

SCHEME OF BCA [REDACTED] PROGRAMME

Semester	Paper Code	Paper Category	Paper Title	Teaching Hrs/Week				Credit	Examination Scheme					
				Lecture	Tutorial	Practical	Practical(P)/Theory(T)		Term End Examination		Internal Assessment		Total	
									Max	Min	Max	Min	Max	Min
I	SOSBCA-101	Major	Problem solving using 'C'	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-102	Minor	Internet & E-Commerce	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-103	GEC	Discrete Mathematics	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-104	AEC	PC Package	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-105	Major	Practical in C	-	-	4	P	2	60	21	40	14	100	35
	SOSBCA-106	Minor	Practical in PC Package	-	-	4	P	2	60	21	40	14	100	35
			Total					20						
II	SOSBCA-201	Major	Object Oriented Programming in C++	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-202	Minor	DBMS	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-203	GEC	Computer Organization and Architecture	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-204	AEC	Communicative English Grammar	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-205	Major	Practical in C++	-	-	4	P	2	60	21	40	14	100	35
	SOSBCA-206	Minor	Practical in SQL	-	-	4	P	2	60	21	40	14	100	35
			Total					20						
III	SOSBCA-301	Major	Python Programming	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-302	Minor	Computer Graphics & Multimedia	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-303	GEC	Introduction to Operating Systems	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-304	SEC	Communication Techniques	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-305	Major	Practical in Python Programming	-	-	4	P	2	60	21	40	14	100	35
	SOSBCA-306	Minor	Practical in Computer Graphics & Multimedia	-	-	4	P	2	60	21	40	14	100	35
			Total					20						

SKM 77

IV	SOSBCA-401	Major	Programming In Java	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-402	Minor	Data Structures using C++	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-403	GEC	Accounting & Management Control	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-404	SEC	Numerical Methods	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-405	Major	Practical In Java	-	-	4	P	2	60	21	40	14	100	35
	SOSBCA-406	Minor	Practical In Data Structures	-	-	4	P	2	60	21	40	14	100	35
			Total					20						
V	SOSBCA-501	Major	Programming In Advance Java	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-502	Minor	Web Technology	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-503	DSE1	Artificial Intelligence & Expert System	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-504	SEC	Software Engineering	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-505	Major	Practical in Advance Java	-	-	-	P	2	60	21	40	14	100	35
	SOSBCA-505	Minor	Practical in Web Technology	-	-	-	P	2	60	21	40	14	100	35
			Total					20						
VI	SOSBCA-601	Major 1	Mobile Application Development	3	-	-	T	3	60	21	40	14	100	35
	SOSBCA-602	Major2	Introduction to ASP.Net & C#	3	-	-	T	3	60	21	40	14	100	35
	SOSBCA-603	DSE2	Networking Concepts	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-604	DSE3	Soft Computing	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-605	Project	Minor Project	-	-	-	P	6	60	21	40	14	100	35
			Total					20						
VII	SOSBCA-701	Major	Data Mining	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-702	Minor	Introduction To R Programming	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-703	DSE4	Digital Marketing	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-704	SEC	Analysis and Design of Algorithms	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-704	Major	Practical in Data-Mining	-	-	4	P	2	60	21	40	14	100	35
	SOSBCA-705	Minor	Practical in R Programming	-	-	4	P	2	60	21	40	14	100	35
			Total					20						
VIII	SOSBCA-801	Major	Cyber Security	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-802	Minor	Cloud Computing	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-803	DSE5	Data Science using Python	3	1	-	T	4	60	21	40	14	100	35
	SOSBCA-804	Major	Practical in Data Science using Python	-	-	4	P	2	60	21	40	14	100	35
	SOSBCA-805	Project	Major Project	-	-	-	P	6	60	21	40	14	100	35
			Total					20						

Signature

Course Outcomes- Upon completion of this course student will get the skill of writing code in C language through decision control statements, loop statements, arrays, modular programming and pointers after that student will write efficient programs in C language. The main focus is on problem solving techniques, algorithms, flow charts and writing efficient programs.

UNIT I

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms – Some more Algorithms – Flow Charts – programming techniques - top down, bottom up, Modular structured -features, merits & demerits, Testing & debugging. **Introduction to C:** Introduction – Structure of C Program – Writing the first C Program – File used in C Program – Compiling and Executing C Programs – Using Comments – Keywords – Identifiers –Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples – Type Conversion and Type Casting.

UNIT II

Decision Control and Looping Statements: Introduction to Decision Control Statements –Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Goto Statement. **Functions:** Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions

UNIT III

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays – Two Dimensional Arrays for inter-function communication – Multidimensional Arrays.
Strings: Introduction declaration, string functions - strcat, strcpy, strcmp, strlen, strstr. functions.

UNIT IV

Pointers: Introduction to Pointers – declaring Pointer Variables– Pointer Expressions and Pointer Arithmetic, Passing Arguments to Functions using Pointer – Pointer and Arrays – Pointers and Strings – Array of pointers .
Structure, Union Data Types: Introduction of Structures and Union ,difference between structure and Union.

UNIT V

The Pre-processor: #define, defining function like macros, #include, conditional compilation directives i.e. #if, #elif and #ifdef & #undef
File Management : Introduction - File handling, File structure, File handling function, File types, streams, Text, Binary File system basics, The file pointer, opening a file, closing a file, Writing a character, Reading a character, Using fopen(), getc(), putc(), and fclose(), Using feof(), working with string fputs() and fgets(), Command line arguments

Text & Reference Books :

1. Let us C Yashwant Kanitkar, BpBpublicatiuon
2. Programming in ANSI C Balgurusuamy Tata McGraw Hill
3. C Programming Schaum, s series
4. C in Depth ,Deepali and S K Srivastava
5. Programming with ANSI & Turbo C Kamthani, pearson Education.



PAPER CODE: SOSBCA-102
INTERNET & E-COMMERCE

Course Outcomes- At the end of this course, students will get the skill of using Internet and its services, E-Mail, different protocols and how to work on browser that perform searching on search engine. Students will aware general idea of e-commerce and their business significance.

UNIT I

Introduction of Internet & E-Commerce: Internet ,Intranet, Extranet and Its services, H/W & S/W requirements to connect to the Internet, Introduction of WWW, Web server and Web Client, Difference between the web and internet , Internet Addressing- IP Address, Domain Name Address, Domain name registration, Universal Resource Locator.

UNIT II

Internet Service Provider (ISP), Choosing an Internet service Provider: Stability, Customer service, Performance , Pricing, Web publishing concepts, Broadband and Baseband connections, Basics of E-mail, Newsgroups, Mailing Lists.

UNIT III

Data Transmission Protocols, Client/ Server Architecture, FTP , HTTP and its usage , Remote Logging Protocols, Terminal Emulation, Message board, Internet chatting- Voice chat, Text chat, Voice Over IP (voIP).

UNIT IV

Introduction of Web browser, Types of Web browser, Functions of Web browser, Internet Search Engine : What is search engine, How do search engine work, Types of search engines, Web portals, Space on host server for website.

UNIT V

History of E-Commerce, Elements ,Types, functions of E-Com, Advantages and Disadvantages of e-com, E-Commerce practices VS traditional business practices. E-Business: E-Business Vs E-Commerce, EDI-Who use EDI, Origin Benefit Migration to open EDI-Approach.

Electronic Payment System, Electronic or digital cash- Electronic checks- Benefits, Online credit based system, Del card, smart Cards.

Text & References Books:

1. Alexis Leon and Mathews Leon- Internet for everyone (Tech World)
2. Douglas Comer- The Internet Book (Prentice Hall)
3. E-Commerce By Dr. Varinder Bhatia
4. Information Technology By Nitin K Nayak

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PAPER CODE: SOSBCA-103
DISCRETE MATHEMATICS

Course Outcomes- Students completing this course will get the skill to express a logic sentence in terms of predicates, quantifiers, logical connectives, Algebra of propositions as well as Set Theory. They will be skilled to evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.

UNIT-I

Introduction and Preliminaries: Logical connectives, Truth tables, Tautologies and Contradiction, Logical equivalence, Algebra of propositions. Set Theory: Set, Singleton set, Finite and Infinite sets, Subsets, Proper subsets, Equality of sets, Union, Intersection and Difference of sets, Universal set, De Morgan laws, Symmetric difference of sets, Generalized De Morgan laws, Cartesian product of sets.

UNIT-II

Relations: Relation between two sets, Binary relation on a set, Types of binary relations, Equivalence relation, Equivalence class, Partition of a set, Fundamental theorem of equivalence relation, Composition of relations. Functions: Function or mapping, One-one, Many-one, Into and onto mappings, Identity mapping, Constant mapping, Equality of mappings, Inverse of a mapping, Composition of mappings.

UNIT-III

Boolean algebra: Definition and properties of Boolean algebra, a brief introduction to the application of Boolean algebra to switching theory, conversion of complicated switching circuits to simple one, Disjunctive and Conjunctive normal forms. Graph Theory: Introduction to graph theory, Paths and Circuits, Trees, Spanning trees, Cut-sets, Fundamental circuits and cut-sets.

UNIT-IV

Matrices: Introduction, Expression of complex numbers in the form of a matrix, De Moivre's theorem, Elementary transformations, Elementary matrices, Equivalent matrices, Properties of equivalent matrices, Sub-matrix of matrix, Rank and Nullity of a matrix, Row equivalence and canonical form, Normal form of a matrix.

UNIT-V

Solution of Homogeneous and Non-homogeneous system of linear equations, Characteristic roots and Characteristic vectors of a matrix, Caley-Hamilton theorem, to find the inverse of a nonsingular matrix using Caley-Hamilton theorem.

Text & Reference Books:

1. Discrete Mathematical Structures with Applications to Computer Science by Tremblay & Manohar.
2. Discrete Mathematics by Iyengar, Chandrasekharan, Venkatesh & Arunachalam.
3. Discrete Mathematical Structures by Kolman, Busby & Ross.
4. Graph Theory with Applications to Engineering and Computer Science by Narsingh Deo.
5. Discrete Mathematical structure by Kolman.
6. Discrete Mathematics by J.P. Sharma 7. Graph Theory by Harvey.



UNIT – 1

Ms Windows: Introduction to Ms- Windows; Features of Windows; Various Versions of Windows & Its Use; Working With Windows; My Computer & Recycle Bin ; Desktop, Icons And Windows Explorer; Screen description & working styles of Windows; Dialog Boxes & Toolbars; Working with Files & Folders; Shortcuts & Autostarts; Accessories and Windows Settings using Control Panel; Start button & Program lists; Installing new Hardware & Software.

UNIT – II

Basics of Ms-Word: Creating Word Documents; The Word Window , Entering Text . Editing Document Text; Text, Copying and Moving Text. Applying Text Enhancements; Applying Fonts and Font Styles In Word, Highlighting Text For Distinctive Look . Aligning and Formatting ; Aligning Text, Using Indentation Options, Setting Line Spacing Options, Using Tabs. Creating Lists, Numbers and Symbols ; Numbering and Bullets, Creating Special Characters. Replacing and Checking Text ; Creating and Applying Frequently Used Text, Finding and Replacing Text , More About Spelling and Grammar, Using The Thesaurus Command. Getting Into Print ; Using Print Preview, Changing Page Orientation and Paper Size, Aligning Text Vertically, Settling Margins, Printing Options. Advanced Formatting Techniques In Word :Formatting Pages; Formatting Sections, Creating and Modifying Page Numbers, Creating Headers and Footers , Taking Care of Loose Ends .Working With Columns ; Working With Newspaper Columns, Revising Column Structure. Constructing High-Quality Tables ; Creating and Revising Tables , Modifying Table Structure , Formatting Tables , Using Tables Calculatingly. Working Smarter with Word ; Using Templates. Creating Outlines In Word ; Creating an Outline , Modifying an Outline.

UNIT- III

Access Concepts & Terms : Database Tables ,Relational Databases , Records , Fields , Controls & Objects , Queries & Dynasets, Forms, Reports ,Properties , Wizards , Macros , Access Requirements , Starting & Quitting Access , The Access Workspace & Tool, Views . Creating database & tables with & without wizard , field name , data types & properties , adding & deleting fields in fields , renaming fields & their caption , reslzing fields , freezing columns , primary key field & indexing fields. Form: Form wizard , saving & modifying forms : Entering & Editing data , Finding , sorting & displaying data , queries & dynasets , creating & using select queries , using wild cards in queries , reformatting dynasets. Reports : Creating reports, previewing reports, printing reports, modifying, saving. Relational databases – definition, purpose, creation, viewing, deleting. Expressions , Macros.

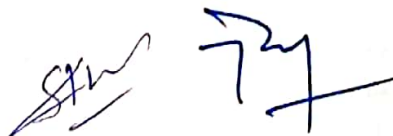
UNIT - IV

Creating Excel Worksheets :Entering and Editing Cell Entries ; The excel Application Window , Workbooks and Worksheets, Moving the Cell Pointer, Entering Text and Numbers , Revising Text and Numbers. Working with Numbers ; Creating Formulas, Formatting numbers. Changing Worksheet Layout ; Adjusting Column Width and Row Height, Inserting and Deleting Rows and Columns, Inserting and Deleting Cells , Moving and Copying Cell Contents , Naming a Worksheets , Selecting Worksheets , Copying and Moving Worksheets, Inserting and Deleting Worksheets, Other Formatting Options ; Aligning Text , Border and Color. Printing in Excel ; Print Preview, Changing Page Setup , Checking Worksheet Spelling. Advanced Techniques in Excel : Using Functions and References ; Using Functions , Entering Functions, Relative and Absolute Cell References. Naming Ranges ; Naming Ranges , Using Names . Creating Easy-to-Understand Charts ; Pie Charts , Series Charts , Creating Charts , Moving , Sizing , and Printing Chart Objects . Editing and Formatting Charts ; Adding a Data Series , Deleting a Data Series , Modifying and Formatting Charts.

UNIT – V

Creating PowerPoint Presentations: Creating a Basic Presentation , Building Presentations, Modifying Visual Elements , Formatting and Checking Text , Adding Objects, Applying Transitions , Animation Effects and Linking , Preparing handouts , Taking the Show on the Road.

Reference : 1. Microsoft Office 97 : Will Train , Gini Courter, Annette Marquis bpb Publication.



PAPER CODE SOS BCA-201
OBJECT ORIENTED PROGRAMMING IN C++

Course Outcomes: After successful completion of this course, student will get the skill to use of object oriented programming concepts such as class, object, inheritance, encapsulation, polymorphism and stream classes which will help us to design software and to solve real life problems.

UNIT-I

Introduction to OOPS languages: concept, characteristics of OOP's languages, benefits of OOP's, disadvantage of OOP's. Application of OOP's.

Classes & Objects: Specifying a Class, Creating Objects, Accessing Class members, Defining member function, Outside Member Functions as inline, Accessing Member Functions within the class, Static data member, Access Specifiers: Private, Protected and Public Members. class. Passing objects to function, Returning objects, Object assignment, This pointer.

UNIT-II

Constructor & Destructor : Introduction, Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Default Argument, Constructing two dimensional Array, Destructor.

Array, Pointers, and references: Array of objects, Pointers to object, Pointer to class members. References: Reference parameter, Passing references to objects, Returning reference, Independent reference, The Dynamic Allocation operators New, delete.

UNIT-III

Function & operator overloading : Function overloading, Overloading constructor function finding the address of an overloaded function, Operator Overloading: Creating a member operator function, Creating Prefix & Postfix forms of the increment & decrement operation, Overloading the shorthand operation (i.e. +=, -= etc), Operator overloading restrictions,

UNIT-IV

Inheritance : Base class Access control, Inheritance & protected members, Protected base class inheritance, Inheriting multiple base classes, Constructors, destructors & Inheritance, When constructor & destructor function are executed, Passing parameters to base class constructors, Granting access, Virtual base classes . Virtual functions & Polymorphism : Virtual function, Pure Virtual functions, Early Vs. late binding

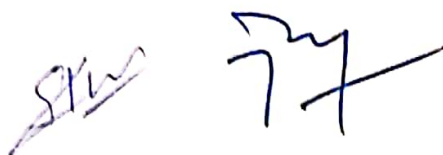
UNIT-V

The C++ I/O system basics : C++ streams, The basic stream classes: predefined streams, Formatted I/O: Formatting using the ios members, Using manipulators to format I/O, Creating your own manipulators, -File Management: Introduction — File handling, File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing a character, Reading a character.

Text & Reference Books :

1. C++ The complete reference - Herbert Schildt, - TMH Publication Object Oriented Programming
2. Object Oriented Programming With - R. Subburaaj, Vikas Publishing House, New Delhi.
3. C++- E. Balguruswamy, Tmh Public
4. Object oriented programming and C++, R Rajaram, New Age International.
5. Mastering C++ K. R. VenuGopal, T.RaviShanker, Tata Mcgrawhill.

- R. Lafore



Course Outcomes- After successful completion of this course, student will get the, skill systems' various data managing throw database management system various models and SQL queries. Skill of students will be increase so they can easily develop database with all the constraints which will help in storing and retrieving data easily

UNIT-I

DBMS Concepts and architecture Introduction, Advantages, of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Functions of DBA, ER data model: Entitles and Entity types, Defining the E-R diagram, Concept of Generalization, Aggregation and Specialization. Network data model, hierarchical model and Relational data model.

UNIT-II

Relational Database Concept and Design: Introduction to relational database, Structure of Relational Database, Relational model terminology domains, Attributes, Tuples, Relations, relational DB schema. Relational algebra: Basic operations selection and projection, Set Theoretic operations Union, Intersection, set difference and division, Join operations: Inner, Outer, Left outer, Right outer and full outer join.

UNIT-III

Normalization: Functional Dependency, definition, trivial and nontrivial FD, Normalization 1NF, 2NF, 3NF, Decomposition using FD dependency preservation, BCNF, 4NF

Working with Table: Creation, Insertion, Updating, Deletion of tables, Modification of structure of tables, Removing, Deleting, Dropping of Tables.

UNIT-IV

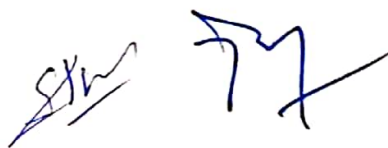
Data Constraints, Column level & table Level Constraints. Null, Unique Key, Default key, Foreign key, Check Integrity constraints. Defining different constraints on the table Defining Integrity Constraints in the ALTER TABLE Command, Select Command, Logical Operator, Range Searching, Pattern Matching.

UNIT-V

PL/SQL, SQL & PL/SQL differences, block structure, variables, constants, data type, assigning database values to variables, select ... into, cursors, using flow control and loop statement, procedures & functions - concept, creation, execution, advantages, syntax, deletion, Triggers - Concept, use, how to apply database triggers, type of triggers, syntax, deleting.

Text & Reference Books :

1. INTRODUCTION OF DATABASE SYSTEM - C.J. DATE - ADDITION - ESLEY
2. Principles of database system - Jeffery D. Ullman Galgotia Publication
3. Database system concepts - Henry F. Korth
4. Ivan Bayross, "SQL, PL/SQL", BPB Publications"
5. Liebschuty, "The Oracle Cook Book", BPB Publication
6. Michael Abbey, Michael J. Corey, "Oracle a Beginners guide". TMH Publication.



PAPER CODE SOS BCA-203
COMPUTER ORGANIZATION AND ARCHITECTURE

Course Outcomes: On completion of the course, Students will get the skill to examine the operation of the major building blocks of a computer system and it also familiar to boolean algebra, logic gates, logic circuits, and memory hierarchy.

UNIT -I Boolean algebra ,boolean laws and theorems, Logic gates, Demorgan's theorem, Duality theorem, Binary addition, subtraction, K-map simplification, SOP, POS.

UNIT -II Combinational Circuits-Multiplexer, Demultiplexer, Encoder, Decoder, Half adder, Full adder.

Sequential circuits- Flip flops, Registers and its types, Counters, Asynchronous Counter, Synchronous counter.

UNIT-III Semiconductor memories , RAM and ROM, memory addressing, Memory cells, Secondary memories, Cache memory, Virtual memory.

UNIT-IV Instruction and Instruction sets, Instruction cycle, addressing Modes, Basic concept of Pipelining, Types of data transfer techniques.

UNIT-V Accessing I/O devices-Interrupts-Direct Memory Access-Buses-Interface circuits- Standard I/O interfaces(PCI,SCSI,USB).

Text & Reference Books:

1. Digital Computer Organisation -Morris Mano-Pearson
2. Digital Principles and applications Malvino A.P.& Leech Tata Mc Gra Hill
- 3.Computer organization and architecture Latest Edition- ilam Stalling
- 4.Computer System design and architecture- V.P. Heuring, H.F. Jordan.

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Course Outcomes- At the end of this course, students will get the skill of English grammar in writing and speaking. Hence communicative skill of students will be increase that make student more appropriate in corporate world.

UNIT-I.

Sentence - Its Kinds, Subject and Predicate. Parts of Speech- Noun, Pronoun, Adjective, Preposition, Verb and Adverb in detail.

UNIT-II

Tenses- Present, Past and Future (Indefinite, Continuous, Perfect & Perfect Continuous. Sequence of Tenses. Active and Passive Voices. Direct and Indirect Narration.

UNIT-III

Subject-Verb Agreement. Articles. Punctuation. Conditional Sentences. Word Building- forming Nouns from Verbs/ Adjectives and vice versa, Prefixes and Suffixes.

UNIT-IV


Uses of Infinitive, Participles and Gerund. The Structure of sentences- Clauses (Subordinate and Co-ordinate) and Phrases, Simple, Compound and Complex Sentences. Transformation of Sentences. Synthesis of Sentences.

UNIT-V

Translation- From Hindi to English & Vice Versa. Writing a paragraph in about 100-150 words on Current National/International Events, Renowned Political Leaders, Sports Personalities, Social Workers, Thinkers, Scientists, Noble Prize Winners, etc.

Text & Reference Books :

1. A.J. Thomson & A.V. Martinet: A practical English Grammar.(OUP)
2. F.T.Wood : A Remedial English Grammar for Foreign Students.(Macmillan)
3. Michael Swan : practical English Usage.(OUP, ELBS)
4. Wren & Martin : High School English Grammar & composition. (Revised by N.D.V. Prasada Rao, S.C. Chand & Co.)
5. W.S. Allen: Living English Structure.



Course Outcomes: At the end of this course, students will get the skills to understand basic knowledge of IT and basics of internet, Data science and AI applications can be developed so students can aware of machine learning and latest technologies . students will also able to bulld web page using HTML.

Unit I

Introduction: Basic syntax, Literal Constants, Numbers, Variable and Basic data types, String, Escape Sequences, Operators and Expressions, Evaluation Order, Indentation, Input Output functions, Comments.

Unit II

Data Structure: Control Flow: Conditional Statements - If, If-else, Nested If-else. Iterative Statement - For, While, Nested Loops. Control statements - Break, Continue, Pass. List, Tuples, Dictionary and Sets.

Functions- defining a function, calling a function, types of. function, function arguments, anonymous function, global and local variables.

Unit III

Exception: Exception Handling, Except clause, Try finally clause, User Defined Exceptions. Modules and Packages. Standard Libraries: File I/O, Sys, Date and Time and multi-threading.

Unit IV

Object oriented programming: Class and Object, Attributes, Methods, Scopes and Namespaces, Inheritance, Overloading, Overriding, Data hiding.

Unit V

Tkinter: Introduction, Tkinter controls, import package, Frame, Button, Label, Entry, Radio, checkbox, Grid, pack, Menu. Database- Introduction, connections with python, executing queries using Tkinter.

Text & Reference books :

1. Timothy A. Budd: Exploring python, McGraw-Hill Education.
2. R.Nageshwar Rao , "Python Programming" ,Wiley India
3. Think Python: Allen B. Downey, O'Reilly Media, Inc.



Course outcomes - Student will get the skill to solve the problem Devices' of Graphics systems Applications, Display and Input Devices. Student will get the skill of –utilization of Algorithm like DDA, Bresenham's algorithm for line and circle ,mid-point, scan line algorithm etc, and 3D Concept.

UNIT-I

Basics of graphics systems applications, display devices : video displays, raster-scan displays, random scan displays, dvst, flat-panel displays. Input devices : keyboards, mouse, trackball and space ball, joysticks, digitizers, image scanner, touch panel, light pens, voice systems etc.

UNIT-II

Line drawing algorithms: DDA Algorithm, Bresenham's line Algorithm. Bresenham's Circle drawing algorithm, Mid-Point Circle Algorithm, Scan-line Polygon Fill Algorithm, Inside-Outside test, Boundary Fill algorithm, Flood-Fill algorithm. Pixel, Pixel addressing, Antialiasing.

UNIT-III

Two-dimensional geometric transformation: Translation, Rotation, Scaling, Reflection, Shear, Matrix representation and Homogeneous coordinates. Composite transformation: Translations, Rotations, Scalings. General Pivot-Point Rotation and Scaling.

UNIT-IV

Clipping :cohen-sutherland line clipping algorithm, line clipping using non rectangular clip windows, polygon clipping, text clipping.

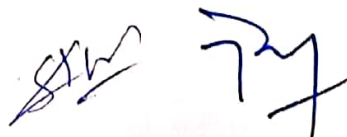
3D Concept:Three-Dimensional Object Representations – Three-Dimensional Geometric and Modeling Transformations – Three-Dimensional Viewing – Color models – Animation

UNIT-V

Introduction to multimedia: review of multimedia, multimedia applications, multimedia systems architecture, multimedia hardware, multimedia software, representation and operations on various multimedia data types: text, images, graphics, video and audio, introduction to multimedia authoring.

Text & Reference books:

- 1.Computer Graphics – R.C.S. Asthana, N.K. Sinha, New Age International
- 2.Principles of Interactive Graphics Newman & Sproul McGraw Hill
- 3.Computer Graphics : Principles & Practice Second Ed. in C Foley, Van Dam, Feiner, Hughes Pearson Education, Eleventh Indian Reprint.
- 4 Computer Graphics Apurva A Desai PHI Learning, 2009
- 5 Computer Graphics Herrington S. Prentice Hall –
- 6 Computer Graphics with Multimedia A Rajaraman Narosa.



Course Outcomes- At the end of the course students will be able to outline various concepts and features of operating systems. Compare various operating systems with respect to characteristics and features. Implement algorithms of CPU scheduling, memory scheduling and disk scheduling. Make changes in the OS configurations as per need.

UNIT I

Computer system overview, Basic elements, functions and types of operating system, Serial processing, Batch System, multi- programmed, time sharing systems, system components, operating system services, system calls, processor, registers, instruction execution, interrupts, Interrupt processing.

UNIT II

Memory hierarchy, cache memory, I/O communication techniques, concept of process, memory management, information protection, scheduling and resource management structure, process description, process state, two state process model, creation and termination of processes, five state model, suspended process, process description, process attributes.

UNIT III- Semaphores, classical problem of synchronization, monitors, atomic transactions, system model, deadlock characterization, method for handling deadlocks, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, combined approach to deadlock.

UNIT IV- Process concepts, process state and process control block, process scheduling, scheduling criteria, scheduling algorithms, multiple-processor scheduling, real-time scheduling, critical section problem.

UNIT V- Loading programs, fixed portioning, dynamic portioning, relocation, simple paging, segmentation, loading and linking. Paging, segmentation, segmentation with paging, virtual memory, demand paging, performance of demand paging, page replacement and its algorithms.

Text & Reference Books:

1. Operating System Concepts- Silberschatz & Galvin, Addison Wesley publication
2. Operating System - W. Stallings, Second Edition, prentice Hall of India.



PAPER CODE SOS BCA - 304
COMMUNICATION TECHNIQUES

Course outcomes - After completion of the course, students will get the grammar skill of English language. Students can understand Language Skills like Listening, Speaking Reading, and Writing. Students can understand the purpose, role, importance, elements of communication. Students can understand how to prepare general and technical documents.

UNIT I-

Review of English Grammar - Parts of Speech, Subject-Verb Agreement, Tenses, Narration, Voice.

UNIT II

Communication (Purpose, Role, Importance, Elements), Effective and Efficient Communication, Spoken and Written Communication, Barriers to Effective Communication.

UNIT III

Listening: Introduction, Effective and Efficient Listening, Types of Listening, Barriers to Effective Listening. **Speaking:** Introduction, Role of Speaker and Audience, Style and Body Language, Making Speeches, Presentations, Group Discussion, Meeting, Interview, Debate.

UNIT IV

Reading: Introduction, Purpose, Comprehension, Tactics and Strategies. **Writing:** Introduction, Guidelines for Good writing, Various Writing Styles (General and Technical).

UNIT V

Drafting of General and Technical documents (applications, letters (enquiry, replies and complaints), resume, CV, précis, reports, notice writing, covering letter, e-mails,), Use of audio-visual aids: OHP, Slides, charts, computers.

Text & Reference Books :

1. Wren & Martin – Grammar
2. Books Prescribed by M.P. Uchcha Shiksha AnudanAyog are The Text Books For This syllabus.
3. Technical Communication, M.H. Rizvi, Tata McGrawhill

PAPER CODE 605 BCA-401
PROGRAMMING IN JAVA

Course Outcomes - After completion of the course, student will get the of object-oriented programming in Java language. Apart from this student will get the skill of using AWT components, arrays, Strings: String, and Collection Framework: Set, List, Queue, and Maps.

UNIT-I

Introduction of Java: Types of Java, Feature of Java, Vs JAVA, JAVA environment, JAVA virtual machine. Constant & Variables, Declaration of Variables, Scope of Variables, Data Types in Java, Operators in Java, Control statements in Java.

UNIT-II

Basic concept of OOPS: OOPS terminology, Classes, methods, creating instance & class variable, accessing class member, Constructor, Methods overloading, Method overriding final classes, finalizer method, Abstract method & classes, visibility control, Interfaces (Defining interfaces, extending interfaces, implementing interfaces, accessing interfaces), Package - system package, using system package, creating package accessing a package, adding a class to a package.

UNIT-III

Arrays: One Dimensional & Two Dimensional, Strings: String, stringBuffer, and stringBulder, Collection Framework: Set, List, Queue, Maps.

UNIT-IV

Exception Handling- Fundamental, types, uncaught exception, using try and catch, multiple catch, nested try, throw, throws, finally.

Java thread model, creating threads, extending thread class, stopping & blocking a thread, Life cycle of thread, thread exception, thread priority, synchronization- Implementing and runnable interface, inter thread communication, multithreading.

UNIT-V

What is an applet, applet architecture, applet life cycle, a simple applet program, AWT-Working with Graphics; line, rectangles, ellipses, circles, arcs, polygons Working with colors; Working with fonts.

Text & Reference Books:

Java Complete Reference - Tmh Publications

Java Volume I & II - Pearson Education

Programming In Java, 2nd Edition, E. Balaguruswamy, Tmh Publications

Peter Norton Guide To Java Programming, Peter Norton, Techmedia Publications.



Course Outcome- The goal of this subject is to introduce the theory and develop the algorithms of different types of data structures. Understanding the operations of different data structures and implement in C++. Explain use and application in real life for different data structures.

Unit-I

Introduction to Data Structure, Array, Records, Stacks Introduction to Stack & Primitive Operation on Stack, Stack as an Abstract Data Type, Multiple Stack, Stacks Application: Infix. Post Fix, Prefix and Recursion, Introduction to Queues, Primitive Operations on the queues. Queue as an Abstract Data Type, Circular Queue, Dequeue, Priority Queue, Applications of Queue.

Unit-II

Pointer, It's Limitation and Operation. Linked List & their type: linear, circular & Doubly linked list, Operations on various type of linked list, application of Linked list: Polynomial manipulation.

Unit-III

Tree: General & Binary Tree. Conversion of General to Binary Tree. Binary Search Tree (BST) & It's Representation and Operation. Traversal Methods- In Order, Pre Order & Post Order, Application of Binary Tree: Manipulation of Arithmetic Expression. Multiway Search Tree, Balance Tree & Their Types.

Unit-IV

Graph: Graph & Their Category & Representations, Traversing Technique: Breadth First & Depth First Search. Spanning Trees, Technique of Minimum Spanning Tree (MST), Application of Graphs: Pert & Related Techniques.

Unit-V

Heaps and Hash Table. Introduction to file organization; Sequential, Indexed sequential, Relative & Direct file organization. Searching: Linear & Binary Search. Sorting: Concept, selection sort, Bubble sort merge Sort, Tree sort & Partition - Exchange sort.

Text & Reference Books:

1. Trembley & Sorrenson. Data Structure. Tata Mcgraw Hill.
2. Salaria R.S. Data Structures and Algorithms using C++. Khanna Publishing.
3. Lipschuists. Data Structure. Schaum's Outline Series. Mcgraw Hill Publication.

STW

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Course Outcomes - After completion of the course, student will get the skill to describe models and methods relating to reporting, communication, Rules of Journal, Simple Journal entries, types, format and balancing of Cash Book. Student should be able to meaning and need of material control.

UNIT-I

Purpose of Accounting and Uses of Accounting Information, Meaning of Financial Accounts, Important concepts of Accounts, types of accounts, Rules of Journal, Simple Journal entries, Cash Book - Types, Format of cash book, balancing of cash Book, Ledger, posting of entries, Double entry book-keeping.

UNIT-II

Trial Balance, Adjustment Entries Relating to Closing Stock, Outstanding Expenses, prepaid Expenses, Accrued Income, Unearned Income, Depreciation and Interests on Capital, Valuation of Assets and Depreciation Methods: Straight Line Method, Diminishing Balance Method, Simple Final Accounts

UNIT-III

Meaning and need of material control, purchasing of materials, inspection of materials, FIFO and LIFO methods of outgoing material, their advantages and limitations, Methods of Payments of Wages.

UNIT-IV

Unit Costing, Preparation of Cost Sheet and Statement of Cost (Including calculation of tender price) Overhead Costing.

UNIT-V

Meaning and scope of financial management, functions of finance, Objectives of financial management, Mathematics of finance: present value techniques, Cash and Fund Flow Statement, importance & usefulness of statement,

Text & Reference Books:

1. Book Keeping by Grewal T.S.
2. Cost Accounting by S.K. Maheshwari.

Course Outcomes- Student will get the skill to solve the common numerical methods like Arithmetic, Floating point number operations, Normalization and their consequences, Emphasis on computational Algorithms, Iterative methods, False position, and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.

Unit – I

Computer Arithmetic, Floating point number operations, Normalization and their consequences, Emphasis on computational Algorithms, Iterative methods, Zeros of a single transcendental equation and zeros of polynomials using Bisection, False position, Newton-Raphson and Secant methods, convergence of solutions.

Unit – II

Simultaneous linear equations, Solution of simultaneous linear equations, Gauss elimination method with pivoting, Gauss – Jordan method, Jacobi's iteration method and Gauss – Seidel iteration method, Ill-conditioned equations and refinement of solutions.

Unit – III

Difference Operators and Interpolation: Definition of Forward, Backward, Shifting, Divided difference, Central and Averaging Operators and their relationships, Newton's forward difference, backward difference and divided difference interpolation formulae, Lagrange's Interpolation formula.

Unit – IV

Numerical Differentiation and Integration: Numerical Differentiation using Newton's forward difference, backward difference and divided difference interpolation formulae, General Quadrature formula, Newton Cote's integration, Trapezoidal rule, Simpson's one – third and three – eight rules.

Unit – V

Numerical Solution of Ordinary Differential equations by Euler's Method, Modified Euler's method, Taylor's series method, Picard's method, Runge Kutta, second order and fourth order methods, Predictor-corrector methods.

Text & Reference Books:

1. Computer Oriented Numerical Methods by V.Rajaraman.
2. Numerical Analysis by S.S.Sastry.
3. Numerical Algorithms by E.V.Krishnamurthy
4. Numerical Methods by B.S.Grewal.
5. Numerical Methods for Scientific & Engg. Computer by Jain & Iyenger.
6. Numerical Method by Bala Guru Swamy .
7. Computer oriented Numerical Method by Salaria.
8. Numerical & Statistical Methods In Computer By Singh.

PAPER CODE:SOSBCA-501
PROGRAMMING IN ADVANCE JAVA

Course Outcomes — After completion of the course, student will get the skill to create, debug and run multi-tier and enterprise-level applications. Student will get the skill to access database through Java programs using Java Data Base Connectivity (JDBC), create dynamic web pages, using Servlet and JSP, and make use of Java Bean.

UNIT-I

Started with Web Applications in java :

Introduction to web applications, Benefits of web applications, Web Architecture Models- Model-1 Architecture, Model-2 Architecture.

Introducing MVC Architecture : Model component, View component, Controller component.

UNIT-II

Introduction to JDBC : Introducing JDBC, Communicating with database : obtaining connection, creatingjdbcstatement object, executing SQL statement, closing connection. Creating DSN, understanding various JDBC drivers. Creating table by using JDBC, types of statements : statement, prepared statement, callable statement, working with ResultSet.

UNIT-III

Introduction to Servlet : Needs for server side Extensions, what is servlet, advantage of servlet, understanding of servlet api Stage of Servlet life cycle : loading of servlet, Initializing of a servlet, Request Handling, Destroying the servlet. deploying servlet application, generic servlet class.

UNIT-IV

Introduction to JSP : Understanding of JSP, Advantage of JSP, Describing Jsp Architecture.

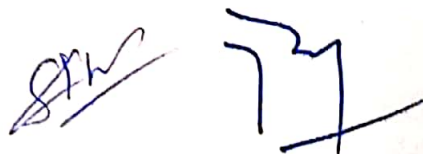
Jsp Life Cycle : page translation, Compilation stage, Loading and initialization stage, request handling, destroying stage.

UNIT-V

Introduction to JavaBeans : Introduction of JavaBean, advantages of using JavaBeans, Describing Tags • describing Action Tag, describing useBean Tag, describing setProperty Tag.

Text & Reference Books:

1. Java Complete Reference — Tmh Publications
2. Java Volume I & II — Pearson Education
3. Programming In Java, 2nd Edition, E. Balaguruswamy, ,Tmh Publications
4. Peter Norton Guide To Java Programming , Peter Norton, Techmedia Publications.



PAPER CODE: SOSBCA- 502
WEB TECHNOLOGY

Course Outcomes: the student will be able: Analyze a web page and identify its element and attributes. Create web page using HTML and Cascading style sheet. Build dynamic web pages using Java script. Create XML Document.

Unit -I

HTML: Introduction, head section: style. Body section: header, paragraph, text formatting, Linking, internal Linking, Embedding image, lists, tables, frames, other special tags and characters.

Unit -II

Web page using HTML: what can you do with HTML, Creating, saving and viewing HTML document's, applying structure Tags , tags and attributes , image, Hyperlink, background and color controls, different HTML tags, table layout and presentation, size and attributes, list types, frames and forms in web pages.

Unit-III

CSS: Introduction, level of style sheets, style specification formats, Selector forms, property value forms, font, list, color, alignment of text ,box models, Pseudo Classes and Pseudo Elements, background Image.

Unit-IV

JAVA Script: introduction, object orientation and Java script, general syntactic characteristics screen output, keyboard input, primitives, operations, Expressions , controls statements, object creation and modification, Arrays function, constructor, pattern matching using regular expressions.

Unit -V

XML Basics: introduction, HTML vs XML, syntaxes of XML Document, XML attributes, DHTML :Document object model and collection- using the collection all, moving object around the documents.

Text & Reference Books:

1. Robert w. Sebesta "programming the world wide web" forth edition Pearson Education 2007
2. Jeffery C. Jackson " web technologies A computer science perspective" Pearson Education 2006
3. Ivan Bayross, "web Enabled commercial Application development using HTML, Java script, DHTML BPB publication.



PAPER CODE: SOSBCA-503
ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM

Course Outcomes - After completion of the course, student will get the skill of expressing production system, search techniques, life cycle of expert system of better utilization of multiple resources. Student will get the skill of expressing and work on speech recognition, neural network, Fuzzy logic and also be able to work on PROLOG.

UNIT- I

Introduction-Definition- future of Artificial intelligence, applications of artificial intelligence, characteristics of Intelligent Agents-typical Intelligent agents- Problem solving Approach to Typical AI problem-Search Strategies- Uninformed-Heuristics-informed.

UNIT- II

Problem solving: Defining the problem as state space search, Production system, Problem characteristics, Problem system characteristics, Search techniques: Generate and test , Hill climbing, Best first search, A* algorithm, Problem reduction. Knowledge representation: Level of representation, Knowledge representation schemes.

UNIT- III

Expert system: Definition, Role of knowledge in expert system, Architecture of expert system. Expert system development life cycle: Problem selection, Prototype construction, Formalization, Implementation, Evaluation, Knowledge acquisition: Knowledge engineer, Cognitive behavior, Acquisition techniques, Formal logic, Inference Engine, Sematic net, Frame, Scripts.

UNIT- IV

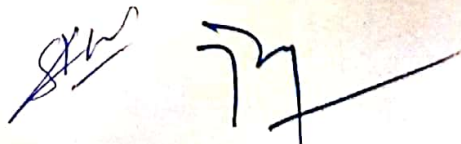
Perception: Sensing, Speech recognition, Vision, Action, Neural networks: Introduction, Comparison of artificial neural networks with biological neural networks, Learning in neural networks, Perceptrons, Back propagation networks, application of neural networks.

UNIT- V

Programming in Logic (PROLOG): Introduction, Prolog variables, Using rules, Input and Output predicates, Fail and cut predicates, Recursion, Arithmetic operation, Compound object, Dynamic database, Lists, String, File operations

Text & reference Books:

1. David W. Rolston: Principles of Artificial intelligence and Expert System Development, McGraw Hill Book Company
2. Elaine Rich, Kevin Knight: Artificial Intelligence, Tata McGraw Hill
3. Carl Townsend: Introduction to Turbo Prolog, BPB
4. Stamations V. Kartalopoulos: Understanding Neural Networks and Fuzzy Logic, PHI
5. Dan W. Patterson, " Introduction to AI and ES", Pearson Education, 2007
6. Peter Jackson, " Introduction to Expert Systems", 3rd Edition, Pearson Education, 2007
7. Stuart Russel, Peter Norvig "AI – A Modern Approach", 2nd Edition, Pearson Education 2007.



PAPER CODE SOSBCA – 504
SOFTWARE ENGINEERING

Course Outcomes- After completion of the course, students will get the skills to solve software crisis by understanding various software life cycle models, and software requirements analysis & specifications. Students will get the skill of software design, design process, design fundamentals, design notations & specification modularization, design structure charts.

UNIT – I

Introduction: Software Crisis, software engineering, Software Processes & Characteristics, Need of Software life cycle models, Waterfall, Prototype, and Spiral Models. Software Requirements analysis & specifications: Requirement elicitation techniques: Interview, form analysis, need for SRS, Characteristics of SRS.

UNIT – II

Software Project Planning: Issues involved in software estimation, Size Estimation like lines of Code & Function point method, Cost Estimation Models - COCOMO, Software project management technique = Gantt Chart.

UNIT-III

Basic Concept of Software Design, Design process, design fundamentals, software design levels: Architectural Design, high level design, detail Design, Design notations & specification Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, , Object Oriented Design, software design approaches: Top-Down and Bottom-Up Design. S/W Configuration Management terminology.

UNIT - IV

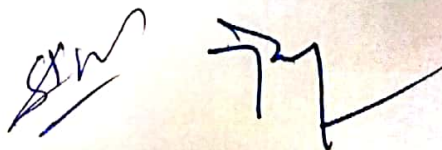
Basic concept of object-oriented analysis & Design, traditional paradigm versus object-oriented paradigm, Overview of UML: class diagram object diagram, use case diagram, sequence diagram, activity diagram, component diagram, collaboration diagram.

UNIT – V

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, software testing, Test cases, Software Maintenance: Types of software Maintenance, software maintenance model: Quick fix Model, taute's maintenance model, Concept of Software Re- engineering & Software Reverse engineering- Definition, purposes and objectives, benefits.

Text & Reference Books:

1. Software Engineering – A practitioner's approach"- R. S. Pressman, 5th Ed., McGraw Hill Int.
2. Software Engineering (Principle & Practices –Waman S. Jawadekar , Tata McGraw Hill
3. An Integrated approach to software Engineering,- Pankaj Jalote , Narosa Publication
4. Software Engineering- Shari Lawrence, Pfleeger, Pearson edu.
5. Unified software development Process- Ivar Jacobson, Grady Booch, Pearson edu.



PAPER CODE: SOSBCA – 601
MOBILE APPLICATION DEVELOPMENT

Course outcomes - After completion of the course, student will get use built-in the skill to write simple GUI applications, use built-in widgets and components, work with the-database to store data locally, and much more. Student can understand Mobile Computing- mobile Application programming. Apart from that student can also understand the android software development platform and android Framework.

UNIT-I

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell., Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp& comm, View files, disk related commands,

UNIT-II

An Introduction to Mobile Computing- mobile Application Programming, Different Platforms. Operating systems- Architecture and working of Android, iOS and Windows phone, Comparison of Android, iOS and Windows phone, Android Development Environment -Advantages and Future of Android , Android Software Development Kit for Eclipse

UNIT-III

Android Software Development Platform - Understanding Java SE and the Dalvik Virtual Machine , The Directory Structure of an Android Project , Common Default Resources Folders , The Values Folder Leveraging Android XML , Screen Sizes, Launching Your Application

UNIT-IV

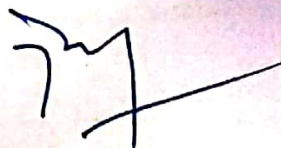
Android Framework Overview- The Foundation of OOP: The APK File, Android Application Components, Android Activities: Defining the UI, Android Services: Processing in the Background, Broadcast Receivers: Announcements and Notifications,

UNIT-V

Views and Layouts, Buttons, Menus, and Dialogs, Graphics Resources in Android- Introducing the Drawables , Implementing Images , Core Drawable Subclasses, Using Bitmap, PNG , JPEG and GIF Images in Android . Handling UI Events-An Overview of UI Events in Android , Listening for and Handling Events, Touchscreen Events, Keyboard Events ,Context Menus ,Controlling the Focus

Text and Reference Books:

1. OnurCinar , "Beginning Android 4" , Apress Publication
2. Reto Meier, "Professional Android 4 Application Development", Wrox
3. IstvánNovák, Zoltan Arvai, GyörgyBalássy and David Fulop, "Beginning Windows 8 Application Development "
4. Allen Sanders and Kevin Ashley, "Professional Windows 8 Programming: Application Development with C# and XML", Wrox Publication.



PAPER CODE SOSBCA - 602
INTRODUCTION TO ASP.Net & C#

Course Outcomes — After completion of the course, students will get the skill write an object oriented program using custom classes. The skill of students will be increase so they can easily build and debug well-formed Web Forms with ASP. NET Controls. Student will be able to understand ASP.NET framework, Applications Web servers, installation of IIS. Web forms AND web form controls.

UNIT-I

Programming in C#: Overview of C#, C# environment, datatype, type conversion, variables, constants, operators: Arithmetic Operators , Relational Operators, Logical Operators, Bitwise Operators, Assignment Operators, Misc Operators, , decision making, loops, overview of OOP's: (class, object ,methods, encapsulation, Inheritance, polymorphism, abstraction.

UNIT-II

Programming in C#: Arrays, String, Structure, Enum, Operator Overloading, Interfaces, PreprocessorDirectives, Namespace, Regular Expression : Character escapes, Character classes, Anchors, Grouping constructs, Quantifiers, Backreference constructs, Alternation constructs, Substitutions, Exception handling, File I/O :StreamReader, StreamWriter, StringReader, StringWriter. C# Attributes, C# Properties, C# Reflection.

UNIT-III

Introduction to ASP.Net: Overview of ASP.NET framework, ASP.NET Application Life Cycle, page life cycle phases : Initialization, Instantiation of the controls on the page, Restoration and maintenance of the State, Execution of the event handler codes, Page rendering. Understanding ASP.NET Controls, Applications Web servers, installation of IIS. Web forms, web form controls -server controls, client controls, web forms & HTML.

UNIT-IV

Programming in ASP.Net: Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project. Event Handling- Application and Session Events, Page and Control Events.


Validation controls: RequiredFieldValidator, RangeValidator, CompareValidator, RegularExpressionValidator, CustomValidator, ValidationSummary. States Of ASP.Net : View State, Control State, Session State, Application State.

UNIT-V

Database connectivity in ASP.Net: Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.

Text & Reference Books :

1. VB.NET Black Book by steven holzner —dreamtech
2. ASP.NET Unleashed C# programming — wrox publication
3. C# programming Black Book by Matt tells.

PAPER CODE : SOSBCA - 603
NETWORKING CONCEPTS

COURSE OUTCOMES:

After completion of the course, student will get the skill to use appropriate network tools to build network topologies and familiarize with the basic taxonomy and terminology of computer networking area. Student will be able to establish a solid knowledge of the layered approach that makes design, implementation and operation of extensive networks possible.

UNIT I

Introduction to Network, Data Communication System: Purpose, Components : Source, transmitter, transmission System, receiver and destination. Data transmission: Frequency, Spectrum and Bandwidth. Time-domain and frequency domain Concepts. Relationship between data-rate and Bandwidth. OSI reference model, TCP/IP reference model.

UNIT II

Physical Layer: Transmission Media: Magnetic Media, Twisted-Pair cables, Baseband & Broadband Coaxial cables, Fibre Optics. Wireless Transmission: Radio Transmission, Microwave Transmission.

UNIT III

Data Link Layer: Services, Framing, Error Control, Error-Detecting & Correcting Codes. Data Link Protocols: Stop-And-Wait Protocol, Sliding Window Protocol. HDLC ; Static & Dynamic Channel Allocation In LAN & MAN.

UNIT IV

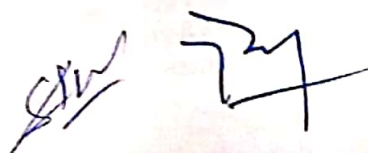
Routing, Routers, Bridges, Gateways, Routing Algorithms: Distance vector and Link state algorithm ; general principle of congestion control , congestion control Algorithms: Leaky bucket and token bucket , Token Bus, Token Ring. Ip Addressing, Subnets.

UNIT V

TCP connection management Transport protocol: UDP and TCP headers, Application Layer protocols: DNS, SMTP, FTP, POP , HTTP.

Text & Reference books :

1. Computer Networks By Tanenbaum
2. Data & Computer Communications By Stallins.
3. Data Communication and Networking By Behrouz A. Forouzan



COURSE OUTCOMES:

At the end of this course, students will get the skills to understand basic knowledge of AI and basics of Fuzzy logic, Most of the applications are developed using Neural networks and genetic algorithms so students will be aware to all these technologies. Students will be aware some hybrid applications developed using these technologies

UNIT I

Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Artificial Intelligence: Introduction, Knowledge representation issues, Propositional and predicate logic, monotonic and non monotonic reasoning, forward Reasoning, backward reasoning.

UNIT II

Fuzzy Logic: Fuzzy set theory, Fuzzy set versus crisp set, Crisp relation & fuzzy relations, Fuzzy systems: crisp logic, fuzzy logic, introduction & features of membership functions, Fuzzy rule base system : fuzzy propositions, formation, decomposition & aggregation of fuzzy rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

UNIT III

Neural Network : What is Neural Network, Learning rules and various activation functions, Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference between ANN and human brain, characteristics and applications of ANN, single layer network, Perceptron training algorithm, Linear separability, Introduction to Associative Memory, Adaptive Resonance theory and Self Organizing Map, Recent Applications

UNIT IV

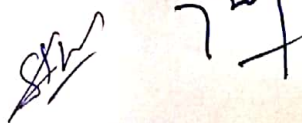
Genetic algorithms : Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modelling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

UNIT V

Hybrid soft computing techniques & applications: Neuro-fuzzy hybrid systems - genetic neuro hybrid systems - genetic fuzzy hybrid and fuzzy genetic hybrid systems - simplified fuzzy ARTMAP - Applications: A fusion approach of multispectral images with SAR, optimization of traveling salesman problem using genetic algorithm approach, soft computing based hybrid fuzzy controllers

Text & Reference books :

1. S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication.
2. S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications
3. Iresh A Dhotre . Technical Publication
4. Bose, Neural Network fundamental with Graph , Algo.&Appl, TMH
5. Kosko: Neural Network & Fuzzy System, PHI Publication
6. Klir&Yuan ,Fuzzy sets & Fuzzy Logic: Theory &Appli.,PHI Pub.
7. Hagen, Neural Network Design, Cengage Learning.



Course Outcomes- The students should be made to be familiar with the concepts of data mining and be acquainted with the tools and techniques used for knowledge discovery and process.

Unit I

Data mining Introduction: Definition, Data mining tasks, Data mining as a step of Knowledge Discovery process, Applications of Data mining; Data objects and types of attributes, Recalling mean, median, mode and weighted arithmetic mean.

Unit II

Data quality , overview of data pre processing. Classification analysis- definition, Overview of various classification techniques; Decision tree induction- working, examples ,specifying attribute test conditions.

Unit III

Evaluating the performance of a classifier- Holdout method, Random sub sampling , cross validation , Bootstrap; Association analysis: support, confidence, association rules ,Frequent Item sets. Frequent item set generation - Apriori principle , Apriori algorithm and examples, FP growth algorithm and examples.

Unit IV

Cluster analysis: Definition , overview of basic clustering methods, Density based methods- DBSCAN. Hierarchical and non-hierarchical techniques, K-MEDOID Algorithm, Partitioning, Clara, Clarans. Advanced Hierarchical algorithms.
Decision Trees: Decision tree induction, Tree pruning, Extracting classification rules from decision trees, Decision tree construction algorithms, Decision tree construction with pre-sorting.

Unit V

Techniques for Data mining: Introduction, Learning, Genetic algorithms. Web Mining: Web mining, Text mining, Content mining, Web structure mining. Searching Techniques: Optimal, non-optimal, Minmax, $\alpha - \beta$ pruning.

Text & Reference books :

1. Data Mining: Concepts and Techniques, 3rd edition, Jiawei Han and Micheline Kamber
2. Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Pearson Education.
3. Data Mining: A Tutorial Based Primer, Richard Roiger, Michael Geatz, Pearson Education 2003.
4. Introduction to Data Mining with Case Studies, G.K. Gupta, PHI 2006
5. Insight into Data mining: Theory and Practice, Soman K. P., Diwakar Shyam, Ajay V., PHI 2006
6. Data Mining:: Practical Machine Learning Tools and Techniques (Morgan Kaufmann Series in Data Management Systems) by Witten, Frank, Hall.

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PAPER CODE: 505BCA-702
INTRODUCTION TO R PROGRAMMING

Course Objective: At the end of this course, students will get the skill of visualization of data, manipulation of comprehensive data, and be able to apply R programming for Text processing, and data analytics from a statistical perspective.

Unit 1

Basic of statistical and programming features of R, Why R programming language, Advantage of R, applications of R, data types of R, R data structures like vectors, matrices, arrays, list and data frames.

Unit 2

Control structures, vectorized if and multiple selection, functions, Read/write data from/in files, extracting data from websites.

Unit 3

Clean data, Transform data by sorting, Recoding, slicing, merging, adding/removing new/existing columns, centering, scaling and normalizing the data values.

Unit 4

Converting types of values, using string in-built functions, statistical analysis of data for summarizing and understanding data.

Unit 5

Visualizing data using scatter plot, line plot, bar chart, histogram and box plot, Designing GUI: Building interactive application.

Text & Reference Books :

1. Cotton, R., Learning R: a step by step function guide to data analysis. 1st edition. O'reilly Media Inc.
2. Gardner, M. (2017). Beginning R: The statistical programming language, WILEY.
3. Lawrence, M., & Verzani, J. (2016). Programming Graphical User Interfaces in R. CRC press.

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Course Outcomes — After completion of the course, student will get the skill to identify the importance of digital marketing. Student will get learn to manage the website and understand the Google web master tool ,Google Adwords and social media platform.

Unit-I

Introduction: marketing vs sales, digital marketing ,traditional marketing Vs digital marketing, inbound vs outbound marketing, digital marketing benefit, digital marketing applications, digital marketing channels, digital marketing business model;

Unit-II

Web Design: web design, publishing a Basic website, design Principal and website copy, Domains and buying a Domain, core Objective of Website and flow, One Page website.

Search Engine Optimization: Search engine basics, How the search engine works, Search engine Algorithm, Search engine optimizations fundamentals; Keywords and SEO content Plan; On-site and Off-site SEO; optimize organic Search Ranking.

Unit-III

Google Web Masters Tools; How GWT can help monitor website's performance?, how GWT helps to understand ,how google search views your website?, how to set up GWT? ;

Introduction Adwords, why GoogleAds Appear, The Adwords Auction, Google Ads costs,Feature and Services; Create a Google Adwords Account;

Unit-IV

Social media marketing: introduction; major social media platforms for marketing; Facebook profiles and Pages, Business Categories, Custom URLs, Invite, Page Likes, Facebook Events, Facebook Insight Reports, Business Manager ,Boosting Posts and Page Promotion; Twitter ,opening account, twitter terminology, making a trend on twitter, campaign inside; social media for business;

Unit-V

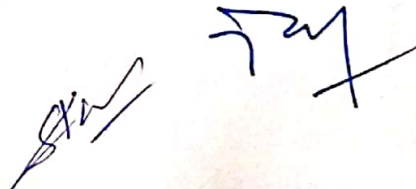
Content marketing: content marketing concept and strategies; Planning, Creating, Distributing and promoting content; Optimize website UX and Landing pages;

Creating & Managing a YouTube Channel;

Digital Marketing Budget & Plan; Resource Planning; Cost Estimating; Cost Budgeting; Cost Control

Text & Reference Books :

1. Fundamentals of digital marketing by puneet singh bhatia
2. Understanging digital marketing by Damainryan
3. Digital marketing by seema gupta



PAPER CODE: 505BCA - 704
ANALYSIS AND DESIGN OF ALGORITHMS

Course Outcomes- Students will be able to understand fundamentals of algorithms, Understanding various design methods like divide and conquer technique, Greedy strategy, dynamic programming, backtracking, branch and bound and lower bound theory and they will become familiar with computational complexity.

UNIT 1:
Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, analysis, design and comparison of various algorithms based on this technique. Introduction to divide and conquer technique, binary search, merge sort, quick sort, strassen's matrix multiplication.

UNIT 2:
Study of Greedy strategy: examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, prims and Kruskal algorithm, knapsack problem, job sequencing with deadlines, single source shortest path algorithm

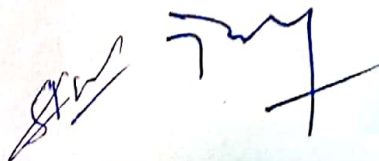
UNIT 3:
Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd-Warshall algorithm, Bellman and Ford algorithm.

UNIT 4:
Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem. Introduction to branch & bound method, Least cost search, bounding, FIFO branch and bound, LC branch and bound.

UNIT-5:
Meaning of lower bound theory and its use in solving algebraic problems
Computational Complexity: Complexity measures, Non deterministic Algorithms, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples-Travelling salesman problem, subset sum problem.

Text and Reference Books:

1. Horowitz, Sahani, Rajasekaran "Fundamentals of Computer Algorithms", Universities Press.
2. Thomas H. Cormen, "Introduction to Algorithms", PHI.
3. Vinod K. Rajput "Design and analysis of Algorithms"



PAPER CODE: SOSBCA – 801
CYBER SECURITY

Course Outcomes- This course aims to give an introduction to and an overview over the concepts of vulnerabilities, threats, attacks, and security measures and mechanisms in both computer systems and computer networks.

UNIT I

Introduction of cyber security: Cyber security, Security terminologies and principle, Cyber security threats, Types of security threats, Concept of cyber crime, Cyber fraud and cheating, Challenges of cyber crime, Cyber terrorism.

UNIT II

Cyber threats/attacks: Denial of service (DOS) attack, Types of denial of service attacks, Hacking, Types of hacking, Cracking, Malware attacks, Spoofing, Phishing attacks, SQL injection, Cross site scripting.

UNIT III

Cryptography: Introduction, Cryptographic techniques, Encryption, Decryption, Public key cryptography, Private key cryptography.

Digital Signature: Introduction, working of digital signature, Digital certificate, Certificate Authority.

UNIT IV

Cyber crime and criminal justice: Cyber crime IT Act 2000 and other IT Acts, Indian evidence act of 1872 Vs Information technology Act 2000, Monetary penalties, Strategies to tackle cyber crime and trends.

UNIT V

Network and web defense Tools of cyber security: Firewall, Types of Firewall, Virtual Private Networks, Intrusion Detection System, Secure socket layer (SSL), Transport layer security (TSL), IPsec (Internet Protocol Security).

Text & Reference Books:

1. Nitin K.Naik, Cyber and Network Security.
2. Jeetendra Panday, Introduction to Cyber Security.
3. Yuri Diogenes and ErdalOzkaya, Cybersecurity-Attack and Defense Strategies.
4. Threat modeling designing for security, Adam Shostack.



Course Outcomes-The key objectives of this course are for participants to be able to understand the concepts, characteristics, delivery models and benefits of cloud computing

Unit I

Introduction: History of cloud computing, Introduction of cloud computing, characteristics of cloud computing, cloud computing services, cloud services requirements, cloud and dynamic infrastructure, cloud computing applications, Social networking.

Unit II

Cloud computing architecture: Cloud architecture, layers of cloud, types of clouds, network connectivity in cloud computing, cloud interoperability, scalability and fault tolerance, cloud deployment models

Unit III

Virtualization: Virtualization structure and mechanism, levels of virtualization, virtualization of cpu, memory and i/o devices, virtualization benefits, virtual cluster and resource management, cloud governance.

Unit IV

Cloud service models and providers: Types of cloud service models, pros and cons of service models, characteristics of models, cloud service providers, cloud platform, cloud storage

Unit V

Cloud security and issues: Cloud information security fundamentals, cloud security services, security challenges, cloud security threats and attacks, secure cloud software

Common standards: Cloud computing standards, standards for security, Intrusion detection system

Text & Reference Books:

1. Pankaj Sharma, Cloud Computing.
2. Srinath Beldona, Introduction to Cloud Computing.
3. Jaydip Sen, Cloud Computing Architecture and Applications.
4. A. Srinivasan and J.Suresh, Cloud Computing: A practical approach for learning and implementation.



Course Objectives- Students will be able to know the data science concepts and process. Students can get the knowledge of machine learning and deep learning concepts with some models. Learn how to incorporate python modules such as pandas and matplotlib into your jupyter notebook.

UNIT I

Introduction to Data Science and Big Data Analytics - Big Data Overview, Data Structures, Benefits and uses of Data Science and Big Data, Facets of Data, The Data Science Process, The Big Data Ecosystem and Data Science, A Working Example.

UNIT II

Data Science Process- Overview of Data Science Process, Defining Research Goals, Retrieving Data, Cleaning, Integrating and Transforming Data, Exploratory Data Analysis, Build the Model.

UNIT III

Introduction to Machine Learning- Overview of Machine Learning, Applications of Machine Learning in Data Science, Machine Learning and Data Science Process, The Modeling Process, Types of Machine Learning, Introducing Clustering with K-means.

UNIT IV

Introduction to Deep Learning- What is Neural Network, Single Layer Perceptron Model, Multilayer Perceptron Model, Convolutional Neural Networks, Recurrent Neural Networks, Restricted Boltzmann Machines, Deep Belief Networks

UNIT V

Introduction to Python Libraries for Data Science- Introduction to Scikit- Learn, NumPy, Pandas, Matplotlib.

Text & Reference Books:

1. Introducing Data Science BIG DATA, MACHINE LEARNING, AND MORE, USING PYTHON TOOLS DAVY CIELEN ARNO D. B. MEYSMAN MOHAMED ALI
2. Python Data Science Handbook Essential Tools for Working with Data by Jake VanderPlas.
3. Introduction to Deep Learning Using R A Step-by-Step Guide to Learning and Implementing Deep Learning Models Using R by TawehBeysolow.
4. Machine Learning Step-by-Step Guide To Implement Machine Learning Algorithms with Python by Rudolph Russell.

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