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ಕ್ರ.ಸಂ.ಗುವಿಕ/ವಿಮವಿ/ಬಿ.ಓ.ಎಸ್./2018-19/682 ದಿನಾಂಕ: 03.07.2018

ಅಧಿಸೂಚನೆ

ವಿಷಯ: ಬಿ.ಸಿ.ಎ ಕೋರ್ಸಿಗಾಗಿ ಸಿಬಿಸಿಎಸ್ ಪದ್ಧತಿಯನ್ನು ಅಳವಡಿಸಿಕೊಂಡು ಅದಕ್ಕನುಗುಣವಾಗಿ ಪಠ್ಯಕ್ರಮವನ್ನು ಜಾರಿಗೊಳಿಸಿದ ಬಗ್ಗೆ.

ಉಲ್ಲೇಖ: 1) ಸ್ನಾತಕ ಅಧ್ಯಯನ ಮಂಡಳಿಯ ಸಭೆಯ ದಿನಾಂಕ: 13.06.2018.
2) ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯದ ಸಭೆ ದಿನಾಂಕ: 14.06.2018.
3) ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಗೊತ್ತುವಳಿ ಸಂಖ್ಯೆ 11 ದಿನಾಂಕ.26.06.2018.

****

ಉಲ್ಲೇಖ (3) ರಲ್ಲಿನ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್‌ನ ಸಭೆಯ ಗೊತ್ತುವಳಿ ಸಂಖ್ಯೆ 11 ನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸುತ್ತ; ಬಿ.ಸಿ.ಎ ಕೋರ್ಸಿನ I ರಿಂದ VIನೇ ಸೆಮೆಸ್ಟರ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಧ್ಯಯನ ಮಂಡಳಿಯು ಪರಿಷ್ಕರಿಸಿ ಅನುಮೋದಿಸಿರುತ್ತದೆ. ದಿನಾಂಕ 14.06.2018. ರಂದು ಜರುಗಿದ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯದ ಸಭೆಯಲ್ಲಿ ಸದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು 2018-19ನೇ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ ಜಾರಿಗೊಳಿಸಲು ಶಿಫಾರಸ್ಸು ಮಾಡಲಾಗಿದೆ.

ಅದರಂತೆ, 2018-19ನೇ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ ಬಿ.ಸಿ.ಎ ಸ್ನಾತಕ ಕೋರ್ಸಿನ I ರಿಂದ VIನೇ ಸೆಮೆಸ್ಟರ ಪಠ್ಯಕ್ರಮವನ್ನು ಪರಿಷ್ಕರಿಸಿ ಜಾರಿಗೊಳಿಸಲಾಗಿದೆ.

ಈ ಮಾಹಿತಿಯನ್ನು ಸಂಬಂಧಪಟ್ಟ ಶಿಕ್ಷಕರ ಹಾಗೂ ವಿದ್ಯಾರ್ಥಿಗಳ ಗಮನಕ್ಕೆ ತರಲು ಸೂಚಿಸಲಾಗಿದೆ. ಪಠ್ಯಕ್ರಮದ ವಿವರವನ್ನು ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್‌ಸೈಟ್ www.gug.ac.in ದಿಂದ ಪಡೆಯಬಹುದು.

3/7/18

ಕುಲಸಚಿವರು
ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ

ಗೆ,

1. ಮುಖ್ಯಸ್ಥರು, ಗಣಕ ವಿಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಭಾಗ, ಗು.ವಿ.ಕಲಬುರಗಿ.
2. ಎಲ್ಲಾ ಪದವಿ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಂಶುಪಾಲರಿಗೆ.

ಪ್ರತಿಗಳು:

1. ಡೀನ್‌ರು, ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯ, ಗು.ವಿ.ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
2. ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ), ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
3. ನಿರ್ದೇಶಕರು, ಯೋಜನೆ, ಮೇಲ್ವಿಚಾರಣೆ ಹಾಗೂ ಮೌಲ್ಯಮಾಪನ ಮಂಡಳಿ, ಗು.ವಿ.ಕಲಬುರಗಿ.
4. ಗ್ರಂಥಪಾಲಕರು, ಗು.ವಿ.ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
5. ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ನಿಕಾಯದ ಎಲ್ಲಾ ವಿಭಾಗಗಳ ಮುಖ್ಯಸ್ಥರಿಗೆ.
6. ಮುಖ್ಯಸ್ಥರು, ಗಣಕಕೇಂದ್ರ, ಗು.ವಿ.ಕಲಬುರಗಿ ಇವರಿಗೆ ಸದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್‌ಸೈಟ್ ನಲ್ಲಿ ಪ್ರಕಟಿಸಲು ತಿಳಿಸಲಾಗಿದೆ.
7. ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿ / ಕುಲಸಚಿವರ ಆಪ್ತ ಸಹಾಯಕರ ಮಾಹಿತಿಗಾಗಿ.

ENCLOSER TO THE
ITEM No. [11]

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)

GULBARGA UNIVERSITY KALABURAGI

ANNEXURE-5

SCHEME OF STUDY AND EXAMINATION FOR B.C.A. IN COMPUTER SCIENCE UNDER CBCS SCHEME W.E.F. ACADEMIC YEAR 2018-19 AND ONWARDS

Paper Code	Title of the Course	Marks			Duration of Theory / Practical Exam. Hrs.	Teaching Hours/Week			Credits
		Semester	IA	Total		L	T	P	
FIRST SEMESTER 2018-19 & ONWARDS									
AECC-1a	Kannada/MIL-1	80	20	100	03	3	-	-	3
AECC-1b	English-1	80	20	100	03	3	-	-	3
AECC-1C	Environmental Studies	40	10	50	02	2	-	-	2
DSC-1A	Computer Fundamentals	80	20	100	03	4	-	-	4
DSC-2A	Problem Solving Using C	80	20	100	03	4	-	-	4
DSC-3A	Digital Electronics	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1A	Practical-I: Computer Fundamentals Lab	40	10	50	02	-	-	4	2
DSC-2A	Practical-II: Problem Solving Using C Lab	40	10	50	02	-	-	4	2
DSC-3A	Practical-III: Digital Electronics Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR FIRST SEMESTER				**700**					**26**
SECOND SEMESTER 2018-19 & ONWARDS									
AECC-2a	Kannada/MIL-1	80	20	100	03	3	-	-	3
AECC-2b	English-1	80	20	100	03	3	-	-	3
AECC-2C	Indian Constitution	40	10	50	02	2	-	-	2
DSC-1B	Discrete Mathematics	80	20	100	03	4	-	-	4
DSC-2B	Object Oriented Programming in C++	80	20	100	03	4	-	-	4
DSC-3B	Database Management System	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1B	Practical-IV: Discrete Mathematics Lab	40	10	50	02	-	-	4	2
DSC-2B	Practical-V: Object Oriented Programming in C++Lab	40	10	50	02	-	-	4	2
DSC-3B	Practical-VI: Database Management System Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR SECOND SEMESTER				**700**				02	**26**
THIRD SEMESTER 2019-20 & ONWARDS									
AECC-3a	Kannada/MIL-1	80	20	100	03	3	-	-	3
AECC-3b	English-1	80	20	100	03	3	-	-	3
DSC-1C	Computer Oriented Statistical Methods	80	20	100	03	4	-	-	4
DSC-2C	Data Structures and File Processing	80	20	100	03	4	-	-	4
DSC-3C	Operating System	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1C	Practical-VII: Computer Oriented Statistical Methods Lab	40	10	50	02	-	-	4	2
DSC-2C	Practical-VIII: Data Structures and File Processing Lab	40	10	50	02	-	-	4	2
DSC-3C	Practical-IX: Operating System Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR THIRD SEMESTER				**650**					**24**
FOURTH SEMESTER 2019-20 & ONWARDS									
AECC-4a	Kannada/MIL-1	80	20	100	03	3	-	-	3
AECC-4b	English-1	80	20	100	03	3	-	-	3
DSC-1D	Financial Accounting & Management	80	20	100	03	4	-	-	4
DSC-2D	Java Programming	80	20	100	03	4	-	-	4
DSC-3D	Software Engineering	80	20	100	03	4	-	-	4
PRACTICALS									
DSC-1D	Practical-X: Accounting(Tally) Lab	40	10	50	02	-	-	4	2
DSC-2D	Practical-XI : Java Programming Lab	40	10	50	02	-	-	4	2
DSC-3D	Practical-XII: Software Engineering Lab	40	10	50	02	-	-	4	2
TOTAL MARKS FOR FOURTH SEMESTER				**650**					**24**

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FIFTH SEMESTER 2020-21 & ONWARDS									
SEC-1	(a) System Administration and Maintenance (b) Software Testing	40	10(Pr)	50	02	1	-	2	2
SEC-2	(a) Information Security (b) Perl Programming	40	10(Pr)	50	02	1	-	2	2
DSE-1	(a) Python Programming (b) Dot Net Programming (c) Design and Analysis of Algorithm	80	20	100	03	4	-	-	4
DSE-2	(a) Web Technologies (b) Data Mining (c) Computer Graphics	80	20	100	03	4	-	-	4
DSE-3	(a) Data Communication and Networks (b) Multimedia Systems and Applications (c) Hadoop and R Programming	80	20	100	03	4	-	-	4
PRACTICALS									
DSE-1	Practical-XIII: (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				**550**					**22**
SIXTH SEMESTER 2020-21 & ONWARDS									
SEC-3	(a) XML Programming (b) PHP Programming	40	10(Pr)	50	02	1	-	2	2
SEC-4	(a) Office Automation Tools (b) Android Programming	40	10(Pr)	50	02	1	-	2	2
DSE-4	(a) Scilab Programming (b) Principles of Animation (c) Open Source Software	80	20	100	03	4	-	-	4
DSE-5	(a) 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				**550**					**22**
TOTAL MARKS & CREDITS FOR THE COURSE				**3800**					**144**

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.

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DEPARTMENT OF COMPUTER SCIENCE
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Blue print for the DSC paper and DSE paper setting

UNIT	2 Marks Questions	5 marks Questions	10 Marks Questions
I	2	1	2
II	2	1	2
III	3	2	1
IV	3	2	1

Question Papers contains 3 sections:

Section A : 10 Questions of 2 marks, Answer All Questions X 2 = 20 Marks

Section B : 6 Questions of 5 marks, Answer any 4 Questions X 5 = 20 Marks

Section C : 6 Questions of 10 marks, Answer any 4 Questions X 10 = 40 Marks

Total=80 Marks

Distribution of Marks for Practical:

1. Writting 2 programs X 10 marks = 20Marks.
2. Execution of single program 1 X10 = 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)

B.Sc./B.C.A./B.A

UNIT	2 Marks Questions	5 marks Questions	10 Marks Questions
I	2	1	2
II	3	2	1

Question Papers contains 3 sections:

Section A: 5 Questions of 2 marks, Answer All Questions X 2= 10 Marks

Section B : 3 Questions of 5 marks, Answer any 2 Questions X 5= 10 Marks

Section C : 3 Questions of 10 marks, Answer any 2 Questions X 10= 20 Marks

Total=40 Marks

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DSC-1A: Computer Fundamentals

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

UNIT-I **15 Hrs**

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

UNIT-II **15 Hrs**

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.

UNIT-III **15 Hrs**

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.

UNIT-IV **15 Hrs**

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.

References:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

Practical-I: DSC 1A: Computer Fundamentals 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 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.

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DSC 2A: Problem Solving Using C

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

Functions: Concept of Function, Using Functions, Call-by-Value Vs Call-by-reference, Passing Arrays to Functions, Score of Variables, Storage Classes, Inline Functions, and Recursion. **Pointers:** Introduction, Address of Operator (&), Pointer, Uses of Pointers, Arrays and Pointers, Pointers and Strings, Pointers to Pointers, Array of Pointers, Pointer to Array, Dynamic Memory Allocation.

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 verses 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:

1. M.T.Somashekara ,Problem Solving with C, 2E, PHI Learning.
2. Balagurusamy, Programming in ANSI C, McGraw Hill Education India Private Limited; 7/e.
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 **Credits: 02**
Max Marks: 40 **Cont. Assessments. 10**

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

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DSC 3A: Digital Electronics

Teaching: 4 Hrs./ Week **Credits: 04**

Max Marks: 80 Cont. Assessments. 20 **Total Teaching Hrs: 60**

UNIT- I **15 Hrs**

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 **15Hrs**

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 **15Hrs**

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 **15Hrs**

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.
3. Alan. N Marcovitz,Introduction to logic and computer design ,McGraw Hill.
4. Ronald J.Tocci,Digital Systems:Principal and applications,8/e ,pearson education.
5. Bartee J.C., Digital computer Fundamentals,6/e ,TMH.
6. Herbert Taub and Donald schilling , Digital intergrated electronics, McGraw Hill International Edition.
7. Ramesh S. Gaonkar, Microprocessor Architecture, Programming , and Application with the 8085,4/e Penram International Publishers.

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

Practical: 4 Hrs./ Week **Credits: 02**

Max Marks: 40 **Cont. Assessments. 10**

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

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DSC-1B: Discrete Mathematics

Teaching: 4 Hrs./ Week **Credits: 04**
Max Marks: 80 Cont. Assessments. 20 **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, graphics 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.
Boolean Functions and Expression:, Propositional Calculus, Design and Implementation of Digital Networks, Switching Circuits.

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 :

1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", Mc.Graw Hill, 2002.
2. J.P.Tremblay & R. Manohar, "Discrete Mathematical Structure with Applications to Computer Science" Mc.Graw Hill, 1975.
3. V. Krishnamurthy, "Combinatories:Theory and Applications", East-West Press.
4. Seymour Lipschutz, M.Lipson, "Discrete Mathematics'" Tata Mc Graw Hill, 2005.
5. Kolman, Busby Ross, "Discrete Matheamatical Structures", Prentice Hall International.

Practical-IV: DSC-1B: Discrete Mathematics 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 1B Discrete Mathematics Using C.**

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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

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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:

1. M.T. Somashekara, Object Oriented Programming with C++ (2nd Edition), PHI Learning, 2012
2. E. Balagurusamy, Object Oriented Programming with C++, McGrawHill Publications,
3. Herbert Schildt, C++ The Complete Reference,Tata McGraw Hill Publication.
4. Al Stevens,C++ Programming, Wiely Publications. S. B. Lippman& J. Lajoie, C++ Primer, 3rd Edition, 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 **15 Hrs**

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.
Relational Model: Introduction, Terminology, Integrity Constraints, Views.
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.

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UNIT – III **15 Hrs**

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.

Advanced SQL: The SQL Programming Language–Declarations, Assignments, Control Statements, Exceptions, Cursors, Subprograms, Stored Procedures, Functions, and Packages, Triggers, Recursion.

UNIT – IV **15 Hrs**

Transaction Management: Transaction Support–Properties of Transactions, Database Architecture, Concurrency Control–The Need for Concurrency Control, Serializability and Recoverability, Locking Methods, Deadlock, Time Stamping Methods, Multi-version Timestamp Ordering, Optimistic Techniques, Granularity of Data Items, Database Recovery–The Need for Recovery, Transactions and Recovery, Recovery Facilities, Recovery Techniques, Nested Transaction Model. **Security:** Database Security–Threats, Computer-Based Controls–Authorization, Access Controls, Views, Backup and Recovery, Integrity, Encryption, RAID.

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
7. C Coronel, S Morris, Peter Rob, Database Systems: Design, Implementation, and Management

Practical-VI: DSC-3B: Database Management Systems 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 3B Database Management Systems.**

DSC-1C: Computer Oriented Statistical Methods

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

UNIT – I **15 Hrs**

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.

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UNIT – II **15 Hrs**

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

UNIT – III **15 Hrs**

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

UNIT – IV **15 Hrs**

Correlation - Definition-Uses- Scatter diagram –Types – Karl Pearson's Correlation Co-efficient -Spearman's Rank Correlation Co-efficient -Regression equations –Regression coefficient – properties – Simple problems.

References :

1. Pillai, R.S.N, Bagavathi, V. (2009),Statistics,Theory and Practice,7Th Edition,S.Chand Ltd,NewDelhi.
2. Gupta, S.P. (2011) ,"Applied Statistical Methods" ,4th Edition,Sultan Chand & Sons, New Delhi.
3. Ken Black, (2013), "Business Statistics for Contemporary Decision Making", 7th Edition, John Wiley Publications
4. Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
5. Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
6. Graybill, Introduction to Statistics, McGraw.
7. Anderson, Statistical Modelling, McGraw.

Practical-VII: DSC-1C: Computer Oriented Statistical Methods 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 1C Computer Oriented Statistical Methods** Using SPSS Package.

DSC-2C: Data Structures and File Processing

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

UNIT – I **15 Hrs**

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

UNIT – II **15 Hrs**

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

UNIT – III **15 Hrs**

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.

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UNIT – IV **15 Hrs**

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

References :

1. M.T. Goodrich, R. Tamassia and D. Mount, "Data Structures and Algorithms inC++", John Wiley and Sons, Inc., 2004.
2. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", 2nd Ed., Prentice Hall of India, 2006.
3. Robert L. Kruse and A.J. Ryba, "Data Structures and Program Design in C++", Prentice Hall, Inc., NJ,1998.
4. B. Stroupstrup, "The C++ Programming Language", Addison Wesley, 2004.
5. D.E. Knuth, "Fundamental Algorithms (Vol. I)", Addison Wesley, 1997.

Practical-VIII: DSC-2C: Data Structures and File Processing 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 2C Data Structures and File Processing** Using Java.

DSC-3C: Operating System

Teaching: 4 Hrs./ Week **Credits: 04**

Max Marks: 80 Cont. Assessments. 20 **Total Teaching Hrs: 60**

UNIT – I **15 Hrs**

Introduction: System Software, Resource Abstraction, OS strategies, Types of operating systems - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.

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 :
1. A Silberschatz, P.B. Galvin, G. Gagne, "Operating Systems Concepts", 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, "Modern Operating Systems", 3rd Edition, Pearson Education 2007.
3. G. Nutt, "Operating Systems: A Modern Perspective", 2nd Edition Pearson Education 1997.
4. W. Stallings, "Operating Systems, Internals & Design Principles" , 5th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, "Operating Systems -Concepts and design", Tata McGraw Hill 1992.

Practical-IX: DSC-3C: Operating Systems 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 3C Operating System** Using C++.

DSC-1D: Financial Accounting & Management

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

UNIT-I **15 Hrs**

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

UNIT-II **15 Hrs**

Trial Balance: Objectives, Defects of trial balance, Errors disclosed by trial balance, Preparation and locating errors. **Cash Book and Subsidiary books of Accounting:** Kinds of cashbook, Purchase daybook, Sales daybook, Bills receivable book, Bills payable book.

UNIT-III **15 Hrs**

Finance Accounts: Trading account,, Profit & Loss account, Adjustments, Balance Sheet, Forms of balance Sheet, Assets and their classification, liabilities and their classification, uses and limitations.

UNIT-IV **15 Hrs**

Capital & Revenue Expenditure & Receipts: Rules for determining capital expenditure, Deferred Revenue expenditure, Capital & Revenue receipts, Capital & Revenue Profits, Capital & Revenue Loss. **Nature of Financial Management:** Scope of financial functions, finance functions and job of finance manager, organization of finance function.

References :
1. Management Accounting – Manmohan Singh and Goel
2. Financial management- Pandey I. M.
3. Hanif & Mukherjee-Modern Accountancy, TMH, New Delhi.
4. Maheshwari & Maheshwari- An Introduction to Accountancy, Vikas Publishing House Pvt.Ltd., New Delhi.

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Practical-X: DSC-1D: Accounting (Tally) 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 1D Accounting & Finance Management** Using Tally Package.

DSC-2D: Java Programming

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

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,JTextarea, JComboBox, JList, JPannel. – Mouse Event Handling -Adapter Classes- Key Event Handling.
Mouse Event Handling - Adapter Classes- Key Event Handling. Layout Managers – FlowLayout,BorderLayout, GridLayout.- Graphics contexts and graphics objects – color control – font control –Drawing lines, rectangles and ovals –jslider-using menus with frames.

UNIT- IV **15 Hrs**

Packages: Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws - Thread - Synchronization - Runnable Interface - Inter thread Communication – Multithreading.- file streams-Sequential file , Random file.

References :

1. Programming in Java – 2nd Edition by C.Muthu, TMH Publication.
2.Java How to Program by Deitel & Deitel – 6 th Edition- PHI Publication 2005..

Practical-XI: DSC-2D: JAVA PROGRAMMING 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 2D Java Programming.**

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DSC-3D: Software Engineering

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

UNIT I **15 Hrs**

Software engineering: Evolving Role of Software, Software Engineering, Changing nature of Software, Software Myths, and Terminologies, Role of management in software development Software Process and desired Characteristics.
Software Life Cycle Models: Build & Fix Model, Water Fall Model, Incremental Process Model, Evolutionary Process Models, Unified Process, Comparison of Models, Other software Processes, Selection of a Model.

UNIT II **15 Hrs**

Software Requirements Analysis & Specifications: Requirements Engineering, Types of Requirements, Feasibility Studies, Requirements Elicitation, Requirements Analysis Documentation, Validation and Management.
Software Architecture: Its Role, Views, Component & Connector View and its architecture style, Architecture Vs Design, Deployment View & Performance Analysis, Documentation, Evaluation.

UNIT III **15 Hrs**

Function Oriented Design: Design principles, Module level Concepts, Notation & Specification, Structured Design Methodology, and Verification
Object Oriented Design: OO Analysis & Design, OO Concepts, Design Concepts, UML – Class Diagram, Sequence & Collaboration Diagram, Other diagrams & Capabilities, Design Methodology, Dynamic and Functional Modelling, Internal Classes & Operations.

UNIT IV **15 Hrs**

Detailed Design: PDL, Logic/Algorithm Design, State Modelling of Classes, Verification: Design Walkthroughs, Critical Design Review, Consistency Checkers.
Coding: Programming Principles & Guidelines, Coding Process, Refactoring, Verification.

References :

1. Pankaj Jalote, "An Integrated Approach to Software Engineering",3rd Edition, Narosa Publishing House, 2005.
2. K.K. Aggrawal and Yogesh Singh, "Software Engineering", 3rd Edition, New Age International (P) Ltd, 2008.
3. Pressman, R.S., "Software Engineering – A Practitioner's Approach", 3rd Edition, McGraw Hills, 2008.
4. Mall Rajib, "Fundamentals of Software Engineering", PHI, New Delhi, 2005.

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

Practical: 4 Hrs./ Week **Credits: 02**
Max Marks: 20 **Cont. Assessments. 0**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSC 3D Software Engineering Using Manual testing tools.**

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SEC 1(a): System Administration and Maintenance

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

Windows: Windows as operating system, history, versions. PC hardware, BIOS, Devices and drivers. Kernal Configuration and building. Application installation, configuration and maintenance, Server services and Client services, Difference between WindowsXP/windows7 and windows server 2003/2008.

References :

1. Linux Administration: A Beginner&apos Guide 6th Edition by Wale Soyinka Publisher: Mcgraw Higher Ed
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 1(a) System Administration and Maintenance.**

SEC-1(b): SOFTWARE TESTING

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

UNIT –I **8 Hrs**

Introduction: Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System Testing, Basic Terminologies, V Shaped Software Lifecycle Model.
Functional Testing/ Black-box Testing: Boundary Value Analysis, Equivalence Class Testing, Decision Table Based Testing.

UNIT-II **7 Hrs**

Structural Testing / White-box Testing: Basis Path Testing: Program Graph, DD Path graph, Cyclomatic Complexity, Graph Matrices,Control Flow Testing: Statement Coverage, Branch Coverage, Condition Coverage, Path Coverage.

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References :

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach, Seventh Edition,Mc Graw Hill Education.2009.
2. Yogesh Singh, Software Testing, Cambridge University Press, 2011.
3. Software Testing Effective Methods, Tools and Techniques, Renu Rajani and Pradeep Oak, Tata McGraw-Hill

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 :

1. W. Stallings, Cryptography and Network Security Principles and Practices, 4th Ed., Prentice-Hall of India, 2006.
2. C. Pfleeger and SL. Pfleeger, Security in Computing, 3rd Ed., Prentice-Hall of India, 2007.
3. D. Gollmann, Computer Security, John Wiley and Sons, NY, 2002.
4. J. Piwprzyk, T. Hardjono and J. Seberry, Fundamentals of Computer Security,Springer-Verlag Berlin, 2003.
5. J.M. Kizza, Computer Network Security, Springer, 2007.
6. M. Merkow and J. Breithaupt, Information Security: Principles and Practices, Pearson Education, 2006.

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.**

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SEC-2(b) : Perl Programming

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

UNIT-I **08 Hrs**

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

UNIT-II **07 Hrs**

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

References :

1. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGrawHill Publishing Company Limited, Indian Reprint 2009.

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 **Credits: 04**
Max Marks: 80 Cont. Assessments. 20 **Total Teaching Hrs: 60**

UNIT I **15 Hrs**

Introduction: Program Structure – output function – variables, constants, data types, type operators and expressions – control structures – input function. Data structures – str, list, tuple, dict, set.

UNIT II **15 Hrs**

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 **15 Hrs**

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

UNIT IV **15 Hrs**

Classes, objects, inheritance, Testing and debugging, GUI Programming, Relational databases, Web Untangled, Concurrency and Networks.

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References :

1. Bill Lubanovic, Introducing Python- Modern Computing in Simple Packages, O'Reilly Publication
2. Allen Downey, Jeffrey Elkner, Chris Meyers, How to Think Like a Scientist –Learning with Python, Green Tea Press, 2002, First Edition.
3. Charles Dierbach, Introduction to Computer Science Using Python, Wiley Publication.
4. Magnus Lie Hetland, Beginning Python, From Novice to Professional, - Second Edition, APress Publication
5. Allen B. Downey, Think Python-How to think like a computer scientist, first Edition, O'Reilly Publication.

Practical-XIII(a): DSE 1: Python Programming 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 **DSE 1(a) Python Programming.**

DSE 1(b): Dot Net Programming

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

UNIT I **15 Hrs**

Overview of .NET framework, problems with the earlier languages and .NET solution. Overview of .NET binaries and .NET architecture. The role of Microsoft Intermediate Language and Metadata. Understanding Common Language Runtime, Common Type System and Common Language Specification. .NET base classes, overview of .NET Assemblies, .NET memory management.

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.

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References:
1. Visual Basic .NET and the .NET platform – An Advanced Guide – Andrew Troelsen.
2. Programming Visual Basic .NET – Dave Grundgiger.
3. Teach Yourself Visual Basic .NET in 21 days – Duncan Mackenzie and Kent Sharkey
4. Introducing Microsoft .NET – David S. Platt
5. Database Access with Visual Basic .NET – Jeffrey P. McManus, Jackie goldstein and Kevin T. Price.
6. ASP.NET Projects – Building 10 Enterprise Projects – Eric A. Smith

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

DSE 1(c): Design and Analysis of Algorithms

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

UNIT I **15 Hrs**

Introduction: RAM model, O (log n) bit model. Review of data structures: Balanced trees, Mergeable sets. Algorithm Design Techniques: Iterative techniques, Divide and conquer, dynamic programming, Greedy algorithms.

UNIT II **15 Hrs**

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 **15 Hrs**

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 **15 Hrs**

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:
1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", Prentice-Hall of India, 2006.
2. J. Kleinberg and E. Tardós, "Algorithms Design", Pearson Education, 2006.
3. S. Baase, "Computer Algorithms: Introduction to Design and Analysis", Addison Wesley, 1999.
4. A.V. Levitin, "Introduction to the Design and Analysis of Algorithms", Pearson Education, 2006.

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Practical XIII(c): DSE-1: Design and Analysis of Algorithms 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 **DSE 1(c) Design and Analysis of Algorithms** Using C++.

DSE-2(a): Web Technologies

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

1. Ivan Bayross, "Web Enabled Commercial Application Development Using Html, Dhtml,javascript", Perl CGI, BPB Publications, 2009.
2. Ivan Bayross, "Web Enabled Commercial Application Development Using Html, Dhtml,javascript", Perl CGI, BPB Publications, 2009.
3. "BIG Java Cay Horstmann", Wiley Publication , 3rd Edition., 2009.

Practical-XIV(a): DSE-2(a): Web Technology 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 **DSE 2(a) Web Technologies.**

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DSE-2(b): Data Mining

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

UNIT-I **15 Hrs**

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 **15 Hrs**

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 **15 Hrs**

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 **15 Hrs**

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)
2. N.P.Gopalan,B.Sivaselvan ,Data Mining Techniques and Trends ,PHI,2009.
3. Data Mining (Next Generation Challenges and Future Directions)Author : Karguta, Joshi, Sivakumar & Yesha Publishers : Printice Hall of India (2007)
4. Data Mining (Practical Machine Learning Tools and Techniques (Second Edition) Author : Ian H. Witten & Eibe Frank Publishers : Morgan Kaufmann Publishers (An imprint of Elsevier)
5. Data Warehousing, Data mining & OLAP (Edition 2004) Author : Alex Benson, Stephen V. Smith Publishers : Tata McGraw – Hill

Practical-XIV(b): DSE-2: Data Mining 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 **DSE 2(b) Data Mining.**

DSE-2(c): Computer Graphics

Teaching: 4 Hrs./ Week **Credits: 04**

Max Marks: 80 Cont. Assessments. 20 **Total Teaching Hrs: 60**

UNIT I **15 Hrs**

A Survey of Computer Graphics, Overview of Graphics systems: Video Display Devices, Raster-Scan System, Random-Scan Systems, Graphics Monitors and Workstations, Input Devices, Graphics Software.

UNIT II **15 Hrs**

Points and Lines, Line-Drawing Algorithms, Circle-Generating Algorithms, Ellipse-Generating Algorithms, Parallel Curve Algorithms, Pixel Addressing, Filled-Area Primitives, Line Attributes, Curve Attributes, Colour and Gray scale Levels, Area-Fill Attributes.

UNIT-III **15 Hrs**

Two Dimensional Geometric Transformation, Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations, Transformation Function, Raster Methods for Transformation, Three-Dimensional Concepts, Three-Dimensional Display Methods, Three-Dimensional Graphics Packages.

UNIT-IV **15 Hrs**

Colour Models and Colour Applications: Intuitive Colour Concepts, RGB Colour Model, YIQ Colour Model, Conversion Between HSV and RGB Models, Colour Selection and Applications, Computer Animation, Design of Animation Sequences, General Computer-Animation Functions, Raster Animations, Computer-Animation Languages, Key-Frame Systems, Morphing, Simulating Accelerations, Motion Specifications, Direct Motion Specification.

References:

1. Donald Hearn and M. Pauline Baker, Computer Graphics-C version, 2/e, Pearson Education.
2. James D. Foley, Andres Van Dam, Steven K. Feiner, and John F. Hughies, Computer Graphics- Principles and Practice, 2/e, Pearson Education(2006).
3. Francis S. Hill Jr, Computer Graphics using open GL, 2/e. Pearson Education.
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 **Credits: 02**

Max Marks: 40 **Cont. Assessments. 10**

Lab. Assignments shall be carried out to implement the techniques/methods studied in Paper **DSE 2(c) Computer Graphics Using C++.**

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DSE-3(a): Data Communication and Networks

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

UNIT – I **15 Hrs**

Basic Concepts: Components of data communication, distributed processing, Line configuration, topology, transmission mode, and categories of networks. OSI and TCP/IP Models: Layers and their functions, comparison of models. Digital Transmission: Interfaces and Modems: DTE-DCE Interface, modems, cable modems. **Transmission Media:** Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon Capacity.

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, historiçal 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:

1. A.S. Tenanbaum, Computer Networks, 4th Ed., Pearson Education Asia, 2003.
2. Behrouz A. Forouzan, Data Communication and Networking, 2nd Ed., Tata McGrawHill.
3. D. E. Comer, Internetworking with TCP/IP, Pearson Education Asia, 2001.
4. William Stallings, Data and Computer Communications, 7th Ed., Pearson education Asia,2002.
3. Loney and Koch, Oracle 10g: The Complete Reference, Tata McGraw Hill, 2006.
4. David Flanagan, Java Script, The Definitive Guide, O'Reilly Media, 2006.
5. Marty Hall, Larry Brown, and Yaakov Chaikin, Core Servlets and Java ServerPages:Core Technologies (Vol. II), 2nd Ed., Sun Microsystems Press, 2006.
6. S.K. Singh, Database Systems Concepts, Design and Applications, Pearson Education 2006.

Practical-XV: DSE-3(a): Data Communication and Networks 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 **DSE 3(a)** Data Communication and Networks **Using C++ & Demonstration to done with Trainer Kits.**

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DSE-3(b): Multimedia Systems & Applications

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

UNIT – I **15 Hrs**

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**

Multimedia and the Internet: History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW - Web Servers, Web Browsers, Web page makers and editors, Plug-Ins and Delivery Vehicles, HTML, Designing for the WWW –Working on the Web, Multimedia Applications - Media Communication, Media Consumption, Media Entertainment, Media games.

UNIT-IV **15 Hrs**

Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing, Virtual Reality, Digital Camera. Assembling and delivering a Multimedia project-planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM: The CD family, production process, CD-i – Overview – Media Types Technology.

References:

1. Tay Vaughan, "Multimedia: Making it work", TMH, 1999.
2. Ralf Steinmetz and Klara Naharstedt, "Multimedia: Computing, Communications Applications", Pearson, 2001.
3. Keyes, "Multimedia Handbook", TMH, 2000.
4. Steve Heath, "Multimedia & Communication Systems", Focal Press, UK, 1999.
5. K. Andleigh and K. Thakkar, "Multimedia System Design", PHI, PTR, 2000.
6. Steve Rimmer, "Advanced Multimedia Programming", MHI, 2000.

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

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DSE-3(c) : Hadoop & R Programming

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

UNIT I **15 Hrs**

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)
3. An Introduction to R: A Programming Environment for Data Analysis and Graphics Author(s) William N Venables, David M Smith.
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 **Credits: 01**
Max Marks: 40 **Cont. Assessments. 10**

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 **Credits: 02**
Max Marks: 30 Cont. Assessments. 0 **Total Teaching Hrs: 15**

UNIT-I **07 Hrs**

XML Programming introduction: Understanding Mark-up Languages, Introduction to XML and its Goals.
XML Basics: XML Structure and Syntax, Document classes and Rules.

UNIT-II **08 Hrs**

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

References:

1. William J. Pardi , XML in action web technology, Microsoft Press, 1999
2. Michael J. Young, Step by Step XML , Microsoft Press, 2002
3. XML in a Nutshell by Harold, Elliotte Rusty and W. Scott Means. 2004. , 3rd Edition.O'Reilly & Associates. 689 p. ISBN 0596007647.
4. Beginning XML by Danny Ayers, Joe Fawcett, and Liam R. E. Quin, 5th Edition,Wrox Publication, January 2012.
5. Learning XML by Erik T. Ray O'Reilly Media 1st edition 2001.

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

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

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 **Credits: 02**
Max Marks: 30 Cont. Assessments. 0 **Total Teaching Hrs: 15**

UNIT-I **07 Hrs**

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 **08 Hrs**

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

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Practical IA : SEC-3(b) : PHP Programming Lab

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

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 **Credits: 02**
Max Marks: 30 Cont. Assessments. 0 **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.
2. Sushila Madan , Introduction to Essential tools,JBA,2009.
3. Anita Goel, Computer Fundamentals, Pearson, 2012

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

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

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 **Credits: 02**
Max Marks: 40 Cont. Assessments. 10 **Total Teaching Hrs: 15**

UNIT I **07 Hrs**

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.
Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, and Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

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Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a 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:

1.Android application development for java programmers. By James C. Sheusi. Publisher: engage Learning, 2013.

ONLINE READING / SUPPORTING MATERIAL:

1. http://www.developer.android.com
2. http://developer.android.com/about/versions/index.html
3. http://developer.android.com/training/basics/firstapp/index.html
4. http://docs.oracle.com/javase/tutorial/index.htm (Available in the form of free downloadable ebooks also).
5. http://developer.android.com/guide/components/activities.html
6. http://developer.android.com/guide/components/fundamentals.html
7. http://developer.android.com/guide/components/intents-filters.html.
8. http://developer.android.com/training/multiscreen/screensizes.html
9. http://developer.android.com/guide/topics/ui/controls.html
10. http://developer.android.com/guide/topics/ui/declaring-layout.html

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

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

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 **Credits: 04**
Max Marks: 80 Cont. Assessments. 20 **Total Teaching Hrs: 60**

UNIT I **15 Hrs**

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 **15 Hrs**

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.

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UNIT III **15 Hrs**

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 **15 Hrs**

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 uppercase and lowercase, 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. Achuthsankar 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 **Credits: 02**
Max Marks: 40 **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 **Credits: 04**
Max Marks: 80 Cont. Assessments. 20 **Total Teaching Hrs: 60**

UNIT-I **15 Hrs**

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

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UNIT-II **15 Hrs**

Types of Animation: Cell Animation, Stop Motion Animation, Computer Animation, 2-DAnimation, 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 **15 Hrs**

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, Arcs, Solid Drawing ,Appeal, slow in and slow out, Secondary Action.

UNIT-IV **15 Hrs**

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 Straus & Giroux Pub.(U.S.A)

Practical XVI(b) : DSE-4 : Principles Of Animation 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 **DSE 4(b) Principles of Animation.**

1. Develop a simple animated short film
2. Develop a simple animated short film with back ground 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

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DSE-4(c) : Open Source Software

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

UNIT I **15 Hrs**

Introduction to Open sources: Need of Open Sources – Advantages of Open Sources–Application of Open Sources. **Open source operating systems:** LINUX: Introduction – General Overview – Kernel Mode and user mode. Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals.

UNIT II **15 Hrs**

Open Source Database: MySQL: Introduction – Setting up account – Starting, terminating and writing your own SQL programs – Record selection Technology – Working with strings – Date and Time– Sorting Query Results.

UNIT-III **15 Hrs**

Open Source Programming Languages: PHP: Introduction – Programming in web environment – variables – constants – data types – operators – Statements – Functions – Arrays –OOP – String Manipulation and regular expression.

UNIT-IV **15 Hrs**

PERL: Perl backgrounder – Perl overview – Perl parsing rules – Variables and Data – Statements and Control structures – Subroutines, Packages, and Modules- Working with Files – Data Manipulation.

References:

1. Rasmus Lerdorf and Levin Tatroe, "Programming PHP", O'Reilly, 2002
2. Wesley J. Chun, "Core Phython Programming", Prentice Hall, 2001
3. Martin C. Brown, "Perl: The Complete Reference", 2nd Edition, Tata McGrawHill Publishing Company Limited, Indian Reprint 2009.
4. Steven Holzner, "PHP: The Complete Reference", 2nd Edition, Tata McGrawHill Publishing Company Limited, Indian Reprint 2009.
5. Vikram Vaswani, "MYSQL: The Complete Reference", 2nd Edition, Tata McGraw -Hill Publishing Company Limited, Indian Reprint 2009.

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

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DSE-5(a) : Digital Image Processing

Teaching: 4 Hrs./ Week **Credits: 04**
Max Marks: 80 Cont. 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**

Image Restoration degradation model, Unconstrained restoration Lagrange multiplier and Constrained restoration, Inverse filtering removal of blur caused by uniform linear motion, Wiener filtering, Geometric transformations-spatial transformations.

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:

1.Rafael C. Gonzalez, Richard E. Woods, , Digital Image Processing', Pearson, Second Edition,2004
2.Anil K. Jain, , Fundamentals of Digital Image Processing', Pearson 2002.
3.Kenneth R. Castleman, Digital Image Processing, Pearson, 2006.
4.Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.
5.D,E. Dudgeon and RM. Mersereau, , Multidimensional Digital Signal Processing', Prentice Hall Professional Technical Reference, 1990.
6.William K. Pratt, , Digital Image Processing' , John Wiley, New York, 2002
7.Milan Sonka et al, 'IMAGE PROCESSING, ANALYSIS AND MACHINE VISION', Brookes/Cole, VikasPublishing House, 2nd edition, 1999.

Practical-XVII(a): DSE-5 : Digital Image Processing 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 **DSE 5.(a) Digital Image Processing Using Scilab/Matlab.**

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DSE-5(b) : Cyber Forensics

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

UNIT I **15 Hrs**

Introduction to Computer Forensics : Computer forensics definitions ,Computers' roles in crimes ,Computer forensics tasks ,Prepare for an investigation, Collect evidence ,Preserve evidence ,Recover evidence, Document evidence Challenges associated with making cybercrime laws, Jurisdictional issues.

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:

1. Guide to Computer Forensics and Investigations, By Bill Nelson, Amelia Phillips, Christopher Steuart
2. Scene of the Cybercrime, by Debra Littlejohn Shinder.
3. John R. Vacca, Computer Forensics: Computer Crime Scene Investigation, 2nd Edition, Charles River Media, 2005
4. Christof Paar, Jan Pelzl, Understanding Cryptography: A Textbook for Students and Practitioners, 2nd Edition, Springer's, 2010
5. Ali Jahangiri, Live Hacking: The Ultimate Guide to Hacking Techniques & Countermeasures for Ethical Hackers & IT Security Experts, Ali Jahangiri, 2009
6. Computer Forensics: Investigating Network Intrusions and Cyber Crime (Ec-Council Press Series: Computer Forensics), 2010

Practical-XVII(b): DSE-5: Cyber Forensics 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 **DSE 5(b) Cyber Forensics.**

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DSE-5(c) : Cloud Computing

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

UNIT I **15 Hrs**

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 **15 Hrs**

Cloud Computing: Application Paradigms.: Challenges of cloud computing, Architectural styles of cloud computing, Workflows: Coordination of multiple activities, Coordination based on a state machine model: The Zookeeper, The Map Reduce programming model, A case study: The Web application, Cloud for science and engineering, High-performance computing on a cloud, Cloud computing for Biology research, Social computing, digital content and cloud computing.

UNIT III **15 Hrs**

Cloud Resource Virtualization: Virtualization, Layering and virtualization, Virtual machine monitors, Virtual Machines, Performance and Security Isolation, Full virtualization and par virtualization, Hardware support for virtualization, Case Study: Xen a VMM based par virtualization, Optimization of network virtualization, v Blades, Performance comparison of virtual machines, The dark side of virtualization.

UNIT IV **15 Hrs**

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:

1. Dan C Marinescu: Cloud Computing Theory and Practice. Elsevier(MK) 2013.
2. Rajkumar Buyya , James Broberg, Andrzej Goscinski: Cloud Computing Principles and Paradigms, Willey 2014.
3. John W Rittinghouse, James F Ransome:Cloud Computing Implementation, Management and Security, CRC Press 2013.
4. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter TATA McGraw- Hill , New Delhi – 2010

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5. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008

Practical XVII(c): DSE-5: Cloud Computing 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 **DSE 5(c) Cloud Computing.**

Practical-XVIII: Major Project Report

Teaching: 12 Hrs./ Week **Credits: 06**
Max Marks: 150 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.

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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

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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

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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

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Dept. of Computer Science
Gulbarga University, Gulbarga

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.-

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