Statistical Techniques	40	16	10	4	50	20	0	0	50
BCA (Y-203)	-	Operating System	40	16	10	4	50	20	0	0	50
BCA (Y-204)	-	Web technology and Application Development using .Net & C#	40	16	10	4	50	20	0	0	50
BCA (Y-205)	-	RDBMS Concepts & Oracle	40	16	10	4	50	20	0	0	50
BCA (Y-206)	-	Software Engineering	40	16	10	4	50	20	0	0	50
BCA (Y-207)	-	Organizational Behaviour	40	16	10	4	50	20	0	0	50
FC (Y-204A)	-	Moral Value & Languages	80	32	20	8	100	40	0	0	100
FC (Y-204B)	-	ENVIRONMENTAL STUDIES	80	32	20	8	100	40	0	0	100
BCA (Y-208)		Lab-I							50	20	50
BCA (Y-209)		Lab-II							50	20	50
Total			440		110		550		100		650

FACULTY OF COMPUTER APPLICATION
CLASS: BCA SECOND YEAR

SUBJECT- PROGRAMMING WITH C++ AND DATA STRUCTURES
CODE- BCA(Y-201)

UNIT I

Introduction Procedural Vs Object Oriented Programming, Classes, Object, Data, Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing, Object Oriented Languages, Object Based languages. **Basics of C++:** A Brief History of C++, Application of C++, Compiling & Linking, Tokens, Keywords, Identifiers & Constants , Basic Data Types, User-Defined Data Types, Symbolic Constant, Type Compatibility, Reference Variables, Operator in C++, Scope Resolution Operator, Member Dereferencing Operators, Memory Management Operators, Manipulators, Type Cast Operator. **Functions In C++:** The Main Function, Function Prototyping, Call by Reference Call by Address, Call by Value, Return by Reference, Inline Function, Default Arguments, Constant Arguments, Function Overloading, Function with Array.

UNIT II

Classes & Object: A Sample C++ Program with class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member, Functions, Array of Objects, Object as Function Arguments, Friend Functions, Returning Objects, Constant member functions, Pointer to Members, Local Classes. **Constructor & Destructor:** Constructor, Parameterized Constructor, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructor, Destructor.

UNIT III

Inheritance: Defining Derived Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructor in Derived Classes, Nesting of Classes. Operator Overloading & Type Conversion , Polymorphism, Pointers, Pointers with Arrays C++, Streams, C++ Stream Classes, Unformatted I/O Operation, Formatted I/O Operation, Managing Output with Manipulators.

UNIT IV

Basic Idea of Data Structures: Introduction to Data Structure, Classification, Operations on Data Structure, Dynamic Memory Allocation. **Arrays**: Array Address Calculation, operations on array and its algorithms, Application of Arrays, Limitations, Sparse Matrix. **Stacks:** Introduction, Representation of Stack, Implementation, Applications of stack: Infix, Prefix, Postfix expressions, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of Postfix expression using Stack. **Recursion:** Recursive Definition and Processes, Example of Recursion, Recursion Vs. Iteration. **Queues:** Introduction, Representation of Queue, Implementation, Circular Queue, Dequeue, and Priority Queue.

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CLASS: BCA SECOND YEAR

UNIT V

Linked Lists: Linear List Concept, Linked List v/s Array, Linked List Terminology, Linked List Data Structure, Representation of Linked List in Memory, Types of Linked List: Simple, Circular, Doubly Linked List, Circular Doubly Linked List, Operations on Linked List: Creation, Traversing, Searching, Insert Node (Empty List, Beginning, Middle, End), Delete Node (First, General Case) Count, Sort List.

Introduction to Trees: Tree Terminology, Binary Tree, Types of Binary Tree, Representation of Binary Tree, Binary Tree Traversal (Inorder, Preorder, Postorder), Binary Tree Creation, Expression Tree, Binary Search Tree ,Insertion and Deletion in BST, Graph Terminology.

Sorting & Searching Techniques: Bubble Sort, Selection Sort, Binary search and Sequential Search.

Textbooks & Reference books:

1. Herbert Schildt,"C++ The Complete Reference"
2. Kanetkar, "Let us C++"
3. E. Balagurusamy, "Object Oriented Programming with C++"
4. Seymour Liptsuz, "Data Structure"
5. Tannebaum, "Data Structure"
6. Y.P. Kanetkar, "Data Structure through C++"
7. Y. Langsam, M. Augenstin and A. Tannenbaum, —Data Structures using C and C++, Pearson Education Asia,
8. Stanley Lippman & Lajoi, "C++ Primer"
9. Bjarne Stroustrup, "C++ Programming Language"

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CLASS: BCA SECOND YEAR

SUBJECT- COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES
CODE- BCA(Y-202)

UNIT I

Computer Arithmetic: Floating Point representation of numbers and operations, normalization and their consequences, pitfalls in computing, errors in numbers.

Solution of algebraic and transcendental equations: Introduction, Bisection method, the method of false position (Regula Falsi), Newton-Raphson method, secant method, their algorithms & comparative study of all the methods.

UNIT II

Solution of simultaneous linear algebraic equations: Direct Method: Gauss elimination method, Gauss Jordan Elimination method. Iterative Method: Gauss seidel method, pivoting, Ill-conditioned equations.

Numerical Integration: General quadrative formula for equidistant ordinates, Trapezoidal Rule, Simpson's 1/3 rule, Simpson's 3/8 rule and their algorithms.

UNIT III

Interpolation & Extrapolation: Introduction, Finite Differences: Forward differences, backward differences, Interpolation with evenly spaced points: Newton's forward difference interpolation formula, Newton's backward difference interpolation formula.

Interpolation with unevenly spaced points: Lagrange's interpolation formula, Newton's divided difference interpolation formula.

UNIT IV

Numerical solution of ordinary differential equations: Introduction, Euler's method and algorithm, Euler's modified method, Taylor's series, Picard's method, Runge Kutta method of order 2 and its algorithm, Runge kutta method of order 4 and its algorithm.

UNIT V

Correlation & Regression : Correlation, definition, Utility, Types of Correlation, Karl Pearson's coefficient of correlation, shortcut method, step deviation method, merits and limitations of Karl Pearson's coefficient of correlation, Rank correlation coefficient,its merits and demerits.

Regression: Definition, Utility, Linear Regression lines: Freehand curve method, method of least squares, line of regression, regression coefficient and its properties.

Textbooks & Reference Books :

1. Shastri S.S., —Introductory methods of Numerical Analysis, PHI.
2. Rajaraman V., —Computer Oriented Numerical Methods, PHI.
3. Prahlad Tiwari – Numerical Analysis
4. Ray & Harswarup Sharma - Mathematical Statistics
5. H.C. Agarwal - Numerical Methods
6. Gupta & Kapoor – Fundamentals of mathematical Statistics
7. Krishnamurthy - Computer based Numerical Algorithm

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CLASS: BCA SECOND YEAR

8. Salvadori - Computer Oriented Numerical Methods

SUBJECT- OPERATING SYSTEM
CODE- BCA(Y-203)

UNIT I

Introduction: Definitions, functions and types of operating system, System components, Operating system Structure, System Calls, System Programs, Interrupts, Microkernel .

Process Management: Process Concepts, Process states & Process Control Block, Process Scheduling: Scheduling Criteria, Scheduling Algorithms (Preemptive & Non- Preemptive) –FCFS, SJF, RR, Priority, Multiple-Processor, Real-Time, Multilevel Feedback Queue Scheduling.

UNIT II

Process Synchronization: Critical Section Problem, Semaphores, Classical Problems of Synchronization and their Solutions, Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

Memory Management: Introduction, Address Binding, Logical versus Physical Address Space, Swapping, Contiguous & Non-Contiguous Allocation, Fragmentation (Internal & External), Compaction, Paging, Segmentation

UNIT III

Virtual Memory: concept, Demand Paging, Performance of Demand Paging, Page Replacement Algorithms.

File Management: Concept of File System(File Attributes, Operations, Types), Functions of File System, Types of File System, Access Methods (Sequential, Direct & other methods), Directory Structure (Single-Level, Two-Level, Tree- Structured, Acyclic-Graph, General Graph), Allocation Methods (Contiguous, Linked, Indexed).

UNIT IV

Disk Management: Disk Scheduling Algorithms (FCFS, SSTF, SCAN, C-SCAN, LOOK), Swap Space Management, Disk Reliability, Recovery, Security: Security Threats, Protection, Trusted Systems, Windows Security.

UNIX : Introduction to UNIX, UNIX System Organization (the Kernel and the Shell), Files and Directories, Library Functions and System Calls, Editors (vi and ed). Introduction to the Concept of Open Source Software, Linux, Linux Architecture, Linux File System (inode, Super block, Mounting and Un-mounting), Essential Linux Commands, Kernel, Process Management in Linux, Signal Handling, System Call, System Call for Files, Processes and Signals

UNIT V

Shell Programming: Types of Shells, Shell Meta Characters, Shell Variables, Shell Scripts, Shell Commands, the Environment, Integer Arithmetic and String Manipulation, Special

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Command line Characters, Decision Making and Loop Control, Controlling Terminal Input, Trapping Signals, Arrays, I/O Redirection and Piping, Vi and Emacs Editors, Shell Control Statements, Find, Shell Meta- Characters, Shell Scripts, Shell Keywords, Shell Procedures and Reporting, Handling Documents, Changing Process Priority with Nice, Scheduling of Processes at Command, cron, Batch commands.

Process Management and Process Synchronization: Command line argument, Background processes, process synchronization, Sharing of data, user-id, group-id, pipes, fifos, message queues, semaphores, shared variables, Coding, Compiling, Testing and Debugging. AWK programming – report printing with AWK.

Textbooks & Reference Books:

1. Abraham Silberschatz and Peter Baer Galvin, —Operating System Concepts, Addison-Wesley.
2. Andrew Tanenbaum, —Modern Operating Systems, Prentice Hall.
3. Harvey M. Deitel, —An introduction to Operating Systems, Addison-Wesley.
4. Milan Milankovic, —Operating Systems, Concepts and Design, TMH
5. William Stallings, —Operating Systems: Internal and Design Principles, 3rd Edition, PHI.
6. Gary Nutt, —Operating Systems, A modern Approach, Third Edition, Addison Wesley, 2004
7. D.M. Dhamdhere, —Operating Systems: A Concept Based Approach. Second Edition, Tata McGraw-Hill, 2007.
8. Sumitabha Das — Unix Concepts and Applications, TMH.
9. Yashwant Kanetkar —Unix Shell Progamming, BPB.
10. Parata —Advanced Unix–A Programmer's Guide, BPB.
11. Meeta Gandhi, —The C Odyssey Unix– The Open Boundless C, BPB.

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CLASS: BCA SECOND YEAR

SUBJECT- WEB TECHNOLOGY AND APPLICATION DEVELOPMENT USING .NET & C#
CODE- BCA(Y-204)

UNIT I

HTML - HTML Introduction, HTML Syntax, Head & Body Sections, Basic HTML Tags, Inserting, formatting, & modifying text, Lists – ol,ul & dl. Inserting images, hyperlinks, internal links. Working with tables: table tags & attributes. Form Controls – text field, textarea, radio button, checkbox, drop down list box, button etc.

UNIT II

Cascading Style Sheet – Introduction, merits, types, creating Divs with ID & Classes. CSS backgrounds, border, & box model.

Javascript - Overview, JavaScript vs. Java, Comments, Variables, Alertbox, Prompt & confirm. Expressions: Arithmetic operators, Assignment operators, Logical operators, Expressions and precedence, Statements: If statement, For statement, While statement, Break/Continue, Functions.

UNIT III

ASP.Net - Overview ofASP.NET framework, Installation of **Visual Studio**, ASP.NET Standard Controls & **Code in C#** for – Labels, Text box, Button, Link Button, Radio Button, Radio Button List, Check Box, Check Box List, Calendar control, Adrotator Control, File upload control. Running a web application, creating a multi-form web project.

UNIT IV

State management: Client side- Cookies, query string, hidden fields. Server Side-View state, Session state, Application state.

Form Validation: Client side validation, server Side validation, Validation Controls: Required Field, Comparison, Range, Regular Expression validator, validation summary and custom validation.

UNITV

Database Connection: SQL Server Database File, Configuring SQL Data Source Control, Connection Class, Command Class, Data Adapter Class, Dataset Class. Displaying data in data bound Controls and Data Grid.

Textbooks & Reference Books:

1. Laura Lemay, Rafe Colburn, Jennifer Kyrnin, "Mastering HTML, CSS & Javascript Web Publishing" , BPB Publications
2. Thomas A. Powell , " HTML & CSS: The Complete Reference" , McGraw Hill
3. Black Book , "Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book: HTML, Javascript, PHP, Java, Jsp, XML and Ajax" , Dreamtech press
4. Black Book , "ASP.NET 4.5, Covers C# and VB Codes" , Dreamtech press
5. Matthew Macdonald , "ASP.NET: The Complete Reference" , McGraw-Hill

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6. Imar Spaanjaars, "Beginning ASP.NET 4.5 in C# and VB", Wrox

SUBJECT- RDBMS CONCEPTS & ORACLE
CODE- BCA(Y-205)

UNIT I

Introduction: Evolution of DB and DBMS, need for Data Management, Introduction and Application of DBMS, File System versus Database System. **Concepts of DBMS:** Data, Information, Database, Components of DBMS, Architecture of a database system – Physical, Conceptual and User level, Data Independence – Logical and Physical, DBMS terminology, Data Dictionary.
Concepts of Multitier Architecture in databases, Brief idea about distributed databases, parallel databases, mobile databases, temporal databases, spatial databases, geographic databases, data warehousing, data mining, data visualization, OODB and XML Databases, Multimedia and Web Databases.

UNIT II

Database Models: Network, Hierarchical and Relational Models, Features and Comparison of the three models..
RDBMS: Introduction to Relational Database, Structure of Relational Database, Relational Model terminology- domains, Attributes, Tuples, Relations, Relational DB Schema, ER-Model, ER-Diagram, ER-concepts, and types of relationships. Codd's 12 rules.
Normalization: Functional Dependency, definition, Trivial and Non-Trivial Functional Dependencies, Steps involved in normalization, 1NF, 2NF, 3NF, Decomposition using Functional Dependency preservation, BCNF, Multi-valued Dependency, 4NF, Join Dependency, 5NF.

UNIT III

Idea about Generalization, Aggregation, Specialization.
Indexing & Hashing : Basic Concepts, Indexing: b+ tree & B- tree index files, Hashing: static & dynamic hashing . **Elementary Concepts of Database Security:** System failure, Backup and Recovery Techniques, Authorization and Authentication. **Relational Algebra:** Formal Definition, Fundamental Operations – select, project, union, set, difference, Cartesian product & rename, additional operations & extended operations.

UNIT IV

Concept of SQL sublanguages – DDL, DML, DCL, TCL, SCL etc., Embedded SQL.
Interactive SQL: Oracle data types, table creation, modifying the structure of tables, dropping and renaming tables. **DML commands:** Insertion, updation, deletion operations, many faces of select command, data constraints, logical operators, range searching, pattern matching, oracle functions, use of Alias, grouping data from tables, manipulating dates in sql.

UNIT V

Joins: Equi Join, Self Join, Cross Join. Sub queries, Indexes, Views, Sequences, Roles, Synonyms. **TCL Commands:** use of savepoint, rollback, commit commands. **DCL Commands**: creating user accounts, granting permissions, revoking permissions. Concept of importing and exporting database files.

Text Books & Reference Books:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database System Concepts" McGraw Hill
2. Rajesh Narang "Database Management System" PHI
3. C.J. Date , "An introduction to database system "

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4. Bipin C. Desai, "An Introduction to Database System" .
5. Ramakrishnan Gehrke , "Database management system".

SUBJECT- SOFTWARE ENGINEERING
CODE- BCA(Y-206)

UNIT I

Introduction to Software Engineering: Introduction to Software, Types of software, Software Components, Software Characteristics, Software Engineering , Scope and necessity of Software Engineering, Software Engineering Processes, Factors affecting Quality and Quantity of Software. Software Development Life Cycle (SDLC), **Software Models:** Water Fall Model, Prototype Model, RAD Model, Evolutionary Development Models (Spiral Model, Incremental Model Concurrent Development Model)

Software Requirement Analysis: Requirement Specifications: Need for SRS, Nature of SRS, Characteristics, Components of SRS. Requirements analysis: Review and Management of User Needs, Feasibility Study, Information Modeling, IEEE Standards for SRS, Various SRS Templates, Validation of SRS.

UNIT II

Software Metrics and Measurement: Software Process and Project Metrics, Software Measurement, Cyclomatic Complexity Measures: Control Flow Graphs, Software Quality Matrices. **Software Project Planning:** Objectives, Scope, Software Cost Estimation: Decomposition Techniques: Software sizing , Problem Based Estimation, Line of Code(LOC) Vs Function Point (FP) Based Estimation, Process Based Estimation; Empirical Estimation Models: The COCOMO Model; Make/Buy Decision, Software Risk Management.

Software Analysis : Analysis Model, Process and various Documents. **Conventional Analysis:** Data Modeling (ER Diagram), Functional Model & Information Flow (DFDs), Behavioral Modeling, Structured Analysis, Data Dictionary. **Object Oriented Analysis:** Domain Analysis, Object Oriented approach Process (Use Case), Object-Relational Model, Object- Behavioral Model.

UNIT III

Software Design: Conventional Design: Design Process, Principles & Concepts, and Design Model. **Object Oriented Design:** Design Issues, Design Process: System Design, Object Design. **Software Design Document:** Software Design Document & its various example templates: Data Design, Architecture Design, and Interface Design & Procedural Design. **Coding:** Code Debugging, Verification and Code Optimization.

Testing, Deployment & Maintenance: Objectives, Types of Software Testing, Testing for Functionality and Performance, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suite Preparation, Levels of Testing: User, Integration, System Alpha and Beta Testing, User Acceptance of Products, Roll out of Software & Deployment Issues. Need for Maintenance, Categories of Maintenance: Corrective, Preventive, Adaptive and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering, Software Reuse.

UNIT IV

Introduction to Software Project Management (SPM): Project stakeholders, Project management knowledge areas, Project management tools and techniques, Project success factors: The Role of the Project Manager: Job description, Skills for project manager, Ethics in Project Management, Project

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Management Software. Project Integration Management . Project Execution, Monitoring and Controlling the Project.

Project Time Management: Importance of Project Schedules and Time Management, Activity Definition, Activity Sequencing, Activity Resource Estimation, Activity Duration Estimation, Schedule Development, Gantt Charts, Critical Path Method (CPM), Program Evaluation and Review Technique (PERT) **Project Cost Management:** Importance and Principles of Project Cost Management, Cost Estimation, Types of cost estimates, Cost estimation tools and techniques, Cost Budgeting, Cost Control, **Project Quality Management:** Importance of Project Quality Management, Quality planning, Quality assurance, Quality control, Tools and Techniques for Quality Control, Pareto analysis, Statistical sampling, Testing, ISO standards for quality, Cost of Quality.

UNIT V

Project Human Resource Management: Motivation theories, Maslow's hierarchy of needs, Improving effectiveness, Human Resource Planning, Project organizational charts, Responsibility assignment matrices, Management plans and resource histograms, Acquiring the Project Team, Resource assignment, Resource loading, Resource leveling, Developing the Project Team, Managing the Project Team.

Software Configuration Management (SCM), Software Version Control. Software Quality Management, Software Quality Assurance (SQA), Software Reliability & Reliability Models, Clean Room Software Engineering Approach. **CASE Tools:** Overview of CASE Tools Framework, Features, Advantages and Limitations of CASE Tools, Awareness about Some Commercial CASE Tools Use and Applications.

Textbooks & Reference books:

1. R. S. Pressman, —Software Engineering: A Practitioners Approach, McGraw Hill.
2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
3. Pankaj Jalote, —Software Engineering, Wiley.
4. Pankaj Jalote —Software Project Management In Practice, Pearson Education,
5. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, —Fundamentals of Software Engineering, PHI Publication.
6. Ian Sommerville, —Software Engineering, Addison Wesley.

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FACULTY OF COMPUTER APPLICATION
CLASS: BCA SECOND YEAR

SUBJECT- ORGANIZATIONAL BEHAVIOR
CODE- BCA(Y-207)

UNIT I

Fundamentals of OB : Definition, Scope and importance of OB, Relationship between OB with other disciplines –Psychology, Sociology, Anthropology and Political science. Challenges and Opportunities for OB.. Theoretical framework and models of OB (cognitive, behavioristic and social cognitive).

UNIT II

Individual Differences and Behavior: Foundations of individual behavior: Biographical Characteristics, Ability and learning. Attitudes, Values and Job Satisfaction. Attitude: Importance of attitude in an organization, Measuring Attitude, Components of attitude, Relationship between behavior and attitude.

Importance of Values and Ethical behavior. Job satisfaction: Concept and measurement. Concept of Personality and Emotions. The Big Five personality model, Significant personality traits suitable to the workplace (personality & job –fit theory), Emotions, Emotional Intelligence. Developing Emotional Intelligence at the workplace. Perception: Meaning and concept of perception, Factors influencing perception, Motivation: Definition & Concept, Theories of Motivation (Maslow's Need Hierarchy & Herzberg's Two Factor model Theory). The Process Theories (Vroom's expectancy Theory & Porter Lawler model). Contemporary Theories- Equity Theory of Work Motivation.

UNIT III

Group Behaviour and Interpersonal Influence: Foundation of Group Behavior: The Meaning of Group, Group behavior & Group Dynamics, Types of Groups, The Five –Stage Model of Group Development. Managing Teams: Work teams In Organization, Developing Work Teams, Team Effectiveness & Team Building, Managing Conflict and Negotiation- Conflicts in Organizations, A contemporary perspective on intergroup conflict, What causes intergroup conflict, The causes of dysfunctional intergroup conflict, Managing intergroup conflict through Resolution, Stimulating Constructive intergroup conflict, Negotiations- Negotiation tactics, Increasing negotiation effectiveness. Assertive Behaviour- Interpersonal Orientations, Facilitating smooth relations, Stroking.

Job stress: Concept of Stress, Stress model, Work stressors, Stress outcomes, Stress moderators, Stress prevention and management, Employee counseling, Types of counseling.

UNIT IV

Organization System and Processes:

Communication - The importance of communication, The communication process, Communicating within organizations, Information richness, How technology affects communication, Interpersonal communication, Multicultural communication, Barriers to effective communication, Improving Communication in organizations, Promoting ethical communications.

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Decision Making - Types of decisions, A Rational Decision-making Process, Alternatives to Rational Decision making, Behavioral influences on decision making, Group decision making, Creativity in group decision making.

Leadership - Concept of Leadership, Styles of Leadership, Traits Approach, Contingency leadership Approach, Contemporary leadership, meaning and significance of contemporary leadership, Contemporary issues in leadership, Contemporary theories of leadership, Concept of Transformational leadership, Multicultural leadership, Success stories of today's Global and Indian leaders.

UNIT V

Organizational Design, Change And Innovation : Designing an organizational structure, Division of labour, Delegation of authority, Departmental biases, Span of control, Dimensions of structure, Organizational design models, Multinational Structure and Design, Virtual Organizations.

Organizational Culture: Meaning & Definition of Organizational Culture, Creating & Sustaining Organizational Culture. Types of Culture (Strong vs. Weak Culture, Soft vs. Hard Culture & formal vs. Informal Culture), Creating Positive Organizational Culture, Concept of Workplace Spirituality. Organizational behaviour across cultures, Conditions affecting multinational operations, Managing International Workforce, Productivity and cultural contingencies, Cross cultural communication.

Organizational Change: Meaning, definition & Nature of Organizational Change, Types of organizational change, Forces that acts as stimulants of change, Implementing Organizational Change : How to overcome the Resistance to Change, Approaches to managing Organizational Change , Kurt Lewin's-Three step model, Seven Stage model of Change & Kotter's Eight Step plan for Implementing Change, Leading the Change Process, Facilitating Change, Dealing with Individual & Group Resistance, Intervention Strategies for Facilitating Organization Change, Methods of Implementing Organizational Change, Developing a Learning organization, Organizational Development: Concept and Techniques of OD. The future of Organizational Behaviour.

Text Books& reference books

1. Organizational Behaviour by Robins
2. Organizational Behaviour by Nelson & Quick
3. Organizational Behaviour by Fred Luthans
4. Organizational Behaviour –Niraj Kumar
5. Organizational Behaviour by Stephen Robins, Timothy Judge, Neharika Vohra
6. Organizational Behaviour by M N Mishra
7. Organizational Behaviour by K Ashwathappa

Supplementary Reading Material

1. Contemporary Leadership Theories: Enhancing the Understanding of the complexity, subjectivity and dynamic of leadership by Ingo Winkler
2. Organizational Performance in a Nutshell by Daniel M.Wentland

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FACULTY OF COMPUTER APPLICATION
CLASS: BCA SECOND YEAR

FOUNDATION COURSE (MORAL VALUE AND LANGUAGE-II)
Code: FC(Y--204A)

UNIT-I

हिन दी भाषा:

1. वह तोड़ती पत थर)कविता) - सूर्यकांत त्रिपाठी निराला
2. दिमागी गुलामी)निबंध) - राहुल सांकत यायन
3. वर्ण -विचार (स वर- ट यंजन, वर्गीकरण, उच चारण स थान

UNIT-II

हिन दी भाषा

1. नारीत व का अभिशाप)निबंध) - म हादेवी वर्मा
2. चीफ की दावत)कहानी - (भीष म साहनी
3. विराम चिन ह) -संकलित(

UNIT-III

हिन दी भाषा: नैतिक मूल य

1. शिकागो ट याख यान)ट याख यान - (स वामी विवेकानंद
2. धर्म और राष ट्रवाद) -लेख) महर्षि अरविन द
3. सादगी)आत मकथा)- महात मा गांधी
4. चित त जहां भय शून य)कविता)- रवीन द्रनाथ टैगोर

UNIT IV

English:

1. Tree: Tina Morris
2. Night of the Scorpion : Nissim Ezekiel
3. Idgah : Premchand (translated by Khushwant singh
4. Letter to God : G.L. Swanteh (translated by Donald a Yates
5. My Bank Account : Stephen Leacock
6. God sees the Truth but waits : Leo Tolstoy

UNIT V

English:

1. Short Essay on given topics
2. Correspondence skills (format & Informal letters and Application)
3. Translation of sentences/passage English to Hindi and Hindi to English.

Suggested Readings: Madhya Pradesh Hindi grant academy Bhopal published book.

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FACULTY OF COMPUTER APPLICATION
CLASS: BCA SECOND YEAR

FOUNDATION COURSE (ENVIRONMENTAL STUDIES)
Code: FC(Y—204B)

UNIT I

Study of Environment and ecology: Definition and Importance of Environment and Ecology, Public participation and Public awareness.

UNIT II

Environmental Pollution : Air Pollution, water Pollution, noise Pollution, heat and nuclear pollution- Definition, Causes, effect and prevention of pollution, Disaster management – Flood, Earthquake, cyclones and landslides.

UNIT III

Environment and social problems: Sustainable development- Introduction, Energy problems of cities, solar energy, biogas and wind energy, Water conservation – rain-water harvesting.

UNIT IV

Role of mankind in conserving natural resources: Food resources – World food problem , Energy resources – increasing demand for energy.

UNIT V

Environment conservation laws: Conservation laws for air and water pollution, Wildlife conservation laws, Role of information technology in protecting environment & health.

Suggested Readings:

- **Madhya Pradesh Hindi grant academy, Bhopal published book.**

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FACULTY OF COMPUTER APPLICATION
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Lab I

BCA(Y- 208)

SUGGESTED LIST OF PRACTICALS

I. (A) C++

1. Write a program to convert decimal (integer) number into equivalent binary number.
2. Write a program to print Fibonacci series.
3. Write a program to find factorial of a given number using recursion.
4. Write a program to swap the contents of two variables with functions value parameters, address parameters and pointer parameters.
5. Write a program to check given string is palindrome or not.
6. Write a max function which accepts two numbers and find the maximum of two numbers. The two given numbers can be integer, float, or double so that the functions may call the overloaded functions.
7. Write a program to perform multiplications of two matrices.
8. Write a program to design a class distance with feet and inches as data members. Use a data function to set and show the distance.
9. Write a program to design a class with length and height as data member. Use a data function to get value of length and height from the keyboard and display area of right angle triangle.
10. Write a program to overload the binary operator to add two complex numbers.
11. Write a program to find the area and volume of a rectangular box using constructor.
12. Write a program to design a class time with hours, minutes and seconds as data members. Use a data function to perform the addition of two times objects in hours, minutes and seconds.
13. Write a program to implement single inheritance.

I. (B) Data Structures

1. Write a program to traverse an array.
2. Write a program to insert item at kth position in an array.
3. Write a program to delete kth position item from array.
4. Write a program to push and pop operations on a stack using array.
5. Write a program to insert and delete operation on a queue using array.
6. Write a program for selection sort.
7. Write a program for bubble sort.
8. Write a program for linear (sequential) Search.

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9. Write a program for binary search.
10. Write a program to implement linked list.

II. Implementation of Numerical and Statistical Methods

1. Write a program to implement Bisection Method.
2. Write a program to implement False Position Method.
3. Write a program to implement Newton Raphson Method.
4. Write a program to implement Trapezoidal Rule.
5. Write a program to implement Simpson's 1/3 Rule.
6. Write a program to implement Simpson's 3/8 Rule.
7. Write a program to implement Lagrange's interpolation formula.
8. Write a program to implement Euler's method.
9. Write a program to implement Runge Kutta Method of order 2.
10. Write a program to implement Runge Kutta Method of order 4.
11. Write a program to implement Karl Pearson's Coefficient of Correlation.

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Lab II
BCA(Y- 209)

SUGGESTED LIST OF PRACTICALS

A. SQL

1. Create tables named Employee, Department, and Salary. Implement all DDL commands on it.
2. On the Employee Table use the many faces of SELECT command.
3. On a table perform WHERE CLAUSE, HAVING, GROUP BY, ORDER BY, IN, NOT IN, BETWEEN
4. Create a Database implementing Primary and Foreign Key.
5. Implement I/O Constraints and Business Rule constraints on the database created as in 4 above.
6. Perform Nested Queries on table STUDENT.
7. Perform different types of JOINS on any two tables.
8. Create VIEWS, SEQUENCES and SYNONYMS on a table.
9. Use of SAVEPOINT, ROLLBACK and COMMIT command.

B. Web technology

I. HTML, CSS and Javascript:

1. Design a home page which displays information about your college department using paragraph and list tags, apply basic formatting, insert images also.
2. Create hyperlinks in home page connecting it to 3 different pages. Also, create 3 hyperlinks in home page, which jump to 3 different headings on the same page.
3. Design a timetable and display it in tabular format. Implement CSS backgrounds and borders in the page.
4. Design a Registration form in HTML using HTML forms. Apply CSS on web page and various form controls.
5. Implement JavaScript validation on a sign-up form.
6. Design a web-page whose content can be changed using JavaScript events.
7. Write a html code inserting JavaScript to create a basic calculator.

II. .Net & C#

8. Design & code an .aspx web form using textbox, label and button control to calculate simple interest.
9. Design a program in ASP.Net to print student's grade based on the following criteria(using nested if) :

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1)Grade A – percent>=75 2)Grade B – percent >=60 and <75 3) Grade C – for others

10. Calculate factorial of number using for and while loop
11. Calculate gross salary of an employee based on options selected from the check box list. Options are using checkbox list:
    1) HRA, 2) DA and 3) PF
12. Write a program using radio button list control to change the colour of a label, and use check box list control to change the bold, italic and underline styles of that label .

III. Mini Project using Visual Studio

Create a sign-up form (in 70% width of body) which takes data through text-fields, radio-buttons, check-boxes, drop-down list, calendar control etc. Apply various types of validation through validation controls and then fill that data into a table of a SQL Server Database File. Make space for Advertisements in 30% body and display ads u

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BCA III[rd] YEAR

Annual Scheme

S.n.	Subject Code	Subject Name	Theory		CCE/Internal		Practical		Project/Internship		Total
			Max	Min	Max	Min	Max	Min	Max	Min	
1	BCA(Y-301)	Computer Networks, Internal Tech. & Security	40	16	10	4					50
2	BCA(Y-302)	Core Java	40	16	10	4					50
3	BCA(Y-303)	Management Information System	40	16	10	4					50
4	BCA(Y-304)	Python Programming	40	16	10	4					50
5	BCA(Y-305)	E-Governance	40	16	10	4					50
6	BCA (Y-306)	Principles and Practices Of Management	40	16	10	4					50
7	FC(Y304A)	Foundation Course: paper-I Moral Value & Languages	80	32	20	8					100
8	FC(Y304B)	Foundation course: Paper-II Basics Of Computer App. &Information Technology	80	32	20	8					100
9	BCA(Y-307)	Project: Application development using PHP/JSP & MySQL							100	40	100
10	BCA(Y-308)	LAB 1 – Java Programming					50	20			50
11	BCA(Y-309)	LAB 2 – Python Programming					50	20			50

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Faculty of Computer Application
Class BCA Third Year
Subject – Computer Networking & Internet Security
CODE- BCA(Y-301)

UNIT –I

Definition and concept of networking, transmission modes, transmission media, internetworking, connecting devices adapters, routers, evolution of network technology, standards and protocol, introduction to analog signal, digital signal, modulation and demodulation OSI reference model-layered architecture, function of each layer, protocol used.

UNIT – II

Switching-message, packet and circuit switching, multiplexing – FDM, TDM, WDM, SONET, cellular network, satellite network, IEEE 802 STANDARDS-CSMA/CD, TOKEN BUS, TOKEN RING, FDDL. Routing algorithms – Distance vector routing, link state routing, TCP/IP – overview, architecture, function of each layer and protocol, IP addressing, subnet and subnet mask, IP addressing-classes, IPV4, IPV6.

UNIT- III

Bootstrap protocol, DHCP, mobile IP, DNS, telnet, SMTP, HTTP, SNMP, TFTP, ATM network, ATM architecture, BISDN reference model, ATM applications, data link control- Line discipline, flow control, error control, conventional encryption – convention encryption, conventional encryption model, steganography, classical encryption techniques, simplified DES, block cipher design principles, block cipher modes operation.

UNIT – IV

Cryptography, public key encryption and has functions- public key cryptography, principles of public key cryptosystems. The RSA algorithm, message authentication and hash functions authentication requirements, authentication function, message authentication codes, MAC algorithm, has function algorithms, secure hash algorithm (SHA-1, SHA256, SHA-512), IP security.

UNIT – V

Network security at various layers, secure – HTTP, SSL, PSP, authentication Header, key distribution protocols, digital signature, digital certificates, security protocol, levels of security, virus and worms related threats, malicious programs, FIREWALL design principles. Wi-Fi, Bluetooth, infrared.

Suggested Textbook & reference Books:

- Forouzan, Data communication - TMG
- Tanenbaum, Computer Networks.
- William stallings, Cryptography and network security.
- P S Gill, Cryptography & Network Security.
- Rajnish Agrawal, B Tiwari, Data Communication & Computer Network.

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Faculty of Computer Application
Class BCA Third Year
Subject-Core Java
CODE-BCA(Y- 302)

UNIT –I

History and features of java, C++ Vs. java, how java works, JAVA program structure, java virtual machine concepts, java platform overview, primitive data types, tokens., variables and constants, operators, precedence, expressions statements – branching, looping and jumping, labeled statements.

UNIT – II

Classes, objects and methods & defining a class, adding variables and methods, creating objects, constructors, instances field and methods initialization by constructors, access methods arrays, string and string buffer classes, wrapper classes, using the JDK tools.

UNIT- III

Inheritance, super class, subclass basic types using super keyword, abstract and final classes, method overloading, interface, thread, thread life cycle, multithreading example, Synchronized threading, priorities of thread.

UNIT – IV

Exception landing: Fundamental exception types, uncaught exceptions, throws, throw, try catch, finally, built in exceptions, creating your own exceptions. Packages, built in packages, creating your own package – put/output – basics- streams, Byte and character streams.

UNIT – V

Applet programming – Local and remote applets, applets Vs. Application creating and executing java applets, inserting applets in a web page, java security, passing parameters to applets, aligning the display, HTML tags & applet tag, getting input from the user,
Networking – basics, networking classes and interfaces, using java.net package, TCP/IP and datagram programing.

Suggested Textbook & reference Books:

- E. Balaguruwamy, "Programming with java".
- Schidt, "Java complete reference", TMH,
- Das Rashmikanta, "Core Java", IE. Vikas publication,
- BansalNitin, Ajit Kumar, "A simplified approach to java programming", Kalyani publications.

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Faculty of Computer Application
Class BCA Third Year
Subject – Management Information Systems
CODE- BCA(Y-303)

UNIT –I

The system concept: Definition characteristics of systems, elements of a system, open and closed system, formal and informal information systems, and computer based information systems, decision support system, and interpersonal communication system, physical or abstract systems.
System analysis and design life cycle: SDLC, requirements specifications, role of system analyst, attributes of a systems analyst,

UNIT – II

Systems analysis: System planning and initial investigation, information gathering tools, tools used in system analysis, data flow diagrams, case study for use of DFD, leveling of DFDs, logical and physical DFDs, structured and unstructured DFDs, types of interviews and questionnaires, data dictionary, decision trees and structured English, feasibility study, cost/benefit analysis.
Systems Design: Logical & physical design, design methodologies, structured design, input/output and forms design: input design, output design requirements of form design, screen design, graphical user interfaces, interactive I/O on terminals, specification oriented design vs. procedure oriented design, file organization and database design.

UNIT- III

System implementation: System testing and validation, system quality assurance, level of quality assurance, implementation and software maintenance, hardware and software selection, project scheduling, system maintenance, Maintenance activities and issues, security, disaster/recovery planning, ethics codes and standards of behavior in system development.

UNIT – IV

Management and decision making – Models of decision making – classical, administrative and Herbert Simon's models – attributes of information and its relevance to decision making, types of information. Information technology – Definition, IT capabilities and their organization impact, IT enabled services such as call centers, Geographical information system etc., Data base management systems- data warehousing and data mining, information security and control – Quality assurance- Ethical and social dimensions – Intellectual property rights as related to IT services / IT products – managing global information systems.

UNIT – V

Decision support system – Importance of decision support system, characteristics of decision support system, computerized decision support-decision making, introduction and definitions, models phases of the decision making process the intelligence phase, design phase, implementation phase, and executive information systems - executive support systems – expert systems and knowledge based expert systems – artificial intelligence.
Performance evaluation and monitoring, model building, simulation, quality control and quality assurance.

Suggested Textbook & reference Books:

- Laudon & Laduon – management information systems, person education Asia.
- Jawadekar – Management information systems, Tata McGraw hill.
- Elias M.Awad, "System analysis and Design.

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Faculty of Computer Application
Class BCA Third Year
Subject – Python Programming
CODE- BCA(Y-304)

UNIT –I

Python Basics – python interpreter, python idle, dynamically typed and strongly typed features, basic data type, variables, expressions, statements, operators, flow of execution, input and output statements, conditionals: Boolean values and operators, conditional (if), alternative {if-else}, chained conditional (if-elif-else), integration, while, for, break, continue, pass, implementing 'for' through range(), 'in' and 'not in' operators for sequence traversal, creating and executing py scripts.

UNIT – II

Data structures: Lists append, extend, insert, index, remove, pop count, sort, reverse, slicing, list comprehension, copying a list deep copy, shallow copy. Tuples – index, count, usage, use of tuples as a swap function, dictionaries keys values, tuples, nested dictionaries, dictionary comprehension, strings single line and multi-line string, formatter, is digit, is alpha, is alnum, is lower, is tittle, is space, title, lower, upper, strip, splitines, join etc. sets union, intersection, subset, superset, difference, symmetric difference, copy, add, remove, discard etc.

UNIT- III

Functions & File Handling: Inbuilt functions –id, len, chr, ord etc, defining and calling a function arguments, global versus local variables, defining and using lambda fiction, the map(), filter(), reduce() functions.

Working with files: read, write and append modes: r,w,a,r+,w+,a+, reading-read(), redline(), read lines(), writing-write(), write lines(), Seek(), tell(), word count, copy file scripts through file handling concepts.

UNIT – IV

Classes, modules and exceptional handling: classes, introduction, member variables and defining methods, constructor, destructor, data encapsulation, inheritance, multiple inheritances, diamond problem solving technique of python.

Modules inbuilt modules – sys, random, time etc. import, from import, from import, constructing package, role of _init_.py

Exceptional handling: the try-except-else-finally block, the raise statement, the hierarchy of exceptions, adding exceptions.

UNIT – V

Database & GUI programming: importing SQLite, connecting to database, creating table, insert, select, update, delete, drop tables, accessing and modifying tables through python.

Graphical user interfaces; event driven programming paradigm, tkinter module, creating simple GUI; buttons, labels, entry fields, dialogs; widget attributes – sizes, fonts, color layouts, nested frames.

Suggested Textbook & reference Books:

- Tanejsheetal & kumar naveen, "python programming: A modular approach", person.
- Zed A. Shaw, "Learn python the Hard Way", Zed Shaw's hard way series.
- Liang Y. Daniel, "introduction to programming using python", Person.
- Charles Dierbach, "Introduction to computer sciences using Python", Wile.

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Faculty of Computer Application
Class BCA Third Year
Subject – E-Governance
CODE - BCA(Y-305)

UNIT –I

Introduction to E-Governance: Needs of E-governance, issue in E-Governance application and the digital divide: Evolution of E-Governance, its scope and content, parent global trends of growth in E-Governance, other issues.

Models of E-Governance: Introduction: Model of Digital governance, broadcasting wilder dissemination model, critical flow model, comparative analysis model, mobilization and lobbying model, interactive service model government-to-citizen-to-government model, (G2C2G), evolution in E-governance through E-Governance models.

UNIT – II

E-Governance infrastructure and strategies: E-readiness: Digital system infrastructure, legal infrastructural preparedness, institutional infrastructural preparedness, human infrastructural preparedness, technological infrastructural preparedness, and evolutionary stages in E-Governance.

Data warehousing and data mining in government: Introduction national data warehouse. Census data, prices of essential commodities, other areas for data warehousing and data mining, agriculture, rural development, health planning, education, commerce and trade, other sectors.

UNIT- III

Center Security: Information system threats and attacks, classification of threats and assessing damages, security in mobile and wireless computing – security challenges in mobile devices, authentication service security, security implication for organizations, laptops security framework for information security, ISO 27001, SEE-CMM, security metrics, information security Vs privacy.

Basic principles of information security, confidentiality, integrity, availability and other terms in information security, information classification and their roles, security threats to E-Commerce, virtual organization, business transactions on web, E-Governance and EDI, Concepts in electronics payment system, E-Cash, Credit/Debit cards.

UNIT – IV

Virtual private networks- Need use to tunneling with VPN, authentication mechanisms, types of VPN's and their usage, security concerns in VPN.

IT Act & Cyber Laws: Cyber-crime and cyber laws, types of cyber-crimes, cyber law issue in E-Business management, overview of Indian IT act, information technology act 2000, International scenario in cyber laws: data protection laws in EU and USA, Ethical issues in intellectual property rights, copy right, patents, data privacy and protection, Domain name, software piracy, plagiarism, issues in ethical hacking.

UNIT – V

Case studies: Indian context: Cyber laws, implementation in the land reform, Human Resource management software: India: NICNET. Collectorate, computer aided administration of registration department (CARD), smart nagarpalika, national reservoir level and capacity monitoring system, computerization in Andhra Pradesh, EkalsevaKendra, sachivalayavahini, Bhoomi, IT in judiciary, E-Khazana, DFGT, PARJA, E-Seva, E-Panchayat, General information

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services of national informatics center; E-Governance initiative in USA; E-Governance in China; E-Governance in Brazil and Sri Lanka.

Suggested Textbook & reference Books:

- CSR Prabhu – E-Governance; Concepts and case studies, prentice- Hall of India private limited, 2004.
- Backus, Michiel, - E-Governance in developing countries, IICD Research brief, No. 1, March 2001.
- N.Gopalsomy,- Information technology & E-Governance, New age publication, First Edition 2009.
- Godbole,- Information system security, Willey.
- Merkov, Breithaupt – Information security, Pearson education.
- Sehou, Shoemaker, - Information assurance for the enterprise, Tata McGraw Hill.
- Indian IT Act 2000- Bare Act Professional.
- PavanDuggal, - Cyberlaw- The Indian perspective: 2009 edition with IT act amendments 2008, Saakshar law publications.

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Faculty of Computer Application
Class BCA Third Year
Subject – Principles and Practices of Management
CODE- BCA(Y-306)

UNIT –I

Introduction to management concept, Definition and characteristics: Management as an art or sciences: Objective of business management, manager, roles and responsibilities, management theories and practices, core functions of management.

UNIT – II

Planning: Introduction (Concept, Definition and characteristics) Types of planning, significance of planning, planning versus forecasting, planning principles, planning process, factors responsible for failure management by objectives.

UNIT- III

Organizing: Introduction (Concept, Definition and characteristics), Organizing process and its importance: Span of management, organizing principles, and line and staff relationships, delegation of authority, depart mentation, centralization and decentralization.

UNIT – IV

Direction: Introduction, components of directing, principles of directing, directing styles: tools for directing, leadership style and importance.

Controlling: Introduction, control process, Types of control, controlling principles and techniques: Resistance to control- effects and ways to overcome resistance, controlling by exception.

UNIT – V

Coordinating: Introduction, elements of coordination, and principles of coordination and approaches of coordination.

Staffing: Introduction, Roles and responsibility of staffing: staffing process, factors affecting, staffing process.

Suggested Textbook & reference Books:

- Haroid Koontz, O'Donnell and Heinz welhrich, 'Principles of management', McGrawHill Co.
- R.D. Agarwal, 'Organization and management concepts', Tata McGrawHill.
- Newman and Warran, 'The process of management; Concepts', Behavior and practices', PHI
- S M Shukla, 'Principles of management', SahityaBhawan, Agra.
- Robbins S.P. and Decenzo David, Fundamentals of management; Essential concepts and applications", Pearson Education,
- Hillier Frederick S. and Hillier Mark S. – Introduction to management science: A modeling and case studies approach with spreadsheets, Tata McGraw Hill, 2nd Ed., 2008.

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Faculty of Computer Application
Class: BCA–III Year
Paper-I (Foundation Course (Moral Value and Language-III)
Code: FC(Y-304A)

इकाई -1

हिन्दी भाषा

1. मेरे सहयात्री (यात्रा व्रतांत) - अमतलाल बेगड
2. मध्यप्रदेश की लोक कलाएं (संकलित)
3. लोकोक्तियां एवं मुहावरे (संकलित)

इकाई -2

हिन्दी भाषा

1. पत्रकरिता के विभिन्न आयाम (संकलित)
2. मध्यप्रदेश का लोक साहित्य (संकलित)
3. पत्र लेखन - आवेदन, प्रारूपण, आदेश परिपत्र ज्ञापन, अनुस्मारक

इकाई -3

नैतिक मूल्य

1. विश्व के प्रमुख धर्म एवं महत्वपूर्ण विशेषताएं (हिन्दू धर्म , जैन धर्म,बौध्द धर्म, सिक्ख धर्म , ईसाह धर्म , इस्लाम धर्म
2. सत्य के साथ मेरे प्रयोग (महात्मा गांधी की आत्म कथा का संक्षिप्त संस्करण)

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UNIT – 4

1. Stopping by Woods on a Snowy evening: Robert Frost.
2. Cherry Tree: Ruskin Bond
3. The Axe: R.K. Narayan
4. The Selfish Giant: Oscar Wilde
5. On the rule of the Road: A.G Gardiner
6. The song of kabir: Translated by Tagore

UNIT – 5

Direct-Indirect speech, Active-Passive Voice, Similar words with different meaning. Report Writing, Narration of events and situations. Drafting of E- mails, Drafting CV.

Text Books and References Books:

1. हिन्दी ग्रंथ अकादमी की पुस्तकें

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Faculty of Computer Application
Class: BCA–III Year
Foundation Course
PaperII (Basics of Computer App. & Information Technology)
Code: FC(Y-304B)

Unit-I

PowerPoint-I Creating presentation using Slide master and Temp late in various Themes & Variants. Working with slides: New slide, move, copy, And delete duplicate, and slide layouts, Presentation views. Format Menu: Font, Paragraph, Drawing & Editing. Printing presentation: Print slides, notes, handout uts and outlines. Saving presentation in different file formats.

Unit-II

PowerPoint-II Idea of Smart Art graphics, inserting text/data using SmartArt, Converting old style presentation into new style through Smart Art.Inserting objects (Video, Audio, Symbol, Equation, etc.), table & excel sheets, picture, chart, photo album, shapes and Smart Art; Trimming of audio/videos. Connecting slides through hyperlink and action button. Slide sorter, slide transition and animation effects. Presenting the slide show: Setup Slide Show, Rehearse Timing.

Unit-III

MS Excel Workbook & Worksheet Fundamentals: Concept of Row, Column & Cell; creating a new workbook through blank & template. Working with worksheet: Entering data into worksheet (General, Number, Currency, Date, Time, Text, Accounting, etc.); Renaming, Copying, Inserting, deleting & protecting worksheet. Working with Row & Column (Inserting, Deleting, Pasting, and Resizing & Hiding), Cell & Cell formatting, and Concept of Range. Charts: Preparing & editing different types of Charts, Inserting trend line, Backward & forward forecasting. Working with formulas: Formula bar; Types of functions; Syntax & uses of the following functions: SUM,

Unit-IV

Internet & Web Services Internet: World Wide Web, Dial-up connectivity, l eased line, VSAT, Broad band, Wi-Fi, URL, Domain name, Web Browser (Internet Explorer, Firefox, Google Chrome, Opera, UC browser, etc.); Search Engine (Google, Bing, Ask, etc.); Website: Static & Dynamic; Difference between Website & Portal-mail: Account Opening, Sending & Receiving Mail s, Managing Contacts & Folders. Basics of Networking: Types of Networks (LAN, WAN ,

MAN); Network Topologies (Star, Ring, Bus, Hybrid).Elementary idea of - Cloud Computing & Office Web Apps, Mobile Computing & Mobile Apps.

Unit-V

Cyber Ethics, Security & Privacy• Email, Internet & Social Networking Ethics Types of viruses & antivirus Computer security issues & its protection through Firewall & antivirus

Suggesting Reading-

1. Computer Science And Information Technology- S.K.Vijay And Pankaj Singh-Books Of Hindi Granth Academy
2. Computer Study –Pankaj Singh

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Faculty of Computer Application
Class BCA Third Year
Subject – Project: Application Development using PhP & MySQL
CODE- BCA(Y-307)

Recommendation: The technology to be used for project development to be revised every 2 years as per the prevailing trends and need of the prevailing trends and needs of the industry/market.

Guidelines for Project Development in BCA Final Year.

- Internal Evaluation (CCE) will be based on viva on project synopsis (i.) system study and system design, (ii.) Presentation) submitted by the student – 10 marks.
- External Evaluation will be based on, Viva and demonstration of the work done in the project – 40 Marks.

1. Project will consist of software development taken up in a group consisting of not more than 2 students.
2. Report will be submitted jointly by the group in one copy.
3. Project can be done eithers on-the-job training in a software development organization/company or it can be a self-effort as a suitable solution to a real world problem identified in consultation with guide teacher.

GUIDELINES FOR PROJECT FORMULATION

TYPE OF PROJECT

It is suggested that the project to be chosen should have some direct relevance to the real world. Students are expected to work out a solution for real life problems involving diverse application domains in some industry/development laboratories/educational institutions/software companies; however, it is not mandatory for a student to work on a live project. The student can formulate or innovate project problem with the help of his/her guide.

The project work will give an opportunity to the students to develop quality software solution. Project development should involve 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. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, and develop good understanding of SDLC.

Project Ethics to be adhered to: Plagiarism to be avoided: The project should be genuine and original in nature and should not be copied from anywhere, students should be encouraged to work in the suggested areas listed at the end of the guidelines.

Calendar for project

S. No.	Topic	Date
1.	Assigning of teacher guide	Before 25 July
2.	Topic finalized	Before 20 August
3.	Submission of the project abstract and synopsis (CCE 1)	Before 25 September

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4.	PPT presentation (CCE 2)	Before 20 December
5.	First proof of the project report to be checked by teacher guide	Before 20 February
6.	Final submission and Viva/Demonstration by external examiner	2nd Week of March

Project Proposal (Synopsis)

The project proposal should be prepared in consultation with the mentor in organization/ Teacher guide; the project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. The project proposal should contain complete details in the following form.

1. Title of the project
2. Introduction and objective of the project.
3. Relevance of the topic for the benefit of the society.
4. Analysis: (DFDs at least up to second level, ER Diagrams/ Class diagrams/ Database design etc. as per the project requirements.)
5. Design: A complete structure which includes: Number of modules and purpose of each module to provide and estimation of the student's effort on the project. Data structures as per the project requirements for all the modules.
6. Testing process to be used.
7. Reports generation (Mention tentative content of report)
8. Tools/Platform, Hardware and software requirement specifications.
9. Are you doing this project for any Industry/Client? Mention Yes/No. If Yes, Mention the name and address of the industry or client.
10. Future scope and further enhancement of the project.

Incomplete project proposals in any respect should be given another chance and resubmitted after incorporating changes and suggestions given by the guide. CCE marks to be given based on synopsis viva.

Project report Formulation:

I. The project report must contain the following in detail:
   1. Certificate from the organization where project has been undertaken.
   2. Certificate of originality (Format given).
   3. Declaration (Format given).
   4. Acknowledgement (Format given).
   5. Introduction
   6. Objectives
   7. Tools/Environment used
   8. Analysis Document (This should include SRS in proper structure based on software engineering concepts, E-R diagrams/Class diagrams/any related diagrams (if the former are not applicable), Data flow diagrams/other similar diagrams (if the former is not applicable), Data dictionary)
   9. Design document (Modularization details. Data integrity & constraints including database design, Procedural design, user interface design)

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10. Program description (Detailed specification instead of code), Comments & description)
11. Testing (Test case designs are to be included separately for unit testing, integration testing, system testing, reports of the outcome of unit testing, integration testing, system testing are to be included separately, also details of debugging and code improvement are to be included.)
12. Input and output screens.
13. Implementation of security for the software developed (In case, you have set up a user name and password for your software, you should ensure the security of user name and password during transmission to server)
14. Limitation, future scope for improvement/enhancement of the project.
15. Application of the project mentioning benefit to the real world.
16. Bibliography/References
17. Synopsis

II. The project report may not be more than 80 1.5mm spaced A-4 size typed pages.

III. Executable file of the project must be submitted in soft copy attached at the back of the project report.

IV. The project report should be hard bound: should consist of a contents page; all pages of report should be numbered: content should be well organized in a meaningful manner: Printouts of text & screen layouts should be original and should not be Xeroxed)

Important points for preparation & submission of the project report

1. The project report should be submitted in A-4 size typed in 1.5mm line space, justified, (Font times New Roman, size normal 12, Heading 16 and subheading 14)
2. The length of the report should be between 50 to 80 pages including the cover page, summary, table of contents, list of figures, list of tables, and acknowledgement.
3. Ensure that project synopsis and the final report contain the signatures of both the guide and the student along with date.
4. If any project report is received in absence of the items listed above, it will be rejected and returned to students for compliance, also, violation of project guidelines may lead to rejection of the project.
5. Spiral bound photocopy of the project report is to be submitted to the college, original copy of the same project report is to retain with the student is supposed to carry his copy while appearing for viva voce.
6. If the title and content of the project differs from the title mentioned in the project proposal, the project report should be rejected by the external examiner and valuation to be done accordingly.

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SUUGESTED LIST OF TOPICS FOR APPLICATION DEVELOPMENT

A sample list of topics for project development is provided below. This is just a suggested list and students are free to choose any other innovative project relevant to computer applications which can be developed using PHP/MySQL.

- Customer targeted E-Commerce
- Automated faculty evaluation system
- Online health shopping portal with product recommendation
- College forums with alumni with content filtering
- SQL injection prevention system
- College social network project
- ERP System
- Online book recommendation using collaborative filtering
- Monitoring suspicious discussions on online forums
- Fake product review monitoring & removal for genuine ratings
- A commodity search system for online shopping using web mining
- Secure online auction system
- Farming assistance web service
- Online loan application & verification system
- Matrimonial portal
- Online herbs shopping project
- Online bakery shop system
- Course material distribution system
- Online furniture shop project
- Hotel room comparison system project
- Salon management project
- Sports club management project
- Online blood bank project
- Stationery management system
- Online application for the training and placement
- Online leave management system
- Airline reservation system
- Recipe management system
- Complaint management system
- Web based meeting scheduler
- Student project allocation and management
- Ticket reservation system
- Content management system
- Call center management
- Online on- request courses coordination system
- Civil registry
- Online career guidance and placement unit
- Ad agency

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Formats of certificates to be included

A. Cover page:

PROJECT REPORT

ON

<Project Title>

SUBMITTED TO

Sri Satya Sai University of Technology & Medical Sciences, Sehore

<Logo of university>

IN PARTIAL FULLFILLEMENT OF THE DEGREE OF

Bachelor of Computer Applications

Session < >

By

Name: .....
Roll No. : .....
Enrollment No.: .....

Under the Guidance of

<Name of Internal Guide>

<Designation>

<Name of External Guide>

<Designation>

Enroll No.:

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E. Certificate of Originality

Certificate of Originality

This is to certify that the project report entitled _____submitted to Sri Satya sai University of Technology & medical sciences, Sehore, in partial fulfillment of the requirement for the award of the degree of Bachelor of Computer Application, is an original work carried out by Mr./ Ms. _____ Enrollment No.: _____ Roll No.:_____.

The matter embodied in this project is a genuine work done by the student and has not been submitted whether to this university or to any other University/ Institute for the fulfillment of the requirement of any course of study.

Signature of the Guide
Name, Designation &
Address of the Guide

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Faculty of Computer Application
Class BCA Third Year
CODE - BCA(Y-308)
LAB I
Java Programming

A. CORE JAVA PROGRAMMING (USING ANY TEXT EDITOR)

1. Find greater number between two numbers using conditional operator.
2. Find the factorial of number if number is given by user using command line argument.
3. Write a program to check if a number is prime or not.
4. Write a program to display tables from 2 to 10.
5. Write a program to print Fibonacci series.
6. Enter a no. and check whether it is even or odd.
7. Write a program to find sum & average of 10 no. using arrays
8. Write a program to display reverse of a digit no. using array.
9. Write a program to display grade according to the marks obtained by the student.
10. Write a program to calculate the salary of an employee if salary is greater than or equal to 20000 and year of service is greater than or equal to 5 years then bonus will be 2000 otherwise 1000 and print grass salary of employee.
11. Write a program to convert the given no of days into months & days using with classes, objects and method.
12. Write a program to convert given string into uppercase and lowercase and get the length of string using array.
13. Create a package called "Arithmetic" that contains methods to deal all arithmetic operations. Also write a program to use the package.
14. Define an exception called "marks out of bound" exception that is thrown if the entered marks are greater than 100.
15. Write a program using application of single inheritance. Find the area of rectangle & volume of cube.
16. Develop a simple real life application to illustrate the use of multithreading.
17. Write a program using multiple inheritance calculate area and parameter of a circle.
18. Write a program which takes input from keyboard and sends output to the console.
19. Write an applet program to draw a rectangle (Color=Orange) and a right aligned oval.
20. Develop an applet that receives 3numeric values as inputs from the user and then display the larges no. on the screen.

B. MANAGEMENT INFORMATION SYSTEM LAB

1. Identify some real time Business Domain Problems.
2. Documentations of any identified problem (Preparation of problem statement) by using process analyst tools for making DFD/ER diagrams.

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Class BCA Third Year
Python Programming
CODE- BCA(Y-309)
LAB II

Suggested List of Practical

1. Find all numbers which are multiple of 17, but not the multiple of 5, between 2000 and 2500?
2. Print the first 2 and last 3 characters in a given string use the string slicing.
3. Write a program that eliminates duplicates in a list.
4. Implement shallow copy and deep copy of a list.
5. Find the largest of n numbers, using a user defined function largest ()
6. Write a function that capitalizes all vowels in a string.
7. Read a line containing digits and letters, write a program to give the count of digits and letters.
8. Write a function my reverse () which receives a string as an input and returns the reverse of the string.
9. Use the list comprehension methodology in python, to generate the squares of all odd numbers in a given list.
10. Generate a dictionary and print the same. The keys of the dictionary should be integers between 1 to 10 (both inclusive). The values should be the cubes of the corresponding Keyes.
11. Create a nested dictionary the roll number of a student maps to dictionary. The inner dictionary will have name, age and place as keys, read details of at least three students.
12. Enter a word create a dictionary with the letters of this word as keys, and the corresponding ASCII values as values.
13. Define a class with three methods, readstring(), printString(), writeString(). The first method should read the contents of a file. The second method should print the contents to the console. The third method should write the contents to a new file.
14. Create a class account which has constructor to input account no, name balance from user, print account () to display the account details, and deposit (), withdraw () which inputs amount and add/subtract them form the total amount of individual object.
15. Create a database table in SQLite from the table data in python.
16. Implement DML commands in SQLite from python interface.
17. Implement tkinter methods in a python script.

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MINUTS OF BOARD OF STUDIES MEETING

Name of Department:- Science and Computer Science

Minutes of Board of Studies Committee Meeting, held on Dated on **22/11/2021**

The Board of Studies Committee Meeting was held in the room of Department of Science and Computer science at 3:00 PM. on **22/11/2021**, Following members were present.

1. Dr.Sanjay Rathore, Dept. of Science -Chairman
2. Dr. K.W Shah, Professor Botany Govt: PG College Pipariya , Hoshangabad-External
3. Dr.Mohit Arya , Professor Zoology , Govt: KRG College, Gwalior- External
4. Dr.Pushpendra Sharma,Professor,Chemistry
5. Dr. Neelu Jain , Professor , Chemistry
6. Dr.Syed Shahab Ahmed, Professor , Botany
7. Dr. Geeta Khoobchandani, Associate Professor, Physics
8. Dr. Shobha Malviya ,Professor, Microbiology
9. Dr. Syed Shahnawaz Ali, Professor, Mathematics
10. Dr. Tabassum Khan ,Professor , Hindi
11. Dr. Babina Bohra, Assistant Professor, English
12. Ms. Dhanvarsha Kushwaha, Assistant Professor , Mathematics
13. MS. Khushboo Vaidhya, Assistant Professor , Environment Science

The chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:1 The new syllabus and scheme of the UG (B.Sc., BCA) courses is discussed by the members of the Board of Studies. In which it is discussed that in the First Year of B.Sc. and BCA syllabus have

been taken from the syllabus published by Madhya Pradesh Higher Education dept. according to National Education Policy, 2020.

Discussion: All members discussed the agenda on scheme and syllabus of B.Sc. and BCA for the Academic Session 2021-22. All members agree to implement the proposed scheme and syllabus as per New National Education Policy 2020.

Resolution: It is resolved that the new syllabus and scheme of the UG (B.Sc. and BCA) courses is recommended by all members of relative subjects present in the Board of Studies meeting.

The new syllabus and scheme were recommended for implementation from academic session 2021-22.for the student admitted in session 2021-22. Minutes of the meeting may be placed before the academic council for approval

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairperson)

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FACULTY OF EDUCATION

DEPARTMENT OF SCIENCE & COMPUTER APPLICATION

ANNUAL SCHEME OF BCA IST YEAR

SESSION 2021-22

S.No.	Course Code	Subject	Course Title	Credit	Pre-Requisite (If Any)	Theory		CCE/Internal				Practical/Project		Total Marks
						Max.	Min.	Class Test		Assignment/Presentation		Max.	Min.	
								Max.	Min.	Max.	Min.			
Core Course /Major Subject(Select Any one)														
1	S1-BCAA1T	Computer Fundamentals, Organization and Architecture	Computer Fundamentals, Organization and Architecture	4	The Study This Course , Student Must Have Basic Knowledge Of Computers	75	25	15	5	10	3	-	-	100
	S1-BCAA1P	Computer Fundamentals, and Digital lab	Computer Fundamentals, and Digital lab	2	Open For All	-	-	-	-	25	8	75	25	100
2	S1-BCAA2T	Programming Methodology & Data Structures	Programming Methodology & Data Structures	4	The Study This Course , Student Must Have Basic Knowledge Of Computers	75	25	15	5	10	3	-	-	100
	S1-BCAA2P	Programming Methodology & Data Structure Lab	Programming Methodology & Data Structure Lab	2	The Study This Course , Student Must Have Basic Knowledge Of Computers	-	-	-	-	25	8	75	25	100
Minor Subject (Compulsory)														

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	S1-BCAB2T	Operating System	Operating System	4	Open For All	75	25	15	5	10	3	-	-	100
	S1-BCAB2P	Operating System	Operating System	2	Open For All	-	-	-	-	25	8	75	25	100
Elective Subject(Select Any One) Open Elective OR (Generic Elective Course) (Select Any One Subject)														
	S1-BCAC1G	Computational Mathematics	Computational Mathematics	6	Student Must Have Basic Analytical Aptitude	75	25	15	5	10	3	-	-	100
	S1-BCAC2G	Discrete Mathematics	Discrete Mathematics	6	Open For All	75	25	15	5	10	3	-	-	100
	S1-BCAD1G	Numerical Methods	Numerical Methods	6	Open For All	75	25	15	5	10	3	-	-	100
	S1-BCAD2G	Probability and Statistics	Probability and Statistics	6	Open For All	75	25	15	5	10	3	-	-	100
	S1-COAP2G	MS OFFICE	MS OFFICE	2	The Study This Course , Student Must Have Basic Knowledge Of Computers	75	25	15	5	10	3	-	-	100
	S1-COAP2R	MS OFFICE	MS OFFICE	2	The Study This Course , Student Must Have Basic Knowledge Of Computers	-	-	-	-	25	8	75	25	100
		NCC	NCC Awareness	4	Open For All	75	25	15	5	10	3			100
		NCC Practical	**NCC Training**	2	Open For All							100	33	100
	NSS-101	NSS	Concept Of	4	Open	75	25	15	5	10	3			100

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			National Service Scheme		For All									
	NSS-102	NSS Practical/Project	Project Tools Of NSS	2	Open For All							100	33	100
Vocational Subject (Select Any One)														
	V1-COM-TALT	Accounting & Tally Course	Accounting & Tally Course	4	Open For All	50	17	-	-	-	-	50	17	100
	V1-PSY-DEVT	Personality Development	Personality Development	4	Open For All	50	17	-	-	-	-	50	17	100
	V1-COS-WEBT	Web Designing	Web Designing	4	Open For All	50	17	-	-	-	-	50	17	100
	V1-COM-DIGT	Digital Marketing	Digital Marketing	4	Open For All	50	17	-	-	-	-	50	17	100
Foundation Course (Compulsory)														
	X1-FCEA1T	Foundation Course	Hindi Language	2	Open For All	50	17							50
	X1-FCHB1T	Foundation Course	English Language and Indian Culture	2	Open For All	50	17							50
	X1-FCAC1T	Foundation Course	environmental education	2	Open For All	50	17							50
	A1-YOSC1F	Yogic Science	Yoga And Mediation	2	Open For All	50	17							50
Inter/Intra Faculty(Compulsory)														
		Field/Project/ Internship/	Field/Project/ Internship/	4	Open For All							100	33	100
TOTAL CREDIT					TOTAL MARKS									

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Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022

1	**Course Code**	S1-BCAC1G	
2	**Course Title**	Computational Mathematics	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational)**	Elective	
4	**Pre-Requisite (if any)**	Students must have basic analytical aptitude.	
5	**Course Learning outcomes (CLO)**	On Successful completion of the course the students shall be able to: • Implement trigonometric solutions for measurements in real world scenarios. • Implement matrices and simultaneous equations to solve complex problems. • Use statistical tools efficiently. • Use mathematical logic and predicate calculus for solving problems. • Apply the concepts of set theory for finding solutions to set related problems.	
6	**Credit Value**	**Theory – 6 Credits**	
7	**Total Marks**	Max. Marks : 25+75	Min. Marks : 33

Part B – Content of the Course

No. of Lectures (in hours per week) : 3 Lectures per week

Total no. of Lectures: 90 Hrs.

Unit	Topics	No. of Lectures
1	**Trigonometry:**Angles& their measurement, values of trigonometric Ratio height and distances, Elementary matrices and types of matrices.	18
2	**Equations:** Simultaneous linear equations, methods of solving simultaneous equations, quadratic equations.	18
3	**Statistics:**Frequency distribution, measure of central tendency: Mean, Mode, Median. **Measure of Variation:** Mean deviation Standard Deviation.	18
4	**Mathematical Logic:**Statements and notations, connectives: Negation, conjunction, and disjunction, statement formulas and truth tables. Tautologies, Tautological implications, contradiction contingency.	18
5	**Set theory:** Basic concepts of set theory, notation, inclusion and equality of sets, the power set, types of sets, operations on set, Venn diagrams.	18

Part C- Learning Resources

Text Books, Reference Books, Other resources

Text Books:

- Business Mathematics S.M. Shukla, SahityaBhawan Publications.
- Business Mathematics D C Agrawal, Sreesaiprakshan.

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- S.K. Sarkar: A Text book of discrete mathematics, S Chand, 2005.
- A Text Book of Discrete Mathematics, 9/E, Sarkar S.K. Chand New Delhi, 2016
- मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तकें

Reference Books:

- Fundamental of Statistics ELHANCE & ELHANCE, KitabMahal Publication.
- Mathematical Statistics, 8/E Ray and Sharma, Ram Prasad & Songs.
- Business Mathematics, J.K. Singh, Himalaya Publishing House, 2017.
- Business Mathematics, 9/E, Sancheti&Kapoor, Sultan Chand & Songs, 2014.
- Discrete Mathematics structures with application to computer sciences", Indian Ediion, J.P. Tremblay, R Manohar, McGraw Hill Education 2017.
- "Discrete Mathematical", 2/E, J.K. Sharma, Macmillan Publication, 2005.

Suggested digital platform web links:

https://freevideolectures.com/university/iit-roorkee/
https://highereducation.mp.gov.in/?page=xhzlQmpZwky1Qb%2Fy5G7w%3D%3D
https://epathshala.nceart.org.in/

Suggested equivalent online courses:

S.No.	Course Title	Duration	Provider
1	Algebra & Trigonometry	15 Week	Swayam
2	Mathematics	8 Week	Mitopen Courseware

Part D- Assessment and Evaluation

Internal Assessment: Continuous Comprehensive Evaluation (CCE) : 25 Shall be based on allotted assignments and class tests. The marks shall be as follows:		**External assessment: University exam (UE): 75 marks** **Time: 02.00 Hours**	
Assessment and presentation of assignment	**4 Marks**	**Section (A):** Three Very Short Questions (50 Words Each) Nine MCQ Questions	03 x 03 = 09 OR 09 x 01 = 9 Marks
Class Test I **(Objective Questions)**	**5 Marks**		
Class Test II **(Descriptive Questions)**	**8 Marks**	**Section (B):** Four Short Questions (200 Words Each)	04 x 09 = 36
Class Test III **(Based on OS commands)**	**8 Marks**	**Section (C):** Two Long Questions (500 Words Each)	02 x 15 = 30
Total	**25 Marks**	**Total**	75 Marks
Any remarks / suggestions:			

Part A Introduction

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Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022

1	**Course Code**	S1-BCAC2G	
2	**Course Title**	Discrete Mathematics	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational)**	Elective	
4	**Pre-Requisite (if any)**	Open for all	
5	**Course Learning outcomes (CLO)**	The Course will enable the students: • Apply the Boolean algebra, switching circuits and their applications. • Minimize the Boolean function using Karnaugh Map. • Understand the lattices and their types. • Graphs, their types and its applications in study shortest path algorithms. • Test whether two Eulerian and Hamiltonian Graphs. • Understand Eulerian and Hamiltonian graphs. • Represent graphs using discrete numeric functions, generating functions and recurrence relations.	
6	**Credit Value**	**Theory – 6 Credits**	
7	**Total Marks**	Max. Marks : 25+75	Min. Marks : 33

Part B – Content of the Course

No. of Lectures (in hours per week) : 3 Lectures per week

Total no. of Lectures: 90 Hrs.

Unit	Topics	No. of Lectures
1	**Relations:**Binary, Inverse, Composite and Equivalence relation, Equivalence classes and its properties, partition of a set, partial order relation, partially ordered and totally ordered sets, Hasse diagram. **Lattices:** Definition and examples, Dual, bounded, distributive and complemented lattices.	18
2	**Boolean Algebra:** Definition and properties, Switching circuits and its applications, Logic gates and circuits. **Boolean functions:**Disjunctive and conjunctive normal forms, Bool's expansion theorem, Minimize the Boolean function using karnaugh Map.	18
3	**Graphs:**definition and types of graphs, sub graphs, Walk, path and circuit, connected and disconnected graphs, Euler graph,	18

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	Hamiltonian path and circuit, Dijkstra's Algorithm for shortest paths in weighted graph.	
4	**Trees:**Definition and its properties, Rooted. Binary and spanning tree Rank and Nullity of graph, Kruskal's and Prim's Algorithm, Cut-set and its properties, Fundamental Circuit and Cut-set, planar graphs. **Matrix representation of Graphs:** Incidence, adjacency, circuit, Cut-set, path.	**18**
5	**Discrete numeric and generating functions:**Operations on numeric functions, asymptotic behavior of numeric functions, generating function. **Recurrence relations and recursive algorithms:** Recurrence relations, Linear recurrence relations with constant coefficients, Homogeneous solution, Particular solutions, Total solutions, Solution by the method of generating functions.	**18**

Keywords/Tags:
Relation, Hasse diagram, lattices, Boolean Algebra, Boolean function, Graph and Subgraph, path and circuit, Tree, spanning tree,, cut-set, matrix representation of graph, Discrete numeric function, Generating function, Recurrence relation, Recursive algorithm.

Part C- Learning Resources

Text Books, Reference Books, Other resources

Text Books:

- J.P. Tremblay and R. Manohar, Discrete Mathematical Structures with Applications to Computer science, McGraw Hill Education, 1st edition, 2017.
- C. L. Liu: Elements of Discrete mathematics, McGraw Hill Education, 4th edition 2017.
- NarsinghDeo: Graph Theory with Applications to Engineering and computer science, Prentice Hall India Learning Private Limited, 1979.
- मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तकें

Reference Books:

- Seymour Lipschutz and Mark Lipson: Discrete mathematics (Schaums Outline), McGraw Hill Education, 3rd Edition,2017.
- Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, Pearson Education Pt.Ltd., Indian Reprint 2003.

Suggested digital platform web links:
https://highereducation.mp.gov.in/?page=xhzlQmpZwky1Qb%2Fy5G7w%3D%3D

Suggested equivalent online courses:
http://nptel.ac.in/course/111106086/
https://ugemoocs.inflibnet.ac.in/idndex.php/course/view_ug/311

Part D- Assessment and Evaluation

Suggest continuous evaluation methods:

Maximum Marks:	100
Continuous Comprehensive Evaluation (CCE)	25 Marks
University Exam (UE)	75 Marks

Internal Assessment: Continuous	Class Test	**15**
	Assignment	**10**

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ComprehensiveEvaluation (CCE)	/Presentation	**Total marks: 25**	
External Assessment: University Exam (UE) Time: 02.00 Hours	**4 Marks**	**Section (A):**Three very Short Questions (50 Words Each)	03 x 03 = 09
		Section (B): Four Short Questions (200 Words Each)	04 x 09 = 36
		Section (C): Two Long Questions (500 Words Each)	02 x 15 = 30
			Total Marks:75

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Part A Introduction			
Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022

1	**Course Code**	S1-BCAD1G	
2	**Course Title**	Numerical Methods	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational)**	Elective	
4	**Pre-Requisite (if any)**	Open for all	
5	**Course Learning outcomes (CLO)**	The Course will enable the students: • Understand numerical methods to find the solution of a system of linear equations • Compute interpolation value for real data. • Find quadrature by using various numerical methods. • Solve system of linear equations by using various numerical techniques. • Obtain solutions of ordinary differential equations by using numerical methods.	
6	**Credit Value**	**Theory – 6 Credits**	
7	**Total Marks**	Max. Marks : 25+75	Min. Marks : 33

Part B – Content of the Course

No. of Lectures (in hours per week) : 3 Lectures per week

Total no. of Lectures: 90 Hrs.

Unit	Topics	No. of Lectures
1	**Methods for solving Algebraic and transcendental Equations:** Bisection method, RegulaFalsi method, secant method, Newton-Raphson method, Ramanujan Method.	18
2	**Interpolation:** Lagrange interpolation, finite difference operators, Interpolation formula using difference, Gregory-Newton forward difference Interpolation, Gregory-Newton Backward difference interpolations.	18
3	**Numerical Integration:** Newton- Cote's formulae, Trapezoidal rule, Simpson's 1/3 rules, Simpson's 3/8 rule, Gauss integration.	12
4	**Methods of solve system of Linear equations:** Direct method for solving system of linear equations: Gauss elimination, LU decomposition, Cholesky decomposition. Iterative	21

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	method: Jacobi, Gauss-Seidel.	
5	**Numerical solution of ordinary differential equations:** Single step methods: Picard, Taylor's series, Euler, Runge-Kutta. Multistep methods: predictor-Corrector, Modified Euler, Milne-simpson.	**21**

Keywords/Tags:
Algebraic and transcendental equations, interpolation, Numerical integration, Gauss elimination method, LU decomposition, Jacobi method, Gauss-seidel method, Picard method, Runge-Kutta method, Predictor-Corrector method, Milne-Simpson methods.

Remark: Scientific calculator will be allowed during examination.

Part C- Learning Resources

Text Books, Reference Books, Other resources

Text Books:

- S.S. Sastry: Introductory Methods of Numerical Analysis, Prentice Hall India Learning Private Limited, Fifth Edition, 2012.
- E. Balagurusamy:: Numerical Methods, Tata McGraw hill Publication, 2017.
- मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तकें

Reference Books:

- M.K. Jain, S. R. K. Iyengar, R.K. Jain, Numerical Method for Scientific and Engineering Computation, New Age Internationa (P) Ltd., 1999.
- Saxena H.C.: Finite Differences & numerical Analysis, S Chand, 2010.

Suggested digital platform web links:
https://epgp.inflibnet.ac.in
https://highereducation.mp.gov.in/?page=xhzlQmpZwky1Qb%2Fy5G7w%3D%3D

Suggested equivalent online courses:
http://nptel.ac.in/course/111106101/
http://nptel.ac.in/course/111106105/
http://nptel.ac.in/course/111106107/
https://ugemoocs.inflibnet.ac.in/idndex.php/course/view_pg/1476

Part D- Assessment and Evaluation

Suggest continuous evaluation methods:

Maximum Marks:	100
Continuous Comprehensive Evaluation (CCE)	25 Marks
University Exam (UE)	75 Marks

Internal Assessment: Continuous ComprehensiveEvaluation (CCE)	Class Test Assignment /Presentation	**15** **10** **Total marks: 25**

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External Assessment: University Exam (UE) Time: 02.00 Hours	**4 Marks**	**Section (A):**Three very Short Questions (50 Words Each) **Section (B):** Four Short Questions (200 Words Each) **Section (C):** Two Long Questions (500 Words Each)	03 x 03 = 09 04 x 09 = 36 02 x 15 = 30 **Total Marks:75**

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Part A Introduction			
Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022

1	**Course Code**	S1-BCAD2G	
2	**Course Title**	Probability and Statistics	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational)**	Elective	
4	**Pre-Requisite (if any)**	Open for all	
5	**Course Learning outcomes (CLO)**	The Course will enable the students: • Describe and calculate the mean deviation, standard deviation, range, quartiles and percentiles. • Understand and use the terminology of probability. • Determine whether two events are mutually exclusive and independent. • Calculate probabilities using the addition and multiplication rules. • Recognize and understand discrete and continuous probability distribution function, binomial, uniform and exponential probability distribution. • Calculate and interpret the correlation coefficient. • Understand basic concepts of linear regression and correlation. • Interpret the student's T probability distribution, chi-square goodness-of-fit, F and Z test.	
6	**Credit Value**	**Theory – 6 Credits**	
7	**Total Marks**	Max. Marks : 25+75	Min. Marks : 33

Part B – Content of the Course

No. of Lectures (in hours per week) : 3 Lectures per week

Total no. of Lectures: 90 Hrs.

Unit	Topics	No. of Lectures
1	**Theory of Probability - I:** Event and sample space, probability of an event, addition and multiplication theorem of probability, Inverse probability, baye's theorem. Continuous probability.	18
2	**Theory of Probability - II:** Probability density function and its applications, standard deviation	18

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	of various continuous probability distributions, mathematical expectation, Expectation of sum and product of random variables.	
3	**Dispersion and Distribution:** Measure of dispersion: Range and interquartile range, Mean deviation and standard deviation, moments, Skewness and Kurtosis, Moment generating function. Theoretical distribution: Binomial, Poisson, Rectangular, Exponential.	**18**
4	**Curve fitting and correlation:** Methods of least squares, Curve fitting, Correlation and regression, Partial and multiple correlations (Up to three variables only)	**18**
5	**Sampling:** Sampling of large samples, Null and alternative hypothesis, Errors of first and second kinds, Level of significance and ciritical region, Tests of significance based on chi-squareχ^2. T, F and Z distribution.	**21**

Keywords/Tags:
Probability, Dispersion, Moment generating function, Theoretical distribution, Curve fitting, Correlation, Regression, Sampling.

Remark: Scientific calculator will be allowed during examination.

Part C- Learning Resources

Text Books, Reference Books, Other resources

Text Books:

- H.C. Saxena and J.N. Kapoor: Mathematical Statistics, S. Chand and Company, 2010.
- E, Rukmangadachari: Probability and statistics, Pearson Education India: First edition, 2012.
- मध्य प्रदेश हिंदी ग्रंथ अकादमी से प्रकाशित विषय से संबंधित पुस्तकें

Reference Books:

- Vijay K. Rohatgi, A.K. Md. EhsanesSaleh: An Introduction to probability and statistics, Wiley: 3rd edition, 2015.
- S. C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statstics, Sultan Chand & sons, 2014.

Suggested digital platform web links:
https://highereducation.mp.gov.in/?page=xhzlQmpZwky1Qb%2Fy5G7w%3D%3D

Suggested equivalent online courses:
http://nptel.ac.in/course/111106112/
http://nptel.ac.in/course/111105090/
https://ugemoocs.inflibnet.ac.in/idndex.php/course/view_ug/313
https://ugemoocs.inflibnet.ac.in/idndex.php/course/view_ug/327

Part D- Assessment and Evaluation

Suggest continuous evaluation methods:
Maximum Marks: 100
Continuous Comprehensive Evaluation (CCE) 25 Marks

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University Exam (UE)	75 Marks		
Internal Assessment: Continuous ComprehensiveEvaluation (CCE)	Class Test Assignment /Presentation	**15** **10** **Total marks: 25**	
External Assessment: University Exam (UE) Time: 02.00 Hours	**4 Marks**	**Section (A):**Three very Short Questions (50 Words Each)	03 x 03 = 09
		Section (B): Four Short Questions (200 Words Each)	04 x 09 = 36
		Section (C): Two Long Questions (500 Words Each)	02 x 15 = 30 **Total Marks:75**

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Part A Introduction			
Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022

1	**Course Code**	SI-COAP2G	
2	**Course Title**	MS OFFICE	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational)**	Elective	
4	**Pre-Requisite (if any)**	Students should have a basic understanding of computer peripherals like mouse, keyboard, monitor, screen etc and their basic operations.	
5	**Course Learning outcomes (CLO)**	On the completion of this course student will be able: • To create and manage professional documents using word. • Analyze, manage and present data using excel. • Create and manage presentation using power point. • To insert a table, picture, or drawing into the document. • To prepare the document to be sent as a circular letter.	
6	**Credit Value**	**Theory – 2 Credits**	
7	**Total Marks**	Max. Marks : 25+75	Min. Marks : 33

Part B – Content of the Course

No. of ofLectures: 30 (1 hour/lecture per week) :1-0-0

Unit	Topics	No. of Lectures
1	MS word: Introduction, features & area of use. Working with MS word: Ribbon tabs-Home, insert, page layout, references, mailings, review and view, using word to create a new document, open, save and print a document, edit and format text, change the layout, background and borders, insert headers and footers, insert and edit tables, insert clip art and pictures to documents. Formatting fonts in word, drop cap in word, applying text effects, using character spacing, borders and colors, inserting header and footer, using date and time option in word. Creating project abstract features to be converted: formatting styles, inserting table, bullets and numbering, changing text direction, cell alignment, footnote, hyperlink, symbols, spell check, track changes.	6
2	Creating a Newsletter: features to be covered:- table of content, newspaper columns, images from files and clipart, drawing toolbar and word art, formatting images, textboxes and paragraphs. Creating a	6

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	feedback form – features to be covered – forms, text fields, inserting objects. Mail merge: creating custom document, creating main document, creating data source, editing data source, opening a data source, sorting the data source, finding a record in data source, editing main document, sorting merged documents, filtering merged documents, printing merged documents, merging onto letterhead, using different data sources with a single main document.	
3	**MS Excel:** Introduction to excel interface understanding rows and columns, naming cells, working with excel workbook and sheets formatting excel work book, new, open, close, save, save as formatting text: font size, font style, font color, use the bold, italic, and underline wrap text, merge and center currency, accounting and other formats, modifying columns, rows & cells, perform calculations with functions, creating simple formulas setting up your own formula, date and time functions, financial functions logical functions, lookup and reference, functions. **Calculations-** Features to be covered: cell referencing, formulae in excel- average, standard deviation, charts, renaming and inserting worksheets, hyper linking, count function, mathematical functions, statistical functions, text functions. Sort and filter data with excel sort and filtering data using number filter, text filter, custom filtering, removing filters form columns, conditional formatting.	6
4	Create effective charts to present data visually inserting column, Pie chart etc. create an effective chart with chart tool, design, format, and layout options, adding chart title, changing layouts, chart styles, editing chart data range editing data series, protecting and sharing the work book protecting a workbook with a password, allow user to edit ranges, track changes, working with comments. Insert excel objects and charts in word, use macros to automate tasks creating and recording macros, assigning macros to the work sheets, saving macro enabled workbook. **Performance analysis-** Features to be covered: split cells, freeze panes, group and outline, sorting Boolean and logical operators, conditional formatting **Cricket score card creation** – features to be covered: pivot tables, interactive buttons, importing data, data protection, data validation.	6
5	**Creating PowerPoint presentation:** Making presentation which demonstrate use of Hyperlinks, inserting – image, clip art, audio, video, objects, tables and charts. Create master layouts (slide, template, and notes), types of views (basic, presentation, slide slotter, note etc.), Inserting – background, textures, design templates, hidden slide. Auto content wizard, slide transition, custom animation, auto rehearsing.	6

Keywords/Tags:

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Remark:			
Part C- Learning Resources			
Text Books, Reference Books, Other resources			
Suggested Readings: • https//:www.youtube.com/watch>v=Zv3XMBb3V6A • https//:www.digimat.in/nptel/courses/video/121106007/L12.html • https//:www.webucator.com/how-to/how-use-main-merge-microsoft-word.cfm • https//:support.microsoft.com/en-us/office/create-pivottable-or-pivotchart-views-in-an-access-desktop-database-83e524df-456d-9dd0-0a48c1aa6752 • https//:support.microsoft.com/en-us/office/create-a-pivottable-to-analyze-worksheet-data-a9a8453-bfe9-40a9-a8e9-f99134456576 **Suggested Readings:** • Microsoft office 97: Will train, Ginicourter,Annette marquis, BPB publication. • MS Office 2000 for everyone: Saxenasanjay, s schnd • Writer's Guide to Microsoft word: Karri Holloway • Access 2016 Bible: Michael Alexander, Richard Kusleika • Excel 2019: Greg Harvey • Microsoft PowerPoint Made easy: Chris smith			
Part D- Assessment and Evaluation (Theory)			
Maximum Marks: 100 Continuous Comprehensive Evaluation (CCE) 25 Marks University Exam (UE) 75 Marks Time: 02:00 hours			
Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment /Presentation	**15** **10** **Total marks: 25**	
External Assessment: University Exam (UE) Time: 02.00 Hours	**4 Marks**	**Section (A):** Three very Short Questions (50 Words Each) **Section (B):** Four Short Questions (200 Words Each) **Section (C):** Two Long Questions (500 Words Each)	03 x 03 = 09 04 x 09 = 36 02 x 15 = 30 **Total Marks: 75**

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Part A Introduction			
Program : Certificate	Class : BCA I Year	Year : 2021	Session : 2021-2022

1	**Course Code**	S1-COAP2R	
2	**Course Title**	MS OFFICE (Practical)	
3	**Course Type (Core Course/Elective/Generic Elective/Vocational)**	Generic Elective	
4	**Pre-Requisite (if any)**		
5	**Course Learning outcomes (CLO)**	On the completion of this course student will be able: • To use keyboard shortcuts to perform tasks. • To create a new document, open, save and print a document. • To edit and format text, change the page layout, background and borders. • To modify power point custom template presentation. • To insert clip art and pictures to documents. • To navigate the start menu to locate programs, files, and settings & create files and folders. • To create a word document with customized template.	
6	**Credit Value**	**Theory – 2 Credits**	
7	**Total Marks**	Max. Marks : 25+75	Min. Marks : 33

Part B – Content of the Course
MS Office (Practical)

No. of Labs = 30 labs each of 2 hours duration(1 lab per week)

Practical lab will be conducted based on the theory syllabus

	List of Practical: 1. Create a document and apply different formatting options. 2. Design a greeting card using word art for different festivals. 3. Create your bio-data and use page borders and shading. 4. Create a document and insert header and footer, page title etc. 5. To create a document, set the margins, orientation, size, column, water mark, and page color and page borders. 6. Insert a table into the document. 7. Prepare a mark sheet of your class subjects. 8. Apply the creating, editing, saving, printing securing & protecting operations to an excel spreadsheets. 9. Prepare a bar chart & pie chart for analysis of five year results of your institute.	**6**

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	10. Work on following exercise on a workbook: A. Copy an existing sheet B. Rename the old sheet C. Insert a new sheet into an existing workbook D. Delete the renamed sheet. 11. Prepare an attendance sheet of 10 students for any 6 subjects of your syllabus calculate their total attendance, total percentage of attendance of each student & average of attendance. 12. Create a worksheet on students list of any 4 faculties and perform following database functions on it. A. Sort data by name B. Filter data by class C. Subtotal of no. students by class. 13. Apply themes and layouts to power point slides and insert pictures, graphics, shapes, and tables into presentations. 14. In power point slide make use of adding transitions and animation & working with master slides. 15. Create a excel worksheet and perform computations using available data and using mathematical functions chosen from menus.	

Keywords/Tags:

Remark:

Part C- Learning Resources

Text Books, Reference Books, Other resources

Suggested Digital platforms, web links:

- https//:www.youtube.com/watch>v=2v3XMBb3V6A
- https//:www.digimat.in/nptel/courses/video/121106007/L12.html
- https//:www.webucator.com/how-to/how-use-main-merge-microsoft-word.cfm
- https//:support.microsoft.com/en-us/office/create-pivottable-or-pivotchart-views-in-an-access-desktop-database-83e524df-456d-9dd0-0a48c1aa6752
- https//:support.microsoft.com/en-us/office/create-a-pivottable-to-analyze-worksheet-data-a9a8453-bfe9-40a9-a8e9-f99134456576

Suggested Readings:

- Microsoft office 97: Will train, Ginicourter,Annette marquis, BPB publication.
- MS Office 2000 for everyone: Saxenasanjay, s schnd
- Writer's Guide to Microsoft word: Karri Holloway
- Access 2016 Bible: Michael Alexander, Richard Kusleika
- Excel 2019: Greg Harvey
- Microsoft PowerPoint Made easy: Chris smith

Part D- Assessment and Evaluation (Theory)

Maximum Marks:	100
Continuous Comprehensive Evaluation (CCE)	25 Marks
University Exam (UE)	75 Marks

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Time: 02:00 hours			
Internal Assessment:	Marks	**External Assessment**	**Marks**
Class Interaction	**10**	**Viva voce on practical**	15
Attendance	**5**	**Practical record file**	10
Assignments (Charts/Seminar/ Technology Dissemination/ Report of Excursion / lab visits/ survey/ industrial visit	**10**	**Table work / experiments**	50
Total	**25**		75

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Part A Introduction			
Program:Certificate/Diploma/Degree	Class: 1 Year	Year:2021	Session:2021-22
Subject: NCC			

1	Course Code		
2	Course Title	NCC Awareness	
3	Course Type(Core course/Elective/Generic Elective/Vocational/...)	Elective	
4	Pre-requisite (if any)	To study this course ,a student must have passed 12th with any subject and must be medically fit. This course can be opted as an elective and it is open for all	
5	Course Learning outcomes(CLO)	The students will develop a sense of responsibility and there by display sense of patriotism, secular values, discipline, improve bearing and develop the quality of immediate and implicit obedience of good things.This paper will enable the students to build and develop leadership through communication. The significant relationship between personality traits and leadership will be achieved and executed.	
6	Credit value	04	
7	TotalMarks	Max.Marks: 25+75	Min.PassingMarks:33

Part B- Content of the Course

Total numbers of Lectures(in hours per week) :2hours per week

Total lectures:60Hours L-T-P (02-00-00)

Unit	Topics	No of

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		Lectures
I	**History of National Cadet Corps:** • National Cadet corps of Independent india • National Cadet corps Act,1948 • Motto of National Cadet corps • Aims and Objectives. • Emblem,NCCflag.NCC song. • Organization of NCC-Army.Navy and Air Wing. • Training centres of NCC	15
II	**Introduction to Defence Services** • Army, Navy and Air Force. • Organizational Structure in Charts • Regimental Structure: command and control • Badges and Ranks:Army, Navy,Air Force • Honors and Awards.	15
III	**Personality development:** • Introduction to personality development • Factors influencing and shaping the personality • Team work and team building, social skills, Etiquettes and manners, Decision making and problem solving, Change your mind set	15
IV	**Leadership:** • Introduction and typeof Leadership • Leadership traits • How to develop leadership. • Leadership case study(Field Marshal General Sam H.F.J.Manekshaw and General K.M Cariappa) **First Aid:** • Scope and objectives • First aid in common emergencies,Dressing of Wounds.	15

Part C- Learning Resources

Text Books, Reference Books, Other resources

Suggested Readings:

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S No	Name of Writers	Name of Book	Name of Publishers	Year of publication
1	Sabharwal,D.P	Personality Development	Finger print publishing,India	2015
2	Sabharwal,D.P	Personality Development(Hindi)	publishing,India	2021
3	Gurav, Aarti	50 Mantras of Personality Development	Buzzing stock Publishing	2013
4	Vasudeva, Sangeetha	Personality Development	Clever Fox publishing	2021
5	Kapoor ,Shikha	Personality Development and Soft skills	Dream Tech Press	2020
6	Sinha, Surya	Complete Personality Development course (Hindi)		2012
7	Agrawal,(Dr.) Vijay	Student and Personality Development (Hindi)	Benteen Books	2012
8	Shekhar,(Dr0. Priyanshu	Personality Development guide (Hindi)	PrabhatPrakashan	2016
9	Anand, Arunsagar	Personality Development Course (Hindi)	V & S Publication	2013
10	Sharma, Robin	Leadership Wisdom	Jaico publishing House	2003
11	Maxwell, John C	5-Levels of leadership	Cross liance	2014
12	Dravid,Rahul and Iyer,Prakash	The Secret of Leadership	Penguin ,India	2020
13	Dr. Bomi	The Leadership Handbook		2020
14	Bindra, Vivek	Everything about	Diamond Pocket	2018

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		Leadership	Books	
15	Carnegie,Dala	The Leader in you	Amazing reeds	2018
16	Subramanian,Ramesh and Ramiah,Ramkrishan	Leadership by Values	Notion Press	2020
17	Manivannan,C.andManivannan,T.Latha	Text Book of FirstAid and Emergency Nursing	EMMESS Medical Publishers	2020
18	Popli,Harvinder and Sharma, Nirmal	Emergency First aid Safety Oriented	CBS Publishers	
19	Jain,N>C>and Saakshi	First Aid and Emergency Case	AITBS Publishers	2019
20	Pippa,Dr.Keech	Practical Guide to First Aid	Anees Publishing House	
21	Gupta,RK	NCC National Cadet Corps(Hindi & English)	Ramesh Publication	2021
22		Hand Book of NCC	Kanti Publication, Itawa	2017
23		Hand Book of NCC an unique book for NCC Cadets	Naveen Publication	2019
24	Ranjan, Shashi and kumar,Aashish	Hand Book of NCC	Goodwin Publication	2021
25	Chauhan,Lt(Dr) Rajeev kumar	NCC National Cadet Corps	Aakriti publication	2021
26		Cadets Hand book	NCC Directorate M.p.& C.G	
27	Goyal,Hariom	Personality Development	KalpazPublication,India	

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28	Mitra,Barun K	Personality Development and Soft Skills	Oxford University Press India	
29	Mishra, Rajeev k	Personality Development-Transform Yourself	Rupa and Company India	

2.Suggestive digital platforms web links: 1. https://www.en.mwikipedia.org

2. https://www.firstaidforfree.com

Suggested equivalent online courses:

Part D- Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum marks: 100

Continuous Comprehensive Evaluation(CCE): 25 Marks University Exam (UE) 75 Marks

Internal Assessment: Continuous Comprehensive Evaluation(CCE): 25 Marks	Class Test Assignment/Presentation	15 10
External Assessment: University Exam Section:75 Time ; 02.00 Hours	**Section(A):**ThreeVery Short Questions(50 words Each) **Section(B):** Four Short Questions(200 Words Each) **Section(C):** Two Long Questions (500 Words Each)	03x03=09 04x09=36 02x15=30 Total 75

Any remarks/Suggestions: NIL

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Part A Introduction					
Program: **Certificate/Diploma/Degree**		**Class: 1 Year**	**Year:2021**	**Session:2021-22**	
Subject: NCC					
1	**Course Code**				
2	**Course Title**	**NCC Training**			
3	**Course Type(Core course/Elective/Generic Elective/Vocational/...)**	**Elective**			
4	**Pre-requisite (if any)**	To study this course ,a student must have passed 12th with any subject and must be medically fit. This course can be opted as an elective and it is open for all			
5	**Course Learning outcomes(CLO)**	Aim of the Course is to inculcate a sense of discipline, create self confidence and to create a human resource of organized,trained youth and to develop the quality of immediate and implicit the obedience of orders. Trained the youth to meet any medical emergency by giving aid.			
6	**Credit value**	02			
7	**TotalMarks**	Max.Marks: 25+75	Min.PassingMarks:33		
Part B- Content of the Course					
Total numbers of Lectures-Tutorials-Practical (in hours per week) :2hours per week **L-T-P:00-00-01**					
S.No	**Topics**			**No of Lectures**	**No of Tutorial**

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UNIT-I	Drill: General and Words of command:Attention,Stand at ease, Stand easy. Turning; Right turn,Left Turn and About turn.Sizing, Forming up in three ranks. Numbering and dressing of Troupe. Salute in Army,Navy and Air Force, Its description and training. Falling out and Dismissing.	15	
UNIT-II	Group Discussion on current topics and issues(National & internationals) • Public Speaking/Extempour • First Aid: Bandages and CPR	15	
	TOTAL	30	
Keywords/ Tags: Drill, Troupe,Salute,First aid, CPR			
Part C-Learning Resources			
Text Books,Reference Book, Other Resources			

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Suggested Readings:

S No	Writers	Name of Book	Name of Publishers	Year of publication
1	Ranjan,Shashi and kumar,Aashish	Hand book of NCC	Goodwin Publication	2021
2	Chauhan,Lt(Dr)Rajeev kumar	NCC National Cadet Corps	AakritiPublicaction	2021
3		Cadets Hand book	NCC Directorate M.p.& C.G	
4	Goyal, Hariom	Personality Development	KalpazPublication,India	
5	Mitra,Barun K	Personality Development and Soft Skills	Oxford University Press India	
6	Manivannan,C.andManivannan,T.Latha	Text Book of FirstAid and Emergency Nursing	EMMESS Medical Publishers	2020
7	Popli,Harvinder and Sharma, Nirmal	Emergency First aid Safety Oriented	CBS Publishers	
8	Jain,N>C>and Saakshi	First Aid and Emergency Case	AITBS Publishers	2019
9	Pippa,Dr.Keech	Practical Guide to First Aid	Anees Publishing House	
10	Gupta,RK	NCC National Cadet Corps(Hindi & English)	Ramesh Publication	2021
11		Hand Book of NCC	Kanti Publication, Itawa	2017
12		Hand Book of NCC an unique book for NCC	Naveen Publication	2019

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		Cadets		
2.Suggestive digital platforms web links: 1. https://www.en.mwikipedia.org 2. DG NCC TRAINING APP.				
Part D- Assessment and Evaluation				
Suggested Continuous Evaluation Methods:				
Internal Assessment	Marks	External Assessment	Marks	
Class Interaction/Quiz	10	Viva Voce on Practical	15	
Attendance	05	Practical Record File	10	
Assignments	10	Table Work /Experiments	50	
TOTAL	25		75	
Any remarks/Suggestions				

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Part A : Introduction			
Program:- **Certificate/Diploma/Degree/ Course**	**Class: 1 Year**	**Year:2021**	**Session:2021-22**
Subject: National Service Scheme (NSS)			

1	**Course Code**	NSS101
2	**Course Title**	Concept of National Service Scheme
3	**Course Type**	Elective
4	**Pre-requisite (if any)**	To study this course,a student must have passed 12th with any subject. This course can be opted as an elective and it is open for all
5	**Course Learning outcomes(CLO)**	**Course Objective:-** 1. Main objective of syllabus is developing the personality and character of the students youth through voluntary community service.It will also help them understand the rich cultural service. It will also help them understand the rich cultural diversity of India and have pride through a better Knowledge of the Country. 2. Understand the community in which they work and their relation. 3. Identity the needs and problems of the community and involve them in problem-solving. 4. Develop capacity to meet emergencies and natural disasters. 5. Practice national integration and social harmony and. 6. Utilize their knowledge in finding practical solutions to individual and community problems. **Learning Outcome:-** To impart hands- on skills in Preparation. Theend of the papera student should be able to: 1. Understand the importance of having community problems and their solution. It might help in job opportunity in some Government approved NGOs, and Ministry of youth affairs and Sports.

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		2. The students can carry out basic information about Community, which in turn and be of great help in disaster management fields. 3. Students can also go for Social Community Courses, Opening opportunities in different social activity related department.	
6	**Credit Value**	**Theory -04**	
7	**Total Marks**	**Max.Marks: 25+75**	**Min.Passing Marks:33**

Part B- Content of the Course

Total numbers of Lectures(in hours per week) :2hours per week

Total lectures: 60 Hours

Unit	Topics	No of Lectures
I	**Introduction and Basic Concepts of NSS:** • History and Philosophy. • Aims and Objectives. • Emblem sign, NSS badge,NSS flag. • NSS song: LakshyaGeet, SadbhawnaGeet, RastriyeyuvaGeet. **Key Words:**-Concept of NSS.	15 Hours
II	**Organization of NSS, Regular Activities and Programmes:** • Organization structure of NSS. • Concept of regular activities. • Basis of adoption of village/ slums. • Methodology of conducting survey. • Calendar of NSS activities. • Maintenance of nss work diary. **Key Words:**- Regular Activities.	15 Hours
III	**Day camp,Special camp and Personality development:** • Various Demension of day camp. • Special camp at college/Unit level. • Other Camps: District level camp, University level camp,State level Leadership Training camp. • NIC camp, Sahshik activity camp, pre –RDC,RDCcamp.	15 HOurs

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	Key Words:- Youth Camping.	
IV	**Youth and volunteerism:** • Definition, Issues, challenges and opportunities for Youth. • Youth as an agent of social change. • Indian Tradition of volunteerism. • Needs and importance of volunteerism. • Motivation and constraints of volunteerism. **Key Words:**-Youth volunteerism.	15 Hours

Part C- Learning Resources	
Text Books, Reference Books, Other resources	
Suggested Reading Materials: 1. National Service Scheme Manual, Government of india. 2. TrainiringProgramme on national Programmescheme,TISS. 3. Orientation Courses for NSS programme officers, TISS. 4. Case material as Training Aid for field workers,Gurmeet Hans. 5. Social service opportunities in Hospitals, Kapil K. Krishan, TISS. 6. Social Problems in india, Ram Ahuja.	
Suggested equivalent online Courses: http://www.thebetterindia.com/140/national-service-scheme-nss htt://en.wikipedia.org/viki/national-service-scheme htt://nss.nic.in	
Part D- Assessment and Evaluation (Theory)	
Maximum Marks:	**100**
Continuous comprehensive Evaluation (CCE):	**25**
University Exam(UE):	**75**
Time: 02.00Hours	

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Internal Assessment: Continuous Comprehensive Evaluation (CCE):	Class Test	**15**
	Assignment/Presentation	**10**
	Total	**25**
External Assessment: University Exam	Section(A): Three Very Short Questions (50 words Each)	**03x03= 09**
	Section(B): Four Short Questions (200 words Each)	**04x09 =36**
	Section(C): Two Long Questions (500 words Each)	**02x15 =30**
	Total	**75**

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Part A : Introduction			
Program:- Certificate/Diploma/Degree/Course	Class: B.Sc.1 Year	Year:2021	Session:2021-22
Subject: National Service Scheme (NSS)			

1	Course Code	NSS102
2	Course Title	Project Tool of NSS
3	Course Type	Practical/ Project Work
4	Pre-requisite (if any)	To study this course ,a student must have passed 12th with any subject. This course can be opted as an elective and it is open for all
5	Course Learning outcomes(CLO)	**Course Objective:-** Each student Will Have the option to select two skill-areas out of the list based on the local conditions and opportunities, and will Prepare a report based on field situation. **Learning Outcome:-** To impart hands- on skills in Preparation. The end of the paper,a student should be able to: Project work of NSS will aim to enhance the employment potentiol of the NSS volunteers or, alternately to help them to job opportunities in government approved NGOs,ministry of youth Affairs and Sports.
6	Credit Value	Practical -02
7	Total Marks	Max.Marks: 25+75 Min.Passing Marks:33

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Part B- Content of the Practical Course	
Total numbers of Lectures (in hours per week) :2hours per week **Credits -02 (Total Lectures :30 Hours)**	
Scheme of Practical Examination :-	Max.Marks (25+75=100)
• Internal Assessment:- Marks-25 1. Class Interaction. (05)	Max.
• Quiz.	(05)
• Seminar.	(07)
• Assigments.	(08)
• External Assessment:- Marks-75	Max.
• Report of Regular Activities in the Society.	(15)
• Report of NSS Volunteerism.	(10)
• Report of Communication Skills.	(10)
• Report of Camping Activity .	(15)
• Report of Excursion/Training/Survey/Data Collection .	(10)
• Viva-Voce.	(05)
• Practical Record	(10)
List of Practical/ Project Activity:- **Communication Skill:-** Personality development, communications Skill development, Problem-Solving. **Key Words**- Communication skill project activity.	05
Youth and Community :- Adoption of slum, Survey of slum, Service of Slum, Identification of problems of slum areas. **Key Words-** Youth community project activity.	07 Hours
Youth and Health:- AIDS, Drugs and substance abuse, Home nursing, First Aid, Yoga as a tool for healthy lifestyle etc. **Key words**- Regular activity, project activity.	05 Hours

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Environmental Issues:- Natural disaster management, natural resource management,Rain water harvesting,Afforestation, Waste management etc. **Key words-** Natural resources/ disaster management project activity.	06 Hours
Awareness Programe :- Peer mentoring in preventing crimes, cyber crime and prevention ,juvenile justice,save girls child protection, Blood donation awareness,swacch Bharat abhiyan, Corona virus awareness etc. **Key Words-** Volunteerism awreness project activity.	07 Hours
Part C : learning Resources	
Text Books, Reference Books, Other resources	

Suggested Reading Materials:

- National Service Scheme Manual, Government of india.
- TraininingProgramme on national Programmescheme,TISS.
- Orientation Courses for NSS programme officers, TISS.
- Case material as Training Aid for field workers,Gurmeet Hans.
- Social service opportunities in Hospitals, Kapil K. Krishan, TISS.
- Social Problems in india, Ram Ahuja.

Suggested equivalent online Courses:

http://www.thebetterindia.com/140/national-service-scheme-nss

htt://en.wikipedia.org/viki/national-service-scheme

htt://nss.nic.in

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Sri Satya Sai
University of Technology and Medical Sciences
(Established under Govt. of M.P. Registered under UGC 2(F) 1956)

Ref. No.: SSSUtms/SoE/MCA/01 Date: 08-06-2020

Name of Faculty: **School of Engineering**

Name of Department: **Master of Computer Application**

The Board of Studies Committee Meeting of Department of Master of Computer Application (MCA) was conducted in online mode through Microsoft Team at 2:30 PM. On 08-06-2020, Following members were present.

1.	Dr. Rajeev Pandey UIT R.G.P.V. Bhopal	External Member
2.	Dr. Sanjay Sharma OIST Bhopal	External Member
3.	Mr. Arif Hakeem, Asst. Prof. (CSE)	Chairmen
4.	Dr. Jitendra Sheetlani Asst. Prof (MCA)	Member
5.	Mr. Kailash Patidar Asst. Prof. (CSE)	Member
6.	Mr. Harsh Lohiya, Asst. Prof. (CSE)	Member
7.	Mr. Manoj Verma, Asst. Prof. (IT)	Member
8.	Mr. Manoj Yadav Asst. Prof. (CSE)	Member
9.	Mr. Sudeesh Chouhan Asst. Prof. (CSE)	Member
10.	Mr. Narendra Sharma Asst. Prof. (CSE)	Member

Minutes of Meeting:

1. The Chairman of Board of Studies Committee welcomes and addressed the members and introduced external BOS Members to the Board.
2. Address by chair regarding the rationale for the proposal of Scheme and Syllabus based on **2 Year** Model for 1st to 2nd Semester.
3. Chairman of the Board of Studies explained the guidelines, commonalities, workshop to suit discipline requirements and uniqueness.
4. Proposed Scheme and syllabus 1st to 2nd Semester is presented by chair and following issue has been discussed and resolved.

I. Chairman of Board of Studies Committee expressed their concern about motivating students towards domain specific courses in 1st semester and 2nd semester courses like ecommerce, oracle and other advance courses.

II. Dr. Rajeev Pandey gathered the information and suggested to include some sensors based chapter as a part of curriculum keeping in view the utility of IOT in near future and increase the chances of job opportunities.

III. Contents of core electives course should be revisited keeping in view of present and future demand in Computer Application, suggested by Dr. Sanjay Sharma.

IV. Mr. Arif Hakeem gives their concern over Emerging and Enduring Fields, Areas identified for Additional Training, Emerging and Enduring Tools and Techniques required for the Computer Application Post Graduates to meet the global challenges in the next 10 to 20 years

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Keeping in view the suggestions of BOS member as above. The final syllabus is prepared and mailed to all. No BOS member raise any objection. Hence ,the syllabus and scheme of 1st and 2nd semester are hereby approved.

The Chairman thanks the member for cooperation, their suggestions and peaceful conduction of meeting.

Signature of All members (Including Chairman)

1.	Dr. Rajeev Pandey UIT R.G.P.V. Bhopal	External Member
2.	Dr. Sanjay Sharma OIST Bhopal	External Member
3.	Mr. Arif Hakeem, Asst. Prof. (CSE)	Chairmen
4.	Dr. Jitendra Sheetlani Asst. Prof (MCA)	Member
5.	Mr. Kailash Patidar Asst. Prof. (CSE)	Member
6.	Mr. Harsh Lohiya, Asst. Prof. (CSE)	Member
7.	Mr. Manoj Verma, Asst. Prof. (IT)	Member
8.	Mr. Manoj Yadav Asst. Prof. (CSE)	Member
9.	Mr. Sudeesh Chauhan Asst. Prof. (CSE)	Member
10.	Mr. Narendra Sharma Asst. Prof. (CSE)	Member

Chairman

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Scheme of Examination *w.e.f. 2020-21*

First Semester – MCA(Master in Computer Application))- 2 year Course

Sr No.	Sub Code	Subject Name	Max Marks (Theory Slots)			Max. Marks (Practical Slot)		Total	Periods per Week			Credits
			End Sem	Mid Sem	TW	End Sem	Internal assessment		L	T	P	
1	MCA-2101	Computer Fundamental & Programming in c	70	20	10	-	-	100	3	1	-	4
2	MCA-2102	Computer Organization & Architecture	70	20	10	-	-	100	3	1	-	4
3	MCA-2103	Software Engineering	70	20	10	-	-	100	3	1	-	4
4	MCA-2104	Discrete Mathematical Structure	70	20	10	-	-	100	3	1	-	4
5	MCA-2105	Business English & Communication	70	20	10	-	-	100	3	1	-	4
6	MCA-2106	Lab-I (Prog. Lab in c)	-	-	-	120	80	200	-	-	8	8
7	MCA-2107	Lab-II (Communication Lab)	-	-	-	30	20	50	-	-	2	2
Total			350	100	50	150	100	750	15	5	10	30

L: Lecture- T: Tutorial- P: Practical

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Scheme of Examination *w.e.f. 2020-21*

Second Semester – MCA(Master in Computer Application))- 2 year Course

Sr No.	Sub Code	Subject Name	Max Marks (Theory Slots)			Max. Marks (Practical Slot)		Total	Periods per Week			Credits
			End Sem	Mid Sem	TW	End Sem	Internal assessment		L	T	P	
1	MCA-2201	Programming in C++	70	20	10	-	-	100	3	1	-	4
2	MCA-2202	Database Management System	70	20	10	-	-	100	3	1	-	4
3	MCA-2203	Operating System	70	20	10	-	-	100	3	1	-	4
4	MCA-2204	Theory of Computation & Algorithm	70	20	10	-	- 20	100	3	1	-	4
5	MCA-2205	E-Commerce & Governance	70	20	10	-	-	100	3	1	-	4
6	MCA-2206	Lab-III (Programming in C++)	-	-	-	120	80	200	-	-	8	8
7	MCA-2207	Lab-IV (DBMS (ORACLE/MY SQL))	-	-	-	30		50	-	-	2	2
Total			350	100	50	150	100	750	15	5	10	30

L: Lecture- T: Tutorial- P: Practical

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2101	COMPUTER FUNDAMENTAL AND PROGRAMMING IN C	3	1	0	4	4

COURSE PREAMBLE: The subject provides the basic knowledge of Programming to understand the various disciplines of Computer Programming. This knowledge area consists of those skills and concepts that are essential to problem-solving and programming practice independent of the underlying paradigm. Student will learn various concepts and techniques for problem-solving and will implement those ideas using C programming.

COURSE OUTCOMES:

At the end of the Course, the student will be able:

- To design Software and program in C Language.
- To understand the flow and working principle of programming in C.
- To understand Function, Array, Pointer and union in C programming.

UNIT-I

Computer: Definition, Classification, Organization i.e. CPU, register, Bus architecture, Instruction set, Memory & Storage Systems, I/O Devices, and System & Application Software. Computer Application in eBusiness, Bio-Informatics, health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc. Operating System: Definition, Function, Types, Management of File, Process & Memory.

UNIT-II

Introduction to programming & Basics of C: Fundamentals of Programming languages Generation of languages, Algorithm and Flowcharts.

History of C; Structure of a C Program Concepts of Algorithm and Flowcharts, Process of compilation, Basic features of C Language like Identifier, Keywords, Variable, data types, Operators and Expression. Basic screen and keyboard I/O

UNIT-III

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Control Statements: Test Conditions, Conditional execution and selection, Iteration and Repetitive Executions, Nested loops. Arrays: Introduction to contiguous data types. One dimensional arrays, multidimensional arrays, Array as strings, multidimensional character arrays. Operations on strings.

UNIT-IV

Functions: Concept of modular programming, Using functions, Scope of data, Recursive functions. Command line arguments. Pointers: Need of pointer, Types and uses of pointer, Array and Pointers. Pointers and strings, Pointer to Pointer, Pointers and functions, other aspect of pointers.

UNIT-V

Dynamic memory management: dynamic memory management functions like malloc( ), calloc( ), free( ); User Defined Data Types: Introduction to structures, usage of structure, nested structures, Union and its usage, Enumeration types, bit fields.

Miscellaneous Features: File handling and related functions; printf & scanf family;C preprocessor – basics, #include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef; Variable argument list functions.

Reference Books:

1.Programming in ANSI C, by Balagurusamy, Publisher - Tata McGraw Hill.
2. Computer Science: A Structured Programming Approach Using C, by Behrouz A. Forouzan & Richard F. Gilberg, Publisher - Thomson Education.
3. Programming with ANSI and Turbo C, by Ashok N Kamthane, Publisher – Pearson Education.
4. Let us C, by Yashwant Kanitkar, Publisher – BPB Publication

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2102	COMPUTER ORGANIZATION AND ARCHITECTURE	3	1	0	4	4

COURSE PREAMBLE: In the modern era, computer system is used in most aspects of life. You may use many different types of software on a computer system for particular applications ranging from simple document creation to space data processing. But, how does the Software Is executed by the Computer Hardware? The answer to this basic question is contained in this Course.

COURSE OUTCOMES:

At the end of the Course, the student will be able:

- To design digital circuits by simplifying the Boolean functions.
- To understand the organization and working principle of computer hardware components.
- To understand mapping between virtual and physical memory.

Unit-I

Information Representation: Number systems, BCD codes, error detecting and correcting codes. Binary arithmetic operations, Booths multiplication. Binary Logic: Boolean algebra, Boolean functions, truth tables, canonical and standard forms, simplification of Boolean functions, digital logic gates. Encoders, decoders, multiplexers, de-multiplexers and comparators.

Unit II

Memory organization: Secondary Memory, Primary Memory :Random access memory, Read Only memory basic cell of static and dynamic RAM, Building large memories using chips, Concept of segmentation & Paging, Associative memory, cache memory organization, virtual memory organization.

UNIT-III

Architecture of a simple processor: A simple computer organization and instruction set, instruction formats, addressing modes, instruction cycle, instruction execution in terms of microinstructions, interrupt cycle ,concepts of interrupt and simple I/O organization, Synchronous & Asynchronous data transfer, Data Transfer Mode : Program Controlled, Interrupt driven, DMA(Direct Memory Access). Implementation of processor using the building blocks.

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UNIT-IV

Register Transfer Language and Micro-operations: concept of bus, data movement among registers, a language to represent conditional data transfer, data movement from/to memory. Design of simple Arithmetic & Logic Unit & Control Unit, arithmetic and logical operations Along with register transfer, timing in register transfer.

UNIT-V

Processor Design: -Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

Reference Books:

1. Computer System Architecture, Morris Mano, PHI
2. Computer Organization, Hamacher, MGH
3. Computer Architecture, Carter, Schaum Outline Series, TMH
4. System Architecture, Buad, VIKAS
5. The Fundamentals of Computer Organization, Raja Rao, Scitech
6. Computer Organization & Design, Pal Chowdhury, PHI

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2103	SOFTWARE ENGINEERING	3	1	0	4	4

COURSE PREAMBLE: This Software engineering deals with the Software development process models, planning the Software Project and many analyses related to development of software. The objectives of this Course are to make the learner efficiently work as software engineer. S/he should be well acquainted with all the phases of Software Development Life Cycle. The learner should be able to apply the concepts learned for doing research.

COURSE OUTCOMES:

At the end of the Course, the student will be able:

- To get an insight into the processes of software development
- To Model software projects into high level design using DFD,UML diagrams
- To Measure the product and process performance using various metrics

Unit I

The Software Product and Software Process: Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics.

Unit II

Requirement Elicitation, Analysis, and Specification Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability.

Unit III

Software Design The Software Design Process, Design Concepts and Principles, Software Modeling andUML, Architectural Design, Architectural Views and Styles, User Interface Design, Functionorlented Design, SA/SD Component Based Design, Design Metrics.

Unit IV

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Software Analysis and Testing Software Static and Dynamic analysis, Code inspections, Software Testing, Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, TestOracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit, Testing Frameworks, Integration Testing, System Testing and other Specialized, Testing, Test Plan, Test Metrics, Testing Tools. , Introduction to Object-oriented analysis, design and comparison with structured Software Engg.

Unit V

Software Maintenance & Software Project Measurement Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support, Project Management Concepts, Feasibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance(SQA). Project Plan, Project Metrics.

Reference Books:

1. Pankaj Jalote ,"An Integrated Approach to Software Engineering", Narosa Pub, 2005
2. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning
3. R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition2006, McGraw-Hill.
4. Sommerville,"Software Enginerring",Pearson Education.
5. Richard H.Thayer,"Software Enginerring & Project Managements", WileyIndia
6. Waman S.Jawadekar,"Software Enginerring", TMH
7. Bob Hughes, M.Cotterell, Rajib Mall " Software Project Management", McGrawHill

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2104	DISCRETE MATHEMATICAL STRUCTURE	3	1	0	4	4

COURSE PREAMBLE: This is an introductory course in mathematics. This subject deals with the introduction to Set Relation, Function Possets, Hasse Diagram and Lattice and Graph. The objectives of this Course are the student Know the theory and their application of Math function in computer. Solve the different types of problems by applying theory and appreciate the important application of mathematics in Computer.

COURSE OUTCOMES:

At the end of the Course, the student will be:

- To understand, develop and solve mathematical Set theory.
- Able to design and solve Boolean functions for defined problems
- Apply the acquired knowledge of finite automata theory and design discrete problems to solve by computers.

UNIT-I

Discrete Numeric function and Recurrence relation: Introduction to discrete numeric functions and generating functions Introduction to recurrence relations and recursive algorithms, linear recurrence relations with constant coefficients, homogeneous solutions, particular solutions and total solutions

UNIT-II

Sets, Relations and Functions: Sets, Subsets, Power sets, Complement, Union and Intersection, De-Morgan's law Cartesian products, Relations, relational matrices, properties of relations, equivalence relation, functions ,Injection, Surjection and Bijective mapping, Composition of functions, the characteristic functions and Mathematical Induction.

UNIT-III

Proportions & Lattices: Proposition & prepositional functions, Logical connections Truth-values and Truth Table, the algebra of prepositional functions-the algebra of truth values-Applications (switching circuits, Basic Computer Components).

Partial order set, Hasse diagrams, upper bounds, lower bounds, Maximal and minimal element, first and last element, Lattices, sub lattices, Isotonicity, distributive inequality, Lattice homomorphism, lattice isomorphism, complete lattice, complemented lattice distribution lattice.

UNIT-IV

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Groups: Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, example and standard results, Rings and Fields: definition and standard results.

UNIT-V

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

Reference Books:

1. J.P.Trembley & R.P.Manohar "Discrete Mathematical Structure with applications to Computer Science".
2. Kenneth H. Rosen-203 "Discrete Math & its Applications" 5th ed.
3. K.A. Ross and C.R.B. Wright "Discrete Mathematics ".
4. Bernard Kolman & Robert C. Busby "Discrete Mathematical Structures for Computer Science"

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S.S.U.T.M.S. School of Engineering SEHORE (M.P.)

SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2105	BUSINESS ENGLISH & COMMUNICATION	3	1	0	4	4

COURSE PREAMBLE: Communicare effectively (Verbal and Non Verbal). The objectives of this Course are the Develop interview skills and Develop Leadership qualities and essentials of the student.

COURSE OUTCOMES:

- To understand, develop and solve problem in Communication.
- Improve Skill for communication
- Discussion of audio-visual

UNIT I

Spoken Skills:

Spoken Skills Preparing for oral presentation, conducting presentations, Listening: Barriers of Listening skill-Approaches to Listening –How to improve Listening exercises. Speaking: Paralanguage: Sounds, stress, Intonation- Art of conversation – Presentation skills – Public speaking- Expressing Techniques

UNIT II

Reading & Writing Skills:

Reading: Kinds of Reading – Causes of reading difficulties – Reading strategies - exercises. Writing: Effective writing – Paragraph ,Essay, Reports, Letters, Articles, Notices, Agenda & Minutes.

UNIT III

Communication:

Modes of Communication- Barriers – Interpersonal skills , Negotiation skills Non- Verbal communication – Etiquettes.

UNIT IV

Spoken Skills:

Group Dynamic skills: Group Discussion – Team building & Team work – Be a manager or leader – Decision making – creativity – Time & Stress management skills, Group Discussions. Group Discussions.

UNIT V

Media of Communication:

Interview skills: Types of Interviews – Preparing for interview – Preparing a CV – Structuring the interview, Mock Interview Quick Tips. Telephonic Conversation; Negotiations;.

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Reference Books:

1. Sanghi, Seema, Improve your communication skills. 2nd edition.
2. Burnard, Philip. Interpersonal skills Training: A source book of activities. 2005.
3. Ashley, Roderic. How to enhance your employability. 1998.
4. Dr. Alex, K. Soft sill: know yourself & know the world. 2010.
5. Cornerstone. Developing softskills. 4th edition 2005.
6. Jones, Daniel. An outline of English phonetics.
7. Aggarwal, Rohini. Business communication and Organization & Management.
8. Grath. E.H. Basic Managerial skills for all.
9. Maxwell, John C. Developing the leader within you.

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2106	LAB- I (PROG. LAB IN C)	0	0	8	4	8

COURSE PREAMBLE: To make the student learn a programming language. To learn problem solving techniques. To teach the student to write programs in C and to solve the problems.

COURSE OUTCOMES:

After Completion of this course the student would be able to

- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given algorithm.
- Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
- Write programs that perform operations using derived data types

List of Experiment

1. WAP to identify whether given number is prime or not.
2. WAP to identify whether given number is even or odd.
3. WAP to print whether given year is leap year or not.
4. WAP to find the sum of the digits of a number.
5. WAP to input 3 sides of triangle and identify the type of triangle.
6. WAP to input 5 digit numbers and find the sum of the first and last digit.
7. WAP to check whether the number is power of 2 or not.
8. WAP to find out GCD of two numbers.
9. WAP to check whether given number is perfect power of any natural number.
10. WAP to determine sum of odd series from 1 to N 6.
11. WAP to calculate factorial of a number.

Reference Books:

1. Kerninghan & Ritchie "The C programming language", PHI
2. Schildt "C:The Complete reference" 4th ed TMH.
3. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi
4. Kanetkar Y. "Let us C", BPB.

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Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2107	LAB- II (COMMUNICATION LAB)	0	0	2	1	2

COURSE PREAMBLE: To inform the learners how to write clearly and logically.

COURSE OUTCOMES:

After Completion of this course the student would be able to

- Understand doing self-introspection and self-vigilance
- Achieve high quality of life, strength and sovereignty of a developed nation
- Understand the importance of writing skills and its techniques
- Envision the dangers of scientific and technological innovations
- Improve the exposure to universal happenings
- Communicate the necessity to exercise humour in the daily life

List of Experiments:-

1. Listening Comprehension.
2. Pronunciation, Intonation, Rhythm
3. Practicing everyday dialogues in English
4. Interviews.
5. Formal Presentation
6. Report Writing

Reference Books

1. Effective Technical Communication by Barun K. Mitra. Oxford Univ. Press, 2006, New Delhi
2. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., New Delhi.
3. How to Build Better Vocabulary by.M.Rosen Blum, Bloomsbury Pub. London.
4. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors; Delhi India Ltd. Delhi.
5. Manual of Practical Communication by L.U.B. Pandey & R.P. Singh; A.I.T.B.S. Publications India Ltd.; Krishan Nagar, Delhi.

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2201	PROGRAMMING IN C++	3	1	0	4	4

COURSE PREAMBLE: The objective of course is to develop programming skills of students, using object oriented programming concepts, learn the concept of class and object using C++ and develop classes for simple applications.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Identify importance of object oriented programming and difference between structured oriented and object oriented programming features.
- Able to make use of objects and classes for developing programs.
- Able to use various object oriented concepts to solve different problems.

UNIT-I

Introduction: Comparison of C and C++, Cout, Cin, Data Type, Type Conversion, Control Statement, Loops, Arrays and string arrays fundamentals, Function, Returning values from functions, Reference arguments, Overloaded function, Inline function, Default arguments, Returning by reference.

UNIT-II

Object and Classes: Implementation of class and object in C++, access modifiers, object as data type, constructor, destructor, Object as function arguments, default copy constructor, parameterized constructor, returning object from function, Structures and classes, Classes objects and memory, static class data, Arrays of object, Arrays as class Member Data, The standard C++ String class, Run time and Compile time polymorphism.

UNIT-III

Operator overloading and Inheritance: Overloading unary operators, Overloading binary operators, data conversion, pitfalls of operators overloading, Concept of inheritance, Derived class and base class, access modifiers, types of inheritance, Derived class constructors, member function, public and private inheritance.

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UNIT-IV

Pointer and Virtual Function: Addresses and pointers, the address-of operator & pointer and arrays, Pointer and Function pointer, Memory management: New and Delete, pointers to objects, debugging

pointers, Virtual Function, friend function, Static function, friend class, Assignment and copy initialization, this pointer, dynamic type information

UNIT-V

Streams and Files: Streams classes, Stream Errors, Disk File I/O with streams, file pointers, error handling in file I/O with member function, overloading the extraction and insertion operators, memory as a stream object, command line arguments, printer output, Function templates, Class templates Exceptions, Containers, exception handling.

REFERENCES:

1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore; Galgotia
3. Balagurusamy; Object oriented programming with C++; TMH
4. Herbert Shildt, "The Complete Reference C++", Tata McGraw Hill publication

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2202	DATABASE MANAGEMENT SYSTEM	3	1	0	4	4

COURSE PREAMBLE: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Upon successful completion of this course, students should be able to:
- Describe the fundamental elements of relational database management systems
- Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
- Design ER-models to represent simple database application scenarios

UNIT-I

Basic Concepts: - DBMS Concepts and architecture, Introduction, Review of file organization techniques, Database approach v/s Traditional File accessing approach, Advantages of database systems, Data models, Schemas and instances, Data Independence, Functions of DBA and designer, Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database,

UNIT-II

Data models and Relational Databases: - Various data models, Basic concepts of Hierarchical data model, Network data model, and Relational data model, Comparison between the three types of models, Relational Data models: - Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension,

UNIT-III

Relational Query languages & SQL: - Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. SQL: - Data definition in SQL, update statements and views in SQL, QUEL & QBE, Data storage and definitions, Data retrieval queries and update statements.

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UNIT-IV

Database Design:- Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multi-valued dependencies.

UNIT-V

Advance Concepts:- Introduction of Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery and transaction processing, basic concepts
of object oriented data base system and design.

References:

1. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3. Toledo; Data base management systems;TMH
4. Panneeselvam "Database Management System" PHI
5. Date C J, "An Introduction To Database System", Addision Wesley
6. Ashutosh Kumar Dubey "Data Base Management Concepts" Katson Publication

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Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2203	**OPERATING SYSTEM**	**3**	**1**	**0**	**4**	**4**

COURSE PREAMBLE: To learn the fundamentals of Operating Systems. Mechanisms of OS to handle processes and threads and their communication mechanisms involved in memory management in contemporary OS. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Students demonstrate an ability to analyze a problem, identify and define the computing requirements appropriate to its solution.
- Students demonstrate an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

UNIT-I

Introduction: Evolution of operating systems (History of evolution of OS with the generations of computers), Types of operating systems, Multitasking, Timesharing, Multithreading, Multi programming and, Real time operating systems, Different views of the operating system.

UNIT-II

Processes: The Process concept, The process control block, Systems programmer's view of processes, Operating system services for process management, Scheduling algorithms, First come first serve, Round Robin, Shortest run time next, Highest response ratio next, Multilevel Feedback Queues, Performance evaluation of scheduling algorithms stated above.

UNIT-III

Memory Management : Memory management without swapping or paging, Concepts of swapping and paging, Page replacement algorithms namely, Least recently used, Optimal page replacement, Most recently used, Clock page replacement, First in First out (This includes discussion of Belady's anomaly and the category of Stack algorithms), Modeling

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paging algorithms, Design issues for paging system, Segmentation, Segmented Paging, Paged Segmentation.

UNIT-IV

Deadlocks: Concepts of deadlock detection, deadlock prevention, deadlock avoidance. Banker's Algorithm Inter-process Communication and Synchronization: The need for inter-process synchronization, Concept of mutual exclusion, binary and counting semaphores, hardware support for mutual exclusion.

UNIT-V

Disks: Disk hardware, Disk scheduling algorithms (namely First come first serve, shortest seek time first, SCAN, C-SCAN, LOOK and C-LOOK algorithms) Error handling, track-at-a-time caching, RAM Disks. Clocks: Clock hardware, memory-mapped terminals, I/O software.

Reference Books:

1.Galvin P.L.Abraham Silberschatz. "Operating System Concepts". John Wiley & Sons Company.

2. William Scallings "Operating Systems" , Prentice Hall of India Pvt. Ltd.
3. Joshi R.C. "Operating System" Wiley India

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2204	THEORY OF COMPUTATION & ALGORITHM	3	1	0	4	4

COURSE PREAMBLE: To make the students aware of and well-groomed in the use of the tools & Techniques of designing and analyzing algorithms and to understand Regular languages, Context free grammar, Use the Turing machine and an un-decidable problem

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Apply the acquired knowledge of finite automata theory and design discrete problems to solve by computers.
- Understand and implement the features DFA, NFA, Transition systems and Conversion of NDFA to DFA.

UNIT – I

Theory of automata: Theory of automata, Strings Alphabets and language, Finite state systems, Deterministic finite automata with moves, Two way finite automata, finite automata with output, Mealy & Moore machines

UNIT – II

NFA and DFA: Description, DFA,NFA, Transition systems, Conversion of NDFA to DFA. Removal of ∈ transition from ∈ – NDFA, Pumping lemma for regular set, Closure properties of regular set, Decision algorithm for Regular set, Myhill - Nerode theorem and initialization of finite automata Regular Expression and Language.

UNIT – III

Regular languages: Context free grammar, Chomsky Normal form, Greibach Normal form, Pumping lemma for CFL, Application for CFL of Pumping lemma. Closure properties of CFL, CYK algorithm, YACC, Introduction to LR grammar.

UNIT – IV

Pushdown automata: Informal description Definition Equivalence of PDA's and CFL's Prop Turning machine construction. Modification of turning machine.

UNIT – V

Undecidability Universal turing machine and an undecidable problem Rice theorem, Greibach theorem, Recursion finite theory, Chomsky hierarchy, Unrestricted Grammar, Context sensitive Language Computational Complexity theory, Intractable problem.

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Reference Books

1. Introduction to Automata Theory Language and Computation, By John E. Hopcraft & Jeffary D. Ullman
2. Introduction to Automata Theory Language and Computation By John E. Hopcraft Jeffary D. Ullman & Rajeev Motwani.
3. Theory of Computer Science K.L.P. Mishra, N. ChandraShekaran.

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SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2205	E-COMMERCE & GOVERNANCE	3	1	0	4	4

COURSE PREAMBLE: The primary objective for most ecommerce teams is to generate revenue – to be very efficient at selling through understanding complex consumer behavior to maximize conversion rates; and up-sell and cross-sell products and services to maximize value over the lifetime of the customer.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- To protect and promote the interest of trade, commerce and industry.
- To unite people engaged in trade, commerce and industry for concerted action to protect and promote their common interests.
- To take interest in and formulates it's view matters directly or indirectly affecting the business community.

Unit I

Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal; environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

Unit II

Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, Introduction to m-commerce, case study: e-commerce in passenger air transport.

Unit III

E-Government, theoretical background of e-governance, Issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

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Unit IV

E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nation wide networking in e-governance, e-seva.

Unit V

E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

Reference Books:

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2.C.S.R. Prabhu, "E-governence: concept and case study", PHI Learning Private Limited.
3.V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4.David Whiteley, "E-commerce study , technology and applications", TMH.

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SCHOOL OF ENGINEERING

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Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2206	LAB-III (PROGRAMMING IN C++)	0	0	8	4	8

COURSE PREAMBLE: The primary objective for Programming in C++ is to Introduces the principles of data abstraction, class, inheritance and polymorphism, principles of virtual functions .

COURSE OUTCOMES:

At the end of the Course, the student will be able

Ability to develop applications for a range of problems using Programming in C++ techniques.

LIST OF EXPERIMENTS:-

1. Write a program to find minimum of three numbers using conditional operator.
2. Write a program to swap two numbers (call by reference)
3. Write a program to find the product of two matrices.
4. Write a program to arrange the array elements in ascending order.
5. Write a program to count number of words, characters, vowels in a given string.
6. Write a program to declare a class. Declare pointer to class. Initialize and display the contents of the class member.
7. Write a program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.
8. Write a program to overload unary operator using friend function.
9. Write a program to overload – operator.
10. Write a program to invoke Constructor and Destructor.

Reference Books:

1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore; Galgotia
3. Balagurusamy; Object oriented programming with C++; TMH
4. Herbert Shildt, "The Complete Reference C++", Tata McGraw Hill publication

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SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2207	LAB-IV (DBMS (ORACLE/MY SQL))	0	0	2	1	2

COURSE PREAMBLE: The primary objective for DBMS (ORACLE/MY SQL) lab to explain basic database concepts, applications, data models, schemas and instances.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Apply the basic concepts of Database Systems and Applications.
- Use the basics of SQL and construct queries using SQL in database creation and interaction. Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
- Analyze and Select storage and recovery techniques of database system.

LIST OF EXPERIMENTS:-

1. Study of DBMS, RDBMS and ORDBMS.
2. To study Data Definition language Statements.
3. To study Data Manipulation Statements.
4. Study of SELECT command with different clauses.
5. Study of SINGLE ROW functions (character, numeric, Data functions).
6. Study of GROUP functions (avg, count, max, min, Sum).
7. Study of various type of SET OPERATORS (Union, Intersect, Minus).
8. Study of various type of Integrity Constraints.
9. Study of Various type of JOINS.
10. To study Views and Indices

Reference Books:

1. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley.
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill.
3. Toledo; Data base management systems; TMH.
4. Ashutosh Kumar Dubey "Data Base Management Concepts" Katson Publication.

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(Established under Govt. of M.P. Registered under UGC 2(F) 1956)

Ref. No.: SSSUTMS/SOE/MCA/03 Date: 10/06/2021

Name of Faculty: School of Engineering

Name of Department: Masters of Computer Application

Minutes of Board of Studies Committee Meeting Dated on 10-06-2021

The Board of Studies Committee of Department of Masters of Computer Application (MCA) was conducted in online mode through google meet at 2:30 PM. on 10-06-2021, Following members were present.

1. Dr. Rajeev Pandey, UIT, R.G.P.V. Bhopal
2. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal
3. Mr. Arif Hakeem, Asst. Prof., Chairman
4. Mr. Manoj Verma, Assi. Prof., Member
5. Mr. Harsh Lohiya, Assi. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

The Chairman of Board of Studies Committee welcomes and appreciated the efforts put up by the faculty for progress of the departmental activities. The following Agenda points were discussed and resolved.

Agenda:

Preparation of Scheme and Syllabus of MCA based on **2 Year Model** for III & IV sem.

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Ref. No.: SSSUTMS/SOE/MEM/03 Date: 10/10/2014

Discussion Scheme & Syllabus

Scheme and Syllabus was put before the members as per AICTE guidelines, met the current demand in industry, it was discussed in details by the members and some modifications were suggested.

Resolution of the Discussion:

It was resolved that Scheme and Syllabus for III & IV Sem. Following AICTE guidelines and which also met the current demand in industry should be modified and may be accepted.

The Chairman thanks the members for peaceful conduction of meeting.

Signature of All members (Including Chairman)

1. Dr. Rajeev Pandey, UIT. R.G.P.V. Bhopal
2. Dr. Uday Chourasia, UIT, R.G.P.V. Bhopal
3. Mr. Arif Hakeem, Asst. Prof., Chairman
4. Mr. Manoj Verma, Asst. Prof., Member
5. Mr. Harsh Lohiya, Asst. Prof. Member
6. Mr Gaurav Saxena, Asst. Prof., Member
7. Mr. Rishi Khushwah, Asst. Prof., Member
8. Mr. Kailash Patidar, Asst. Prof., Member
9. Mr. Manoj Yadav, Asst. Prof., Member
10. Mr. Harsh Pratap, Asst. Prof., Member
11. Mr. Sudeesh Chouhan, Asst. Prof., Member
12. Mr. Narendra Sharma, Asst. Prof., Member

Chairman

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Scheme of Examination *w.e.f. 2020-21*

Third Semester– MCA(Master in Computer Application) - 2 year Course

S.No.	Sub Code	Subject Name	Periods per Week			Credits	Max Marks Theory			Max. Marks Practical		Total Marks
			L	T	P		End Sem Exam	Mid Sem	TW	End Sem Practical / Viva	Practical Record/Quiz/ Assignment/ Presentation	
1	MCA-2301	Data Structure	3	1	-	4	70	20	10	-	-	100
2	MCA-2302	Computer Networks & Data Communication	3	1	-	4	70	20	10	-	-	100
3	MCA-2303	Computer Graphics & Multimedia	3	1	-	4	70	20	10	-	-	100
4	MCA-2304	Elective-I	3	1	-	4	70	20	10	-	-	100
5	MCA-2305	Elective-II	3	1	-	4	70	20	10	-	-	100
6	MCA-2306	Minor Project	-	-	8	8	-	-	-	120	80	200
7	MCA-2307	Programming Lab (Data Structure & Computer Graphics) and (JAVA/DOT NET/WEB Technology)	-	-	2	2	-	-	-	30	20	50
TOTAL			15	5	10	30	350	100	50	150	100	750

Elective-I **A) Compiler Design** **B) Distributed Computing** **C) Theory Of Computation**
Elective-II **A) JAVA** **B) DOT Net** **C) Web Technology**

L: Lecture- T: Tutorial- P: Practical

w.e.f. July- 2021

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Scheme of Examination

Fourth Semester - MCA (Master of Computer Application)

S.No.	Sub Code	Subject Name	Periods per Week			Credits	Max Marks Theory			Max. Marks Practical		Total Marks
			L	T	P		End Sem Exam	Mid Sem	TW	End Sem Practical/ Viva	Practical Record/Quiz /Assignment / Presentatio	
1	MCA-2401	Python	3	1	-	4	70	20	10	-	-	100
2	MCA-2402	Elective-III	3	1	-	4	70	20	10	-	-	100
3	MCA-2403	Elective-IV	3	1	-	4	70	20	10	-	-	100
4	MCA-2404	Major Project	-	-	16	16	-	-	-	240	160	400
5	MCA-2405	Programming Lab (Python)	-	-	2	2	-	-	-	30	20	50
TOTAL			9	3	18	30	350	100	50	150	100	750

L: Lecture- T: Tutorial- P: Practical

Elective-III A) Artificial Intelligence B) Cloud Computing C) Data Warehouse & Mining

Elective-IV A) Machine Learning B) IoT C) Data Science & Big Data

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

MCA-2301 DATA STRUCTURE

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2301	DATA STRUCTURE	3	1	0	4	4

COURSE PREAMBLE: This course provides an introduction to the basic concepts and techniques of Linear and nonlinear data Structures and Analyze the various algorithm.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Identify user defined data types, linear data structures for solving real world problems.
- Write modular programs on nonlinear data structures and algorithms for solving engineering problems efficiently.
- State what is an undirected graph, directed graph and apply BFS and DFS to traverse a graph

UNIT-I

Review of C programming language. Introduction to Data Structure: Concepts of Data and Information. Classification of Data structures, Abstract Data Types, Implementation aspects: Memory representation. Data structures operations and its cost estimation. Introduction to linear
data structures- Arrays, Linked List: Representation of linked list in memory, different implementation of linked list. Circular linked list, doubly linked list, etc. Application of linked list: polynomial manipulation using linked list, etc.

UNIT-II

Tree: Definitions - Height, depth, order, degree etc. Binary Search Tree - Operations. Traversal, Search. AVL Tree, Heap, Applications and comparison of various types of tree; Introduction to forest, multi-way Tree, B tree, B+ tree, B* tree and red-black tree.

UNIT-III

Stacks: Stacks as ADT, Different Implementation of stack, multiple stacks. Application of Stack: Conversion of infix to postfix notation using stack, evaluation of postfix expression, Recursion.

Queues: Queues as ADT, Different implementation of queue, Circular queue, Concept of queue and Priority Queue, Queue simulation, Application of queues.

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UNIT-IV

Graphs: Introduction, Classification of graph: Directed and Undirected graphs, etc, Representation, Graph Traversal: Depth First Search (DFS), Breadth First Search (BFS), Graph algorithm: Minimum Spanning Tree (MST)- Kruskal, Prim"s algorithms. Dijkstra"s shortest path algorithm; Comparison between different graph algorithms. Application of graphs.

UNIT-V

Sorting: Introduction, Sort methods like: Bubble Sort, Quick sort, Selection sort, Heap sort, Insertion sort, Shell sort, Merge sort and Radix sort; comparison of various sorting techniques. Searching: Basic Search Techniques: Sequential search, Binary search, Comparison of search methods. Hashing & Indexing. Case Study: Application of various data structures in operating system, DBMS etc.

Text Books

1. AM Tanenbaum, Y Langsam& MJ Augustein, "Data structure using C and C++", Prentice Hall India.
2. Robert Kruse, Bruse Leung, "Data structures & Program Design in C", Pearson Education.

Reference Books

1. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education.
2. N. Wirth, "Algorithms + Data Structure = Programs", Prentice Hall.
3. Jean – Paul Trembly , Paul Sorenson, "An Introduction to Structure with application", TMH.
4. Richard, GilbergBehrouz, Forouzan ,"Data structure – A Pseudocode Approach with C", Thomson press.

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Programme : Master of Computer Application (MCA) - 2 Year Course

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MCA-2302 COMPUTER NETWORKS & DATA COMMUNICATION

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2302	COMPUTER NETWORKS & DATA COMMUNICATION	3	1	0	4	4

COURSE PREAMBLE: This course is to provide students with an overview of the concepts and fundamentals of computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Understand the basics of data communication, networking, internet and their importance.
- Analyze the services and features of various protocol layers in data networks.
- Analyze TCP/IP and their protocols.
- Recognize the different internet devices and their functions.

UNIT-I

Introduction: Computer Network, Use of computer networks; Type of networks; Network software: protocol hierarchies. Design; issues for the layers, interface and services, types of services, services primitives; Reference models: The OSI reference model, TCP/IP reference model. Example networks: The Internet, Novel Netware, Window NT.

UNIT-II

Physical layer: Transmission media: magnetic media, Twisted pair, Base band / broadband coaxial cable, fiber optics; Analog, digital, wireless transmission; Transmission and switching; ISDN system architecture, Satellite versus fiber; Terminal handling. The Data link layer Design Issues: services provided, framing, Error control, flow control; Error detection and correction; Error correcting codes, Error detecting codes; Elementary data link protocols: Unrestricted simplex, simplex stop and wait, simplex protocol for noisy channels; sliding window protocols: one bit, go back n, selective repeat; DLL in the Internet.

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UNIT-III

Medium access sub layer: Static/dynamic channel a llocation in LANs and MANs; multiple access protocols: ALOHA, carrier sense, collision free, limited contention, wireless LAN; IEEE standard 802 for LANs and MANs: Ethernet; token bus, token ring, comparison of 802.3, 802.4, 802.5; Bridges: bridges from 802.x and 802.y, Transparent bridges, High speed LANs.

UNIT-IV

Network Layer: Design Issues, Internet organization of network layer; Rating algorithms: optimality principle, shortest path, flooding, Flow - bared, hierarchical, multicast, broadcast; congestion control algorithms: General principle, prevention, Traffic shaping, choke packets, load shading etc.; Internetworking: How network differ, connectionless internetworking, Tunneling, internetworking, fragmentation, firewalls; Network layer in the Internet: IP protocol, IP address, subnets, OSPF, BGP, FTP, telnet, email. etc

UNIT-V

Network Programming: Basically Sockets : Overview, Unix Domain Protocols, Overview, Unix Domain Protocols, socket-address, socket-system calls, reserved ports, passing file descriptions, I/O asynchronous & multiplexing, socket implementations.

References:

1. A.S.Tanenbaum, "Computer Network", 4th addidon, PHI
2. Forouzan "Data Communicadon and Networking 3ed", TMH

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Programme : Master of Computer Application (MCA) - 3 Year Course

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MCA- 2303 COMPUTER GRAPHICS & MULTIMEDIA

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2303	COMPUTER GRAPHICS & MULTIMEDIA	3	1	0	4	4

COURSE PREAMBLE: This course familiarizes the students with fundamental algorithms that are used in interactive graphics systems. The students will learn algorithms and techniques of fundamental 3D computer graphics and understand the relationship between the 2D and 3D versions of such algorithms. This course will benefit the students to apply these algorithms and techniques in upcoming real world scenarios.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Illustrate the algorithm for drawing 2D Primitives.
- Identify the visible and invisible surfaces of 3D objects by using surface detection algorithm.
- Summarize various compression techniques and color models in multimedia.
- Develop animation for graphics design problems.

UNIT-I

Introduction to Raster scan displays, Storage tube displays, refreshing, flickring, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball , tablets and joysticks, graphical input techniques etc.

UNIT-II

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Belzier Method, B-spline Method.

UNIT-III

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen. Point Clipping, Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection,
phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

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UNIT-IV

An Introduction – Multimedia applications – Multimedia System Architecture - Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases. Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia -Tools, presentation tools, authoring tool.

UNIT-V

Compression & Decompression – Multimedia Data & File Format standards :-TIFF, MIDI, JPEG, DIB, MPEG,RTF, – Multimedia I/O technologies - Digital voice and audio – Video Image and animation–Full motion video – Storage and retrieval technologies.

Reference Books:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI Learning, 3rd Indian reprint edition , 2008.
3. Tay Vaughan, "Multimedia making it work", Tata McGraw Hill edition.
4. Amarendra N Sinha & Arun D Udai , "Computer Graphics", McGraw Hill publication Fundamental of

Computer Graphics and Multimedia, Mukherjee, PHI Learning

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Programme : Master of Computer Application (MCA) - 2 Year Course

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MCA-2304A COMPILER DESIGN

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2304A	COMPILER DESIGN	3	1	0	4	4

COURSE OBJECTIVES:

1. To teach concepts of language translation and phases of compiler design
2. To describe the common forms of parsers
3. To inculcate knowledge of parser by parsing LL parser and LR parser
4. To demonstrate intermediate code using technique of syntax directed translation
5. To illustrate the various optimization techniques for designing various optimizing compilers

COURSE OUTCOMES:

At the end of the course students will be able to:

1. Use compiler construction tools and describes the Functionality of each stage of compilation process
2. Construct Grammars for Natural Languages and find the Syntactical Errors/Semantic errors during the compilations using parsing techniques
3. Analyze different representations of intermediate code.
4. Construct new compiler for new languages

UNIT – I

Overview of the Translation Process, A Simple Compiler, Difference between interpreter, assembler and compiler. Overview and use of linker and loader, types of Compiler, Analysis of the Source Program, The Phases of a Compiler, Cousins of the Compiler, The Grouping of Phases, Lexical Analysis, Hard Coding and Automatic Generation Lexical Analyzers, Front-end and Back-end of compiler, pass structure.

UNIT – II

Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT – III

Bottom-Up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

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UNIT – IV

TYPE CHECKING: Definition of type checking, type expressions, type systems, static and dynamic checking of types, specification of a simple type checker, equivalence of type expressions, type conversions, overloading of functions and operators.

RUN TIME ENVIRONMENTS: Source language issues, Storage organization, storage-allocation strategies, access to non-local names, parameter passing, symbol tables and language facilities for dynamic storage allocation.

UNIT – V

Run Time Memory Management Source Language Issues, Storage Organization, Storage-Allocation Strategies, and Access to Non local Names, Parameter Passing, Symbol Tables, and Language Facilities for Dynamic Storage Allocation, Dynamic Storage Allocation Techniques.

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman (2007), Compilers Principles, Techniques and Tools, 2nd edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. Alfred V. Aho, Jeffrey D. Ullman (2001), Principles of compiler design, Indian student edition, Pearson Education, New Delhi, India.
2. Kenneth C. Louden (1997), Compiler Construction– Principles and Practice, 1st edition, PWS Publishing.
3. K. L. P Mishra, N. Chandrashekaran (2003), Theory of computer science- Automata Languages and computation, 2nd edition, Prentice Hall of India, New Delhi, India.
4. Andrew W. Appel (2004), Modern Compiler Implementation C, Cambridge University Press, UK.

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MCA- 2304B DISTRIBUTED COMPUTING

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2304B	DISTRIBUTED COMPUTING	3	1	0	4	4

COURSE PREAMBLE:

- To introduce fundamental principles of distributed systems, technical challenges and key design issues.
- To impart knowledge of the distributed computing models, algorithms and the design of distributed system.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Demonstrate knowledge of the basic elements and concepts related to distributed system technologies;
- Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
- Analyze the various techniques used for clock synchronization and mutual exclusion
- Demonstrate the concepts of Resource and Process management and synchronization algorithms
- Demonstrate the concepts of Consistency and Replication Management
- Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications.

Unit I

Evolution of Distributed Computing -Issues in designing a distributed system- Challenges-Minicomputer model – Workstation model - Workstation-Server model- Processor - pool model - Trends in distributed systems. Distributed computing environment, web based distributed model, computer networks related to distributed systems and web based protocols.

Unit II

Synchronization :- Clock Synchronization, Logical Clocks, Election Algorithms, Mutual Exclusion, Distributed Mutual Exclusion-Classification of mutual Exclusion Algorithm, Requirements of Mutual Exclusion Algorithms, Performance measure. Non Token based Algorithms: Lamport Algorithm, Ricart-Agrawalas Algorithm, Maekawas Algorithm Token Based Algorithms: Suzuki-Kasamis Broardcast Algorithms, Singhals Heurastic Algorithm, Raymonds Tree based Algorithm, Comparative Performance Analysis.

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Unit III

Message Passing: Inter process Communication, Desirable Features of Good Message-Passing Systems, Issues in IPC by Message, Synchronization, Buffering, Multidatagram Messages, Encoding and Decoding of Message Data, Process Addressing, Failure Handling, Group Communication,

Remote Procedure Calls: The RPC Model, Transparency of RPC, Implementing RPC Mechanism, Stub Generation, RPC Messages, Marshaling Arguments and Results, Server Management, Communication Protocols for RPCs, Complicated RPCs, Client-Server Binding, Exception Handling, Security, Some Special Types of RPCs, Lightweight RPC, Optimization for Better Performance.

Unit IV

Distributed Shared Memory: Design and Implementation issues of DSM, Granularity, Structure of Shared memory Space, Consistency Models, replacement Strategy, Thrashing, Other Approaches to DSM, Advantages of DSM.

Synchronization: Clock Synchronization, Event Ordering, Mutual Exclusion, Election Algorithms.

Unit V

Distributed File Systems: Desirable Features of a good Distributed File Systems, File Models, File Accessing Models, File-shearing Semantics, Filecaching Schemes, File Replication, Fault Tolerance, Design Principles, Sun's network file system, Andrews file system, comparison of NFS and AFS.

Naming: Desirable Features of a Good Naming System, Fundamental Terminologies and concepts, Systems-Oriented Names, Name caches, Naming & security, DCE directory services.

Reference Books:

1. Distributed OS by Pradeep K. Sinha (PHI)
2. Tanenbaum S.: Distributed Operating Systems, Pearson Education
3. Tanenbaum S. Maarten V.S.: Distributed Systems Principles and Paradigms, (Pearson Education)
4. George Coulouris, Jean Dollimore, Tim Kindberg: Distributed Systems concepts and design.

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MCA-2304CTHEORY OF COMPUTATION

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2304C	THEORY OF COMPUTATION	3	1	0	4	4

COURSE PREAMBLE:

- The main objective of this course is to introduce the major concept areas of language translation and to develop an awareness of the function and complexity of modern compilers.
- This course is a study of the theory and practice required for the design and implementation of interpreters and compilers for programming languages

COURSE OUTCOMES:

- Able to design Finite Automata machines for given problems.
- Able to analyze a given Finite Automata machine and find out its Language.
- Able to design Pushdown Automata machine for given CF language(s).
- Able to generate the strings/sentences of a given context-free languages using its grammar.
- Able to design Turing machines for given any computational problem.

UNIT – I

Introduction of the theory of computation, Finite state automata– description of finite automata, properties of transition functions, Transition graph, designing finite automata, FSM, DFA, NFA, 2-way finite automata, equivalence of NFA and DFA, Mealy and Moore machines.

UNIT – II

Regular grammars, regular expressions, regular sets, closure properties of regular grammars, Arden''s theorem, Myhill-Nerode theorem, pumping lemma for regular languages, Application of pumping lemma, applications of finite automata, minimization of FSA.

UNIT – III

Introduction of Context Free Grammar, derivation trees, ambiguity, simplification of CFGs, normal forms of CFGs, Chomsky Normal Form and Greibach Normal forms, Pumping lemma for CFLs, Decision algorithms for CFGs, Designing CFGs, Closure properties of CFL's.

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UNIT – IV

Introduction of PDA, formal definition, closure property of PDA, examples of PDA, Deterministic Pushdown Automata, NPDA, conversion PDA to CFG, conversion CFG to PDA.

UNIT – V

Turing machines: basics and formal definition, language acceptability by TM, examples of TM, variants of TMs: multitape TM, NDTM, Universal Turing Machine, offline TMs, equivalence of single tape and multitape TMs. Recursive and recursively enumerable languages, decidable and undecidable problems – examples, halting problem, reducibility. Introduction of P, NP, NP complete, NP hard problems and Examples of these problems.

REFERENCES:

1. Hopcroft & Ullman "Introduction to Automata theory, languages & Computation", Narosha Publishing house.
2. Lewish Papadimutrau "Theory of Computation", Prentice Hall of India, New Delhi.
3. Peter linz, "An Introduction to formal language and automata", Third edition, Narosa publication.
4. Marvin L. Minskay "Computation : Finite & Infinite Machines", PHI.
5. Mishra & Chander Shekhar "Theory of Compuer Science (Automate, Language & Computations), PHI.

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MCA- 2305A JAVA

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2305A	JAVA	3	1	0	4	4

COURSE PREAMBLE:

1. To understand the basic concepts and fundamentals of platform independent object oriented language.
2. To demonstrate skills in writing programs using exception handling techniques and multithreading.
3. To understand streams and efficient user interface design techniques.

Course Outcomes: After successful completion of the course, the students are able to

1. Use the syntax and semantics of java programming language and basic concepts of OOP.
2. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
3. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
4. Design event driven GUI and web related applications which mimic the real word scenarios

Unit I

Introduction: Introduction to Java, Java buzzword, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects: Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Unit II

Synchronization :- Inheritance and Polymorphism : Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in Java, Package in java, UTIL package.

Unit III

Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames. Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box. Applet and its life cycle, Introduction to swing.

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Unit IV

Strings: Exploring the String class, String buffer class, Command-linearguments.

Library: Date class, Wrapper classes.

Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle,

Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter Thread communication, daemon threads, deadlocks.

I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Unit V

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet. Color class and Graphics.

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menu bar.

Text Book:

1. Java The Complete Reference 9th Edition, Herbert Schildt, McGraw Hill Education (India) Private Limited, New Delhi.

Reference Books:

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
2. Introduction to Java programming, By Y.Daniel Liang,Pearson Publication.

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MCA- 2305B DOT NET

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2305B	DOT NET	3	1	0	4	4

COURSE PREAMBLE:

- To Understand code solutions and compile C# projects within the .NET framework.
- To Design and develop professional console and window based .NET application
- To Demonstrate knowledge of object-oriented concepts Design user experience and functional requirements C#.NET application.
- To Construct classes, methods, and assessors, and instantiate objects.
- To Understand and implement string manipulation, events and exception handling within .NET application environment

Course Outcomes: After successful completion of the course, the students are able to

- Create and manipulate GUI components in C#.
- Design and Implement Windows Applications using Windows Forms, Control Library, Advanced UI Programming & Data Binding concepts
- Design and Implement database connectivity using ADO.NET in window based application.
- Identify and resolve problems (debug /trouble shoot) in C#.NET window based application
- Identify Industry defined problem and suggesting solution(s) using .NET application.

Unit I

Introduction: Basic .NET Programming using C#, Introduction to .NET technologies, Structure of a C# Program, Data Types, Basic Control Structures, Introduction to classes and objects, Arrays, Introduction to Visual Studio .NET, Introduction to debugging, Classes and Objects, this keyword, Static Properties and Indexer, Inheritance, Overloading (Compile Time Polymorphism), Overriding and Runtime Polymorphism System, Object Boxing and Unboxing, Typecasting, Memory Management, Exception Handling.

Unit II

Visual Basic fundamentals:- The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods.

Classes and Objects: - Types, Structure and Enumeration, Classes, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure.

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Unit III

Advance design concepts, Patterns, Roles and Relationships, Advanced Interface Patterns, Adapters and Delegates and Events Data Processing and I/Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features.

Unit IV

Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: - All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events.

Unit V

Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader. Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

REFERENCES:

1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in VB; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH.

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MCA- 2305C WEB TECHNOLOGY

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2305C	**WEB TECHNOLOGY**	3	1	0	4	4

COURSE PREAMBLE:

The main objective of the course is present the basic web technology concepts that are required for developing web applications. The key technology components are descriptive languages, server side program elements and client side program elements. In addition the course gives specific contents that are beneficial for developing web-based solutions, like relational data-base communication basics and information security principles and approaches.

Course Outcomes: After successful completion of the course, the students are able to

- Students are able to develop a dynamic webpage by the use of java script and
- DHTML
- Students will be able to write a well formed / valid XML document.
- Students will be able to connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
- Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
- Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.

Unit I

Introduction: History of the Internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, Internet address and domains. Introduction World Wide Web (WWW), working of web browser and web server, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

Unit II

Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations, DTD files and basics of Cascading Style Sheet (CSS). Document object Model (DOM) history and levels, Document tree, DOM event handling.

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Unit III

Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java.

Unit IV

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, Introduction to Apache web server. Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI), EJB, Microsoft's Distributed Component Object Model(DCOM) Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

Unit V

Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications. Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

REFERENCES:

1. Web Technologies- A computer science perspective By Jeffrey C. Jackson, Pearson Eduction .
2. Web Technologies-TCP/IP Architecture, and Java Programming By Achyut S. Godbole and Atul Kahate.
3. An Introduction to Web Design Programming by Paul S. Wang Sanda, S Katila, CENGAGE Learning.

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SCHOOL OF ENGINEERING

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Programme : Master of Computer Application (MCA) - 2 Year Course

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MCA- 2307 LAB-III (PROGRAMMING IN C++)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2307	LAB-III (PROGRAMMING IN C++)	0	0	2	1	2

COURSE PREAMBLE: The primary objective for Programming In C++ is to introduces the principles of data abstraction, class, inheritance and polymorphism, principles of virtual functions .

COURSE OUTCOMES:

At the end of the Course, the student will be able

Ability to develop applications for a range of problems using Programming in C++ techniques.

LIST OF EXPERIMENTS:-

1. Write a program to find minimum of three numbers using conditional operator.
2. Write a program to swap two numbers (call by reference)
3. Write a program to find the product of two matrices.
4. Write a program to arrange the array elements in ascending order.
5. Write a program to count number of words, characters, vowels in a given string.
6. Write a program to declare a class. Declare pointer to class. Initialize and display the contents of the class member.
7. Write a program to use pointer for both base and derived classes and call the member function. Use Virtual keyword.
8. Write a program to overload unary operator using friend function.
9. Write a program to overload - operator.
10. Write a program to invoke Constructor and Destructor.

Reference Books:

1. David Parsons; Object oriented programming with C++; BPB publication
2. Object oriented programming in C++ by Robert Lafore: Galgotia
3. Balagurusamy; Object oriented programming with C++; TMH
4. Herbert Shildt, "The Complete Reference C++", Tata McGraw Hill publication

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MCA- 2207 LAB-IV (DBMS (ORACLE/MY SQL))

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2207	LAB-IV (DBMS (ORACLE/MY SQL))	0	0	2	1	2

COURSE PREAMBLE : The primary objective for DBMS (ORACLE/MY SQL) lab to explain basic database concepts, applications, data models, schemas and instances.

COURSE OUTCOMES :

At the end of the Course, the student will be able

- Apply the basic concepts of Database Systems and Applications.
- Use the basics of SQL and construct queries using SQL in database creation and interaction. Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
- Analyze and Select storage and recovery techniques of database system.

LIST OF EXPERIMENTS:-

1. Study of DBMS, RDBMS and ORDBMS.
2. To study Data Definition language Statements.
3. To study Data Manipulation Statements.
4. Study of SELECT command with different clauses.
5. Study of SINGLE ROW functions (character, numeric, Data functions).
6. Study of GROUP functions (avg, count, max, min, Sum).
7. Study of various type of SET OPERATORS (Union, Intersect, Minus).
8. Study of various type of Integrity Constraints.
9. Study of Various type of JOINS.
10. To study Views and Indices

Reference Books:

1. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley.
2. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill.
3. Toledo; Data base management systems; TMH.
4. Ashutosh Kumar Dubey "Data Base Management Concepts" Katson Publication.

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Programme : Master of Computer Application (MCA) - 2 Year Course

PYTHON (MCA-2401)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2401	PYTHON	3	1	0	4	4

Course Objectives:

1. To learn and understand Python programming basics and paradigm.
2. To learn and understand python looping, control statements and string manipulations.
3. Students should be made familiar with the concepts of GUI controls and designing GUI applications.
4. To learn and know the concepts of file handling, exception handling and database connectivity.

Outcomes:

Upon successful completion of this course, the student will be able to:

1. Define and demonstrate the use of built-in data structures "lists" and "dictionary".
2. Design and implement a program to solve a real world problem.
3. Design and implement GUI application and how to handle exceptions and files.
4. Make database connectivity in python programming language.

UNIT1

Introduction to python language, Basic syntax, Literal Constants, Numbers, Variable and Basic Data Types, String, Escape Sequences, Operators and Expressions, Evaluation Order, Indentation, Input, Output, Functions, Comments.

UNIT 2

Data Structure: List, Tuples, Dictionary, Data Frame and Sets, Constructing, Indexing, slicing and common manipulation.

UNIT3

Control Flow: Conditional Statements - If, If-else, Nested If-else. Iterative Statement - For, While, Nested Loops. Control statements - Break, Continue, Pass.

UNIT4

Object Oriented Programming: Class and Object, Attributes, Methods, Scopes and Namespaces, Inheritance, Overloading, Overriding, Data Hiding, Exception: Exception Handling, Except clause, Try finally clause, User Defined Exceptions.

UNIT5

Modules and Packages: Standard Libraries: File I/O, Sys, logging, Regular expression, Date and Time, Network programming, multi-processing and multithreading.

References

1. Timothy A. Budd: Exploring python, McGraw-Hill Education.
2. R. Nageshwar Rao ,"Python Programming" ,Wiley India

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3. Think Python: Allen B. Downey, O'Reilly Media, Inc.

List of Experiments:

1. To write a Python program to find GCD of two numbers.
2. To write a Python Program to find the square root of a number by Newton's Method.
3. To write a Python program to find the exponentiation of a number.
4. To write a Python Program to find the maximum from a list of number
5. To write a Python Program to perform Linear Search
6. To write a Python Program to perform binary search.
7. To write a Python Program to perform selection sort.
8. To write a Python Program to perform insertion sort.
9. To write a Python Program to perform Merge sort.
10. To write a Python program to find first n prime numbers.
11. To write a Python program to multiply matrices.
12. To write a Python program for command line arguments.
13. To write a Python program to find the most frequent words in a text read from a file.
14. To write a Python program to simulate elliptical orbits in Pygame.
15. To write a Python program to bouncing ball in Pygame.

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

Artificial Intelligence MCA-2402(A)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA- 2402(A)	Artificial Intelligence	3	1	0	4	4

Objective:- It presents the concepts of Artificial Intelligence and the participants will get to work in the areas of Machine learning, Deep Learning, implement methods to solve problems using Artificial Intelligence and Natural Language Processing.
Outcome:- This course is designed in synchronization with the industry to provide the participants in-depth knowledge and skills required by AI fields around the globe. It provides comprehensive knowledge about the fundamental principles, methodologies and industry practices in AI.

1. Fundamentals of neural networks and fuzzy logic

2. Supervised learning and unsupervised learning.

3. Nero Dynamical Models

UNIT-I

Introduction: Overview of AI, AI technique and problems, Characteristics of AI, LISP Programming, input output and local variables, Numeric and Basic list manipulation functions, predicates and conditionals, Iteration and recursion, property lists and arrays.

UNIT-II

Search and Control Strategies: overview of production systems, characteristics of production systems, control strategies, forward and backward chaining, study of depth first and breadth first search, Hill climbing Techniques, branch and bound technique, best first search & A* algorithm, AND / OR graphs, problem reduction & AO* algorithm, constraint satisfaction problems.

UNIT-III

Knowledge Representations: Problems in representing knowledge, knowledge representation using propositional and predicate logic, skolemization, resolution principle & unification, interface mechanisms, horn's clauses, semantic networks, frame systems and value inheritance, scripts, conceptual dependency.

UNIT-IV

Planning: Planning, various types of planning techniques like goal stack planning, hierarchical planning , nonlinear planning. Parsing techniques, context free grammar, recursive transition nets, augmented transition nets, case and logic grammars, semantic analysis. Introduction to game playing, game playing techniques like minimax procedure.

UNIT-V

Probabilistic Theory and Expert System: Introduction of Probability theory, bayes theorem and bayesian networks, certainty factor. Introduction to expert system and application of expert systems, various expert system shells, vidwan frame work, knowledge acquisition, case studies, MYCIN.

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References:- 1.Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.
2.Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin.

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

CLOUD COMPUTING MCA-2402(B)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2402(B)	CLOUD COMPUTING	3	1	0	4	4

Objective:-

- The fundamental ideas behind Cloud Computing, the evolution of the paradigm, its applicability; benefits, as well as current and future challenges.
- The basic ideas and principles in data center design; cloud management techniques and cloud software deployment considerations.
- Different CPU, memory and I/O virtualization techniques that serve in offering software, computation and storage services on the cloud; Software Defined Networks (SDN) and Software Defined Storage (SDS).
- Cloud storage technologies and relevant distributed file systems, no sql databases and object storage.
- The variety of programming models and develops working experience in several of them.

Outcomes:-

1. Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
2. Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost, and then study how to leverage and manage single and multiple datacenters to build and deploy cloud applications that are resilient, elastic and cost-efficient.
3. Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model.
4. Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.
5. Analyze various cloud programming models and apply them to solve problems on the cloud.

UNIT-I

Introduction, Cloud computing history, Cloud architecture, Characteristics of cloud computing as per NIST, Cloud services requirements, System Models for Distributed and Cloud Computing, NIST Cloud Computing Reference Architecture, Applications, ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis, Satellite Image Processing, CRM and ERP, Social networking.

UNIT-II

Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources, Cloud services (Iaas, Paas & saas).

UNIT-III

Basics of Virtualization, Types of Virtualization, Implementation Levels of Virtualization, Virtualization Structures, Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data-center Automation. Virtual LAN (VLAN) and Virtual SAN (VSAN) and their benefits.

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UNIT-IV

Cloud Security:- Security Overview Infrastructure security, Data security and storage, Network security – I, Network security – II. Host security, Disaster recovery and management, Cloud Information security fundamentals. Cloud security services, Design principles. Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture.

UNIT-V

Cloud Solutions: - Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management Third Party Cloud Services, Market Based Management of Clouds.

Case study: - Amazon cloud services, Amazon EC2, Amazon S3, Google cloud services. Google Map reduce, GFS, Sales Force, Windows Azure- EMC cloud services, IBM cloud services, Apache Hadoop.

TEXT BOOKS:

1. George Reese – Cloud Application Architectures: Building Applications and Infrastructure in the cloud – O'Reilly Media Inc., 2009
2. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter – Cloud Computing A practical Approach – McGraw Hill, 2010

REFERENCES:

1. Kenneth Hess, Amy New Man – Practical Virtualization Solutions – Prentice Hall, 2010
2. Shahed Latif, Tim Mather, Subra Kumara swamy – Cloud Security and Privacy : An Enterprise perspective on risks and compliance – O'Reilly Media Inc., 2009
3. Gautam Shroff – Enterprise Cloud Computing: Technology, Architecture, Applications – Cambridge University Press, 2010

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

DATA WAREHOUSING & MINING MCA-402 (C)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA- 2402(C)	DATA WAREHOUSING & MINING	3	1	0	4	4

Objectives:

The objective of this course is to familiar with mathematical foundations of data mining tools, Understand and implement classical models and algorithms in data warehouses and data mining, Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Outcomes:

Students will be able to:

- Understand Data Warehouse fundamentals, Data Mining Principles
- Design data warehouse with dimensional modeling and apply OLAP operations.
- Identify appropriate data mining algorithms to solve real world problems
- Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
- Describe complex data types with respect to spatial and web mining

UNIT–I

Introduction to Data warehouse, Need for data warehousing, Data warehousing Components, Data Mart, Data Warehouse Architecture, Data Extraction, Cleanup, and Transformation Tools –Metadata repository and management, Dimensionality and Concept Hierarchy Generation. Major Issues in Data Mining. Star ,Snowflake and Galaxy Schemas for Multidimensional databases

UNIT–II

Data Preprocessing, Data Integration and Transformation, Data Reduction. Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning, Discretization and Concept Hierarchy Generation, Basics of data mining, Data mining techniques, KDP (Knowledge Discovery Process), Application and Challenges of Data Mining.

UNIT–III

Introduction of Web Structure Mining, Web Usage Mining, Spatial Mining, Text Mining, Security Issue, Privacy Issue, Ethical Issue. Reporting and Query tools and Applications, Tool Categories, The Need for Applications, Online Analytical Processing (OLAP) Need Multidimensional Data Model, OLAP Guidelines, Multidimensional versus Multi relational OLAP, Categories of Tools ,OLAP Tools and the Internet.

UNIT–IV

Data mining algorithms Association rules, Association Rule Mining, Single Dimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, Fp Growth Algorithm, Time series mining association rules, latest trends in association rules mining.

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UNIT–V

Clustering, Basic issues in clustering, Types of Clustering. Firm conceptual clustering systems, Partitioning methods: k-means, expectation maximization (EM), Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Categorization of methods, Partitioning methods, Outlier Analysis.

REFERENCES:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay ", Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
4. Daniel T. Larose, "Data Mining Methods and Models", Wile-Inter science, 2006

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

MACHINE LEARNING MCA-2403(A)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2403(A)	MACHINE LEARNING	3	1	0	4	4

Course Objectives :

- To introduce students to the basic concepts and techniques of Machine Learning.
- To develop skills of using recent machine learning software for solving practical problems.
- To gain experience of doing independent study and research.
-

Course Outcomes : Students will be able to:

- machine learning algorithms as supervised, semi-supervised, and unsupervised.
- Effectively use machine learning toolboxes.
- Be able to use support vector machines.
- Be able to use Recognize the characteristics of machine learning that make it useful to real-world problems.
- Characterize regularized regression algorithms.
- Understand the concepts behind neural networks for learning non-linear functions.
- Understand and apply unsupervised algorithms for clustering.

UNIT –I

Introduction to machine learning, scope and limitations, regression, probability, statistics and linear algebra for machine learning, convex optimization, data visualization, hypothesis function and testing, data distributions, data preprocessing, data augmentation, normalizing data sets, machine learning models, supervised and unsupervised learning.

UNIT –II

Linearity vs non linearity, activation functions like sigmoid, ReLU, etc., weights and bias, loss function, gradient descent, multilayer network, backpropagation, weight initialization, training, testing, unstable gradient problem, auto encoders, batch normalization, dropout, L1 and L2 regularization, momentum, tuning hyper parameters.

UNIT –III

Convolutional neural network, flattening, subsampling, padding, stride, convolution layer, pooling layer, loss layer, dense layer 1x1 convolution, inception network, input channels, transfer learning, one shot learning, dimension reductions, implementation of CNN like tensor flow, keras etc.

UNIT –IV

Recurren neural network, Long short-term memory, gated recurren unit, translation, beam search and width, Bleu score, attention model, Reinforcement Learning, RL-framework, MDP, Bellmap equations, Value Iteratop and Policy Iteration, , Actor-critic model, Q-learning, SARSA

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UNIT –V

Support Vector Machines, Bayesian learning, application of machine learning in computer vision, speech processing, natural language processing etc, Case Study: ImageNet Competitions

TEXT BOOKS RECOMMENDED:

1. Christopher M. Bishop, "Pattern Recognition and Machine Learning", Springer-Verlag New York Inc., 2nd Edition, 2011.

2. Tom M. Mitchell, "Machine Learning", McGraw Hill Education, First edition, 2017.

3. Ian Good fellow and Yoshua Bengio and Aaron Courville, "Deep Learning", MIT Press,2016

REFERENCE BOOKS:

1. Aurelien Geron, "Hands-On Machine Learning with Scikit-Learn and TensorFlow:Concepts, Tools, and Techniques to Build Intelligent Systems", Shroff/O'Reilly; First edition (2017).

2. Francois Chollet, "Deep Learning with Python", Manning Publications, 1 edition (10January 2018).

3. Andreas Muller, "Introduction to Machine Learning with Python: A Guide for DataScientists", Shroff/O'Reilly; First edition (2016).

4. Russell, S. and Norvig, N. "Artificial Intelligence: A Modern Approach", Prentice HallSeries in Artificial Intelligence. 2003.

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

INTERNET OF THINGS MCA-2403(B)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2403(B)	INTERNET OF THINGS	3	1	0	4	4

Course Objectives:

1. To learn physical design, logical design and enabling technologies of internet of things.
2. To acquire knowledge about IoT platforms design methodology.
3. To learn about IoT physical servers and cloud offerings.
4. To study IoT case studies using python.

Course outcomes:

1. Understand principles, concepts, and technologies for internet of things.
2. Able to build physical and logical design of IoT systems.
3. Understand cloud platforms for IoT.

UNIT I

INTRODUCTION:-

Definitions and Functional Requirements –Motivation – Architecture- Web 3.0 View of IoT– Ubiquitous IoT Applications – Four Pillars of IoT – DNA of IoT - TheToolkit Approach for End-user Participation in the Internet of Things. Middleware for IoT:Overview – Communication middleware for IoT–IoT Information Security.

UNIT II

IOT PROTOCOLS

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Issues with IoT Standardization – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus – KNX – Zigbee Architecture – Network layer – APS layer – Security .

UNIT III

WEB OF THINGS

Web of Things versus Internet of Things – Two Pillars of the Web – Architecture Standardization for WoT– Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals and Business Intelligence. Cloud of Things: Grid/SOA andCloud Computing – Cloud Middleware – Cloud Standards – Cloud Providers and Systems –Mobile Cloud Computing – The Cloud of Things Architecture.

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UNIT IV

INTEGRATED

Integrated Billing Solutions in the Internet of Things Business Models for the Internet of Things - Network Dynamics: Population Models – Information Cascades - Network Effects - Network Dynamics: Structural Models - Cascading Behavior in Networks - The Small-World Phenomenon.

UNIT V

APPLICATIONS

The Role of the Internet of Things for Increased Autonomy and Agility in Collaborative Production Environments - Resource Management in the Internet ofThings: Clustering, Synchronization and Software Agents. Applications - Smart Grid – Electrical Vehicle Charging.

REFERENCES:

1. The Internet of Things in the Cloud: A Middleware Perspective - Honbo Zhou - CRC Press –2012
2. Architecting the Internet of Things - Dieter Uckelmann; Mark Harrison; Florian Michahelles- (Eds.) – Springer2011
3. Networks, Crowds, and Markets: Reasoning About a Highly Connected World - David Easley and Jon Kleinberg, Cambridge University Press - 2010
4. The Internet of Things: Applications to the Smart Grid and Building Automation by - Olivier
5. Hersent, Omar Elloumi and David Boswarthick - Wiley -2012
6. Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things – Key applications and Protocols", Wiley, 2012

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SCHOOL OF ENGINEERING

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES

Programme : Master of Computer Application (MCA) - 2 Year Course

DATA SCIENCE AND BIG DATA MCA-2403(C)

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2403(C)	DATA SCIENCE AND BIG DATA	3	1	0	4	4

COURSE OBJECTIVES:

- Using predictive analytics and machine learning to significantly increase the sales funnel
- Improve and enhance customer segmentation
- Reduce consumer churn
- Understand good and bad suppliers and customers
- Improve geographic knowledge… and much more.

COURSE OUTCOMES:

After completing the course student should be able to:

1. Understand the concept and challenges of Big Data and Demonstrate knowledge of Big Data Analytics.
2. Explain Hadoop Eco System and develop Big Data Solutions using Hadoop EcoSystem.
3. Practice and gain hands on experience on large-scale analytics tools.
4. Understand social networks mining and analyze the social network graphs.

UNIT 1

Introduction to Big data, Big data characteristics, Types of big data, Traditional versus Big data, Evolution of Big data, challenges with Big Data, Technologies available for Big Data, Infrastructure for Big data, Use of Data Analytics, Desired properties of Big Data system.

UNIT 2

Introduction to Hadoop, Core Hadoop components, Hadoop Eco system, Hive Physical Architecture, Hadoop limitations, RDBMS Versus Hadoop, Hadoop Distributed Filesystem, Processing Data with Hadoop, Map reduce Programming, Managing Resources and Applications with Hadoop YARN, Apache Spark.

UNIT 3

Introduction to Hive Hive Architecture, Hive Data types, Hive Hive Query Language,Introduction to Pig, Anatomy of Pig, Pig on Hadoop, Use Case for Pig, ETL Processing, Data types in Pig running Pig, Execution model of Pig, Operators, Evalfunction, Datatypes of Pig.

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UNIT 4

Introduction to NoSQL, NoSQL Business Drivers, NoSQL Data architectural patterns, Variations of NOSQL architectural patterns using NoSQL to Manage Big Data.

UNIT 5

Mining social Network Graphs: Introduction Applications of social Network mining, Social Networks as a Graph, Types of social Networks, Clustering of social Graphs Direct Discovery of communities in a social graph.

TEXT BOOKS RECOMMENDED:

1. Radha Shankarmani, M. Vijayalakshmi, " Big Data Analytics", Wiley, Second edition

2. Seema Acharya, Subhashini Chellappan, " Big Data and Analytics", Wiley, First edition

REFERENCE BOOKS:

1. Kai Hwang, Geoffrey C., Fox. Jack, J. Dongarra, "Distributed and Cloud Computing", Elsevier, First edition
2. Michael Minelli, Michele Chambers, Ambiga Dhiraj, "Big Data Big Analytics", Wiley

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