客家

2018-19

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家

客家
GULBARGA UNIVERSITY, KALABURAGI

DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS FOR BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)

(CBCS SCHEME)

(REVISED SYLLABUS WITH EFFECT FROM ACADEMIC YEAR 2018-19 & ONWARDS)

Approved the Syllabus by BOS(UG) on dated 06-06-16 & 07-06-18

GULBARGA UNIVERSITY

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) CBCS SYLLABUS

(CBCS Scheme)

(With effect from the academic year 2018-19 and onwards)
<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Title of the Course</th>
<th>Marks</th>
<th>Duration of Theory / Practical Exam. Hrs.</th>
<th>Teaching Hours/Week</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>IA</td>
<td>Total</td>
<td>L</td>
<td>T</td>
</tr>
<tr>
<td>AECC-1a</td>
<td>Kannada/MIL-1</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>AECC-1b</td>
<td>English-I</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>AECC-1c</td>
<td>Environmental Studies</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-1a</td>
<td>Computer Fundamentals</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2a</td>
<td>Problem Solving Using C</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3a</td>
<td>Digital Electronics</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSC-1a</td>
<td>Practical-I: Computer Fundamentals</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2a</td>
<td>Practical-II: Problem Solving Using C</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3a</td>
<td>Practical-III: Digital Electronics</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL MARKS FOR FIRST SEMESTER</strong></td>
<td></td>
<td><strong>700</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AECC-2a</td>
<td>Kannada/MIL-1</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>AECC-2b</td>
<td>English-I</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>AECC-2c</td>
<td>Indian Constitution</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-1b</td>
<td>Discrete Mathematics</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2b</td>
<td>Object Oriented Programming in C++</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3b</td>
<td>Database Management System</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSC-1b</td>
<td>Practical-IV: Discrete Mathematics</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2b</td>
<td>Practical-V: Object Oriented Programming in C++</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3b</td>
<td>Practical-VI: Database Management System Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL MARKS FOR SECOND SEMESTER</strong></td>
<td></td>
<td><strong>700</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AECC-3a</td>
<td>Kannada/MIL-1</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>AECC-3b</td>
<td>English-I</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-1c</td>
<td>Computer Oriented Statistical Methods</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2c</td>
<td>Data Structures and File Processing</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3c</td>
<td>Operating System</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSC-1c</td>
<td>Practical-VII: Computer Oriented Statistical Methods Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2c</td>
<td>Practical-VIII: Data Structures and File Processing Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3c</td>
<td>Practical-IX: Operating System Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL MARKS FOR THIRD SEMESTER</strong></td>
<td></td>
<td><strong>680</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AECC-4a</td>
<td>Kannada/MIL-1</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>AECC-4b</td>
<td>English-I</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>-</td>
</tr>
<tr>
<td>DSC-1d</td>
<td>Financial Accounting &amp; Management</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>4</td>
</tr>
<tr>
<td>DSC-2d</td>
<td>Java Programming</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>4</td>
</tr>
<tr>
<td>DSC-3d</td>
<td>Software Engineering</td>
<td>80</td>
<td>100</td>
<td>03</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSC-1d</td>
<td>Practical-X: Accounting(Tally) Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-2d</td>
<td>Practical-XI: Java Programming Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td>DSC-3d</td>
<td>Practical-XII: Software Engineering Lab</td>
<td>40</td>
<td>50</td>
<td>02</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL MARKS FOR FOURTH SEMESTER</strong></td>
<td></td>
<td><strong>650</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEC-1</td>
<td>System Administration and Maintenance (b) Software Testing</td>
<td>40</td>
<td>10(Pr)</td>
<td>50</td>
<td>02</td>
</tr>
<tr>
<td>SEC-2</td>
<td>Information Security (b) Perl Programming</td>
<td>40</td>
<td>10(Pr)</td>
<td>50</td>
<td>02</td>
</tr>
<tr>
<td>DSE-1</td>
<td>Python Programming (b) Dot Net Programming (c) Design and Analysis of Algorithm</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>03</td>
</tr>
<tr>
<td>DSE-2</td>
<td>Web Technologies (b) Data Mining (c) Computer Graphics</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>03</td>
</tr>
<tr>
<td>DSE-3</td>
<td>Data Communication and Networks (b) Multimedia Systems and Applications (c) Hadoop and R Programming</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>03</td>
</tr>
</tbody>
</table>

**PRACTICALS**

| DSE-1 | Practical-XII: (a) Python Programming Lab (b) Dot Net Programming Lab (c) Design and Analysis of Algorithm Lab | 40 | 10 | 50 | 02 | - | - | 4 | 2 |
| DSE-2 | Practical-XIV: (a) Web Technology Lab (b) Data Mining Lab (c) Computer Graphics Lab | 40 | 10 | 50 | 02 | - | - | 4 | 2 |
| DSE-3 | Practical-XV: (a) Data Communication and Networks Lab (b) Multimedia Systems and Applications Lab (c) Hadoop and R Programming Lab | 40 | 10 | 50 | 02 | - | - | 4 | 2 |

**TOTAL MARKS FOR FIFTH SEMESTER**

**SIXTH SEMESTER 2020-21 & ONWARDS**

| SEC-3 | XML Programming (b) PHP Programming | 40 | 10(Pr) | 50 | 02 | 1 | - | 2 | 2 |
| SEC-4 | Office Automation Tools (b) Android Programming | 40 | 10(Pr) | 50 | 02 | 1 | - | 2 | 2 |
| DSE-4 | Scilab Programming (b) Principles of Animation (c) Open Source Software | 80 | 20 | 100 | 03 | 4 | - | - | 4 |
| DSE-5 | Digital Image Processing (b) Cyber Forensics (c) Cloud Computing | 80 | 20 | 100 | 03 | 4 | - | - | 4 |

**PRACTICALS**

| DSE-4 | Practical-XVI: (a) Scilab Programming Lab (b) Principles of Animation Lab (c) Open Source Software Lab | 40 | 10 | 50 | 02 | - | - | 4 | 2 |
| DSE-5 | Practical-XVII: (a) Digital Image Processing Lab (b) Cyber Forensics Lab (c) Cloud Computing Lab | 40 | 10 | 50 | 02 | - | - | 4 | 2 |
| DSE-6 | Practical-XVIII: Major Project Report (MPR) (90 for Project evaluation, 30 for viva-voce=120,30 for IA, Total=150 marks) | 120 | 30 | 150 | 03 | - | - | 12 | 6 |

**TOTAL MARKS FOR SIXTH SEMESTER**

**TOTAL MARKS & CREDITS FOR THE COURSE**

Note: Course = Paper, AECC: Ability Enhance Course, DSE: Discipline Specific Core Course, SEC=Skill Enhancement Course, DSE: Discipline Specific Elective, L=Lecture, T=Tutorial, P=Practical Additional 2 credits shall be given for the successful completion of two years of NSS/NCC (144+2=146) AECC-1C and AECC-2C shall be approved by the BOS of Environmental Science and Political Science Tutorial/Batch = 20 Students, Practical/Batch = 10 Students, AECC-a, AECC-b paper cover communicative skills. For SEC theory 40 marks, Practical IA 10 marks awarded by the concerned course teacher based on the Practical.
GULBARGA UNIVERSITY, KALABURAGI  
DEPARTMENT OF COMPUTER SCIENCE  
B.Sc./B.C.A./B.A  

**Blue print for the DSC paper and DSE paper setting**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>2 Marks Questions</th>
<th>5 marks Questions</th>
<th>10 Marks Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>II</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>IV</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Question Papers contains 3 sections:

**Section A**: 10 Questions of 2 marks, Answer All Questions $\times$ 2 = 20 Marks

**Section B**: 6 Questions of 5 marks, Answer any 4 Questions $\times$ 5 = 20 Marks

**Section C**: 6 Questions of 10 marks, Answer any 4 Questions $\times$ 10 = 40 Marks

Total=80 Marks

**Distribution of Marks for Practical:**

1. Writing 2 programs $\times$ 10 marks = 20 Marks.
2. Execution of single program 1 $\times$ 10 = 10 Marks.
3. Record Book = 05 Marks.
4. Viva-voce = 05 Marks.

Total = 40 Marks

**Distribution of Marks for Project work for BCA VI Semester Course**

1. Project Evaluation = 90 Marks.
2. Viva-voce = 30 Marks.
3. Internal Marks = 30 Marks

Total = 150 Marks

**Blue print for SEC paper setting and G.E. (B.A. Course only)**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>2 Marks Questions</th>
<th>5 marks Questions</th>
<th>10 Marks Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>II</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Question Papers contains 3 sections:

**Section A**: 5 Questions of 2 marks, Answer All Questions $\times$ 2 = 10 Marks

**Section B**: 3 Questions of 5 marks, Answer any 2 Questions $\times$ 5 = 10 Marks

**Section C**: 3 Questions of 10 marks, Answer any 2 Questions $\times$ 10 = 20 Marks

Total=40 Marks
DSC-1A: Computer Fundamentals

Teaching: 4 Hrs./ Week
Max Marks: 80, Cont. Assessments: 20
Total Teaching Hrs: 60

Credits: 04

UNIT-I

Introduction: Introduction to Computer System, uses, types.
Data Representation: Number systems and character representation, binary arithmetic.

15 Hrs

UNIT-II

Human Computer Interface: Types of software, Operating system as user Interface, utility programs. Devices: Input and output devices, Keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter.

15 Hrs

UNIT-III

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks. Computer Organisation and Architecture: C.P.U., registers, system bus, main memory UNIT, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

15 Hrs

UNIT-IV

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems. Use of Computers in Education and Research: Data analysis, Heterogeneous. Storage, E-Library, Google Scholar, Domain specific packages such as SPSS, Mathematical etc.

15 Hrs

References:

Practical-I: DSC 1A: Computer Fundamentals Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 1A Computer Fundamentals.

NOTE: The practical assignment must include connecting parts of a computer and assembling it to an extent, media formatting and installation of some software. Practical exercises based on Open Office tools using document preparation and spreadsheet handling packages.
DSC 2A: Problem Solving Using C

Teaching: 4 Hrs./Week  
Max Marks: 80 Cont. Assessments. 20  
Credits: 04  
Total Teaching Hrs: 60

UNIT – I  
15 Hrs

Basics of C: Overview of C, Developing Programs in C, Parts of Simple C Program, Structure of a C Program, Comments, Program Statements, C Tokens, Keywords, Identifiers, Data Types, Variables, Constants, Operators and Expressions, Expression Evaluation—precedence and associativity, Type Conversions.

UNIT – II  
15 Hrs

Input-Output: Non-formatted and Formatted Input and Output Functions, Escape Sequences, Control Statements: Selection Statements – if, if-else, nested if, nested if-else, comma operator, conditional operator, switch; Iterative Statements—while, for, do-while; Special Control Statement—goto, break, continue, return, exit.  
Arrays and Strings: One-dimensional Arrays, Character Arrays, Functions from ctype.h, string.h, Multidimensional Arrays.

UNIT – III  
15 Hrs


UNIT – IV  
15 Hrs

User-defined Data Types: Declaring a Structures (Union) and its members, Initialization Structures (Union), Accessing members of a Structures (Union), Array of Structures (Union), Structures versus Unions, Enumeration Types. Files: Introduction, Using Files in C, Working with Text Files, Working with Binary Files, Files of Records, Random Access to Files of Records, Other File Management Functions.

References:
3. Byron Gottfried, Programming with C (Schaum's Outlines Series), McGraw Hill Education; 3/e

Practical-II: DSC 2A: Problem Solving Using C Lab

Practical: 4 Hrs./Week  
Max Marks: 40  
Credits: 02  
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 2A Problem Solving Using C.

[Signature]  
Dept. of Computer Science  
North-Eastern Hill University, Shillong
DSC 3A: Digital Electronics

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20
Total Teaching Hrs: 60

UNIT- I

Digital computers and digital systems: Binary number, Number base conversion, Octal and hexadecimal number, Complements, Binary codes, Binary storage and Registers, Binary logic and integrated circuits, Definition of Boolean algebra Basic Theorems and properties of Boolean algebra, Boolean functions, Canonical and standard forms, Digital logic gates.

UNIT-II

Simplification of Boolean functions: Two, Three and Four variable maps, Sum of products and product of sums simplification, NAND and NOR implementation Non degenerate forms, AND-OR-INVERT method Determination and selection of prime- Implicants. Combinational circuit, design procedure, adders, subtractors, code conversion, analysis procedure, multilevel

UNIT III

Adders: Binary parallel adder, decimal adder, magnitude comparators, decoders, multiplexers, Read-only memory, programmable logic Array Sequential circuit. Flip -flops, analysis of clocked sequential circuits, flip-flop excitation tables, design procedure, design of counters, design with state equations.

UNIT IV

Registers: Registers, ripple counters, synchronous counters, timing sequence the memory unit, example of random access memory. Interregisters transfer, arithmetic, logic and shift micro-operations, conditional control statement, fixed –point binary data, overflow, arithmetic shifts, decimal data, floating-point data, on-numeric data, instruction codes, design of simple counter.

References:
1. Morris Mano M, Digital logic and computer design, PHI.
2. Floyd and jain, Digital Fundamentals, 8/e, pearson education.
4. Ronald J. Tocci, Digital Systems: Principal and applications, 8/e, pearson education.
5. Bartee J.C., Digital computer Fundamentals, 6/e, TMH.

Practical-III: DSC-3A: Digital Electronics Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Lab Assignment shall be carried out based on the paper DSC 3A Digital Electronics.

C H A I R M A N
Dept. of Computer Science
DSC-1B: Discrete Mathematics

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

Credits: 04
Total Teaching Hrs: 60

UNIT I

15 Hrs

Set Theory: Relations and Functions: Set Notation and Description, subset, basic set operations, Venn Diagrams, laws of set theory, partitions of sets, min sets, duality principle, basic definitions of relations and functions, graphs of relations, properties of relations, injective, subjective and bijective functions, compositions.

Recurrence: Recurrence Relations and Recursive Algorithms – Linear-Recurrence Relations with Constant Coefficients; Homogeneous Solutions: Particular Solution, Total Solution, Solution by the Method of Generating functions.

UNIT II

15 Hrs

Graph Theory: Graph and planar graphs – Basic Terminology, Multi-graphs, Weighted Graphs, Paths and Circuits, Shortest Paths, Euclidian Paths and Circuits. Travelling Salesman Problem, Planar Graphs.

UNIT III

15 Hrs

Boolean Proposition: Lattices and Algebraic Structures; Duality. Distributive and Complemented Lattices, Boolean Lattices and Boolean algebra.


UNIT IV

15 Hrs

The proposition Logic: Logic operations, truth-tables and propositions generated by set—equivalence and implication laws of logic, mathematical system, propositions over a universe, mathematical induction, quantifiers.

References:

Practical-IV: DSC-1B: Discrete Mathematics Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 1B Discrete Mathematics Using C.
DSC 2B: Object Oriented Programming in C++

Teaching: 4 Hrs./ Week  Credits: 04
Max Marks: 80 Cont. Assessments. 20'  Total Teaching Hrs: 60

UNIT I  15 Hrs

Introduction: Object Oriented Programming Paradigm, OOP Principles, Advantages of OOP,
Silent features of C++ Language, The Structure of a C++ Program, Sample C++ Programs,
Execution of a C++ program, Errors, Tokens, Keywords and Identifiers, Constants, Variables, Data
types, Operators and Expressions, Selection statements, Iterative Statements, Functions, Arrays,
Structures and Unions, Pointers.

UNIT II  15 Hrs

Classes and Objects: Class Definition and Access Specifiers Private, Public, Passing Objects as
Arguments, Returning Objects from Functions, Arrays of Objects, Arrays as Member Data,
Static Member Data, Static Member Functions, Friend Functions, Friend Class, Const Member
Functions, Const Objects, this pointer, Nesting of Member Functions Constructors and
Destructors: Constructors and their Characteristics, Types of Constructors, Default Constructor,
Parameterized Constructors, Copy Constructor, Dynamic Constructor, Destructor and its
Characteristics Operator Overloading: Syntax of Operator Overloading Function, Overloading
Unary operators, Overloading Binary operators, Overloading Array subscript operator [],
Overloading Function call Operator () , Overloading new and delete Operators, Overloading
operators using Friend Functions, Overloading >> and << operators, Type Casting, Conversion
from Basic type to Derived type and Vice-versa Conversion from one Derived type to another
Derived type and Vice-versa.

UNIT III  15 Hrs

Inheritance: Single Level Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical
Inheritance, Hybrid Inheritance, Virtual Base Class, Pointer to Objects, Pointers to Derived
Classes and Virtual Functions, Pure Virtual Functions and Abstract Class, Constructors and
Destructors in Derived Classes, Constructors and Destructors in Multiple Inheritance, Virtual
Destructor, Private Inheritance, Protected Inheritance, Containers I/O Streams: Built-in
Classes Supporting I/O, Unformatted I/O Operations, Formatting of Outputs, IOS Class Functions
and Flags, Manipulators, Built-in Manipulators, User-Defined Manipulators. File Handling: Built-in
Classes for File I/O Operations, Types of Data Files (Text Files and Binary Files), Opening and
Closing a File, Detecting End of File, Text Files, Character I/O - put(), get() Member Functions,
String I/O - The << operator and the getline() Member Function, Mixed Data I/O - The << and >>
Operators, Binary Files, Objects I/O - write() and read() Member Functions, Random accessing
of a Binary File (seekg(), seekp(), tellg(), tellp() Member Functions), Error Handling During File
I/O Operations- fail(), bad(), good(), Command Line Arguments.

UNIT-IV  15 Hrs

String Handling: String class and its Constructors, The Assignment Operator, The Extraction
Operator >> and the Insertion Operator << , The Relational Operators, Concatenation, Member
Functions of String Class. Exception Handling: Exception Handling Mechanism, Throwing in one
function and catching in the other, Single Try Block-Multiple Catch Blocks, Catching all
Exceptions in a single catch block, Rethrowing an Exception, Specification of Exceptions.

Templates: Class Templates, Class Templates with Multiple Parameters, Function Templates,
Function Templates with Multiple Parameters, Member Function Templates, Overloading
Template functions, Non-type Template Arguments.

References:
Addison Wesley

Practical-V: DSC 2B: Object Oriented Programming in C++ Lab

Practical: 4 Hrs./ Week Credits: 02
Max Marks: 40 Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC-
2B Object Oriented Programming in C++.

DSC-3B: Database Management Systems

Teaching: 4 Hrs./ Week Credits: 04
Max Marks: 80 Cont. Assessments. 20 Total Teaching Hrs: 60

UNIT I

Introduction to Databases: Introduction, Traditional File-Based Systems, Database Approach,
Roles in the Database Environment, Advantages and Disadvantages of DBMSs, The Three-Level
ANSI-SPARC Architecture, Database Languages, Data Models, Functions of a DBMS,
Components of a DBMS.

The Relational Algebra: Unary Operations, Set Operations, Join Operations, Division Operation,
Aggregation and Grouping Operations.

UNIT II

15 Hrs

Entity–Relationship Modelling: Entity Types, Relationship Types, Attributes, Keys, Strong and
Weak Entity Types, Attributes on Relationships, Structural Constraints, Problems with ER Models–
Fan Traps, Chasm Traps.
Enhanced Entity–Relationship Modelling: Specialization/Generalization, Aggregation and
Composition.

Functional–Dependencies: Anomalies, Partial Functional Dependency, Transitive Functional
Dependency, Multi Valued Dependency, Join Dependency.

Normalization: The Purpose of Normalization, How Normalization Supports Database Design,
Data Redundancy and Update Anomalies, Functional Dependencies in brief, The Process of
Normalization, 1NF, 2NF, 3NF, BCNF. The Database Design Methodology for Relational
Databases.

GUK, B.C.A CBCS SYLLABUS 2018-19
UNIT – III

SQL: Introduction, Data Manipulation—Simple Queries, Sorting Results, Using the SQL Aggregate Functions, Grouping Results, Sub-queries, ANY and ALL, Multi-table Queries, EXISTS and NOT EXIST, Combining Result Tables, Database Updates. SQL Data Types, Integrity Enhancement Feature–Domain Constraints, Entity Integrity, Referential Integrity, General Constraints, Data Definition—Creating a Database, Creating a Table, Changing a Table Definition, Removing a Table, Creating an Index, Removing an Index, Views—Creating a View, Removing a View, View Resolution, Restrictions on Views, View Updatability, WITH CHECK OPTION, Advantages and Disadvantages of Views, View Materialization, Transactions, Discretionary Access Control—Granting Privileges to Other Users, Revoking Privileges from Users.


UNIT – IV


References:
1. Thomas M. Connolly, Carolyn E. Begg, Database Systems—A Practical Approach to Design, Implementation, and Management (6e)
2. Sharon Allen, Evan Terry, Beginning Relational Data Modeling
3. Jeffrey A. Hoffer, V. Ramesh, Heikki Topi, Modern Database Management
4. Raghu Ramakrishna, Johannes Gehrke, Database Management Systems
5. Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems
6. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts

Practical-VI: DSC-3B: Database Management Systems Lab

Practical: 4 Hrs./Week
Max Marks: 40
Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 3B Database Management Systems.

DSC-1C: Computer Oriented Statistical Methods

Teaching: 4 Hrs./Week
Max Marks: 80 Cont. Assessments. 20
Total Teaching Hrs: 60

UNIT – I

Nature and scope of statistical methods and their limitations: Classification, Tabulation - Diagrammatic representation of various types of statistical data -Frequency curves an O gives - Lorenz curve.
UNIT – II

Measures of Central tendency: Arithmetic means, Median, Mode – Merits and demerits - graphical solution of Median and Mode.

UNIT – III

Measures of Dispersion: Range, Mean Deviation, Quartile Deviation, Standard Deviation, Coefficient of Variation and their properties – merits and demerits.

UNIT – IV


References :

Practical-VII: DSC-1C: Computer Oriented Statistical Methods Lab

Practical: 4 Hrs./ Week
Max Marks: 40
Credits: 02
Cont. Assessment: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 1C Computer Oriented Statistical Methods Using SPSS Package.

DSC-2C: Data Structures and File Processing

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20
Credits: 04
Total Teaching Hrs: 60

UNIT – I

Basic Data Structures: Abstract data structures- stacks, queues, linked lists and binary trees. Binary trees, balanced trees.

UNIT – II

Searching: Internal and external searching, Memory Management: Garbage collection algorithms for equal sized blocks, storage allocation for objects with mixed size.

UNIT – III

Physical Devices: Characteristics of storage devices such as disks and tapes, I/O buffering. Basic File System Operations: Create, open, close, extend, delete, read-block, write-block, protection mechanisms.
UNIT – IV

File Organizations: Sequential, indexed sequential, direct, inverted, multi-list, directory systems, indexing using B-tree, B+ tree.

References:

Practical-VIII: DSC-2C: Data Structures and File Processing Lab

Practical: 4 Hrs./ Week Credit: 02
Max Marks: 40 Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 2C Data Structures and File Processing Using Java.

DSC-3C: Operating System

Teaching: 4 Hrs./ Week Credit: 04
Max Marks: 80 Total Teaching Hrs: 60
Cont. Assessments: 20

UNIT – I

15 Hrs


UNIT – II

15 Hrs

Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.

UNIT – III

15 Hrs

Process Management: System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model.

UNIT – IV

15 Hrs

Scheduling: Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies. Memory Management: Mapping addresses space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory.
References:

Practical-IX: DSC-3C: Operating Systems lab

<table>
<thead>
<tr>
<th>Practical: 4 Hrs./Week</th>
<th>Credits: 02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Marks: 40</td>
<td>Cont. Assessments: 10</td>
</tr>
</tbody>
</table>

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 3C Operating System Using C++.

DSC-1D: Financial Accounting & Management

<table>
<thead>
<tr>
<th>Teaching: 4 Hrs. / Week</th>
<th>Credits: 04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Marks: 80, Cont. Assessments. 20</td>
<td>Total Teaching Hrs: 60</td>
</tr>
</tbody>
</table>

UNIT-I 15 Hrs

Accounting: Basic of Accounting, Accounting Mechanics- Double Entry System, Classification, Rules for Debit and Credit Concepts & Conventions, Indian Accounting Standards.
Ledger: Meaning, subdivision, Mechanics of Posting, balancing of Ledger accounts.

UNIT-II 15 Hrs


UNIT-III 15 Hrs


UNIT-IV 15 Hrs


References:
1. Management Accounting – Mannmohan Singh and Goel
2. Financial management- Pandey I. M.
Practical-X: DSC-1D: Accounting (Tally) Lab

Practical: 4 Hrs./ Week
Max Marks: 40
Credits: 02
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 1D Accounting & Finance Management Using Tally Package.

DSC-2D: Java Programming

Teaching: 4 Hrs./ Week
Max Marks: 80
Credits: 04
Total Teaching Hrs: 60
Cont. Assessments: 20

UNIT- I
15 Hrs

Introduction to Java: Features of Java - Object Oriented Concepts - Data Types - Variables - Arrays - Operators - Control Statements- Input and output- Scanner and System class- print(), and println() methods.

UNIT- II
15 Hrs
Classes – Objects: Constructors - Overloading method - Access Control - Static and fixed methods - Inner Classes - String Class - Inheritance - Overriding methods - Using super- Abstract class - Type Wrapper classes for primitive types – Auto boxing and auto Unboxing --Recursion.

UNIT- III
15 Hrs
GUI components: Common GUI Event types and Listener Interfaces- JOptionPane – JLabel, JTextfield, JButton, JCheckBox, JText area, JComboBox, JList, JPanel. – Mouse Event Handling - Adapter Classes- Key Event Handling.

UNIT- IV
15 Hrs

References:

Practical-XI: DSC-2D: JAVA PROGRAMMING Lab

Practical: 4 Hrs./ Week
Max Marks: 40
Credits: 02
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 2D Java Programming.
DSC-3D: Software Engineering

Teaching: 4 Hrs./ Week  
Max Marks: 80 Cont. Assessments. 20

UNIT I


UNIT II

Software Requirements Analysis & Specifications: Requirements Engineering, Types of Requirements, Feasibility Studies, Requirements Elicitation, Requirements Analysis Documentation, Validation and Management.

UNIT III

Function Oriented Design: Design principles, Module level Concepts, Notation & Specification, Structured Design Methodology, and Verification

UNIT IV

Coding: Programming Principles & Guidelines, Coding Process, Refactoring, Verification.

References:

Practical-XII: DSC-3D: Software Engineering Lab

Practical: 4 Hrs./ Week  
Max Marks: 20

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSC 3D Software Engineering Using Manual testing tools.
SEC 1(a): System Administration and Maintenance

Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0

Credits: 02
Total Teaching Hrs: 15

UNIT-I

7 Hrs

Linux: Basics of operating system, services. Installation and configuration, maintenance. What is a Linux Operating system, Kernel, API, cli, gui. Difference between Linux/Unix and other operating systems. Features & Architecture Linux features, advantages, disadvantages.

UNIT-II

8 Hrs


References:
2. Microsoft Windows Operating System Essentials by Tom Carpenter

Practical IA: SEC 1(a): System Administration and Maintenance Lab

Practical: 2 Hrs./Week

Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC I(a) System Administration and Maintenance.

SEC-1(b): SOFTWARE TESTING

Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0

Credits: 02
Total Teaching Hrs: 15

UNIT-I

8 Hrs


UNIT-II

7 Hrs

References:

Practical IA: SEC-1(b): SOFTWARE TESTING

Practical: 2 Hrs./Week  Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 1(b) Software Testing Using Testing tools.

SEC-2(a): Information Security

Teaching: 1 Hrs./Week  Credits: 02
Max Marks: 30 Cont. Assessments. 0  Total Teaching Hrs: 15

UNIT-I  8 Hrs

Overview of Security: Protection versus security; aspects of security-data integrity, data availability, privacy; security problems, user authentication.
Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer overflow; system threats- intruders; communication threats-tapping and piracy.

UNIT-II  7 Hrs

Cryptography: Substitution, transposition ciphers, symmetric-key algorithms Data Encryption Standard, advanced encryption standards, public key encryption -RSA; Diffie-Hellman key exchange, Message Authentication MAC, hash functions.

References:

Practical IA: SEC-2(a): Information Security Lab

Practical: 2 Hrs./Week  Cont. Assessments. 10
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 2(a) Information Security.
SEC-2(b) : Perl Programming

Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0

UNIT I
Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures.

UNIT II
Subroutines, Packages, and Modules – Working with Files – Data Manipulation.

References:

Practical IA : SEC-2(b): Perl Programming Lab

Practical: 2 Hrs./Week
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 2(b) Perl Programming.

DSE 1(a): Python Programming

Teaching: 4 Hrs./Week
Max Marks: 80 Cont. Assessments. 20

UNIT I

UNIT II
List, dict, set and generator-comprehensions. User defined functions - variable number of arguments, default parameters, key value pairs as arguments, Data Storage, Data formatting.

UNIT III
Modules, packages and programs, systems, Regular expressions, File Handling, Errors and Exception handling.

UNIT IV
Classes, objects, inheritance, Testing and debugging, GUI Programming, Relational databases, Web Untangled, Concurrency and Networks.
References:
1. Bill Lubanovic, Introducing Python- Modern Computing in Simple Packages, O'Reilly Publication

Practical-XIII(a): DSE 1: Python Programming Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 1(a) Python Programming.

DSE 1(b): Dot Net Programming

Teaching: 4 Hrs./ Week
Max Marks: 80
Cont. Assessments: 20
Total Teaching Hrs: 60

UNIT I
15 Hrs


UNIT II
15 Hrs

Introduction to Visual Studio .NET, Visual Studio .NET IDE. Building Visual Basic .NET application. VB.NET language fundamentals, object oriented Programming with VB.NET, cross language inheritance, Namespaces, accessing the registry. Interfaces and collections - Understanding interface-based Programming, building a custom enumerator, building a clone able object, comparable objects

UNIT III
15 Hrs

Introducing Windows Forms, GDI+ namespaces, Windows Form controls.
Data access with ADO.NET – The need for ADO.NET, ADO.NET namespaces, ADO.NET managed providers, OLEDB managed providers, SQL managed providers, Accessing XML through ADO.NET.

UNIT IV
15 Hrs

Web development and ASP.NET – Problems with classic ASP. Benefits of ASP.NET, ASP.NET namespaces, architecture of ASP.NET web application. Building and understanding web services, anatomy of a web service, overview of web service namespaces, building a simple web service, Web Service Description Language (WSDL), generating a proxy with VB.NET. Deployment of a VB.NET application.
References:
3. Teach Yourself Visual Basic .NET in 21 days – Duncan Mackenzie and Kent Sharkey
4. Introducing Microsoft .NET – David S. Platt
6. ASP.NET Projects – Building 10 Enterprise Projects – Eric A. Smith

Practical-XIII(b): DSE 1: Dot Net Programming Lab

Practical: 4 Hrs./ Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 1(b) Dot Net Programming.

Credits: 02
Cont. Assessments. 10

DSE 1(c): Design and Analysis of Algorithms

Teaching: 4 Hrs./ Week
Max Marks: 80
Total Teaching Hrs: 60

Credits: 04
Cont. Assessments. 20

UNIT I


UNIT II

Searching and Sorting Techniques: Review of elementary sorting techniques-selection sort, bubble sort, insertion sort, more sorting techniques-quick sort, heap sort, merge sort, shell sort, external sorting.

UNIT III

String Processing: KMP, Boyre-Moore, Robin Karp algorithms.
Graphs: Analysis of Graph algorithms Depth-First Search and its applications, minimum Spanning Trees and Shortest Paths.

UNIT — IV

Lower bounding techniques: Decision Trees, Adversaries, Introduction to randomized algorithms, Random numbers randomized Qsort, randomly Built BST Number Theoretic Algorithms: GCD, Addition and Multiplication of two large numbers.

References:
Practical XIII(c): DSE-1: Design and Analysis of Algorithms Lab

Practical: 4 hrs./ Week  
Max Marks: 40  
CREDITS: 02  
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 1(c) Design and Analysis of Algorithms Using C++.

DSE-2(a): Web Technologies

Teaching: 4 Hrs./ Week  
Max Marks: 80  
Cont. Assessments. 20  
CREDITS: 04  
Total Teaching Hrs: 60

UNIT – I  
15 Hrs

Introduction to Web Design: Introduction to hypertext mark-up language (HTML) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, Divisions, Sections.

UNIT – II  
15 Hrs

Customized Features: Cascading style sheets, (CSS) for text formatting and other manipulations, Types, Introduction to DHTML.

UNIT – III  
15 Hrs

JavaScript: Data types, operators, functions, control structures, events and event handling.  
Query: Introduction, Basics, Selectors, Attributes.

UNIT – IV  
15 Hrs

Bootstrap: Introduction, Environment, a simple web page using bootstrap template, Designing tables, forms, buttons.

References:

Practical-XIV(a): DSE-2(a): Web Technology Lab

Practical: 4 Hrs./ Week  
Max Marks: 40  
CREDITS: 02  
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 2(a) Web Technologies.
DSE-2(b): Data Mining

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

Credits: 04
Total Teaching Hrs: 60

UNIT-I

Introduction - What is Data mining , Importance of Data mining, Various kinds of data Data mining, Dat a mining Functionalities, Various kinds of Patterns, Pattern Interesting Classification of Data mining Systems, Data mining Tasks, Primitives Integration of Data Mining System, Major issues in Data Mining.

UNIT-II

Data Processing - Process the Data Descriptive Data Summarization – Measuring Central Tendency Dispersion of Data Graphic, Displays of –Basic Descriptive Data Summaries Data Cleaning Data Integration and Transformation data Reduction-Data Discrimination - Concept Hierarchy Generation.

UNIT-III

Data Warehouse OLAP Technology An overview - Data Warehouse Multidimensional Data Model Data Warehouse Architecture Data Warehouse Implementation from Data Warehouse to Data mining.

UNIT-IV

Mining – Frequent Patterns Associations Correlations - Basic Concepts Road Map Efficient Scalable Frequent Item set Mining methods Mining – Various Kinds of Association rules Analysis - Association mining to Correlation Constrain Based Association mining.

References:

1. Data Mining (Concepts and Techniques) Second Ed (Chapter 1,2,3,5,11) Author : Jiawei Han and Micheline Kamber Publishers : Morgan Kaufmann Publishers (An imprint of Elsevier)

Practical-XIV(b): DSE-2: Data Mining Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 2(b) Data Mining.
DSE-2(c): Computer Graphics

Teaching: 4 Hrs./Week  
Max Marks: 80 Cont. Assessments, 20

UNIT I  

UNIT II  

UNIT-III  

UNIT-IV  

References:

4. Roy A. Plastock and Zhigarg Xiang, Schaum's Outline of Computer Graphics, 2/e, TMH.

Practical-XIV(c): DSE-2: Computer Graphics Lab

Practical: 4 Hrs./Week  
Max Marks: 40

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 2(c) Computer Graphics Using C++.
DSE-3(a): Data Communication and Networks

Teaching: 4 Hrs./ Week  
Max Marks: 80  
Cont. Assessments. 20  
Credits: 04  
Total Teaching Hrs: 60

UNIT – I  
15 Hrs


UNIT – II  
15 Hrs

Telephony: Multiplexing, error detection and correction, Many to one, one to many, WDM, TDM, FDM, circuit switching, packet switching and message switching. Data Link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols overview. ISDN: Services, historical outline, subscriber’s access, ISDN, Layers, and broadband ISDN.

UNIT – III  
15 Hrs

Devices: Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Network Layer Addressing and Routing concepts (Forwarding Function, Filtering Function); Routing Methods (Static and dynamic routing, Distributed routing, Hierarchical Routing); Distance Vector Protocol, Link State protocol.

UNIT – IV  
15 Hrs

Transport and upper layers in OSI Model: Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer.

References:

Practical-XV: DSE-3(a): Data Communication and Networks Lab

Practical: 4 Hrs./ Week  
Max Marks: 40  
Credits: 02  
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(a) Data Communication and Networks Using C++ & Demonstration to done with Trainer Kits.

GUK, B.C.A CBCS SYLLABUS 2018-19  
Page 25
DSE-3(b): Multimedia Systems & Applications

Teaching: 4 Hrs./Week
Max Marks: 80 Cont. Assessments. 20

UNIT – I

Introductory Concepts: Multimedia - Definitions, Basic properties and medium types. (Temporal and non temporal) Multimedia applications Uses of Multimedia, Introduction to making multimedia - The Stages of project, the requirements to make good multimedia, Multimedia skills and training.

Multimedia-Hardware and Software: Multimedia Hardware - Macintosh and Windows Production Platforms, Hardware peripherals - Connections, Memory and storage devices, Media software - Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.

UNIT-II

15 Hrs

Multimedia building blocks Creating & Editing Media elements: Text, image, Sound, Animation Analog/ digital video Data Compression: Introduction, Need, and Difference of Lossless/lossy compression techniques. Brief overview to different compression algorithms concern to text, audio, video and images etc

UNIT-III

15 Hrs


UNIT-IV

15 Hrs


References:

Practical-XV: DSE 3(b): Multimedia Systems & Applications Lab

Practical: 4 Hrs./Week
Max Marks: 40

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(b) Multimedia Systems & Applications.

GUJ, B.CA CBCS SYLLABUS 2018-19
DSE-3(c) : Hadoop & R Programming

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

UNIT I

Introduction to BIG'Data ' & Hadoop Introduction to Map Reduce ' &' HDFS The Hadoop Map Reduce API & Algorithms. How to get started writing programs with Hadoop's API. Programming methodologies and paradigms in Map Reduce Beyond basics: The flow; APIs; Creating Input Formats and Output Formats; Driver; Mapper; Reducer; streaming.

UNIT II

15 Hrs

Introduction to The'Hadoop'Ecosystem'Components An introduction to components surrounding Hadoop, which complete the greater ecosystem of available, processing tools.

UNIT III

15 Hrs

R over view, basic syntax, data types, variable, operators, decision making, loops, functions

UNIT IV

15 Hrs

String, vectors, list, matrices, data frames, reshaping, packages, graphics.

References:
1. Hadoop: The Definitive Guide By: Tom White Hadoop in Practice (By: Alex Holmes)
2. Hadoop Operations (By: Eric Sammer) Instant MapReduce Patterns - Hadoop Essentials How-to (By: Srinath Perera)
4. The Art of R Programming: A Tour of Statistical Software Design Author(s) Norman Matloff

Practical-XV(c): DSE-3 : Hadoop & R Programming Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 3(c) Hadoop & R Programming.

SEC-3(a): XML Programming

Teaching: 1 Hrs./ Week
Max Marks: 30 Cont. Assessments. 0

UNIT-I


UNIT-II

07 Hrs
Other XML Concepts: Scripting XML, XML as Data, Linking with XML.
XML with Style: XSL –Style Sheet Basics, XSL basics, XSL style sheets.

References:
2. Michael J. Young, Step by Step XML, Microsoft Press, 2002

Practical IA: SEC-3(a) : XML programming Lab

Practical: 2 Hrs/ Week

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 3(a) XML Programming.

SEC-3(b): PHP Programming

Teaching: 1 Hrs./ Week
Max Marks: 30 Cont. Assessments. 0

UNIT-I

Introduction to PHP: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other technologies, scope of PHP, Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity.

Handling HTML form with PHP HTML: Capturing Form Data, GET and POST form methods, Dealing with multi value fields, Redirecting a form after submission.

UNIT –II

PHP conditional events and Loops: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, Continue and exit.

PHP Functions: Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value; call by reference, Scope of Function Global and Local.

String Manipulation and Regular Expression : Creating and accessing String, Searching & Replacing String, Formatting, joining and splitting String, String Related Library functions, Use and advantage of regular expression over inbuilt function, Use of preg_match(), preg_replace(), preg_split() functions in regular expression.

Array : Anatomy of an Array, Creating index based and Associative array, Accessing array, Looping with Index based array, with associative array using each() and for each(), Some useful Library function.

References:
1. PHP Programming For Beginners by Tim Warren
2. PHP: The Complete Reference by Steven Holzner

Chairman

GUK, B.C.A CBCS SYLLABUS 2018-19
Practical IA : SEC-3(b) : PHP Programming Lab

Practical: 2 Hrs./Week

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 3(b) PHP Programming.

SEC-4(a) : Office Automation Tools

Teaching: 1 Hrs./Week
Max Marks: 30 Cont. Assessments. 0

Credits: 02
Total Teaching Hrs: 15

UNIT-I

08 Hrs

MS-Word: Introduction to word processor, Features of word XP, Special features of word processing software, Getting into Microsoft word XP, Creating new document, Editing the document, Opening existing document, Saving the document, Print the document, File operation in word XP, Creation of tables in word, Create the header or footer, Graphics, Introduction to mail merge, Creating and working with web page, Editing equations, Keyboard shortcut keys.

UNIT-II

07 Hrs

MS-Power Point: Introduction, Different uses of power point, creating a presentation slide, Open an existing presentation, Auto layout, Components of power point window, Different views of a slide, Different operations on slide, Adding clip art to a presentation, Slide animation, Slide master, Slide number, Printing a presentation, Charts in power point, List of shortcut keys

References:
1. C. V. Uppin and Veeru Uppin, Computer Applications.

Practical IA: SEC 4(a) : Office Automation Tools Lab

Practical: 2 Hrs./Week

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 4(a) Office Automation Tools.

SEC-4(b): Android Programming

Teaching: 1 Hrs./Week
Max Marks: 40 Cont. Assessments. 10

Credits: 02
Total Teaching Hrs: 15

UNIT I

07 Hrs

Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, and Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.
Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating an android project - Hello Word, run on emulator, Deploy it on USB-connected Android device.

UNIT II 08 Hrs

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.
User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.
Database: Understanding of SQLite database, connecting with the database.

References:

ONLINE READING / SUPPORTING MATERIAL:

Practical IA: SEC-4(b): Android Programming lab

Practical: 2 Hrs./ Week
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper SEC 4(b) Android Programming.

DSE-4(a): Sci-lab Programming

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20
Credits: 04
Total Teaching Hrs: 60

UNIT I

Introduction to Scilab: What is scilab, downloading & installing scilab, a quick taste of scilab.
The Scilab Environment: Manipulating the command line, working directory, comments, variables in memory, recording sessions, the scilab menu bar, demos.
Scalars & Vectors: Introduction, initializing vectors in scilab, mathematical operations on vectors, relational operations on vectors, logical operations on vectors, built-in logical functions.

UNIT II

 Scalars & Vectors: Elementary mathematical functions, mathematical functions on scalars, complex numbers, trigonometric functions, inverse trigonometric functions, hyperbolic functions.
 Matrices: Introduction, arithmetic operators for matrices, basic matrix processing.
 Polynomials: Introduction, creating polynomials, basic polynomial commands, finding roots of polynomial, polynomial arithmetic, miscellaneous polynomial handling.
UNIT III

Programming in scilab: Introduction, variables & variable names, assignment statements, arithmetic, relational, logical operators, input & output, flow control/branching/conditional statements, break and continue, handling matrices with loops, scripts, the concept of functions, user defined functions, special function commands.

Menus and Dialog Boxes: Introduction, a simple menu example, scilab window with greetings menu added, executing submenus from command line, linking menus to scilab code from external files, entering data through dialog boxes, printing a message in a message box, dialog box for entering a matrix.

UNIT IV

Graphic Output: Introduction, 2D plotting, function versions for graphic commands, 3D plotting, other graphic primitives, other graphic commands.

String Handling Functions: Symbolic processing in scilab, creation of a linear combination of arguments, string to ASCII conversion, creation of a string of blank characters, conversion of a string to upper case and lower case, string matching, string concatenation, reversing a string, replacement of a string by another, length of a string, type checking.

Statistics: Introduction, basic statistical functions, applying statistical functions on matrices, distributions, frequency of values of a matrix or vector, centre, weighted centre, central moment, correlation, covariance, variance matrix, percentiles, frequencies, cumulative sum, difference of two independent samples, fisher test.

References:
1. Er. Hema Ramachandran, Dr. Aechuthsankar S. Nair, Computer SCILAB–A Free Software to MATLAB
2. Digite, Introduction to Scilab
3. Digite, Optimization in Scilab
4. Scilab Enterprises, Scilab for Very Beginners
5. Digite, Introduction to Discrete Probabilities with Scilab

Practical XVI(a): DSE-4 : Sci-lab Programming Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 4(a) Sci-lab Programming.

DSE-4(b): Principles of Animation

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

Credits: 04
Total Teaching Hrs: 60

UNIT-I

What is Animation: Its definition, early examples of Animation? History of Animation: Stop Motion Photo Animation, Zoetrope, Thaumatrope, Cell and Paper Animation, early Disney’s Cell Animation Processes
UNIT-II
Types of Animation: Cell Animation, Stop Motion Animation, Computer Animation, 2-D Animation, 3-D Animation. Skills for an Animation Artist: Visual and creative development of an Artist, importance of observation with minute details, efficiency to draw gestures, facial expressions, good listener, hard work and patience, creative and innovative.

UNIT-III
Basic Principles of Animation: Illusion of Life, straight action and pose to pose Timing, Exaggeration, Drama and Psychological Effect, Fade in and Fade out, Squash and Stretch, Anticipation, staging, follow through and overlapping action, Arches, Solid Drawing, Appeal, slow in and slow out, Secondary Action.

UNIT-IV
Various Terms: Animation Drawings/Cells, Rough Drawings, Clean ups, Color reference drawings, Layout, Model Sheet, Key Drawings and in Betweens, Master Background, Concept Piece, Character drawing, Story Board.

References:
1. The complete animation course by Chris Patmore- Baron’s Educational Series (New York)
2. Animation Unleashed by Ellen Bessen, Michael Weise Productions, 2008 (U.S.A)
3. The Animator’s Survival Kit by Richard Williams, Arrar Strauss & Giroux Pub. (U.S.A)

Practical XVI(b) : DSE-4 : Principles Of Animation Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 4(b) Principles of Animation.

1. Develop a simple animated short film
2. Develop a simple animated short film with background music
   Computer Animation lab

References:
1. The Illusion of Life: Disney Animation by Frank Thomas, Ollie Johnston (Contributor), Collie Johnston.
2. Adobe Flash CS3
3. The Animator’s Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators by Richard Williams

Chairman
Dept. of Computer Science
Loknath University, Calcutta

GUUK, B.C.A CBCS SYLLABUS 2018-19
DSE-4(c) : Open Source Software

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

Credits: 04
Total Teaching Hrs: 60

UNIT I

UNIT II

UNIT-III

UNIT-IV

References:
1. Rasmus Lerdorf and Levin Tatroe, “Programming PHP”, O’Reilly, 2002

Practical XVI(c): DSE-4 : Open Source Software Lab

Practical: 4 Hrs./ Week
Max Marks: 40

Credits: 02
Cont. Assessments. 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 4(c) Open Source Software.
DSE-5(a) : Digital Image Processing

Teaching: 4 Hrs./ Week  
Max Marks: 80  
Assessments. 20  
Total Teaching Hrs: 60

UNIT- I  
15 Hrs

Elements of digital image processing systems, Vision and Digital Camera working principles, Elements of visual perception, brightness, contrast, hue, saturation, mach band effect, Color image Fundamentals - RGB, HSI models, Image sampling, Quantization, dither, Two dimensional Mathematical preliminaries, 2D transforms - DFT, DCT, KLT, SVD.

UNIT II  
15 Hrs

Histogram equalization and specification techniques, Noise distributions, Spatial averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contra harmonic mean filters, Homomorphic filtering, Colour image enhancement.

UNIT III  
15 Hrs


UNIT IV  
15 Hrs

Edge detection, Edge linking via Hough transform, Thresholding, Region based segmentation Region growing Region splitting and Merging Segmentation by morphological watersheds basic concepts, Dam construction, Watershed, segmentation algorithm, Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic coding, Vector Quantization, Transform coding, JPEG standard, MPEG.

References:


Practical-XVII(a): DSE-5 : Digital Image Processing Lab

Practical: 4 Hrs./ Week  
Max Marks: 40  
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 5.(a) Digital Image Processing Using Scilab/Matlab.

GUK, B.C.A CBCS SYLLABUS 2018-19  
Dept. of Computer Science  
Page 34
DSE-5(b) : Cyber Forensics

Teaching: 4 Hrs./Week
Max Marks: 80 Cont. Assessments. 20

UNIT I


UNIT II

15 Hrs

Computer Crimes: Crimes, Violent crimes where computers are used include terrorism, assault threat, stalking, child pornography ,Nonviolent crimes where computers are used include trespass, theft, fraud, vandalism , Where evidence often resides for different types of crimes ,Address books, chat logs, e-mail, images, movies, Internet browser history, etc.

UNIT III

15 Hrs

Computer Criminals: Using evidence to create a crime timeline , Modify Access Create (MAC) dates associated with files ,Problems with using these (they don't change in a logical fashion in some cases) ,Criminals and crime fighters ,Understanding "cyber criminals" and their victims ,Understanding "cyber investigators.

UNIT IV

15 Hrs

Building a Cybercrime Case: Bodies of law, Constitutional law, Criminal law, Civil law, Administrative regulations ,Levels of law ,Local laws ,State laws ,Federal laws International laws ,Levels of culpability ,Intent ,Knowledge ,Recklessness ,Negligence , Level and burden of proof ,Criminal versus civil cases ,Vicarious liability ,Laws related to computers ,CFAA, DMCA, CAN Spam, etc. Preserving and Recovering Digital Evidence: Disk imaging ,Creating a message digest or hash code for a disk ,Where data hides; deleted and erased data.

References:
2. Scene of the Cybercrime, by Debra Littlejohn Shinder.

Practical-XVII(b): DSE-5: Cyber Forensics Lab

Practical: 4 Hrs./Week
Max Marks: 40
Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 5(b) Cyber Forensics.
DSE-5(c) : Cloud Computing

Teaching: 4 Hrs./ Week
Max Marks: 80 Cont. Assessments. 20

UNIT I

Introduction: Cloud Infrastructure: Cloud computing, Cloud computing delivery models and services, Ethical issues, Cloud vulnerabilities, Cloud computing at Amazon, Cloud computing the Google perspective, Microsoft Windows Azure and online services, Open-source software platforms for private clouds, Cloud storage diversity and vendor lock-in, Energy use and ecological impact, Service level agreements, User experience and software licensing.

UNIT II


UNIT III


UNIT IV

Cloud Resource Management and Scheduling: Policies and mechanisms for resource management, Application of control theory to task scheduling on a cloud, Stability of a two-level resource allocation architecture, Feedback control based on dynamic thresholds, Coordination of specialized autonomic performance managers, A utility based model for cloud-based Web services, Resourcing bundling: Combinatorial auctions for cloud resources, Scheduling algorithms for computing clouds, Fair queuing, Start-time fair queuing, Borrowed virtual time, Cloud scheduling subject to deadlines, Scheduling MapReduce applications subject to deadlines, Resource management and dynamic scaling.

References:
4. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elenpeter
TATA McGraw- Hill , New Delhi – 2010
Practical XVII(c): DSE-5: Cloud Computing Lab

Practical: 4 Hrs./ Week  
Max Marks: 40  
Credits: 02  
Cont. Assessments: 10

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper DSE 5(c) Cloud Computing.

Practical-XVIII: Major Project Report

Teaching: 12 Hrs./ Week  
Max Marks: 150  
Credits: 06  
Cont. Assessments: 30

Practical-XVIII: Major Project Report (MPR) (90 for Project evaluation, 30 for viva-voce=120,30 for IA , Total=150 marks)

- Each student shall carry out an individual project in the Lab.
- The Guide shall be concerned teacher in the department.
- The Project topic should be chosen in consultation with the guide.
- Student shall carry out the analysis and design work for the chosen problem statement and develop the s/w in the Lab.
- The student shall submit two copies of the dissertation documenting the project work carried out by him/her to the Chairman/Head of the Department at the end of the semester term.
- Refer Annexure-I for Project documentation details.
ANNEXURE-I

FORMAT OF THE PROJECT REPORT

1. Cover page as per format
2. Certificate of the project
3. Conference/Seminar/Workshop Attended Certificate
4. Acknowledgement
5. Index
6. Abstract of the project
7. Main Report
   7.1 Introduction
   7.2 Problem statement
   7.3 Literature survey
   7.4 System analysis & design
   7.5 Hardware & software Requirements
   7.6 ERD, DFD
   7.7 System Planning(Charts)
   7.8 Implementation
   7.9 Integration
   7.10 Testing
      7.10.1 Unit Testing
      7.10.2 Integration Testing
      7.10.3 Functional Testing
   7.11 Results & Discussion
   7.12 Advantages & Disadvantages
   7.13 Applications
   7.14 Future Scope
   7.15 Conclusion
   7.16 References
   7.17 Soft copy of the project on CD/Floppy
GUIDE CERTIFICATE

Guide Name:

Full Address:

CERTIFICATE

This is to certify that this project entitled "__________" submitted in partial fulfillment of the Degree of Bachelor of Computer Applications (B.C.A.) to the Department of Computer Science, _______ (University/College Name), by Mr./Ms. __________, Reg. No. __________ is a bonafide work carried out by him/her under my supervision. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to this or any other University/Institution to the best of my knowledge and belief.

Signature of the Guide

CHAIRMAN
Dept. of Computer Science
Jhargram University, Jalpaiguri
COVER PAGE

*Title of the thesis/report*

(Times New Roman, Italic, Font size = 24)

Submitted in partial fulfillment of the requirements
for the award of the Degree of B.C.A.

(Bookman Old Style, 16 point, centre)

Submitted by:
(Student name)
Reg. No.:

Submitted to
GULBARGA UNIVERSITY, KALABURAGI

College/Department
College Name and City
DECLARATION

This is to certify that the dissertation/project report entitled "_________________________" is carried out by me under the supervision of __________________________, for the partial fulfillment of the requirements for the award of the Degree of B.C.A. The contents embodied in this project work, in part or whole, has not been submitted earlier for award of any degree or diploma to this or any other University/Institution.

Signature of the student

( Name of the Student )

Reg. No.-

[Signature]

CHAIRMAN

[Institution's Name]