Department of Computer Science & Applications

A

Revised Syllabus of

BCA - (I to VI Semester)

Session 2017-2018 and onwards

(Effective from July 2017)

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(A Central University)

(Approved by BoS on dated 06-03-2017)

In view of letter no. DOAA/2017/171 dated 24-05-2017 and another letter no. DOAA/2017/179 dated 01-06-2017 and decision of Board of Studies the following shall be rules and regulations regarding conduct of academic activities of the teaching programme:

1. Name of the program : **Bachelor of Computer Applications (BCA)**
2. Duration of the program : 3 Years
   (a) Minimum duration : 3 Years
   (b) Maximum duration : As per University Ordinance
3. Structure of the program:

BCA Course Credit Distribution

Semester	Core Course (CC) Credits	Elective Course (EC) Credits	Language Course (LN) Credits	Skill Based Course (SE) Credits	Total Credits
I	19	--	02	--	**21**
II	20	--	02	--	**22**
III	19	--	--	05	**24**
IV	20	03	--	02	**25**
V	15 (old)	03 (old)	--	--	**18 (old)**
VI	27 (old)	-	--	--	**27 (old)**
TOTAL	**120**	**06**	**04**	**07**	**137**

4. The medium of instruction shall be English (during examination). However lectures may be in Hindi and English both.
5. The minimum 50% listed practicals must have to be completed by the student before appearing in the End Semester Examination.
6. Every student has to attain minimum of 75% of attendance in every course of this programme, failing to which the student will be debarred from appearing in the End Semester Examination. He/ She has to appear in the same in next year as a backlog student after re-registration. In exceptional circumstances (like health problem, NCC, NSS, Sports, youth festival, cultural activity participation etc.) the Dean/HoD may allow student to appear in the End Semester Examination at the 65% attendance in the course.
7. **Scheme of Examination:**

   (a) Mid Semester Examination (ME) : 20 Marks
   (b) Internal Assessment (IA) : 20 Marks
   (c) End Semester Examination (ESE) : 60 Marks

9. Evaluation of Projects:

The project will be assigned individually and a group of students will be monitored by teachers of the department. It will be based on periodic assessment of the progress of the project and End Semester Examining as follows:

(i)	First periodic assessment of the progress after 08 weeks	: 20 Marks
(ii)	Second periodic assessment after 04 weeks	: 20 Marks
(iii)	End Semester Examination will consisted of	
	a. Evaluation of the project report	: 50 Marks
	b. Viva – Voce of the project report	: 10 Marks

10. Evaluation of Field-Work/ Out-station-Visit:

It will be evaluated as follows:

(i)	Performance in the Field-Work / Out-station -visit and aptitude	: 40 Marks
(ii)	End Semester Examination :	
	a. Evaluation of the report on the Field Work	: 50 Marks
	b. Viva-Voce on the report	: 10 Marks

11. Evaluation of Seminars:

(1) Documentation for the seminar	: 20 Marks
(2) First presentation of the seminar	: 20 Marks
(3) End Semester Examination	: 60 Marks

End Semester Examination will consist:

(i)	Presentation of the seminar	: 50 Marks
(ii)	Defend of the presentation	: 10 Marks

12. The credit and teaching hours shall be distributed as under:

Theory	1- Credit = 15 hours / per week 2- Credit = 30 hours / per week 3- Credit = 45 hours / per week 4- Credit = 60 hours / per week
Practical	1- Credit = 30 hours / per week 2- Credit = 60 hours / per week
Tutorial	1- Credit = 15 hours / per week

13. In practical courses students have to maintain a practical file which will be regularly evaluated and signed by the course Incharge/ coordinator.

14. The conflict raised, if any, shall be resolved in the meeting of Departmental council or through the guidelines issued by HoD.

15. A tutorial shall be an interactive session with students and mode of conduct of tutorial shall be decided by concerned teacher/ course-in-charge.

BCA - I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-**LN**-111	English - I	02	-	-	02	20	20	60	100
CSA-**CC**-112	Fundamentals of Computer Science	03	-	-	03	20	20	60	100
CSA-**CC**-113	Digital Principles	03	-	-	03	20	20	60	100
CSA-**CC**-114	Fundamentals of Programming using C	03	-	-	03	20	20	60	100
CSA-**CC**-115	Mathematics for Computer Science	03	-	-	03	20	20	60	100
CSA-**CC**-116	Fundamentals of Accountancy	03	-	-	03	20	20	60	100
Software laboratory (Practical)									
CSA-**CC**-117	Software Laboratory - A	-	-	04	02	20	20	60	100
CSA-**CC**-118	Software Laboratory - B	-	-	04	02	20	20	60	100
		17	**-**	**08**	**21**	**--**	**--**	**--**	**800**

BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-**LN**-211	English - II	02	-	-	02	20	20	60	100
CSA-**CC**-212	PC-Software's	04	-	-	04	20	20	60	100
CSA-**CC**-213	Fundamentals of Data Structures	04	-	-	04	20	20	60	100
CSA-**CC**-214	Object Oriented Programming	04	-	-	04	20	20	60	100
CSA-**CC**-215	Probability and Statistics	04	-	-	04	20	20	60	100
Software laboratory (Practical)									
CSA-**CC**-216	Software Laboratory - A	-	-	04	02	20	20	60	100
CSA-**CC**-217	Software Laboratory - B	-	-	04	02	20	20	60	100
		18	**-**	**08**	**22**	-	-	-	**700**

C : Credit, L : Lecture, T :Tutorial, P : Practical, ME : Mid Exam., IA : Internal Assessment, ESE : End Semester Exam.

BCA - III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-311	Computer Organization	04	-	-	04	20	20	60	100
CSA-CC-312	Java Programming	04	-	-	04	20	20	60	100
CSA-CC-313	Fundamentals of Computer Algorithm	04	-	-	04	20	20	60	100
CSA-CC-314	Operation Research	03	-	-	03	20	20	60	100
CSA-SE-315	Organizational Behavior	03	-	-	03	20	20	60	100
Software laboratory (Practicals)									
CSA-CC-316	Software Laboratory - A	-	-	04	02	20	20	60	100
CSA-CC-317	Software Laboratory - B	-	-	04	02	20	20	60	100
Participation / Presentation/ Visit									
CSA-SE-318	Department Seminar, Workshop Participation/ Poster Presentation /Training/Group Discussion	-	-	-	02	20	20	60	100
	TOTAL	**18**	**-**	**08**	**24**	-	-	-	**800**

BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-411	Operating Systems	04	-	-	04	20	20	60	100
CSA-CC-412	Data Communication and Networks	04	-	-	04	20	20	60	100
CSA-CC-413	Visual Programming	04	-	-	04	20	20	60	100
CSA-CC-414	Database Management Systems	04	-	-	04	20	20	60	100
Elective (Opt Any One of Following)									
CSA-EC-411	Inventory Management (SAD)	03	-	-	03	20	20	60	100
CSA-EC-412	Data Warehousing and Mining	03	-	-	03	20	20	60	100
CSA-EC-413	IT Project Management	03	-	-	03	20	20	60	100
Software laboratory (Practicals)									
CSA-CC-415	Software Laboratory - A	-	-	04	02	20	20	60	100
CSA-CC-416	Software Laboratory - B	-	-	04	02	20	20	60	100
Participation / Presentation/ Visit									
CSA-SE - 417	Seminar, workshop Participation (Outside Department)/Training/ Minor project	-	-	-	02	20	20	60	100
	TOTAL	**19**	**-**	**08**	**25**	-	-	-	**800**

C : Credit, L : Lecture, T :Tutorial, P : Practical, ME : Mid Exam., IA : Internal Assessment, ESE : End Semester Exam.

BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-LN-111	English - I	02	-	-	02	20	20	60	100

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.

(6 Hours)

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

(6 Hours)

B. Spoken English

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

(6 Hours)

UNIT - IV 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.

(6 Hours)

C. Process of writing

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

(6 Hours)

Essential Reading:

1. Tickoo and Subramanian, Functional Grammar
2. Pink and Thomas, English Grammar. Composition and Commercial Correspondence

Suggested Reading:

1. Hema Srinivasan, Alamelu Ramakristhna, Valli Arunachalam Communication Skills -A Practical Approach, Frank Bros. and Co.
2. Dr. V. Ayothi and Dr. R. Vedavali , English for competitive examination , New century book house, 2002

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BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-112	**Fundamentals of Computer Science**	03	-	-	03	20	20	60	100

UNIT -I Introduction to Computers- Generations of Modern Computers Classification of digital Computer Systems- Anatomy of a Digital Computer

(9 Hours)

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.

(9 Hours)

UNIT- III 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.

(9 Hours)

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

(9 Hours)

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

(9 Hours)

Essential Reading:

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

Suggested Reading:

1. Information Technology Concepts, Satish Jain (BPB).
2. Fundamental of Computers, V. Rajaraman (PHI).
3. Prof. Satish Jain, O Level Made Simple Internet Technology and Web Design (BPB).

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BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-113	Digital Principles	03	-	-	03	20	20	60	100

UNIT -I Number System: Binary, Decimal, Octal, Hexadecimal, Conversion binary to decimal, decimal to binary, binary to octal, octal to binary, binary to hexadecimal, hexadecimal to binary etc. Sign magnitude numbers, 1's and 2's complement, Grey code.

(9 Hours)

UNIT- II 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. POS and SOP.

(9 Hours)

UNIT -III Karnaugh map, Pairs, Quads and Octets, Karnaugh simplification, DONOT CARE condition, POS and, SOP methods,

(9 Hours)

UNIT- IV Combinational circuits: Adder, Subtractor, Decoder, Encoder, Multiplexer and Demultiplexer

(9 Hours)

UNIT -V Sequential Circuits: Flip Flops, R S, D, JK, Shift registers, Types of shift registers, Asynchronous and Synchronous counters, Semiconductor memories, ROM, PROMS, EPROMS, RAMS, DRAMS, SRAMS.

(9 Hours)

Essential Reading:

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

Suggested Reading:

1. M.Morris Mano, "Digital Logic and Computer Design", Pearson Publications

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BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-114	**Fundamentals of Programming using C**	03	-	-	03	20	20	60	100

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

(9 Hours)

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.

(9 Hours)

UNIT- III 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.

(9 Hours)

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

(9 Hours)

UNIT -V 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.

(9 Hours)

Essential Reading:

1. Y. Kanetkar, "Lets us C" –BPB.
2. Byron S. Gottfried, Programming with C, Schaum Outline Series, TMH, 2nd Edition 1998
3. Kernighan, B.W. and Ritchie, D.M., "The C Programming Language P H I.

Suggested Reading:

1. Kris A. Jamsa, Programming in C, Galgotia Publications PVT. Ltd.
2. Balaguruswamy, E. 'Computer Concepts and Programming in C', Tata Mc-Graw Hill Education.

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Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-115	Mathematics for Computer Science	03	-	-	03	20	20	60	100

UNIT -I Matrices definition special types of matrices operations symmetric matrices skew symmetric matrices, Inverse Orthogonal matrices Solutions of Simultaneous equations Rank of a matrix, Eigen values.

(9 Hours)

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

(9 Hours)

UNIT -III Sets , types of set, Venn diagram, operation on set, Relation, types of relations, functions , types of functions, gof, fog,etc.

(9 Hours)

UNIT- IV Graph Theory: Introduction application of graphs Finite and Infinite Graphs Incidence and Degree Isolated Vertex, Pendant Vertex. Paths and Circuits Connected Graph, Disconnected Graphs and components, Euler Path & Circuit Graphs, Hamiltonian Paths and Circuits.

(9 Hours)

UNIT -V Trees, Types of Tree, Some property of tress, traversal tree.

(9 Hours)

Essential Reading:

1. R.D.Sharma,"Mathematics" by Dhanpat Rai Publications.
2. Narsingh Deo, Graph Theory with applications to Engineering and Computer Science, PHI, 1997.

Suggested Reading:

1. Trembly & Manohar, Discrete Mathematics for Computer Science, TMH, 1997 (Units 2, 3)

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BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-116	Fundamentals of Accountancy	03	-	-	03	20	20	60	100

UNIT-I

- Meaning and Scope of Accounting – Meaning, Definition, Features, Objectives, Scope and Branches of Accounting
- Distinction between Book-Keeping and Accounting
- Systems of Book Keeping (or Recording), Systems of Accounting
- Accounting Principles, Concepts and Conventions

(9 Hours)

UNIT-II

- Types of Accounts : Personal, Real and Nominal Accounts
- Rules of Debit and Credit of Journal, Compound & Complex Journal Entry, Opening & Closing Entry, Sub division of journal, Accounting Transactions

(9 Hours)

UNIT-III

- Cash Book and Other Subsidiary Books-Meaning, kinds and its Preparation,
- Rules regarding Posting to Ledger and Preparation of Trial Balance
- Capital and Revenue Items

(9 Hours)

UNIT-IV Final Accounts-Meaning, Objectives, Limitations and its Preparation with Adjustments

(9 Hours)

UNIT-V Depreciation-Meaning, Causes, objectives and Methods of Charging Depreciation, Numericals on Straight Line and Diminishing Balance Method – with and without Provision for Depreciation Account

(9 Hours)

Essential Reading:

1. S.N. Maheswari, Advanced Accountancy Vol I, Vikas Publishing
2. R.L.Gupta, Advanced Accounting, S.Chand& Co. New Delhi
3. T.S.Reddy& Murthy, Financial Accounting

Suggested Reading:

1. Jain &Narang, Financial Accounting, Kalyani Publications
2. M.C.Shukla& T.S. Grewal Financial Accounting.

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BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-117	Software Laboratory - A	-	-	04	02	20	20	60	100

Computer Hardware System

(a) Basic structure of computer system along with all elements.
(b) Computer Memory, Cache Memory
(c) Structure of Hard Disk
(d) Different types of I/O devices and their use.
(e) Different devices used to provide power to a Computer System.

DOS Operating System

(a) Booting process.
(b) Concept of Internal and External Commands.
(c) 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.
(d) External commands. Move, Help, Attrib, Sort, More, Tree, Xcopy, Diskcopy, Backup, Recover, Restore, Format, Unformed.
(e) Directory and sub directories.
(f) Printing in Dos.
(g) Removal of subdirectory.
(h) Config. Sys, Autoexe.bat and command .com files.

Practice of DOS Commands by students for file creation, file search, file saving, file updation, file merge, file deletion, file copy, file change in directory etc.

Any other as per teacher concern

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BCA – I Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-118	Software Laboratory - B	-	-	04	02	20	20	60	100

Programmes based on C- Language on following:

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

Any other as per teacher concern

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BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-LN-211	English - II	02	-	-	02	20	20	60	100

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

(6 Hours)

UNIT II:

Precise writing

(6 Hours)

UNIT III:

Report writing -Technical and Scientific report writing. Information Transfer -Tables, Graphs, Organograms, Pie-charts, Bar-charts, Schematic diagrams.

(6 Hours)

UNIT IV:

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

(6 Hours)

UNIT V:

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, and Radiograms.
c) Application for a situation (Curriculum vitae etc.)

(6 Hours)

Essential Reading:

1. Hema Srinivasan, Communication Skills: A Practical Approach
2. Fletcher & Growing, The Business Guide to Effective Writing , New light Publications, New Delhi.

Suggested Reading:

1. Wilna R. Ebbit & David R. Ebbit, Writers Guide (6th edition).
2. Technical Communication, Ramon, Oxford University Press.
3. Technical Communication, Gerson/ Gerson: (Pearson Education India)

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BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-212	PC-Software's	04	-	-	04	20	20	60	100

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.

(12 Hours)

UNIT -II Defining Tabs: using Ruler Bar, Mouse and Tabs Dialog Box. Enhancing 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.

(12 Hours)

UNIT -III 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.

(12 Hours)

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

(12 Hours)

UNIT -V Power Point - 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.

(12 Hours)

Essential Reading:

1. R. K. TAXALI " PC Software for Windows 98, Made Simple" TMH.
2. PC Software- Made Simple by Satish Jian, Published by BPB Pub.
3. Microsoft Office 2016 Step by Setp by Lambert Joan, Publisher – Microsoft Press.
4. Microsoft Office 2016 All –in- One for Dummies by Peter Weverka, Publisher – Wiley.
5. Microsoft Office -2010, By Bittu Kumar, Publisher – V & S Publisher.

Suggested Reading:

1. Will Train, Gini Corter, Annette Marquis "Microsoft Office" BPB.
2. MS-Office by S. S. Shrivastava Publisher – Laxmi Publications.

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BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-213	Fundamentals of Data Structures	04	-	-	04	20	20	60	100

UNIT- I Arrays: One-dimensional Array, Two- dimensional array, Address calculation for 1D and 2 D array, Sparse Matrices, Data structure, classification of data structure. Search - Linear search, Binary search and Hashing.

(12 Hours)

UNIT- II Stack and Queue: Stack- Operations on stack, Implementation of s tack as an array, Application Evaluation of Expression & Conversion -Queues: Queue, Operations on Queues, Implementing the queue

(12 Hours)

UNIT -III Linked List: types of link list, Self Referential, List representations, various insertion and deleting from single link list, Doubly linked list, stack implementation using single linked list, queue implementation using single linked list,. Polynomial- Linked list representations.

(12 Hours)

UNIT -IV Trees: Basic terminology, Binary tree, representation, traversal, Binary search tree (BST) and its traversal, Graph: Definition and Terminology, representation, traversals, and Spanning Tree, Shortest Path.

(12 Hours)

UNIT - V Searching and Sorting: Linear and Binary Searching, Bubble, Selection, Merge, Quick, Insertion sorting.

(12 Hours)

Essential Reading:

1. Ellis Horowitz & Sahani, Fundamentals of Data Structures, Galgotia Publications, New Delhi.
2. Data Structures Using C; Aaron M. Tanenbaum (Pearson Education India)
3. Data Structures Using C and C++ by Yedidyah Langsam, Moshe J. Augenstein, Publisher: Pearson.
4. C Programming and Data Structures by Manjunath Aradhya M. Publisher: Cengage India Private Ltd.
5. Data Structures using C++ by Yashavant P. Kanetkar, Publisher: BPB Publications.

Suggested Reading:

1. Data Structures with C By Seymour Lipschutz, Publisher: McGraw Hill Education.

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BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-214	Object Oriented Programming	04	-	-	04	20	20	60	100

UNIT -I Introduction to Object Oriented Programming (OOP), C++ programming basics, Loops and decisions: Relational operators, loops, decision, logical operators, precedence.

(12 Hours)

UNIT -II Structures, enumerated data types. Functions: Simple functions, passing argument to functions, returning values from functions, reference arguments, overloaded functions, inline functions.

(12 Hours)

UNIT -III Objects and classes: classes and Objects, Specifying the class, using the class, constructors, deconstructions, and 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.

(12 Hours)

UNIT -IV Inheritance: Derived Base class, derived class constructors, overloading member functions, class hierarchies, public and private inheritance, levels of inheritance, multiple inheritance.

(12 Hours)

UNIT -V Virtual functions and other functions: Virtual functions, Friend functions, Static functions this pointer.

(12 Hours)

Essential Reading:

1. Robert Lafore, Object Oriented Programming in C++, Golgotha Publication, 2001.
2. Timothy Budd, An Introduction to Object-Oriented Programming (3rd Edition), Addison Wesley Longman.
3. Object Oriented Programming with C++ (Sixth Edition): E. Balagurusamy. Published by Tata McGraw-Hill Education Pvt. Ltd, 2013.
4. Let us C++, Yashwant Kanetkar, BPB Publications.

Suggested Reading:

3. Peter Coad, "Object-Oriented Design" First Edition, Yourdon Press Computing Series

Approved by BoS on dated 06-03-2017

BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-215	Probability and Statistics	04	-	-	04	20	20	60	100

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.

(12 Hours)

UNIT –II Concept of random variable Discrete and Continuous random variable - Mathematical expectation Simple problems based on Binomial, Poisson and Normal distribution

(12 Hours)

UNIT -III 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.

(12 Hours)

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

(12 Hours)

UNIT – V Measures of dispersion Quartile deviation mean deviation & standard deviation characteristics coefficient of dispersion coefficient of variation moments. Simple correlation, Karl Pearson coefficient, Rank correlation, Linear Regression, Two lines of regression. Properties of regression coefficient

(12 Hours)

Essential Reading:

1. Gupta S. C and Kapoor V. K., Fundamentals of Mathematical Statistics , 11th Edition, S. Chand and Sons 2002.
2. Fundamental of Statistics, Gupta, S. C., Himalaya Publishing House New Delhi.
3. Fundamentals of Statistics, Goon. A. M., Gupta, M. K. and Dasgupta, B. The World Press Private Limited.
4. Trivedi K. S. "Probability and Statistics with Reliability, Queuing and Computer Science Applications " PHI
5. Meyer, P. L. "Probability theory and Statistical Applications" IBH, Oxford, New Delhi -1980.

Suggested Reading:

1. Hooda R.P., Statistics for Business and Economics, 3 rd Edition, Macmillan 2003.
2. Probability and Queneing Theory, Moorthy, M. B. K., Subramani K., Santha A., SciTech Publication Pvt. Ltd.
3. Comprehensive Statistical Method, Arora P. N., Arora Sumeet, Arora, S. and Arora, Amit, S. Chand & Company, Ltd, New Delhi.

Approved by BoS on dated 06-03-2017

BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-216	Software Laboratory- A	-	-	04	02	20	20	60	100

Practicals based on followings :

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

MS- 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

Any other as per teacher concern

Approved by BoS on dated 06-03-2017

BCA – II Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-217	Software Laboratory- B	-	-	04	02	20	20	60	100

Practicals based on following :

OOP (Programs using 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 Inheritances
7. Pointers
8. Virtual Functions, Friend functions, this pointer and Static functions
9. Files
10. Streams

Data Structures

11. Linear Search
12. Binary Search
13. Sort by Selection
14. Sort by Exchange
15. Quick sort
16. Stacks, Queues using arrays
17. Linked List: Insertion and Deletion
18. Polynomial addition using linked list
19. Stack and Queue using Linked List
20. Doubly linked List: Insertion and Deletion
21. Binary tree Traversal [inorder, preorder, postorder]
22. Graph Traversal [breadth first, depth first]

Any other as per teacher concern

Approved by BoS on dated 06-03-2017

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-311	Computer Organization	04	-	-	04	20	20	60	100

UNIT- I Introduction: The Von Neumann model, the system Bus model, A Typical computer system. Data Representation: Binary numbers, binary codes, fixed point representation, floating point representation, error detection codes.

(12 Hours)

UNIT -II Functional units of computer operational concepts stored program concept. Processor Logic Design Processor Organization Arithmetic Logic Unit Design of Arithmetic Circuit Design of Logic Circuit Design of Arithmetic and Logic Unit status register Design of Accumulator.

(12 Hours)

UNIT- III Memory Organization: Memory hierarchy Main memory operations memory mapping.

(12 Hours)

UNIT -IV Addressing Methods and Machine Program Sequence: Instruction Formats Instruction Sequencing Addressing Modes Stacks Subroutine and linkage

(12 Hours)

UNIT -V Input-Output Organization: Peripheral Devices I/O Interface Asynchronous Data Transfer Modes of Transfer DMA.

(12 Hours)

Essential Reading:

1. Morris Mano, Digital Logic and Computer Design, PHI 1987.
2. M.Morris Mano, Computer System Architecture, PHI 1986.

Suggested Reading:

1. V.Karl Hamacher, Zvokog G. Vranesic and Safwat G. Zaky, Computer Organization, McGraw Hill ISE, 1984

Approved by BoS on dated 06-03-2017

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-312	Java Programming	04	-	-	04	20	20	60	100

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.

(12 Hours)

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.

(12 Hours)

UNIT- III 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

(12 Hours)

UNIT -IV Exception Handling: Exception as Objects, Exception hierarchy, Try, Catch, Finally, Throw.

(12 Hours)

UNIT -V Multi threading: Creating threads, Thread Life Cycle, Main Thread, Multiple Threads, Isalive() and join() ,Simple thread program ,Threads Priorities, Thread synchronization. **(12 Hours)**

Essential Reading Material:

1. Herbert Schildt Java2 (The Complete reference) Fourth Edition TMH, Fifth Reprint Chapters 2,3,4,5,6,7,8,9,10,11,12,13,17,19,20,21,22)
2. R Lafore "Object Oriented Programming": Pearson
3. Programming with JAVA (A premier), E. Balaguruswamy, Tata-MC-Graw Hill Publisher Com. Ltd.

Suggested Reading:

1. E. Balaguruswami "OOPs using Java"-TMH
2. Bill Verrens, Inside the Java Virtual Machine, Tata McGraw Hill
3. Sierra and Bates, Head First Java , O'Reilly
4. Horstmann Cay, Big Java , Wiley –India
5. Horstmann, "CORE JAVA" Pearson Education
6. Jan. Grave, "An Introduction to Network Programming with JAVA" JAVA 7 Compatible.

Approved by BoS on dated 06-03-2017

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-313	Fundamentals of Computer Algorithm	04	-	-	04	20	20	60	100

UNIT -I Notion of Algorithm, Growth of functions, Summations, Recurrences: The substitution method, The iteration method, The master method (including proof), Asymptotic Notations Sorting and Searching Techniques, Selection Sort, Bubble Sort, Insertion Sort, Sequential Search, Binary Search.

(12 Hours)

UNIT -II Depth first Search and Breadth First Search, Balanced Search trees, AVL Trees, Heaps and Heap sort, Hash Tables, disjoint set an Divide and conquer.

(12 Hours)

UNIT -III Greedy Techniques, Prim's Algorithm, Kruskal's Algorithm, Dijkstra's and Bellman Ford Algorithm , Huffman trees. Knapsack Problem.

(12 Hours)

UNIT -IV Dynamic Programming paradigm, Warshall's and Floyd's Algorithm, Optimal Binary Search trees, Matrix multiplication Problem, 0/1 Knapsack Problem, maximum network flow problem, naive string matching algorithm , Rabin-Karp Algorithm

(12 Hours)

UNIT -V Backtracking, n-Queen's Problem, Hamiltonian Circuit problem, Subset-Sum problem, Branch and bound, Assignment problem, Traveling salesman problem. Introduction to Computability, Polynomial-time verification.

(12 Hours)

Essential Reading:

1. Jon Kleinberg and Eva Tardos , Algorithm Design, Pearson Edition, 2006.
2. Algorithms" Sanjoy Dasgupta , Christos Papadimitriou Umesh Vazirani TMH

Suggested Reading:

1. Introduction to Algorithms, T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, PHI

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BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-314	Operations Research	03	-	-	03	20	20	60	100

UNIT -I Introduction to Operations Research-Principal components of decision problems – Applications of OR in Industry, business, defence with examples.

(9 Hours)

UNIT -II Linear Programming- component of LPP, types of LPP problems, graphical solution-simplex method including artificial variable technique

(9 Hours)

UNIT -III Sequencing Game theory - optimal solution of two-person zero-sum games - mixed strategies - graphical solution of (2 X n) and (m X 2) games - solution of (m X n) games by linear programming.

(9 Hours)

UNIT -IV PERT and CPM: Concept, definition, terms, network diagrams - determination of floats and critical path – Problem solving using PERT & CPM, Probability considerations in project scheduling.

(9 Hours)

UNIT -V Transportation problem, VAM, NWC-method, minimum cost method, Matrix minima method, Assignment models , Hungarian method, problem solving

(9 Hours)

Essential Reading:

1. Operations Research, Hamdy A.Taha , PHI Publication.
2. Operation Research, S. D. Sharma, Kedar Nath Ram Nath Publications, Delhi.
3. Operations Research, Kanti Swarup, Gupta, P. K. & Man Mohan, Sultan Chand & Sons, New Delhi.
4. Operation Research, P. K. Gupta & D. S. Hira, S. Chand & Company Ltd, New Delhi.

Suggested Reading:

2. Fundamentals of O.R., R.L. Ackoff and M.W. Sasieni, Wiley Publication.

Approved by BoS on dated 06-03-2017

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-SE-315	Organizational Behavior	03	-	-	03	20	20	60	100

UNIT -I Fundamentals of Organizational Behaviour: Nature, Scope, Definition and Goals of Organizational Behaviour; Fundamental Concepts of Organizational Behaviour; Models of Organizational Behaviour;

(9 Hours)

UNIT -II Perception, Attitude, Values and Motivation: Concept, Nature, Process, Importance, Management Behavioral aspect of Perception. Effects of employee attitudes; Personal and Organizational Values;

(9 Hours)

UNIT -III Personality: Definition of Personality, Determinants of Personality; Theories of Personality- Trait and Type Theories.

(9 Hours)

UNIT- IV Work Stress - Meaning and definition of Stress, Symptoms of Stress; Sources of Stress: Individual Level, Group Level, Organizational Level

(9 Hours)

UNIT -V Group Behaviour and Leadership- Nature of Group, Types of Groups; Nature and Characteristics of team; Team Building, Effective Teamwork; Nature of Leadership, Leadership Styles; Traits of Effective Leaders

(9 Hours)

Essential Reading:

1. Organizational Behavior Text, Cases and Games- By K. Aswathappa, Himalaya Publishing House, Mumbai, Sixth Edition (2005)
2. Organizational Behavior Human Behavior at Work - By J.W. Newstrom, Tata McGraw Hill Publishing Company Limited, New Delhi, 12th Edition (2007)
3. Organizational Behavior – By Fred Luthans
4. Organizational Behavior – By Super Robbins

Suggested Reading:

1. Organizational Behavior – Anjali Ghanekar
2. Organizational Behavior Fundamentals, Realities and Challenges, Detra Nelson, James Campbell Quick Thomson Publications
3. Organizational Behavior through Indian Philosophy, By N.M. Mishra, Himalaya Publication.
4. Principles of Management, Franklin Terry,
5. Business Communication, 13th Edition, Lesiker and Petill, Pearson.

Approved by BoS on dated 06-03-2017

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-316	Software Laboratory- A	-	-	04	02	20	20	60	100

Practicals on developing programme using Java

I- Application :

1. Finding area and Perimeter of a circle. Use buffered reader class
2. Substring removal from a string. Use String Buffer class
3. Determining the order of numbers generated randomly using random class
4. Implementation of Point class for image manipulation
5. Usage of calendar class and manipulation
6. String manipulation using char array
7. Database creation for storing telephone numbers and manipulation
8. Usage of vector classes
9. Implementing thread based applications and exception handling
10. Implementing Packages

II – Applets:

11. Working with frames and various controls
12. Dialogues and Menus
13. Panel and Layout
14. Graphics
15. Color and Font

Any other as per teacher concern

Approved by BoS on dated 06-03-2017

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-317	Software Laboratory- B	-	-	04	02	20	20	60	100

Problem solving using Statistical packages /Programming in C / MS-Excel on following topics:

1. Diagramatic Representation: Bar-charts, Pie-diagrams
2. Graphical Representation of data Histograms, Frequency polygon
3. Measures of central tendency Arithmetic mean, Median, Mode
4. Measures of dispersion
5. Skewness and Kurtosis
6. Simple correlation
7. Regression lines of regression
8. Tests of significance based on t
9. Tests of significance based on chi-square
10. Tests of significance based on F

Note: The above mentioned statistical problems may be solved using SPSS/ R-software.

Any other as per teacher concern

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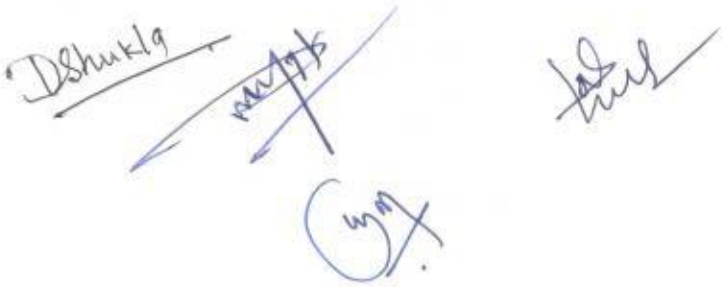

BCA – III Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-SE-318	Departmental Seminar, workshop Participation/ Poster Presentation /Group Discussion /training	--	---	---	02	20	20	60	100

It will be decided by the department or teacher(s) concern. Students have to participate and earn the credit.

This is activity & participation based course:

Note:

(i) Students have to participate in Seminar/ Poster Presentation / Group Discussion/ training program and record their attendance to the course- coordinator.

(ii) Course coordinator will arrange the activities for ME, IA, ESE.

(iii) A summary of academic content of activity and a copy of certificate obtained will have to be submitted by students to the course coordinator for mid-term & internal evaluation (time to time) and same to the End Sem. Exam.

(iv) There may participation by students in three different (or some similar) activities relating to exam., assessment and evaluation.

(v) There will be individual participation of students in each activity.

Approved by BoS on dated 06-03-2017

BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-411	Operating Systems	04	-	-	04	20	20	60	100

UNIT -I Introduction to Operating System: Operating System: Introduction, Objectives and functions. Evolution of Operating System,.

(12 Hours)

UNIT -II Process Description and control: process definition, process states, two state & five state process model, process creation & termination, CPU Scheduling : Types of scheduling, scheduling and performance criteria, scheduling algorithm.

(12 Hours)

UNIT- III Memory Management: Memory partitioning, paging, segmentation, virtual memory. Concurrency and Synchronization: Interposes communication and synchronization. Principles of concurrency, Mutual exclusion: Software approaches, hardware support, semaphores.

(12 Hours)

UNIT- IV Deadlock & starvation: Principles of deadlock, deadlock prevention, deadlock avoidance, deadlock detection and recovery, starvation. Input/ Output Management: Principles of I/O hardware: I/O devices, I/O modules, I/O communication Techniques. Principles of I/O software: Goals, Interrupt handlers, device drivers.

(12 Hours)

UNIT -V File Management: File system, file organization, file directories, file sharing, Record blocking, Error handling.

(12 Hours)

Essential Reading:

1. Stuart E. Madnick and John Donovan Operating System ,TMH Fifth Reprint 2000
2. Silberschatz and Galvin" Operating System Concept", Addison Wesley.
3. Tanenbaum, A.S., ''Modern Operating Systems", Prentice Hall of India Pvt. Ltd.

Suggested Reading:

1. Modern Operating System, Hed, Andrew S. Tanenbaum : (Pearson Education India).
2. Operating System Concept, Peter B. Galvin, Greg Gagne and Abraham Silberschatz, CBS Publishers

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BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-412	Data Communication and Networks	04	-	-	04	20	20	60	100

UNIT -I Introduction: Data Communications, Networks, Protocols and Standards. Basic Concepts: Line Configuration, Topology, Trans mission mode, Categories of Networks.OSI Model: Layered architecture, Functions of the layers, TCP/IP Protocol suite

(12 Hours)

UNIT -II Signals: Analog and digital, periodic and a periodic signals, analog signals, Digital signals. Transmission media: Guided media, unguided media. Multiplexing: FDM, WDM,TDM, Multiplexing Application-The Telephone system.LAN: Project, Ethernet, Other Ethernet networks, Token bus, Token Ring, FDDI, Comparison.

(12 Hours)

UNIT -III Switching: Circuit Switching, Packet Switching, Message Switching. Networking and internetworking devices: Repeaters, Bridges, Routers, Gateways, other devices, Routing algorithms, Distance vector routing, link state routing.

(12 Hours)

UNIT- IV Transport layer: Duties, Connection TCP/IP Protocol suite: Overview of TCP/IP: Internet protocol, Addressing, Sub netting. Protocols in the network layer: ARP, RARP, ICMP, IGMP Transport layer: TCP UDP

(12 Hours)

UNIT -V TCP/IP Protocol suite: PART-2 Application aver: Client server model, BOOTP, DHCP, DNS, FTP,SMTP,,WWW,HTTP.

(12 Hours)

Essential Reading:

1. Data Communication & Networking ,Behuouz A. Forouzan, ,Tata McGraw-Hill.
2. Computer Networks A.S Tanenbaum, Pearson Education.
3. Data Communication and Computer Network, Brijendra Singh, Prentice Hall of India (PHI).

Suggested Reading:

1. Data and Computer Communications, William Stallings, PHI.

Approved by BoS on dated 06-03-2017

BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-413	Visual Programming	04	-	-	04	20	20	60	100

UNIT -I Introduction to GUI - Visual Basic : Starting and Exiting Visual Basic Project Explorer Working with Forms Properties Window Using the Toolbox Toolbars Working with Projects Programming Structure of Visual Basic applications Event and Event driven procedures

(12 Hours)

UNIT -II Adding code and using events: Using literals data types - declaring and using the operator subroutines and functions looping and decision control structures if then else structure select structure, for next, do.. loop and while.. wend.- Using intrinsic Visual basic Controls with methods and Properties: Label ,Text box

(12 Hours)

UNIT- III Command button, Frame, Checkbox, option button, List box, Combo box, Drive List box, directory List box and file list box Formatting controls control arrays.

(12 Hours)

UNIT- IV Functions and Procedure - Passing arguments by value and reference Arrays, dynamic arrays User defined data types symbolic constants using Dialog boxes: Input box , Message box functions - String functions, date and Time function , numeric functions

(12 Hours)

UNIT -V Menus: creating menus, adding code to menus, using MDI forms - MDI form basic building MDI form creating MDI Child Forms

(12 Hours)

Essential Reading:

1. Gary Cornwell , Visual basic 6 , Tata McGraw Hill
2. Scott Warner, Teach yourself Visual basic 6 , Tata McGraw-Hill

Suggested Reading:

1. Noel Jerked "The Complete Reference'', Tata McGraw-Hill
2. Eric A. Smith, Velar Whistler, and Hank Marquis , Visual Basic 6 programming"

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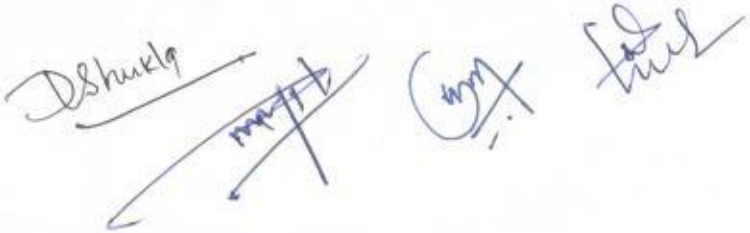

BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-414	Database Management Systems	04	-	-	04	20	20	60	100

UNIT -I Introduction to Database System-Objectives-Entities and Attributes. Data Models Database Management Systems Tree Structures Plex Structures Data Description Languages.

(12 Hours)

UNIT -II Relational data base design: function dependencies & normalization for relational databases: functional dependencies, normal forms based on primary keys, (1NF, 2NF, 3NF & BCNF), lossless join and dependency preserving decomposition.

(12 Hours)

UNIT -III Basic SQL reports and commands Data types and notations String functions Data functions Unions Joints DDL DML DLL.

(12 Hours)

UNIT -IV PL/SQL: Approach and Advantages PL/SQL Blocks -Variables-Manipulating Data Triggers Procedures, functions and packages - Exception handling

(12 Hours)

UNIT -V Locking Techniques Time stamp ordering Validation techniques - Granularity of data items Recovery Concepts - log based Recovery Database Security issues Access Control Statistical Database Security.

(12 Hours)

Essential Reading:

1. James Martin, Computer Database Organization, PHI.
2. Henry F. Korth Abraham Silberschatz, Database System Concepts, McGraw Hill International Editions.
3. An Introduction to Database System, C. J. Date, Vol. 1, Norasa Publishing House

Suggested Reading:

1. Kevin Loney, George Koch, 'Oracle 8i',The Complete Reference.

Approved by BoS on dated 06-03-2017

BCA – IV Semester (Elective I)

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-EC-411	Inventory Management (SAD)	03	-	-	03	20	20	60	100

UNIT-I Management of Inventory- Nature of Inventories, Need to hold Inventories, Objective of Inventory Management, Inventory management Techniques(EOQ Model),

(9 Hours)

UNIT -II Protecting Inventory - Introduction, Legal Duties, The Plan, The Assessment, Theft Analysis of Investment in Inventory, Selective Inventory control-ABC Analysis, The Inventory Management Process, EOQ : Illustrative Problems, Order Point

(9 Hours)

UNIT -III The Basics of Bar Coding -Introduction, Elements of a Bar Code Symbol, Symbologies – Bar Coding Structural Rules, Why Inventory Systems Fail and How To Fix Them:- Introduction, Inventory Record Accuracy

(9 Hours)

UNIT -IV System Development Tools - Role and Benefits of case tools, Drawbacks of case tools, Taxonomy of case tools, Integrated Case Environment, Features of Turbo Analyst, Tools with which to uncover System Dysfunctions:- Flowchart, Run chart, Logic chart, Variance Report

(9 Hours)

UNIT -V Re-engineering- Business Process Re-engineering, Business Processes, BPR Model, Software Re-engineering, Software Maintenance, Software Re-engineering process Models,

(9 Hours)

Essential Reading:

1. Essentials of Inventory Management - by Max Muller.
2. Financial Management - by I. M. Pandey 7th edition
3. Financial Management Theory & Practice - by Prasanna Chandra 6th edition

Suggested Reading:

1. Financial Management - by M. Y. Khan & P. K. Jain, 5th Edition
2. SADSE (System Analysis Design) –by Prof. Khalkar and Prof. Parthasarathy.

Approved by BoS on dated 06-03-2017

BCA – IV Semester (Elective I)

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-EC-412	Data Warehousing and Mining	03	-	-	03	20	20	60	100

UNIT- I The Compelling Need for data warehousing: Escalating Need for strategic information, failures of Past decision-support systems, operational versus decision-support systems, data warehousing – the only viable solution, data warehouse defined Data warehouse

(9 Hours)

UNIT- II The building Blocks: Defining Features, data warehouses and data marts, overview of the components, metadata in the data warehouse Defining the business requirements: Dimensional analysis,

(9 Hours)

UNIT -III Principles of dimensional modeling: Objectives, From Requirements to data design, the STAR schema, STAR Schema Keys, Advantages of the STAR Schema

(9 Hours)

UNIT- IV OLAP in the Data Warehouse: Demand for Online analytical processing, need for multidimensional analysis, fast access and powerful calculations, limitations of other analysis methods, OLAP is the answer, OLAP definitions and rules,

(9 Hours)

UNIT -V Data Mining Basics: What is Data Mining, Data Mining Defined, The knowledge discovery process, OLAP versus data mining, data mining and the data warehouse, Major Data Mining Techniques, Cluster detection, decision trees, memory-based reasoning, link analysis, neural networks.

(9 Hours)

Essential Reading:

1. Paul Raj Poonia, "Fundamentals of Data Warehousing", John Wiley & Sons, 2003.
2. Sam Anahony, "Data Warehousing in the real world: A practical guide for building decision support systems", John Wiley, 2004

Suggested Reading:

1. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P. Ltd., 2001
2. Principles of Data Mining, Handa : (Pearson Education India).

Approved by BoS on dated 06-03-2017

BCA – IV Semester (Elective I)

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-EC-413	IT Project Management	03	-	-	03	20	20	60	100

UNIT – I : Introduction- Characteristics of a project, types of projects, Project Management Body of Knowledge (PMBOK), role of project manager and his qualities, project organization and benefits, idea generation, needs of society, import substitution, project lifecycle, project charter, project sponsor.
Project Planning- Customer needs, stake holder concept, Project scope, feasibility study and report, baseline plan, SWOT analysis, project organization structure and hierarchy, project teams, formation, attitude and aptitude

(9 Hours)

UNIT - II : Structure, project selection methods, breakeven analysis, DCF methods, project implementation, estimation, cost, price, value, scheduling, barcharts, network diagrams, PERT and CPM, schedule crashing, simple introduction to risk management, probability in project management, decision trees.

(9 Hours)

UNIT- III: Procurement: Vendor selection methods, JIT, supply chains, quality ,quality circles, quality control and quality assurance, cause and effect analysis, ISO and concepts of total quality management and six sigma, resource planning and allocation, availability and constraints of resources, resource leveling and crashing.

(9 Hours)

UNIT- IV: Project Control: Project scope, project change request, and control of schedule, resources, cost and quality, project communications, channels, means, meetings, project reports, project audits Project evaluation, project close-out reports, guidelines, audit reports, maintenance and shutdown projects, plant turn around and brief introduction to replacement analysis

(9 Hours)

UNIT- V: Engineering projects: Contour maps, sitemaps, plant layout, suitability of project site, preparation of site, selection and leasing of construction equipment special considerations in selection and location of projects, safety, health, human and environment al factors, project finance, international projects, joint ventures, collaborations, impact of culture, implementation, and handing over of projects

(9 Hours)

Essential Reading:

1. Kamaraju Ramakrishna, "Essentials of Project Management", PHI Learning, New Delhi, 2010
2. Jack T. Marchewka, Information Technology and Project Management, John Wiley & sons P.Ltd, 2003.

Suggested Reading:

1. Prasanna Chandra, "Projects – Planning, analysis, selection, implementation and review", Tata McGraw-Hill, New Delhi, 2010.
2. Chitkara, "Construction Project Management", Tata McGraw- Hill, New Delhi.
3. Harold Kerzner, "Project Management", Wiley, New York.

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BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-415	Software Laboratory -A	-	-	4	02	20	20	60	100

Based on VB programming Lab

1. Building simple applications
2. Working with intrinsic controls and ActiveX controls
3. Application with multiple forms
4. Application with dialogs
5. Application with Menus
6. Application using data controls
7. Application using Common Dialogs
8. Drag and Drop Events and Events Management
9. Database Management
10. Creating ActiveX Controls
11. Cookies Management
12. Session Management
13. Program based on Looping and Branching Concept
14. Working with Predefine Function
15. Creating on own Controls and Toolbar

Any other as per teacher concern

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BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-CC-416	Software Laboratory- B	-	-	04	02	20	20	60	100

Based on SQL programming Lab

1. Commands For DDL and DML
2. Working With different type of Keys
3. Working with different type of Constraints
4. Apply various operation in table
5. Working with pre define function
6. Program based on PL/SQL
7. Working with Triggers
8. Working with Procedures
9. Working with functions and packages
10. Working with Exception handling
11. Working with Backup & Recovery Process
12. Working with Granting
13. Commands for transaction related
14. Working with different type of Join

Use the concepts like data normalization, link between table by means of foreign keys and other relevant database concepts for the following applications. The implementation of each should have necessary input screen (forms) Menu-driven query processing and reports. Necessary validations should be made for each table

1. Library information system
2. Students mark sheet processing
3. Telephone directory maintenance
4. Gas booking and delivering
5. Electricity bill processing
6. Bank Transaction
7. Pay roll processing
8. Personal information system
9. Question database and conducting Quiz
10. Personal diary

Any other as per teacher concern

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BCA – IV Semester

Course Code	Course Title	L	T	P	C	Sessional		ESE	Total
						ME	IA		
CSA-SE - 417	Seminar, workshop Participation (Outside Department)/Training/ Minor project	--	---	--	02	20	20	60	100

It will be decided by the department and teacher(s) concern. Students have to earn this credit.

This is activity & participation based course:

Note:

(i) Students have to participate in Seminar/ Poster Presentation / Group Discussion/ training program and record their attendance to the course- coordinator.

(ii) Course coordinator will arrange the activities for ME, IA, ESE.

(iii) A summary of academic content of activity and a copy of certificate obtained will have to be submitted by students to the course coordinator for mid-term & internal evaluation (time to time) and same to the End Sem. Exam.

(iv) There may participation by students in three different (or some similar) activities relating to exam., assessment and evaluation.

(v) There will be individual participation of students in each activity.

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BCA – V Semester

Code	Title	L	T	P	Credit	Sessional	End	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)							
CSA-E-515	Digital Image Processing	3	-	-	03	40	60	100
CSA-E-516	Simulation & Modeling	3	-	-	03	40	60	100
CSA-E-517	Web Technology	3	-	-	03	40	60	100
	Practical							
CSA-C-518	Software Laboratory- V (a)	-	-	4	02	40	60	100
CSA-C-519	Software Laboratory- V (b)	-	-	2	01	40	60	100
	TOTAL	**-**	**-**	**-**	**18**	**-**	**-**	**700**

BCA – VI Semester

Major Project based on Industrial Training

Code	Title	L	T	P	Credit	Sessional	End	Total
CSA-C-611	Major Project (External) based on Industrial Training	-	-	-	06	120	180	300
CSA-C-612	Comprehensive Viva-Voce based on project	-	-	-	15	80	120	200
CSA-C-613	Seminar on project - topic/others	-	-	-	06	80	120	200
	TOTAL	-	-	-	**27**	-	-	**700**

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BCA – V Semester

CSA-C-511	**Computer Graphics**	**3**	**-**	**-**	**03**	**40**	**60**	**100**

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.

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BCA – V Semester

CSA-C-512	**Unix And Shell Programming**	**3**	**-**	**-**	**03**	**40**	**60**	**100**

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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BCA – V Semester

CSA-C-513	Software Engineering	3	-	-	03	40	60	100

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.
5. Software Engineering - by Roger s. Pressman.

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BCA – V Semester

CSA-C-514	**Computer Networking**	**3**	**-**	**-**	**03**	**40**	**60**	**100**

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. Uyless Black, "Computer Networks", PHI.
3. William A. Shay, "Understanding data communication and networks", Thomsons.
4. Data Communication and Computer Network, Brijendra Singh, Prentice Hall of India (PHI).
5. Data Communications and Networking by Behrouz A. Forouzan, Publisher–McGraw Hill Education.
6. Fundamentals of Computer Networks by Kundu Publisher – PHI,
7. Computer Networking: A Top – Down Approach by James F. Kurose, Publisher – Pearson Education.
8. Computer Networks and Internets by Douglas E. Comer, Publisher- Pearson.
9. Data and Computer Communications by William Stalling, Publisher- Perason Education India.

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BCA – V Semester

CSA-C-515	**Digital Image Processing**	**3**	**-**	**-**	**03**	**40**	**60**	**100**

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.

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BCA – V Semester

CSA-C-516	**Simulation & Modelling**	**3**	**-**	**-**	**03**	**40**	**60**	**100**

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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BCA – V Semester

CSA-C-517	**Web Technology**	**3**	**-**	**-**	**03**	**40**	**60**	**100**

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, Massage 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. Java script 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

CSA-C-518	Software Laboratory- V (a)	-	-	04	02	40	60	100

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.
6. Write a program to draw smoothing polygon.
7. Write a program to draw star, sun, moon.

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.
6. Program based on lopping Concept.
7. Disk Management Command
8. Program based on creating own Command in UNIX.

Any other as per teacher concern

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BCA – V Semester

CSA-C-519	Software Laboratory- V (b)	-	-	02	01	40	60	100

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.

Any other as per teacher concern

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BCA – VI Semester

CSA-C-611	**Major Project (External) based on Industrial Training**	**-**	**-**	**-**	**06**	**120**	**180**	**300**

Guidelines

1. Every student shall be spending more than 2 months for Industrial Training preferably on a live project. A proposal shall be seen by the concerned teachers of the project undertaken.
2. The report in hard bound copy (with attached CD and attached coding) should contain the system design, analysis, feasibility, methodology, screen shots, output etc.
3. 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 himself/ herself in the industrial environment. The coding must be attached at the end of project report in print as well as in CD.
4. Every report should attach 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.
5. There will be project monitoring by the teachers of department also .Groups of students will be notified by HoD assigning teachers.
6. Teachers have to make Mid-term valuation of project in 40% of MM.
7. Before submission of the project, the concern teacher has to sign on the project and there shall be signature of HoD also.
8. At the end, the project will be evaluated by the HoD or by a committee constituted. The score of mid-term evaluation will be added to the End term valuation.
9. The HoD (or departmental council) will resolve the conflicts raised (if any) whose decision shall be final.
10. Few Lectures by the concerned teachers have to be given on topics-Proposal preparation, Methodology, Software and Hardware requirements, Coding, Design, Testing, Validation, Report Writing, Project Presentation.

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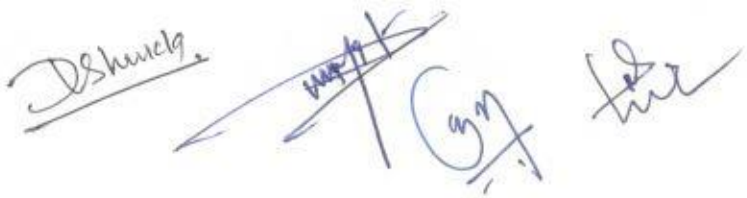

BCA – VI Semester

CSA-C-612	**Comprehensive Viva-Voce based on project**	-	-	-	**15**	**80**	**120**	**200**

Guidelines

1. There shall be viva voce (discussion) with students who is involved in completing the project.
2. There shall be mid-term evaluation in 40% of MM in the form of viva voce.
3. The concern teacher will conduct Viva Voce for Mid-term valuation.
4. The conflict raised, if any, shall be resolved in the meeting of Departmental council or through the guidelines issued by HoD.

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BCA – VI Semester

CSA-C-613	**Seminar on project topic/others**	**-**	**-**	**-**	**06**	**80**	**120**	**200**

Guidelines

1. 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.
2. There shall be mid-term evaluation in 40% of MM in the form of Seminar Presentation.
3. The concern teacher will conduct seminar for Mid-term valuation.
4. Only one student on one topic of project will give presentation.
5. The conflict raised, if any, shall be resolved in the meeting of Departmental council or through the guidelines issued by HoD.

Approved by BoS on dated 06-03-2017


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