

DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS
DR. H. S. GOUR (CENTRAL) UNIVERSITY, SAGAR (M.P.)

Syllabus of

BCA

Bachelor of Computer Applications

First Year (Sem I and Sem II Syllabus)



2016-2017

(Effective from July 2016)

**DR. H. S. GOUR CENTRAL UNIVERSITY,
SAGAR (M.P.)**

D. Shukla

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R. K. Katore

External Expert
Prof. R. K. Katore
Professor in Computer Science
A.P.S. University, Rewa

Structure of BCA Syllabus

First Year (Semester - I) *

Code	Title	L	T	P	Credit	Sessi onal	End Sem.	Total
CSA-C-111	English I	2	-	-	02	40	60	100
CSA-C-112	Fundamentals of Computer Science	3	-	-	03	40	60	100
CSA-C-113	Digital Principles	3	-	-	03	40	60	100
CSA-C-114	Fundamentals of Programming	3	-	-	03	40	60	100
CSA-C-115	Mathematics for Computer Science	3	-	-	03	40	60	100
CSA-C-116	Fundamentals of Accountancy	3	-	-	03	40	60	100
CSA-C-117	Software Laboratory- I (a)	-	-	4	02	-	100	100
CSA-C-118	Software Laboratory- I (b)	-	-	4	02	-	100	100
		17	-	8	21	-	-	800

First Year (Semester - II) *

Code	Title	L	T	P	Credit	Sessio nal	End Sem.	Total
CSA-C-211	English II	2	-	-	02	40	60	100
CSA-C-212	PC-Softwares	4	-	-	04	40	60	100
CSA-C-213	Fundamentals of Data Structures	4	-	-	04	40	60	100
CSA-C-214	Object Oriented Programming	4	-	-	04	40	60	100
CSA-C-215	Probability and Statistics	4	-	-	04	40	60	100
CSA-C-216	Software Laboratory- II (a)	-	-	4	02	-	100	100
CSA-C-217	Software Laboratory- II (b)	-	-	4	02	-	100	100
		18	-	8	22	-	-	700

* Approved by BOS on 05-05-2016

D. Shukla

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R. K. Katane

{ External Expert
Prof. R. K. Katane
Professor in Computer Science
A. P. S. University, Rewa

BCA - I Semester

CSA-C-111	English I	2	0	0	2	Max. Marks : 100
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A. The Basic -Applied Grammar and Usage

UNIT - I **Rules of the Language:** Parts of Speech: Nouns and Pronouns -Correct usage; Adjectives and Degrees of 'Comparison; Verbs -kinds; Tenses; Tense forms; Adverbs; Agreement of the subject with the verb; Phrasal verbs, voice change; Auxiliaries; prepositions -common errors; conjunctions - their correct uses, Clauses -kinds -usage; Articles -determiners, question, tags; Direct and Indirect speech, correction of sentence; Punctuation.

UNIT - II **Vocabulary Building:** Idioms - different kinds, Phrases, Fixed Expressions, common foreign words and expressions (e.g. Adhoc) -Word formation - different processes; spelling; one-word substitutes; word often confused and misused.

B. Spoken English

Pronunciation Drills (Identifying problem areas), vowels consonants, IPA, Phonetic Notations -how to look up a word Dictionary for correct pronunciation.

Conversational English (both theory and practical) stress, Tonal Variations, their importance; what is an interview? How to face an interview?; How to participate in a debate?; What is a Meeting? - Procedures -How to convene?; Discussion -How to participate.

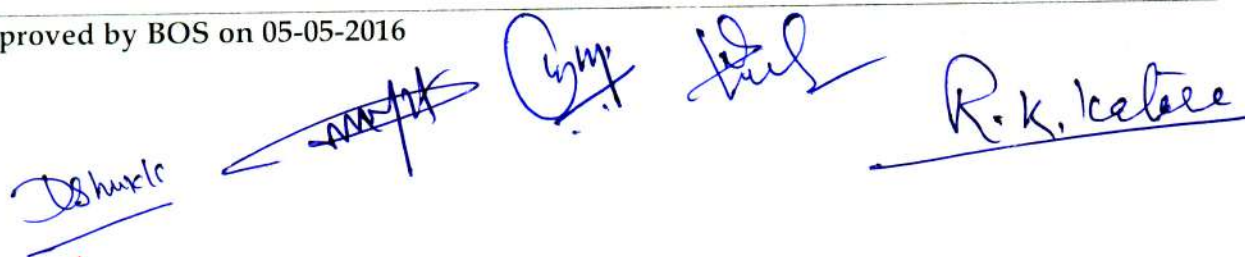
UNIT - III **C. Process of writing**

Sentence Patterns and Paragraph writing. Logical writing - topical sentences - arrangement of facts -supporting materials.

Books Recommended :

1. Tickoo and Subramanian, Functional Grammar
2. Pink and Thomas, English Grammar. Composition and Commercial Correspondence
3. Hema Srinivasan, Alamelu Ramakrishna, Valli Arunachalam Communication Skills -A Practical Approach, Frank Bros. and Co.
4. Dr. V. Ayothi and Dr. R. Vedavali , English for competitive examination , New century book house, 2002

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BCA – I Semester

CSA-C-112	Fundamentals of Computer Science	3	0	0	3	Max. Marks : 100
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UNIT -I Introduction to Computers- Generations of Modern Computers Classification of digital Computer Systems- Anatomy of a Digital Computer

UNIT - II Boolean Algebra and Logic Circuits Input Devices: Keyboard, Mouse, Track ball, Joystick, Scanner, Digital Camera, MICR, OCR, Barcode Reader, Touch Screen, Light Pen. Output Devices: Monitor, Printer, Plotter, Sound Card and Speaker.

Memory Units: RAM, ROM, PROM, EPROM, and EEPROM Auxiliary Storage Devices: Magnetic storage devices-Floppy Diskettes, Hard disks, Removable Hard disks, Magnetic Tapes, Optical Storage - CD-ROM.

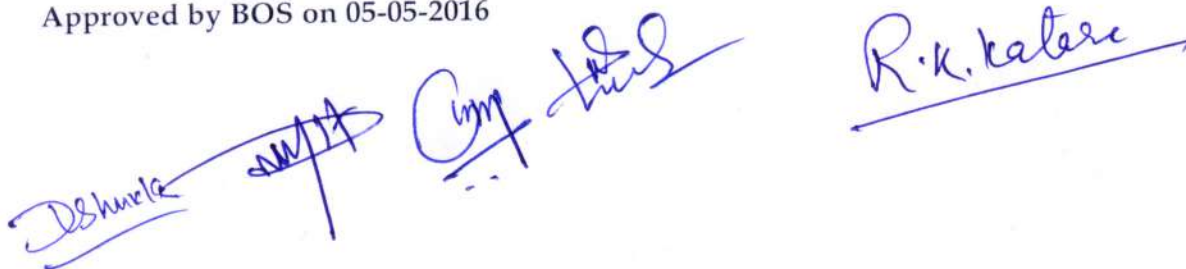
UNIT - III Programming Languages; Machine Language, Assembly Language, High Level Language, Types of High Level Language, Compiler and Interpreters

Introduction to Software Development: Defining the Problem, Program Design, Coding, Testing, Documenting, and maintaining the program.

Books Recommended:

1. Alexis Leon and Mathews Leon Introduction to Computers , Leon TECH World, 1999
2. Peter Norton s Introduction to Computers, Fifth edition , Tata McGraw Hill Publications 2004

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BCA - I Semester

CSA-C-113	Digital Principles	3	0	0	3	Max. Marks : 100
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UNIT - I Boolean algebra, Boolean equation of logic gates, AND, OR, NOT, NOR and NAND gates, truth tables De Morgan's theorems, XOR, XNOR gates, Boolean laws and theorems, Duality theorem.

UNIT - II Karnaugh map, Pairs, Quads and Octets, Karnaugh simplification, DONOT CARE condition, POS and, SOP methods, Grey code, Multiplexer and Demultiplexer, BCD to Decimal decoder, Seven segment decoder, Encoder.

Arithmetic circuits, Binary adder circuits, Sign magnitude numbers, 2's complement, Arithmetic Addition, Subtraction, Adder subtraction Circuits, Half adder, Full adder.

UNIT - III Flip Flops, RS, D, JK, Master Slave, Shift registers, Types of shift registers, Asynchronous and Synchronous counters, Semiconductor memories, Memory cell and their organization. Memory addressing, ROM, PROMS, EPROMS, RAMS, DRAMS, SRAMS, Memory cells, A to D and D to A converters.

Books Recommended:

1. Malvino A. P. & Leech, D. P. - "Digital Principles and Applications"- TMH
2. Malvino "Digital Computer Electronics" TMH

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BCA – I Semester

CSA-C-114	Fundamentals of Programming	3	0	0	3	Max. Marks : 100
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UNIT – I Introduction to Programming Algorithms, Flowchart, Source Program, Object Program, Compilers, Interpreters, Assemblers, Modular Programming: Structured Programming, Top- down approach, Stages of Program Development

UNIT – II Introduction - C character set, Identifiers and keywords. Data type, Declarations, Expressions, statements and symbolic constants, Input-Output: getchar, putchar, scanf, printf, gets, puts, functions, Pre-processor commands, #include, define, preparing and running a complete C program. Operators and expressions: Arithmetic, Unary, Logical, bit-wise, assignments and conditional Operator, Library functions.

Control statements: While, do-while, statement, nested loops, if-else, switch, break, continue and goto statements, comma operator. Arrays: Defining and processing. Multi dimensional arrays. Strings and operations on strings.

UNIT – III Functions: Defining and accessing: Passing arguments, Function prototypes, Recursion. Use of library functions, Storage classes: Automatic, external and static variables.

Pointers: Declarations, Passing to a function. Operations on pointers, pointer and arrays. Array of pointers. Structure: Defining and processing. Passing to a function, Union. Data Files: Open, close, create, process unformatted data files.

Books Recommended:

1. Byron S. Gottfried, Programming with C , Schaum s Outline Series , TMH ,2 nd Edition 1998
2. Kris A. Jamsa , Programming in C , Galgotia Publications PVT.Ltd.,1998
3. Kernighan, B.W.,and Ritchie, D.M., The C Programming Language Prentice Hall of India, 1989.
4. Y. Kanetkar, "Lets Us C" -BPB

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BCA - I Semester

CSA-C-115	Mathematics for Computer Science	3	0	0	3	Max. Marks : 100
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UNIT - I Matrices definition special types of matrices operations symmetric matrices skew symmetric matrices Hermitian and skew Hermitian matrices Inverse Orthogonal matrices Solutions of Simultaneous equations Rank of a matrix Eigen values and eigenvectors Cayley Hamilton Theorem.

UNIT - II Mathematical Logic Connectives Statement Forms Paranthesis Truth Table Tautology and Contradiction/Logical Implications and equivalences Disjunctive and Conjunctive normal forms.

Sets Relation functions Poset Hasse Diagram Lattice and its Properties Boolean Algebra Properties Karnaugh Map (Two, Three and Four Variables Only).

UNIT - III Graph Theory: Introduction application of graphs Finite and Infinite Graphs Incidence and Degree Isolated Vertex, Pendant Vertex and Null Graph. Paths and Circuits Connected Graph, Disconnected Graphs and components Euler Graphs Operations on Graphs Hamiltonian Paths and Circuits

Trees and Fundamentals Circuits: Trees some properties of Trees Pendant Vertices in a Tree Distance and Canters in a Tree Rooted and Binary Trees on Counting Trees Spanning Trees Fundamental Circuits

Books Recommended:

1. Manicavachagom Pillay and others, Algebra, 11th revised edition. Vol II., S.V. Publications, (Unit 1)
2. Narsingh Deo- Graph Theory with applications to Engineering and Computer Science, PHI, 1997. (Unit 4, 5)
3. Trembly & Manohar- Discrete Mathematics for Computer Science, TMH-1997 (Units 2, 3).

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BCA – I Semester

CSA-C-116	Fundamentals of Accountancy	3	0	0	3	Max. Marks : 100
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UNIT - I Accounting Introduction-Meaning-Accounting and book keeping distinguished- objectives of accounting-Branches of accounting-accounting concepts and conventions- accounting standards in India-systems of Accounting

UNIT - II Double entry system-personal accounts, real accounts, nominal accounts-journal-ledger- preparation of trial balance-rectification of errors. Subsidiary books including cash book, bank Reconciliation statement

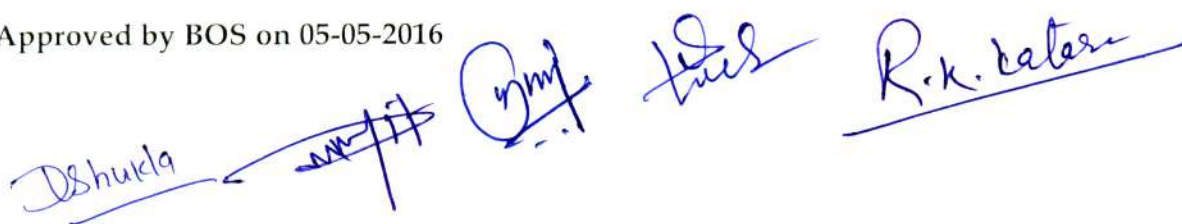
Preparation of trading account- preparation of profit and loss account and balance sheet- Final accounts with Adjustments

UNIT - III Basics of cost Accounting Basic Concepts- Elements of cost -prime cost- works cost- cost of production-concept of inventory -reorder level -minimum level- maximum level -average level- safety stock Ratio Analysis- Liquidity ratios- activity ratios- structural ratios -Profitability ratios -dupont analysis

Books Recommended:

1. S.N. Maheswari, Advanced Accountancy Vol I , Vikas Publishing
2. R.L. Gupta, Advanced accounting , S. Chand & Co. New Delhi
3. Pillai and Baghawati, Cost Accounting
4. Jam and Narang, Cost Accounting , Kalyani Publications
5. T.S. Reddy & Murthy, Financial Accounting
6. Jain & Narang, Financial Accounting
7. M. C. Shukla & T.S.Grewal, Financial Accounting

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CSA-C-117	Software Laboratory- I (a)	0	3	3	2	Max. Marks : 100
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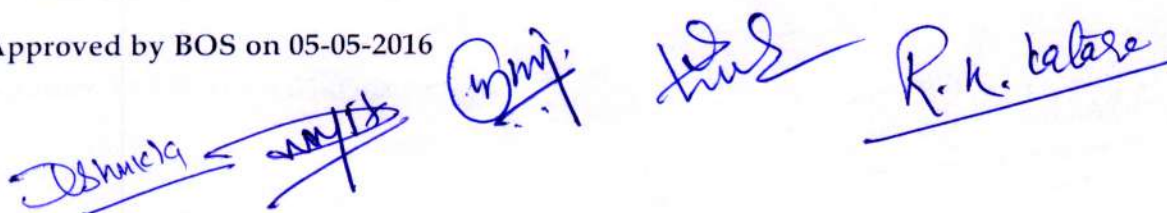
Computer Hardware System

- Explain the basic structure of computer system along with all elements.
- What is Computer Memory? Explain its various types and differentiate between them.
- Explain the concept of Cache Memory? And it's importance.
- Describe the structure of Hard Disk and explain how data can be read/write, from/ to hard disk .
- Explain different types of I/O devices and their use.
- Explain different devices used to provide power to a Computer System.

Dos Operating System

- What do you mean by Operating System? Explain the basic function of OS.
- What is Dos? Explain it's booting process.
- Explain the concept of Internal and External Commands.
- Explain the following internal commands of Dos along with syntax and example.
CLS, Date, Time, Vol, Ver, Dir, MD, CD, RD, Copy , Type, Copy, Del/Erase, Ren, Prompt, Echo.
- Explain the following External commands. Move, Help, Attrib, Sort, More, Tree, Xcopy, Diskcopy, Backup, Recover, Restore, Format, Unformatted.
- Describe the concept of file in Dos. Explain directory and sub directories.
- Explain how a file can be print in Dos.
- Explain how a non empty subdirectory can be removed.
- Explain Config.Sys , Autoexe.bat and command .com files.

Approved by BOS on 05-05-2016

The image shows four handwritten signatures in blue ink. From left to right: the first signature is 'D. Shukla', the second is 'R. K. Kalase', the third is 'R. K. Kalase', and the fourth is 'R. K. Kalase'.

BCA - I Semester

CSA-C-118	Software Laboratory- I (b)	0	3	3	2	Max. Marks : 100
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1. Check for Prime Number, Armstrong number, Fibonacci
2. Summation of the series: $\sin(x)$, $\cos(x)$, $\exp(x)$
3. String Manipulations
 - a. Counting number of vowels, consonants, words, white spaces in a string
 - b. Reversing a string and check for palindrome
 - c. Finding the number of occurrences of a sub string in a given string
 - d. Sub string replacing and removal
4. Recursion
 - a. Factorial
 - b. Reversing a string
 - c. Fibonacci Sequence
 - d. Tower of Hanoi
5. Matrix Manipulations using functions and Case structure
 - a. Addition & Subtraction
 - b. Multiplication
 - c. Transpose
 - d. Check if the given matrix is a Magic square
6. Searching
7. Sorting
8. Structures
9. Pointers
10. Files

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Dshukla    R.K. Kalra

BCA - II Semester

CSA -C-211	English II	2	0	0	2	Max. Marks : 100
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UNIT - I Study Skills:

- a) How to use a dictionary and a library.
- b) Effective writing -reasoning out passages.
- c) Reading Comprehension.
- d) Note-taking

UNIT - II Precise writing

Technical and scientific report writing.

Information Transfer -Tables, Graphs, Organograms, Pie-charts, Bar-charts, Schematic diagrams.

Commercial Correspondence (The form and arrangement of commercial letters- varieties)

- a) Trade Inquiries
- b) Orders, Offers, Quotations
- c) Confirmation and Execution of orders
- d) Refusal and Cancellation of orders
- e) Letters of Complaints
- f) Circular letters
- g) Sales letters

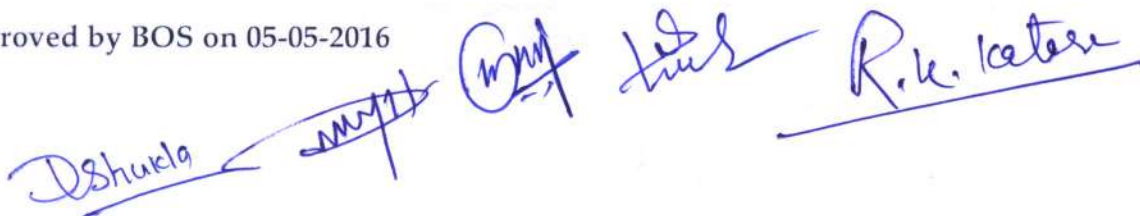
UNIT - III Drafting

- a) Drafting of official/non-technical reports (routine and non-routine)
- b) Drafting of minutes, short speeches, memoranda, News releases, Postal cards and Reply cards, Telegrams, Mailgrams, Cablegrams, Radiograms.
- c) Application for a situation (Curriculum vitae etc.,)

Books Recommended:

1. Hema Srinivasan, Communication Skills: A Practical Approach
 2. Fletcher & Gowing, The Business Guide to Effective Writing, New light Publications, New Delhi.
 3. Wilna R. Ebbit & David R. Ebbit, Writers Guide (6th edition).
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Approved by BOS on 05-05-2016

The block contains four handwritten signatures in blue ink. From left to right, they are: 'D. Shukla', a signature that appears to be 'S. K. S.', 'R. K. Kataria', and another signature that is partially obscured and difficult to read.

BCA - II Semester

CSA -C-212	PC - SOFTWARE	4	0	0	4	Max. Marks : 100
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UNIT - I **MS-Word:** Introduction, Word Processing, Advantages of word processing, Creating, Saving and Editing a document: Selecting, Deleting, Replacing Text, Copying text to another file. Formatting Text and Paragraph: Using the Font Dialog Box, Paragraph Formatting using Bullets and Numbering in Paragraphs, Checking Spelling, Line spacing, Margins, Space before and after paragraph.

UNIT - II Defining Tabs: using Ruler Bar, Mouse and Tabs Dialog Box. Enhancing a Document: Inserting page Breaks, Adding Border, Opening and Closing Toolbars, Using Header and Footers in the Document. Creating and Formatting Tables: Changing Row height, inserting columns, Merging cells Calculations in a Table, Sorting Text, Using Graphics, Using the Drawing Toolbar using word art, Mail merge: Definition, a Practical Example of mail merge, creating charts.

MS Excel Introduction, Definition Excel Screen parts of worksheet, Entering information: Numbers, Formula, Editing Data in a cell, Excel functions, Using a Range with SUM, Moving and copying data, Inserting and Deleting Row and Columns in the worksheet, Using the format cells Dialog box, Using chart wizard to create a chart, Naming ranges, classification of Excel Functions, performing what if analysis with Data Table.

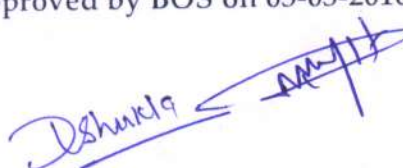
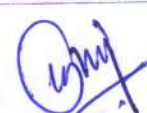
Protecting a workbook with Password, Macro: Recording and Running a Macro, Linking workbook files Using Pivot table, Inserting Hyper links.

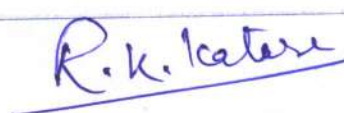
UNIT- III **POWERPOINT:** Introduction, Slide show, Formatting, Creating a Presentation, Inserting clip Arts, Adding Objects, Applying Transitions, Animation effects, formatting and checking text, Modifying Visual elements, Preparing a complete presentation, Case studies.

Books Recommended:

1. R. K. TAXALI " PC Software for Windows 98, Made Simple" TMH.
2. Will Train, Gini Corter, Annette Marquis "Microsoft Office" BPB.

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BCA - II Semester

CSA -C-213	Fundamentals of Data Structures	4	0	0	4	Max. Marks : 100
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UNIT - I Introduction Sparks How to create programs How to analyse programs - Arrays: One-dimensional Array, Two- dimensional array, Application: Sparse matrices, String. Search - Linear search, Binary search and Hashing. Two- way merge-Sorting by Selection, Sorting by exchange, sorting by insertion, sorting by partitioning.

UNIT - II Stacks: User defined data structure, Stack- Operations on stack, Implementation of stack as an array, Application Evaluation of Expression & Conversion -Queues: Queue, Operations on Queues, Implementing the queue, Application.

Linked List: The Storage pool, List representations, Anatomy of a node, implementing the list operations, inserting into an ordered list, deleting from a list, doubly linked list, Keeping a stack in a linked list, keeping a queue in a linked list. Polynomial- Linked list representations.

UNIT - III Trees: Basic terminology, Binary tree, representation, traversal, Binary search tree, threaded binary tree, Application [game tree].

Graph: Definition and Terminology, representation, traversals, Connected Components and Spanning Tree, Shortest Path.

Books Recommended:

1. Ellis Horowitz & Sahani, Fundamentals of Data Structures, Galgotia Publications, New Delhi, 1983.
2. Balaguruswami, 'Ansi C', TMH, Delhi
3. Yashwant Kantitkar, 'Lets Us C', BPB New Delhi

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CSA -C-214	Object Oriented Programming	4	0	0	4	Max. Marks : 100
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UNIT - I Introduction to Object Oriented Programming (OOP), C++ programming basics, Loops and decisions: Relational operators, loops, decision, logical operators, precedence.

Structures, enumerated data types, Functions: Simple functions, passing argument to functions, returning values from functions, reference arguments, overloaded functions, inline functions, variable and storage classes.

UNIT - II Objects and classes: classes and Objects, Specifying the class, using the class, constructors, deconstructions, objects as function arguments, returning objects from function. Arrays: Arrays fundamentals, Arrays a Class member data, Array of objects, Strings. Operator overloading: unary operator, overloading binary operators, Data conversion, Pitfalls of Operator overloading and conversion.

Inheritance: Derived Base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, levels of inheritance, multiple inheritance. Pointers: Address and pointers, pointers and arrays, pointer and functions, pointers and strings, Memory management, pointer to objects.

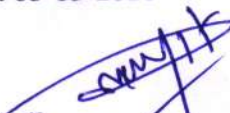
UNIT - III Virtual functions and other functions: Virtual functions, Friend functions, Static functions, and this pointer. Files and Stream: String I/O, Object I/O, I/O with multiple objects, file pointer, disk I/O with member functions.

Books Recommended:

1. Robert Lafore, Object Oriented Programming in C++, Galgotia Pub, 2001.
 2. Timothy Budd, An Introduction to Object-Oriented Programming (3rd Edition) 3rd Edition
 3. Peter Coad, Object-Oriented Design 1st Edition.
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Approved by BOS on 05-05-2016

(Handwritten signatures)




BCA - II Semester

CSA -C-215	Probability and Statistics	4	0	0	4	Max. Marks : 100
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UNIT - I Events and sets sample space concept of probability addition and multiplication theorem on probability conditional probability and independence of events Baye s Theorem- Concept of random variable Discrete and Continuous random variable - Mathematical expectation Simple problems based on Binomial, Poisson and Normal distribution

UNIT -II Introduction to Statistics Nature and scope of statistical methods and their limitations - Primary and Secondary data Classification, tabulation and diagrammatic representation of statistical data - Bar-charts, Pie-diagrams- Graphical Representation of data Histograms, Frequency polygon, Ogives.

Measures of central tendency Arithmetic mean, Median, Mode, Geometric mean, Harmonic mean- properties merits and demerits.

UNIT - III Measures of dispersion Quartile deviation mean deviation & standard deviation characteristics coefficient of dispersion coefficient of variation moments. Simple correlation Karl Pearson s coefficient of correlation Rank correlation Regression lines of regression properties of regression coefficient

Books Recommended:

1. Gupta S. C and Kapoor V. K., Fundamentals of Mathematical Statistics, 11th Edition, S. Chand and Sons 2002.
2. Hooda R.P., Statistics for Business and Economics, 3 rd Edition, MacMillan 2003.

Approved by BOS on 05-05-2016

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BCA - II Semester

CSA-C-216	Software Laboratory- II (a)	0	3	3	2	Max. Marks : 100
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MS-WORD

1. Text Manipulations and Text Formatting
2. Usage of Bookmarks, Footnotes, Columns & Hyperlink
3. Usage of Header, Footer, Bulleting and Numbering & Borders and Shading
4. Usage of Tables - Sorting & Formatting
5. Usage of Spell Check, Find and replace
6. Picture insertion and alignment
7. Creation of documents using templates
8. Mail Merge, Envelopes and Labels

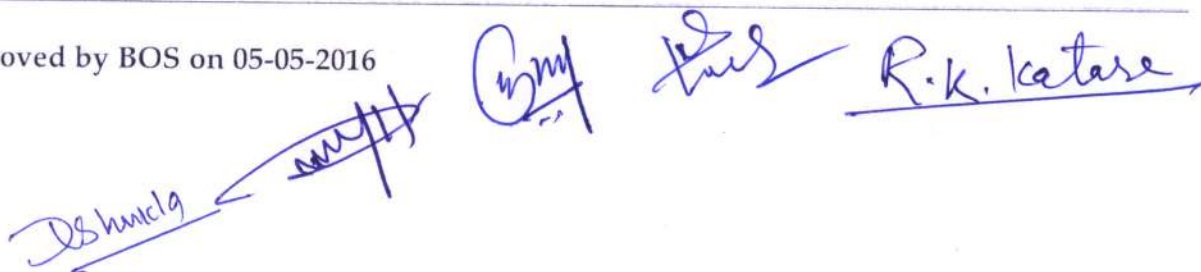
MS-EXCEL

9. Cell Editing and Formatting
10. Usage of Formulae and Built-in functions
11. Data Sorting, filter, form, subtotal, validation, Goal seek
12. Inserting Clip arts, objects, pictures and Data Filter, Validation, Subtotals
13. Usage of auditing, comments
14. Graph
15. Usage of Auto Formatting, Conditional Formatting & Style

POWER POINT

16. Inserting new slides, text box, object, charts, tables, pictures, movies and sound
17. Slide layout, Colour Scheme, Background and Design template
18. Preparation of organizational charts
19. Preset and custom animation, action buttons and settings, Slide Transitions and animations, view show, slide sorter view
20. Presentation using Wizards
21. Usage of Design templates

Approved by BOS on 05-05-2016

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BCA - II Semester

CSA-C-217	Software Laboratory- II (b)	0	3	3	2	Max. Marks : 100
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OOP (C++)

1. Simple Programs using decisions, loops and arrays
2. Simple functions & Inline functions
3. Function overloading & Operator Overloading
4. Usage of classes and Objects
5. Constructors and Destructors
6. Inheritance & Multiple inheritance
7. Pointers
8. Virtual Functions, Friend functions, this pointer and Static functions
9. Files
10. Streams

DATA STRUCTURES LAB

1. Linear Search
2. Binary Search
3. Sort by Selection
4. Sort by Exchange
5. Quick sort
6. Stacks, Queues using arrays
7. Linked List: Insertion and Deletion
8. Polynomial addition using linked list
9. Stack and Queue using Linked List
10. Doubly linked List: Insertion and Deletion
11. Binary tree Traversal [inorder, preorder, postorder]
12. Graph Traversal [breadth first, depth first]

Approved by BOS on 05-05-2016

D. Shukla    R. K. Kataria

Department of Computer Science & Applications

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Revised Syllabus of

BCA (3rd, 4th, 5th & 6th Semesters)



Session 2016-2017 and onwards

(Effective from July 2016)

DR. HARISINGH GOUR VISHWAVIDYALAYA, SAGAR (M.P.)

(A Central University)

Sagar: 470003(M.P.)

(Approved by BOS meeting dated 05-05-2016)

Dhruv

[Signature]

[Signature]

[Signature]

R.K. Katara

{ External Expert
Prof. R.K. Katara
Professor in Computer Science
A.P.S. University, Rewa

Second Year (Semester - III)*

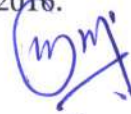
Code	Title	L	T	P	Credit	Sessional	End Sem	Total
CSA-C-311	Design & Analysis of Algorithm	3	-	-	03	40	60	100
CSA-C-312	Statistical Methods	3	-	-	03	40	60	100
CSA-C-313	Object Oriented Programming Using C++	3	-	-	03	40	60	100
CSA-C-314	Data Structure Using 'C'	3	-	-	03	40	60	100
CSA-C-315	Database Management and Design	3	-	-	03	40	60	100
CSA-C-316	Software Laboratory- III (a)	-	3	3	02	-	100	100
CSA-C-317	Software Laboratory- III (b)	-	-	3	01	-	100	100
	TOTAL				18	-	-	700

Second Year (Semester - IV)*

Code	Title	L	T	P	Credit	Sessional	End Sem	Total
CSA-C-411	Numerical Analysis	3	-	-	03	40	60	100
CSA-C-412	Computer Architecture	3	-	-	03	40	60	100
CSA-C-413	Core Java	3	-	-	03	40	60	100
CSA-C-414	Visual Programming	3	-	-	03	40	60	100
CSA-C-415	Optimization Methods	3	-	-	03	40	60	100
CSA-C-416	Software Laboratory- IV (a)	-	3	3	02	-	100	100
CSA-C-417	Software Laboratory- IV (b)	-	-	3	01	-	100	100
	TOTAL				18	-	-	700

* - Approved by BOS dated 05-05-2016.


D. Shukla


R. K. Kataria
 External Expert
 Prof. R. K. Kataria
 Professor in Computer Science
 A. P. S. University, Rewa

BCA - III Semester

CSA -C-311	Design & Analysis of Algorithm	3	0	0	3	Max. Marks : 100
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UNIT-I Algorithm Analysis - Time Space Tradeoffs - Asymptotic Notations -- Properties of big-Oh notation - Recurrence equations - Solving recurrence equations - Analysis of linear search.

UNIT-II Divide and Conquer: General Method - Binary Search - Finding Maximum and Minimum - Merge Sort - Greedy Algorithms: General Method - Knapsack Problem.

Dynamic Programming: General Method - Multistage Graphs - All-Pair shortest paths - Optimal binary search trees - 0/1 Knapsack.

UNIT - III Travelling salesperson problem. Backtracking: General Method - 8 Queens problem - sum of subsets. Graph Traversals - Connected Components - Spanning Trees

Books Recommended:

1. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Computer Algorithms/ C++, Second Edition, Universities Press, 2007.
 2. T. H. Cormen, C. E. Leiserson, R.L. Rivest, and C. Stein, "Introduction to Algorithms", Second Edition, Prentice Hall of India Pvt. Ltd, 2003
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Approved by BOS on 05-05-2016




BCA - III Semester

CSA -C-312	Statistical Methods	3	0	0	3	Max. Marks : 100
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- UNIT - I Sample space and probability events and probability, axioms, probability and independence, Bays theorem with applications, Bernoulli trails, concept of random variables with definition and example
- UNIT- II Discrete random variables, probability mass function and distribution function, Independence of random variables, Bernoulli, Binomial, Poisson, Geometric distributions with properties, Continuous random variables, probability density functions, Exponential and normal distribution. Parameter estimation in inference, properties of estimators, method of moments and maximum likely hood with uses.
- UNIT - III Least square theory, Fitting of lines and curves scatter diagram Coefficient of determination, concept of correlation and correlation coefficient with examples, Rank correlation, linear regression, confidence interval of regression.

Books Recommended:

1. Trivedi K. S. "Probability and Statistics with Reliability, Queuing and Computer Science Applications " PHI
 2. Meyer, P. L. "Probability theory and Statistical Applications" IBH, Oxford, New Delhi - 1980.
-

Approved by BOS on 05-05-2016

   R. K. Kataria

D. Shukla

BCA - III Semester

CSA -C-313	Object Oriented Programming Using C++	3	0	0	3	Max. Marks : 100
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UNIT-I Introduction to OOP- Overview of C++ - Classes - Structures - Union - Friend Functions - Friend Classes - Inline Functions - Constructors - Destructors - Static Members - Scope Resolution Operator.

UNIT-II Array of Objects - Pointer to Object - This Pointer - References - Dynamic Memory Allocation - Function Overloading - Default Arguments- Overloading Constructors.

UNIT-III Operator Overloading - Member Operator Function - Friend Operator Function - Inheritance - Types of Inheritance - Protected Members - Virtual Base Class - Polymorphism - Virtual Functions - Pure Virtual Functions

Books Recommended:

1. Herbert Schildt, C++ - The Complete Reference, Third Edition -Tata McGraw Hill - 1999.
 2. Object -Oriented -Programming in C++ by E Balagurusamy, PHI
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Approved by BOS on 05-05-2016







BCA - III Semester

CSA -C-314	Data Structure Using 'C'	3	0	0	3	Max. Marks : 100
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UNIT - I List, Stack and operations, stack as an array, queue and implementation, circular queue. Applications of queue linked list pointers, dynamic memory allocation linked stack, linked list in array abstract data type.

UNIT - II Searching, sequential and binary search decision tree, big O notation, Triangular, Jagged and inverted tables, Table as ADT. Hashing, Sorting, Insertion, Selection Shell, Merge and Quick sort.

Recursion, divide and conquer tower of Hanoi, Generating permutations, back tracking Non attacking queens, game tree Binary tree, Tree search, tree traversal, tree sort, Binary search tree, AVL trees, Heap sort.

UNIT -III Ordered tree, Forest and Orchards, Tries, graphs, Computer representation, graph traversal depth first, Breadth first, Greedy algorithm, Graph as data structure.

Books Recommended:

1. Kruse, Leung and Tando "Data structure and Program Design in C" PHI
-

Approved by BOS on 05-05-2016

D. Shinde

G. M.

R. K. Vatsara

BCA - III Semester

CSA -C-315	Database Management And Design	3	0	0	3	Max. Marks : 100
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UNIT - I Database System & Evolution of Database technology. Database and Data sharing, planning, Management control Risks and cost of database logical and physical data representation, Database development. Database design- Conceptual design objects and relationships, conceptual data models, Aggregation. Conceptual and Physical Objects.

UNIT - II Relational data model - system development and concepts. Normalization process conceptual model to relational model. Relational algebra, relational implementation with SQL, Schema and table definition Data manipulation, view queries. Relational implementation with graphical query language Data manipulation.

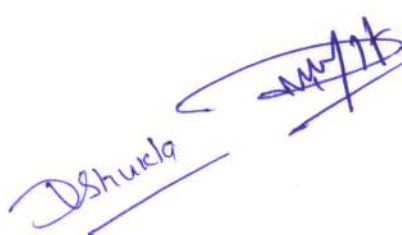
Physical Database System- Physical, storage media, Disk performance factors Data storage format file organization and addressing methods implementing logical relationship. Mapping Logical data structure to Physical data structure, Query optimisation.

UNIT - III Managing the Data base environment - Database administration and Control DBA functions, goals, integrity security and recovery. DBMS selection and implementation, Need analysis, DBMS functions and capabilities evaluation and Implementation.

Books Recommended:

1. Hansen G. W. & Hansen J. V. "Database Management & Design" - PHI.

Approved by BOS on 05-05-2016




R. K. Kataria

BCA - III Semester

CSA -C-316	Software Laboratory - III(a)	0	0	4	2	Max. Marks : 100
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List of programs based on data structure using C- language will be provided by the concerned faculty.

Approved by BOS on 05-05-2016

D. Shukla

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R. K. Kataria

BCA - III Semester

CSA -C-317	Software Laboratory - III(b)	0	0	4	2	Max. Marks : 100
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List of programs based on C++- language will be provided by the concerned faculty.

Approved by BOS on 05-05-2016

D. Shukla [Signature] [Signature] [Signature] R. K. Lal

BCA - IV Semester

CSA -C-411	Numerical Analysis	3	0	0	3	Max. Marks : 100
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UNIT - I Errors in Numerical calculations. Numbers and their accuracy, errors, and error formula. Error in Series approximation. Solution of Algebraic and transcendental equations Bisection method, iteration method, False position method, Newton Raphson method. Root squaring method.

UNIT - II Interpolation - Finite difference, Newton's forward and backward formula for interpolation, Interpolation with unevenly spaced points, Newtons Divided difference formula.

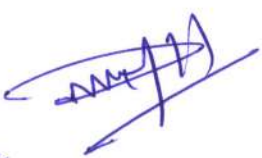
Curve fitting, least square procedures, weighted least square linear and non-linear. Numerical differentiation, numerical integration Trapezoidal rule, Simpson's 1/3 rule, 3/8 rule.

UNIT - III Matrices and Linear system of equations, metric operation, solution of linear system - direct method, iterative method.

Books Recommended:

1. Sastry "Introductory Methods of Numerical Analysis" - PHI

Approved by BOS on 05-05-2016

D. Shukla    R.K. Katore

BCA - IV Semester

CSA -C-412	Computer Architecture	3	0	0	3	Max. Marks : 100
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UNIT - I Structure and Function, The Computer System: Computer Components, Computer Function, instruction Fetch and Execution Cycle, Interrupts and the Instruction Cycle, Interconnection structures, Bus interconnection, PCI Bus.

UNIT - II Computer Memory System and their characteristics, Semiconductor Memory: Main Memory organization: dynamic RAM static RAM, ROM, Chip packaging, error correction, cache memory principles.

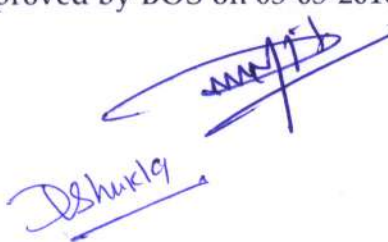
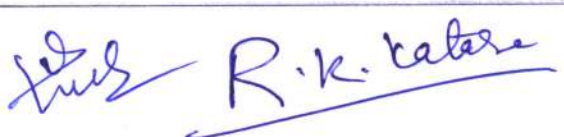
External memory: Magnetic disk and its read and write mechanism, physical characteristics, Disk performance parameters, RAID, optical memory: compact Disk, Digital versatile Disk, Magnetic Taps.

UNIT - III Input/ Output - External devices, I/O module, Programmed I/o and Interrupt driver I/O. Direct Memory Access, I/O channels and processors, External Interface.

Books Recommended:

1. Stallings Williams "Computer Organization and Architecture" -, PHI

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CSA -C-413	Core Java	3	0	0	3	Max. Marks : 100
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UNIT -I Object oriented fundamentals, Features of Java, Java Virtual Machine (JMV), Byte-Code ,JAVA buzzwords, JAVA Environments, Command Line Arguments, Java program structure, Reserved keywords, Identifiers, Literals, Operators, Separators, Variables, Declaring a variable, Scope and lifetime of variables, Data types, Control Statements.

UNIT -II: Arrays: One-Dimensional Arrays, Two-dimension Array, Strings, String Handling, Class :Fundamentals ,The General Form of a Class ,A Simple Declaring Objects ,Assigning Object Reference Variables. Methods: Overloading Methods, Using Objects as Parameters, A Closer Look at Argument Passing, Returning Objects, Recursion Introducing Access Control, Overriding Methods, Final Variables and Methods, Final class, Finalizer Methods, Abstract Methods and Class, Visibility Control.

Inheritance : basic ,Types of Inheritance, Member Access, Creating a Multilevel Hierarchy, When Constructors Are Called Method Overriding ,Dynamic Method Dispatch ,Why Overridden Methods?, Applying Method Overriding, Using Abstract Classes, Using final with Inheritance, Using final to Prevent Overriding

UNIT III : Packages and Interfaces, Exception Handling: Exception as Objects, Exception hierarchy, Try, Catch, Finally, Throw. Multi threading: Creating threads, Thread Life Cycle, Main Thread, Multiple Threads, Isalive() and join() ,Simple thread program ,Threads Priorities, Thread synchronization.

Books Recommended:

1. R Lafore " Object Oriented Programming":
2. E. Balaguruswami" OOPs using Java"-TMH

Approved by BOS on 05-05-2016

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CSA -C-414	Visual Programming	3	0	0	3	Max. Marks : 100
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UNIT I : Introduction of Visual Basic-Features of VB , IDE, Toolbox controls, Object Naming Conventions, events, methods and properties, Data Types in VB, Variables, constants Operators, Manipulating forms: loading, showing and Hiding forms form event.

UNIT II : Visual Basic Control Structures: Selection constructs/Decision Structures-If, select-case, Looping Structures-For, do while, do...loop while, for Each...Next, While...Wend, Nesting loops, Exiting from loops, with. end with, Arrays, Dynamic Arrays. Procedures- Types of procedures, Passing parameters to procedures, Exiting from procedures, Code Modules- Form modules, Standard Modules, Class Modules, Scope and lifetime of Variables.

Library Functions-String functions, Numeric Functions, Date & Time functions, Miscellaneous functions, VB Interface Styles- SDI, MDI. VB Menues, Status bar, Tool bar, Tree View, List View, Rich text box control, MS Flex Grid, DT Picker, Database Programming- Data controls, ADO data control, OLE DB.

UNIT III : Accessing Database Using ADO DC- Extracting Selected Data, Navigating the Record set, Modifying Database through Record set, DSN, Providers Data Environment, Data Report, Error Handling in Visual Basic- Types of Error Handling Errors, Debugging Tools in VB, Package & deployment Wizard.

Books Recommended:

1. Sheriff, A. "Visual Basic 6" PHI.
2. Burrows, William E. "Programming Business Applications with VB" TMH.
3. Sengupta & Chaudhari "Object Oriented Programming & Fundamentals" PHI
4. Donald & Oancea "Visual Basic" PHI
5. Rumbaugh, J. "Object Oriented Modeling and Design" PHI
6. "Mastering in Visual Basic 6" BPB
7. Wrights, P. "Beginning Visual Basic 6" SAP (WROX)
8. Mckelvy, M. "Visual Basic Desk Top applications" BPB.
9. MCSD "Visual Basic 6 Desktop Applications" TMH.
10. Jung "Visual Basic Annotated Archives" TMH

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BCA - IV Semester

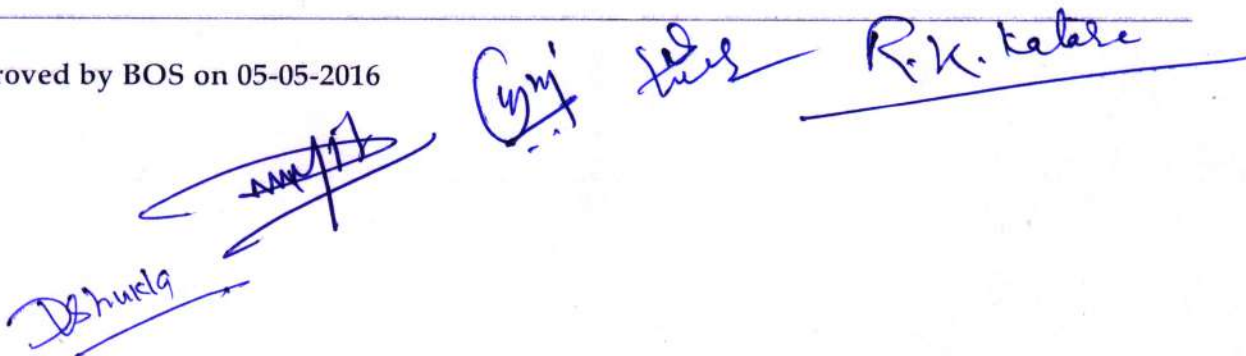
CSA -C-415	Optimization Methods	3	0	0	3	Max. Marks : 100
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- UNIT - I Scope of operations research, Formulation of Simple Linear programming problems, Graphical Method, Simplex Method.
- UNIT - II Primal and Dual LPPs, Dual Simplex Method, Assignments Problems, Transportation Problem. VAM, Method, North-West corner method, Matrix Minima method. Sequencing Problems: Problems of n Jobs and 2 machines, Two jobs on ordered m machines.
- UNIT - III Network Analysis: Minimal Spanning Tree, Shortest Path Problem, Integer programming, Dynamic programming, Non linear programming: Quadratic programming.

Books Recommended:

1. H. S., Kasana and K. D. Kumar, "Introductory Operations Research" Springer International Edition, Berlin (Germany) First Edition 2004.
2. H.A., Taha, "Operations Research: An Introduction", Seventh edition, Prentice Hall of India, New Delhi 2004.

Approved by BOS on 05-05-2016

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BCA - IV Semester

CSA -C-416	Software Laboratory - IV(a)	0	3	3	2	Max. Marks : 100
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List of programs will be provided by the concerned faculty. The practicals will be based on Core Java, and Numerical Analysis.

Approved by BOS on 05-05-2016

D. Shinde Prof. P. S. Patil Prof. G. M. Patil Prof. R. K. Patil

BCA - IV Semester

CSA -C-417	Software Laboratory - IV(b)	0	0	3	1	Max. Marks : 100
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Lab based on Visual Programming.

Approved by BOS on 05-05-2016

D. Shukla [Signature] G. M. [Signature] R. K. Patra

Third Year (Semester - V)*

Code	Title	L	T	P	Credit	Sessional	End Sem	Total
CSA-C-511	Computer Graphics	3	-	-	03	40	60	100
CSA-C-512	Unix And Shell Programming	3	-	-	03	40	60	100
CSA-C-513	Software Engineering	3	-	-	03	40	60	100
CSA-C-514	Computer Networking	3	-	-	03	40	60	100
	Elective paper (any one)	3	-	-	03	40	60	100
CSA-E-515	Digital Image Processing							
CSA-E-516	Simulation & Modelling							
CSA-E-517	Web Technology							
	Practicals							
CSA-C-518	Software Laboratory- IV (a)	-	3	3	02	-	100	100
CSA-C-519	Software Laboratory- IV (b)	-	-	3	01	-	100	100
		-	-	-	18	-	-	700

Third Year (Semester - VI)*

Major Project based on Industrial Training

Code	Title	L	T	P	Credit	Sessional	End Sem	Total
CSA-C-611	Major Project (External) based on Industrial Training	-	-	-	06	-	-	300
CSA-C-612	Comprehensive Viva-Voce based on project	-	-	-	15	-	-	200
CSA-C-613	Seminar on project topic/others	-	-	-	06	-	-	200
	TOTAL	-	-	-	27	-	-	700

* - Approved by BOS on 05-05-2016.

(Signatures)

BCA - V Semester

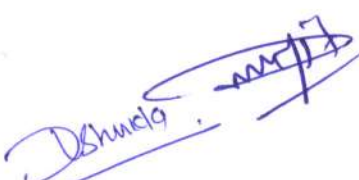
CSA -C-511	Computer Graphics	3	0	0	3	Max. Marks : 100
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- UNIT - I Introduction to Computer Graphics, Types of refresh graphics displays, CRT Raster Scan Basics, Video Basics, Interactive input and output Devices, Raster scan graphics, Line drawing algorithms, Bresenham's algorithm, Scan Conversion.
- UNIT - II Clipping- 2D clipping, line clipping algorithms, Cyrus-Beck algorithm, convex polygon & inward normal, concave clipping, Introduction of 3D clipping, character clipping.
Hidden line and Hidden surface algorithms- Floating horizon, Roberts algorithm, Warnock algorithm, Weiler-Atherton Subdivision algorithm.
- UNIT - III Rendering, Illumination model, surface normal, reflection vector, shading, transparency, shadows, texture, colour.

Books Recommended:

1. Asthana R. G. S. and Sinha N. K., "Computer Graphics", PHI.
2. Haren and Becker, "Computer Graphics", PHI.
3. David F. Rogers, "Procedural Elements for Computer Graphics", TMH.
4. William M. Newman Robert, F. Sproull, "Principles of Interactive Computer Graphics TMH.
5. Folly VanDam, Feine, Hugles, "Computer Graphics", Addison Wesley.

Approved by BOS on 05-05-2016






BCA - V Semester

CSA -C-512	UNIX and Shell Programming	3	0	0	3	Max. Marks : 100
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- UNIT - I Unix Operating System – the kernel structure, Files and commands, directories, shell, The file system basics, directories and file names, permissions, inodes, devices, Introduction of Unix Editors including- nroff, troff.
- UNIT - II Unix file system commands: basic unix commands including chmod, chown sort, kill etc., command line structures, creating new commands, I/O redirection Pipes and Filters, grep family, stream editor(sed), pattern scanning and processing language awk.
- UNIT - III Shell programming- Shell scripts, The Bourne, Korn and C shell, Shell variables and shell scripts, meta characters and environment variables, arguments and parameters, Conditional statements and loops of both shells.

Books Recommended:

1. M. G. Venkateshmurthy, "Unix and shell programming", Pearson Education.
 2. Y. Kanitker, "Unix Shell Programming", BPB.
 3. Maurice Bach, "The Design of the Unix Operating System", PHI.
 4. R. Morgan & McGilton, "Introduction Unix System - V", McGraw Hill International.
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Approved by BOS on 05-05-2016

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DSK/19 ~~Signature~~ (Gm) ~~Signature~~ R.K. Labre

BCA - V Semester

CSA -C-513	Software Engineering	3	0	0	3	Max. Marks : 100
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UNIT - I Software as a product, Software characteristics and components, software process models, linear prototype and RAD models, Evolutionary models, formal methods model.

UNIT - II Software process and project matrices, Software measurement, metric for software quality. Software project scheduling and tracking, task set for software project, scheduling the task.

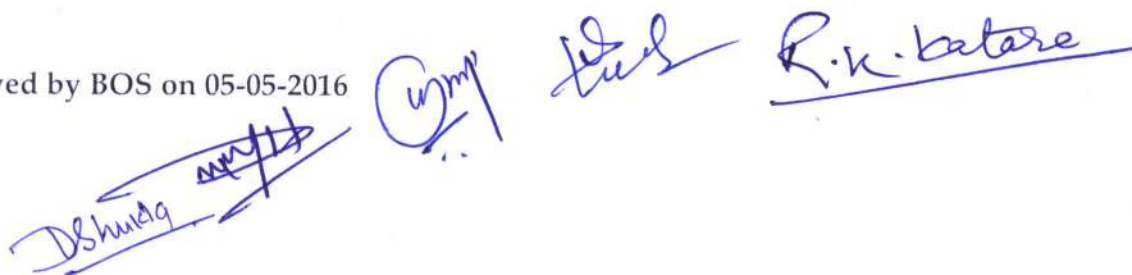
Software analysis concept and principles, modeling, partitioning specifications, software design process, principles and concepts, design concepts, modular design.

UNIT - III Software testing methods, basis path testing, control structure testing, black and white box testing, Testing GUI and Client - server architecture.

Books Recommended:

1. Pressman R. S, "Software Engineering a Practitioner's Approach", McGraw Hill.
2. Ian Sommerville, "Software Engineering", Pearson Education.
3. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa.
4. K. K. Aggrawal & Yogesh Singh, "Software Engineering", New Age.

Approved by BOS on 05-05-2016

The block contains four handwritten signatures in blue ink. From left to right: the first signature is 'D. Shinde' with a date '05/05/16' written above it; the second is a circular stamp containing the word 'Comp'; the third is a signature that appears to be 'R. K. Bhat'; and the fourth is a signature that appears to be 'R. K. Bhat' with a horizontal line underneath.

BCA - V Semester

CSA -C-514	Computer Networking	3	0	0	3	Max. Marks : 100
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UNIT - I Network hardware & Software, **Reference models:** OSI and TCP/IP. ISDN model, Narrow band and broad band ISDN, Switching.

UNIT - II **Physical layer-** Transmission media, wireless transmission, Multiplexing. FDM, TDM, Communication satellite.

Data link layer - framing error detection and correction, data link protocol. Simplex protocol, sliding protocol HDLC, PPP, Medium access sub layer IEEE standard 802 for LANS and MANS. High speeds LANs Fast Ethernet.

UNIT - III **Network layer** - design, Routing algorithms, Internetworking Network layer in the Internet. **Transport layer-**The transport Service, transport protocol, The Application layer- DNS, Email, www.

Books Recommended:

1. Tanenbaum A. S., "Computer Networks", PHI.
 2. Uyles Black, "Computer Networks", PHI.
 3. William A. Shay, "Understanding data communication and networks", Thomsons.
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BCA - V Semester

CSA -E-515	Digital Image Processing	3	0	0	3	Max. Marks : 100
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UNIT - I Digital Image Representation, Fundamentals steps in image processing. Element of Digital image processing System: Image Acquisition, Storage, Processing, Communication, Display. Digital Image Fundamental: Element of Visual Perception, sampling and Quantization, Some Basic Relationship among pixels.

UNIT - II Image Transforms: Introduction to the Fourier Transform, The Discrete Fourier Transform, some properties of two dimensional Fourier transform, Other separable image transform: Walsh transform, Hadamard Transform, Discrete cosine transform, Hotelling transform.

Image enhancement: Spatial domain method, Frequency domain method. Enhancement by point processing: Some simple intensity transformation, Histogram processing, Image subtraction, Spatial Filtering.

Image Restoration: Degradation model, Inverse filtering, Least mean square filter.

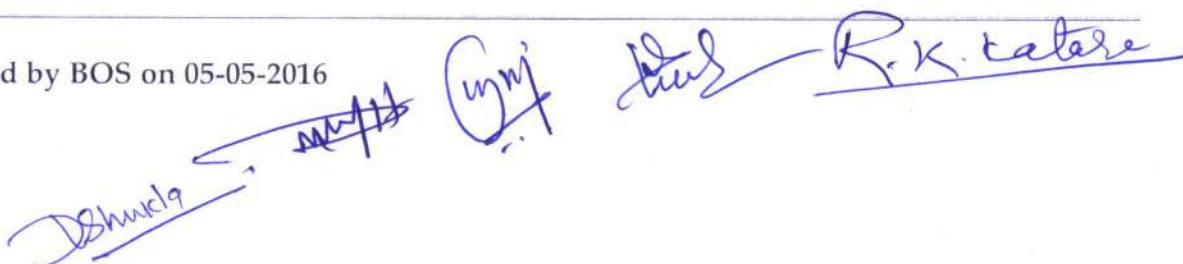
UNIT - III Image Compression: Fundamental- Coding Redundancy, Interpixel Redundancy, Fidelity criteria, Image compression models, Error free compression.

Image segmentation: Detection of Discontinuities: Point Detection, Line Detection, Edge Detection, Thresholding.

Books Recommended:

1. Gonzalez, et. al., "Digital Image Processing", Addition Wesley.
2. Castleman, K. R., "Digital Image Processing", Prentice-Hall.

Approved by BOS on 05-05-2016

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CSA-E-516	Simulation And Modeling	3	0	0	3	Max. Marks : 100
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UNIT - I System & Models - concepts, environment, continuous & discrete system, modeling type of models, static & dynamic, physical and mathematical models.

UNIT - II System simulation techniques, Monte Carlo method, simulation & analytical methods. Continuous model, analogue, digital, hybrid computer, System dynamics, growth and decay models, modified exponential and generalization of growth models.

Probability concepts in simulation, stochastic variables, discrete and continuous probability function, continuous uniform and computer generation of random numbers, uniform random number generator.

UNIT- III Discrete system simulation, discrete event representation of time generation of arrival patterns, simulation of telephone systems, delayed calls, discrete simulation languages.

Books Recommended:

1. Gordan, "System Simulation", PHI.
 2. Narsingh Deo, "System Simulation with Digital Computer", PHI.
 3. Jerry Banks, Carson, Nelson, Nicol, "Discrete Event System Simulation", PHI.
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Approved by BOS on 05-05-2016

(Handwritten signatures and initials)
D. Shukla Amr hul R.K. Kataria

BCA - V Semester

CSA-E-517	Web Technology	3	0	0	3	Max. Marks : 100
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UNIT -I WWW, History, working, web browsers, its functions. Data transmission protocols (TCP/IP suite), client/server architecture and its characteristics, ftp and its usages. Telnet concept, remote logging protocols, terminal emulation, Message board, internet chatting voice chat, text chat.

UNIT - II Types of search engines, searching the web, http and URLs, web servers, HTTP protocols. Web publishing concepts, domain name registration, space on host server for web site, html, design tools, html editors, image editors, issues in web site creations and maintenance, ftp software for upload web site.

HTML- Anatomy of HTML documents, versions of html, elements of html syntax, head & body sections, building html documents insertion texts, images, hyperlinks, backgrounds and color controls, different html tags, table: table layout and presentation, use of font size & attributes, list types and its tags. Use of frames and forms in web pages.

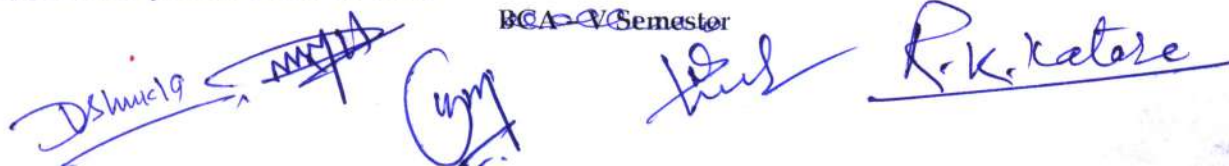
UNIT - III JavaScript overview, JavaScript and the www, JavaScript vs. VB script, JavaScript vs. java, JavaScript versions, script element, inline JavaScript, including JavaScript. Functions: functions introduction, calling functions. JavaScript comments: comments overview, when to comment, types of comments Variables: variables overview, declaring variables, types of variables, casting variables, alert box. Expressions: arithmetic operators, assignment operators, logical operators, expressions and precedence. Statements: if statement, for statement, while statement, break/continue

Books Recommended:

1. V.K. Jain, "O-Level module- M 1.2 Internet & web page designing", BPB Publications.
2. Alexix Leon and Mathews Leon, "Internet for everyone", Vikas Publishing.
3. Internet for dummies, "a beginner's guide to html available at: <http://www/ncsa.uiuc.edu/General/internet/ WWW/HTML primer ALL.html>", Pustak Mahal, New Delhi
4. Mansoor Alam, "Inter and Web Design", Pragya Pub.

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BCA - V Semester



BCA - V Semester

CSA-C-518	Software Laboratory- V (a)	0	3	3	2	Max. Marks : 100
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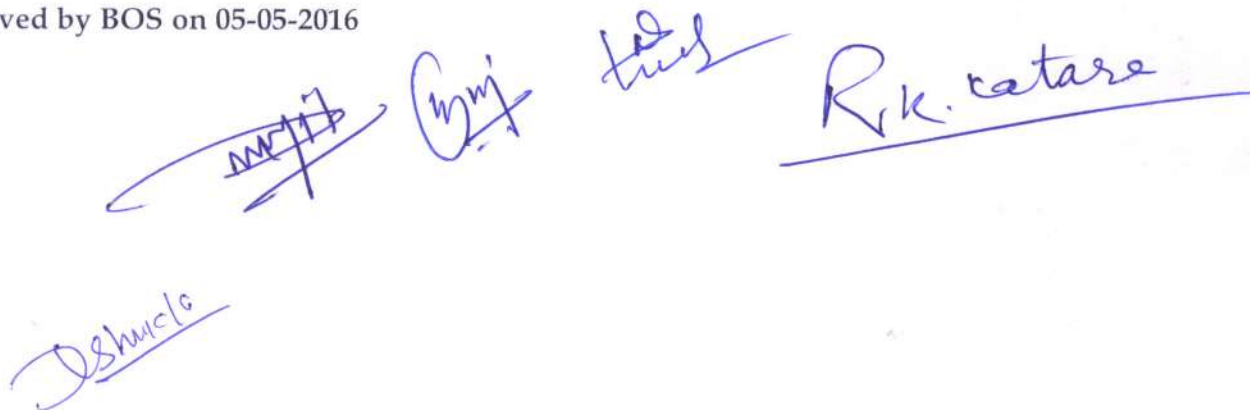
UNIT - I PROBLEMS BASED ON COMPUTER GRAPHICS.

1. Write a program to draw a line or circle.
2. Write a program to display a rainbow.
3. Write a program to draw table and chair.
4. Write a program to draw railway track.
5. Write a program to draw shooting arrow.

UNIT - II UNIX PROGRAMMING

1. Practical based on UNIX commands.
2. Racial based on Control structure using UNIX.
3. General system operation and fundamental system maintenance commands.
4. Execution of shell scripts covered in class.
5. Sed and awk routine execution.

Approved by BOS on 05-05-2016

The block contains five handwritten signatures in blue ink. From left to right, they are: a signature that appears to be 'M. J. ...', a signature that appears to be 'G. ...', a signature that appears to be 'L. ...', a signature that appears to be 'R. K. ...', and a signature that appears to be 'D. ...'.

CSA-C-519	Software Laboratory- V (b)	0	0	3	1	Max. Marks : 100
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PRACTICALS BASED ON ELECTIVE PAPERS**(A) DIGITAL IMAGE PROCESSING:**

List of practicals will be provided by teacher concerned.

(B) SIMULATION & MODELLING:

1. Programme based on random number generation.
2. Programme based on waiting line simulation.
3. The list of practical will be provided by the teacher concerned.

(C) WEB TECHNOLOGY:

1. Create Web Page and apply some block level tags, text level tags
2. Create Web Page and apply background color, text color, horizontal rules and special characters.
3. Create Web Page and include ordered list, unordered list, definite list and Nested list.
4. Create Web Page and include links to
 - a. Local page in same folder.
 - b. Page in different folder
 - c. Page on the Web
 - d. Specific location within document
5. Create Web Page and include images with different alignment and wrapped text
6. Create tables and format tables using basic table tags and different attributes.
7. Create a frameset that divides browser window into horizontal and vertical framesets.
8. Create Web Page and apply style rules.
9. Create Web Page including control structures using JavaScript.
10. Programs based on Event Handling.

Approved by BOS on 05-05-2016

BCA - VI Semester

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-611	Major Project (External) based on Industrial Training	-	-	-	06	-	-	300

Every student shall be spending 4 to 6 months for Industrial Training preferably on a live project. The report in hard bound copy (with attached CD and attached coding) should contain the system design, analysis, feasibility, methodology, screen shots, output etc.

The report should contain the original certificate obtained from the Industry / Company about the originality of the work done there. The certificate must indicate the work has been done by the candidate concerned in the industrial environment. The coding must be attached at the end of project report alongwith CD.

Every report should attached a declaration certificate of the candidate that his/ her contribution in project report is original and performed by himself/herself. Each student will submit a project separately on a distinct topic.

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-612	Comprehensive Viva Voce based on project	-	-	-	15	-	-	200

It will be based on the content of the project report submitted by the student.

Code	Title	L	T	P	Credit	Sessional	Semester	Total
CSA-C-613	Seminar on project topic/others	-	-	-	06	-	-	200
	TOTAL	-	-	-	27	-	-	700

It will be based on the live demonstration of the project completed by student. The student will have to make a power point presentation regarding live demonstration of the output.

Approved by BOS on 05-05-2016

(Signatures)



DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

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