Nizam College (Autonomous)

Department of Informatics

S.Sravanthi
Chairperson, Board of Studies
Department of Informatics, Nizam College, OU
E-Mail – hodinformatics@nizamcollege.ac.in
Mobile: 9949954885

MINUTES OF BOARD OF STUDIES – Informatics

Thursday, 16 June 2022

2:30 PM in Osmania University

A meeting of the Board of Studies Informatics was held on **Thursday, 16 June 2022** at 2.30 pm in Osmania University

Members Attended

1. P.V. Sudha, Professor & Dean of Faculty of Informatics, UCE, OU
2. Mr. Venkatdas BOS, IT Chairperson, Dept of CSE, OU
3. Dr. B.SUJATHA, Assistant Professor, Dept of CSE, OU
4. Mrs. S.SRAVANTHI, Head, BOS Chairperson, Dept of Informatics, Nizam College
5. Mr. T. RAMDAS NAIK, Assistant Professor Contract, Dept. of Informatics Nizam College
6. Ms .HUMERA SHAZIYA, Assistant Professor Contract, Dept. of Informatics Nizam College
7. Mrs. G.KAVITHA, Assistant Professor Contract, Dept. of Informatics Nizam College
8. Mr. Md. NAYEEM UDDIN, Assistant Professor Contract, Dept. of Informatics Nizam College
9. ANANTH BHASKER, Software Developer, Wells Forgo
10. T. JAYADEEP, Software Developer in Wird

P.V.Sudha
16/6/2022
Dean,
Faculty of Informatics
Osmania University

16/06/2022
CHAIRMAN
Board of Studies (IT)
Dept. of Computer Science & Engg.
University College of Engineering
Osmania University, Hyd-500007

23/06/2022
Asst. Professor
Dept. of CSE College of Engg
Osmania University, Hyd

<u>**Invitees**</u>

1. Mrs. SUBHANI BEGUM, Assistant Professor Contract, Dept. of Informatics Nizam College
2. Mr. SHAIK TANVEER AHMED, Assistant Professor Contract, Dept. of Informatics Nizam College
3. Mr. O.SUBHASH CHANDER GOUD, Assistant Professor Contract, Dept. of Informatics Nizam College
4. Mr. M.PURNACHARY, Assistant Professor Contract, Dept. of Informatics Nizam College
5. Ms P.P. Parmeshwari, Assistant Professor Contract, Dept. of Informatics Nizam College

The Chairperson welcomed the members and Invitees.

The following resolutions were made:

B.Sc(M.P.AI&ML):

- Scheme and Syllabi of Semester I & II were discussed and approved.
- Semester III, IV, V & VI, Scheme is discussed and approved

BCA:

- It was resolved to follow the Osmania University syllabus for the course Mathematics foundation of Computer Science for semester I. And the syllabus was approved.

- It was resolved to follow the Osmania University syllabus for the course Introduction to Web Technology for semester I. And the syllabus was approved

- It was resolved to follow the Osmania University syllabus for the course Fundamentals of Probability and Statistics for semester II. And the syllabus was approved

- It was resolved to Replace Data Communication with Computer Networks as per Osmania University for semester II. And the syllabus was approved

The above resolutions were unanimously approved at the meeting.

Dean,
Faculty of Informatics
Osmania University

P.V-Sudha
16/6/2022

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Asst Professor
Dept. of CSE College of Engg
Osmania University, Hyd

S.Sravanthi
Chairperson
BOS Informatics
Nizam College
I/C. DEPARTMENT OF INFORMATICS
M.C.A, M.Sc (IS), B.C.A.
Nizam College, (Autonomous), O.U.,
Basheerbagh, Hyderabad-500 001

Attendance of Members attended to the BOS meeting **Thursday, 16 June 2022.**

S.No	Member's Name	Signature
1	P.V SUDHA Professor & Dean of Faculty of Informatics, UCE, OU	P.V.Sudha 16/6/2022.
2	Mr.VENKAT DAS BOS, IT Chairperson Dept Of CSE, OU	16/6/2022
3	Dr. B.SUJATHA, Assistant Professor, Dept of CSE, OU	23/06/2022
4	Mrs. S.SRAVANTHI Head BOS, Chairperson Dept of Informatics	S.S
5	Mr. T. RAMDAS NAIK Assistant Professor (contract)	
6	Ms. HUMERA SHAZIYA Assistant Professor (contract)	
7	Mrs. G.KAVITHA Assistant Professor (contract)	
8	Mr. Md. NAYEEM UDDIN Assistant Professor (contract)	Nayeem
9	ANANTH BHASKER, Software Developer, Wells Forgo	
10	T. JAYADEEP, Software Developer in Wird	
11	Mrs. SUBHANI BEGUM Assistant Professor (contract)	
12	Mr. SHAIK TANVEER AHMED Assistant Professor (contract)	
13	Mr. O.SUBHASH CHANDER GOUD Assistant Professor (contract)	
14	Mr. M.PURNACHARY Assistant Professor (contract)	
15	Mrs. P.P.PARAMESWARI Assistant Professor (contract)	

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN BACHELOR OF COMPUTER APPLICATIONS (BCA) for A.Y 2022-2023

Semester - I

Course Code	Course Title	Course Type	HrsPerWeek	Credits	Marks CIE+SEE	Duration CIE+SEE
BCA101	Environmental science	AECC-1	2T	2	10I+40E=50	30min+2hr
BCA102	English	CC-1A	4T	4	20I+80E=100	30min+3hr(T)
BCA103	Mathematical Foundations of Computer Science	CC-1B	4T	4	20I+80E=100	30min+3hr(T)
BCA104	Digital Principles	DSC-1A	4T	4	20I+80E=100	30min+3hr(T)
BCA105	Programming in C	DSC-1B	4T+2P=6	5	20I+80E=100T 0+50E=50P	30min+3hr(T) 0+2hr(P)
BCA106	Introduction to Web Technology	DSC-1C	4T+2P=6	5	20I+80E=100T 0+50E=50P	30min+3hr(T) 0+2hr(P)
BCA107	IT Workshop	DSC-1D	2P	1	0+50E=50P	0+2hr(P)
	Total		22T+6P=28	25	110I+590E=700	---

Semester - II

Course Code	Course Title	Course Type	HrsPerWeek	Credits	Marks CIE+SEE	Duration CIE+SEE
BCA201	Human Values and Ethics	AECC-2	2T	2	10I+40E=50	30min+2hr(T)
BCA202	English	CC-2A	4T	4	20I+80E=100	30min+3hr(T)
BCA203	Fundamentals of Probability and Statistics	CC-2B	4T	4	20I+80E=100	30min+3hr(T)
BCA204	Object Oriented Programming	DSC-2A	4T+2P=6	5	20I+80E=100T 0+50E=50P	30min+3hr(T) 0+2hr(P)
BCA205	Data Structures with CPP	DSC-2B	4T+2P=6	5	20I+80E=100T 0+50E=50P	30min+3hr(T) 0+2hr(P)
BCA206	Advanced Computer Networks	DSC-2C	4T	4	20I+80E=100T	30min+3hr(T) 0+2hr(P)
BCA207	Web Programming with PHP	DSC-2D	2P	1	0+50E=50P	0+2hr(P)
	Total		22T+6P=28	25	110I+590E=700	---

P.V. Sudheer

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Asst. Professor
Dept of CSE College of Engg
Osmania University, Hyd

NIZAM COLLEGE (AUTONOMOUS), HYDERABAD

Department of Environmental Studies

Syllabus w.e.f 2019-20

UNIT – I: Ecosystem, Biodiversity & Natural Resources

1. Definition, Scope & Importance of Environmental Studies.
2. Structure of Ecosystem – Abiotic & Biotic components Producers, Consumers, Decomposers, Food Chains, Food Webs, Ecological pyramids.
3. Function of an Ecosystem: Energy flow in the Ecosystem (Single channel energy flow model)
4. Definition of Biodiversity, Genetic, Species & Ecosystem diversity, Hot-spots of Biodiversity, Threats to Biodiversity, Conservation of Biodiversity (Insitu & Exsitu)
5. Renewable & Non- Renewable resources, Brief account of Forest, Mineral & Energy (Solar Energy & Geothermal Energy) resources.
6. Water Conservation, Rain water harvesting & Watershed management.

UNIT-II: Environmental Pollution, global Issues & Legislation

1. Causes, Effects & Control measures of Air Pollution, Water Pollution.
2. Solid Waste Management.
3. Global Warming & Ozone layer depletion.
4. III- Effects of Fire Works.
5. Disaster Management – floods, earthquakes & cyclones.
6. Environmental legislation :-
   a. Wild Life Protection
   b. Forest Act
   c. Water Act
   d. Air Act
7. Human Rights.
8. Women and Child Welfare.
9. Role of Information technology in environment and human health.

Co-ordinator
Environmental Science
Univ. College of Science
Osmania University, Hyderabad

Course Code	Course Title	Type	Hours /week		Cre-dits	Scheme of Examination			
			L	P		MaxMarks SEE	CIE	Duration(hrs) SEE	CIE
BCA102	**English**	CC-1A	4	-	4	80	20	3	1

Unit I

SHORT FICTION: "The Curb in the Sky" by James Thurber- PRONUNCIATION: Consonant sounds-GRAMMAR: Noun-VOCABULARY: Word roots, prefixes and suffixes-SPELLING: Commonly misspelt words- PUNCTUATION: Capitalisation CONVERSATION: Introducing yourself in a formal situation- READING PASSAGE: Chindula Yelamma-WRITING: Expansion of a sentence into a paragraph-SOFT SKILLS: Motivation and goal setting-VALUE ORIENTATION: Well begun is half done

Unit II

PROSE: "Happy People" by William Ralph Inge -PRONUNCIATION: Vowels: monophthongs-GRAMMAR: Pronoun-VOCABULARY: Word roots, prefixes, suffixes-SPELLING: Forming antonyms using un- and dis- PUNCTUATION: Capitalisation- CONVERSATION: Starting and sustaining a conversation - READING PASSAGE: The Million March-WRITING: Sequencing-SOFT SKILLS: Self confidence - VALUE ORIENTATION: Doubt is the beginning of wisdom

Unit III

POETRY: " A Psalm of Life" by Henry Wadsworth Longfellow-PRONUNCIATION: Vowels: diphthongs-GRAMMAR: Auxiliary verbs-VOCABULARY: Homonyms, homographs, homophones-SPELLING: Words ending in -tion and –sion, PUNCTUATION: Full stop and comma-CONVERSATION: Describing your college and course of study-READING PASSAGE: Bathukamma-WRITING: Descriptive writing-SOFT SKILLS: Non-verbal communication and body language-VALUE ORIENTATION: Actions speak louder than words

Unit IV

DRAMA: "The Dear Departed" (an extract) by Stanley Houghton-PRONUNCIATION: Letters with varied pronunciations-GRAMMAR: Main verbs and tenses VOCABULARY: Collocations-SPELLING: Words ending in -tion and –ment- PUNCTUATION: Question mark and exclamation mark-CONVERSATION: Leaving a voicemail, making an appointment over phone-READING PASSAGE: Husain Sagar-WRITING: Dialogue writing-SOFT SKILLS: Interpersonal skills-VALUE ORIENTATION: faith can move mountains

Suggested Reading:

English Made Easy- Editors: E. Suresh Kumar, Sumita Roy and A. Karunaker. Orient BlackSwan 2016.

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rge of Engineering, Osmania University,
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BCA SEM I – THEORY			Hours /week			Scheme of Examination			
Course Code	Course Title	Type	L	P	Credits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA103	Mathematical Foundations of Computer Science	CC-1B	4	-	4	80	20	3	30 Mins

UNIT- I

Fundamentals of Logic: Basic Connectives and Truth Tables, Logical Equivalence, Logical Implication, Use of Quantifiers, Definitions and the Proof of Theorems.

Set Theory and Properties of the Integers: Set and Subsets, Set Operations, and the Laws of Set theory, Counting and Venn Diagrams, Fundamental theorem of Arithmetic.

Relations and Functions: Cartesian Product, Functions onto Functions, Special Functions, Pigeonhole Principle, Composition and Inverse Functions. Principle of Inclusion and Exclusion.

UNIT–II

Generating Functions: Introductory Examples, Definition And Examples, Partitions of Integers.
Recurrence Relations: First – order linear recurrence relation, second – order linear homogenous recurrence relation with constant coefficients.

UNIT-III

Algebraic Structures: Algebraic System – General Properties, Semi Groups, Monoids, Homomorphism, **Groups:** Definition, Examples and Elementary properties, Residue Arithmetic.

UNIT -IV

Graph Theory: Definitions and examples, sub graphs, complements and graph Isomorphism, Vertex degree, Planar graphs, Hamiltonian paths and Cycles.
Trees: Definitions, properties and Examples, Rooted Trees, Spanning Trees and Minimum Spanning Trees.

Suggested Reading:
1. Mott Joe L Mott, Abraham Kandel, and Theodore P Baker, Discrete Mathematics for Computer Scientists & Mathematicians, Prentice Hall NJ, 2nd Edition, 2015.
2. Jr. P. Tremblay and R Manohar Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill, 1987.
3. R.K.Bisht and H.S.Dhami, Discrete Mathematics Oxford Higher Education, 2015

4. BhavanariSatyanarayana, TumurukotaVenkata Pradeep Kumar and ShaikMohiddin Shaw, Mathematical Foundation of Computer Science, BSP, 2016

28/06/2022

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Osmania University, Hyd-500 007

Asst. Professor
Dept. of CSE College of Engg,
Osmania University. Hvd

Course Code	Course Title	Type	Hours/week		Cre-dits	Scheme of Examination			
			L	P		MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA104	**Digital Principles**	DSC-1A	4	-	4	80	20	3	1

BCA SEM I – THEORY

Unit - I

Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates.

Unit - II

Minimization: K-Map Method – Table Method, POS - SOP, Don't Care Conditions, NAND, NOR Implementation.

Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

Unit - III

Synchronous Sequential Logic: Sequential Circuits - Latches, Flip-Flops, An analysis of Clocked Sequential Circuits, State Reduction and Assignment Design Procedure.

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

Unit - IV

Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and flow tables, Race free state assignment, Hazards, Design Example.

Suggested Reading:
1. M.Morris Mano, "Digital Design", 3rd edition, Pearson Education, Delhi, 2007.
2. Donald P Leech, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications", Tata Mc Graw Hill, 2007.

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Course Code	Course Title	Type	Hours /week		Cre-dits	Scheme of Examination			
			L	P		MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA105	Programming in C	DSC-1B	4	3	4+1=5	80(T) 25(P)	20(T) --	3 2	1 --

BCA SEM I – THEORY and PRACTICAL

Unit – I

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and Running Programs, Software Development, Flow charts.

Number Systems: Binary, Octal, Decimal, Hexadecimal

Introduction to C Language - Background, C Programs, Identifiers, Data Types, Variables, Constants, Input / Output Statements

Arithmetic Operators and Expressions: Evaluating Expressions, Precedence and Associativity of Operators, Type Conversions.

Unit - II

Conditional Control Statements: Bitwise Operators, Relational and Logical Operators, If, If-Else, Switch-Statement and Examples. Loop Control Statements: For, While, Do-While and Examples. Continue, Break and Goto statements

Functions: Function Basics, User-defined Functions, Inter Function Communication, Standard Functions, Methods of Parameter Passing. Recursion- Recursive Functions.

Storage Classes: Auto, Register, Static, Extern, Scope Rules, and Type Qualifiers.

Unit – III

Preprocessors: Preprocessor Commands. Arrays - Concepts, Using Arrays in C, Inter-Function Communication, Array Applications, Two- Dimensional Arrays, Multidimensional Arrays, Linear and Binary Search, Selection and Bubble Sort.

Pointers - Introduction, Pointers for Inter-Function Communication, Pointers to Pointers, Compatibility, L-value and R-value, Arrays and Pointers, Pointer Arithmetic and Arrays, Passing an Array to a Function, Memory Allocation Functions, Array of Pointers, Programming Applications, Pointers to void, Pointers to Functions, Command-line Arguments.

Unit - IV

Strings - Concepts, C Strings, String Input/Output Functions, Arrays of Strings, String Manipulation Functions.

Structures: Definition and Initialization of Structures, Accessing Structures, Nested Structures, Arrays of Structures, Structures and Functions, Pointers to Structures, Self Referential Structures, Unions, Type Definition (typedef), Enumerated Types.

Input and Output: Introduction to Files, Modes of Files, Streams, Standard Library Input/Output Functions, Character Input/Output Functions.

Suggested Reading:

1. B.A. Forouzan and R.F. Gilberg, *"A Structured Programming Approach in C"* , Cengage Learning, 2007
2. Kernighan BW and Ritchie DM, *"The C Programming Language"*, 2nd Edition, Prentice Hall of India, 2006.
3. Rajaraman V, *"The Fundamentals of Computer"*, 4th Edition, Prentice-Hall of India, 2006.

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C Lab Experiments:

1. Write programs using arithmetic, logical, bitwise and ternary operators.
2. Write programs simple control statements: Roots of a Quadratic Equation.
3. Reversing digits.
4. Printing multiplication tables,
5. Armstrong numbers.
6. Checking for prime.
7. Sin x and Cos x values using series expansion
8. Conversion of Binary to Decimal, Octal, Hexa and Vice versa
9. Generating a Pascal triangle and Pyramid of numbers
10. Recursion: Factorial.
11. Recursion: Fibonacci.
12. Finding the maximum, minimum, average and standard deviation of given set of numbers using arrays
13. Reversing an array, removal of duplicates from array
14. Matrix addition
15. Matrix Multiplication.
16. Matrix transpose using functions
17. String Functions: inputting and outputting string , using string functions such as strlen(), strcat( ),strcpy( )………etc
18. Writing a simple program for strings without using string functions.
19. Finding the no. of characters, words and lines of given text file
20. File handling programs: student memo printing

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BCA SEM I – THEORY and PRACTICAL			Hours /week			Scheme of Examination			
Course Code	Course Title	Type	L	P	Cre-dits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA106	**Introduction to Web Technology**	DSC-1C	4	3	4+1=5	80(T) 50(P)	20(T) --	3 2	1 --

Unit – I

Introduction to World Wide Web: Web Browsers, Web Servers, Uniform Resource Locators, HTTP. HTML5: Introduction, HTML5 Tags, Links, Images, Multimedia, Lists, Tables, Creating Forms, Styling Forms, Frames.

Unit - II

Dynamic HTML: Cascading Style Sheets, Inline Styles, Style Elements, External Style Sheets, Object Model and Collections – Object Referencing, Collections, Children Frames, Navigator Objects Event Model: ONCLICK, ONLOAD, ONERRORS, ONMOUSEMOVE, ONMOUSEOVER, ONMOUSEOUT, ONFOCUS, ONBLUR, ONSUBMIT ,Error Handling.

Unit - III

Introduction to Java script: Java Script and Forms Variables, Functions, Operators, Conditional Statements and Loops, Arrays DOM, Strings, Java Script Closures, Event and Event Handling.

Unit - IV

Introduction to XML: XML document structure, Document Type Definition, XML Schemas.
Angular JS: Introduction to Angular JS , Expressions, Modules, Directives, Controller.
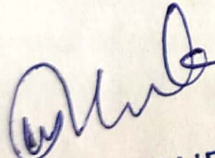
Suggested Reading:
1. Robert W.Sebesta, Programming the World Wide Web, 3rd Edition, Pearson Education, 2006
2. Wendy Willard, HTML5, McGraw Hill Education (India) Edition, 2013
3. John Pollock, Java Script, 4th Edition, McGraw Hill Education (India) Edition, 2013
4. NG   –Book, The Complete book on AngularJS by Ari lerner

16/6/2022

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Web Tehnology Experiments

1. Creating HTML Page using Formatting Tags & Headers
2. Creating HTML Page Ordered and Unordered List
3. Creating HTML Page using Linking Images
4. Creating HTML Page using Table Formatting
5. Creating HTML Page using Images as Anchors
6. Creating HTML Page using Multimedia
7. Creating HTML Page using Frames
8. Demonstrate Internal CSS
9. Demonstrate Embedded CSS
10. Demonstrate External CSS
11. Develop HTML form Using various controls
12. Develop HTML form with mobile validation using Java Script
13. Methods of date and time objects
14. Demonstrating object hierarchy using collection
15. Develop HTML Page Using Mouse Events
16. Develop HTML page to find factorial of a given number using Java Script
17. Develop Time Table using HTML5 and CSS
18. Write basic XML program on DTD
19. Write basic XML program on XML Schema
20. Develop a simple program using Angular Js

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BCA SEM I – PRACTICAL		Hours /week			Scheme of Examination			
Course Code	Course Title	Type	L	P	Cre-dits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA107	IT Workshop	DSC-1D	-	3	1	25	--	2	--

1. System Assembling , Disassembling and identification of Parts / Peripherals
2. Operating System Installation – Install Operating Systems like Windows, Linux along with necessary Device Drivers.
3. Introducing to programming Environment(Linux commands, editing tools such as vi editor, sample program entry, compilation and execution)
4. MS-Office / Open Office
   a. Word – Formatting Page Borders, Reviewing Equations, symbols
   b. Spread Sheet – organize data, usage of formula graphs charts
   c. Power point – features of power point, guidelines for preparing an effective presentation
   d. Access – creation of database, validate data
5. Network Configuration & Software Installation: Configuring TCP/IP, proxy and firewall settings. Installing application software system software & tools.
6. Internet and World Wide Web-Search Engines. Types of search engines, netiquette, Cyber hygiene.
7. Trouble Shooting – Hardware trouble shooting, Software trouble shooting.

Suggested Reading:

1. K. L. James, Computer Hardware, Installation, Interfacing Troubleshooting and Maintenance, Eastern Economy Edition.
2. Gary B.Shelly, Misty E Vermaat and Thomas J. Cashman, Microsoft Office 2007 Introduction Concepts and Techniques, Windows XP Edition, 2007, Paperback.
3. Leslie Lam port, LATEX-User"s Guide and Reference manual, Pearson, LPE, 2nd Edition.
4. Rudraprathap, Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers, Oxford University Press, 2002.
5. Scott Mueller"s, Upgrading and Repairing PCs, 18th Edition, Scott. Mueller, QUE, Pearson, 2008.
6. Cherry A Schmidt, The Complete Computer Upgrade and Repair Book, 3rd Edition, Dream tech.
7. Vikas Gupta, Comdex Information Technology Course Tool Kit, WILEY Dream tech.

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NIZAM COLLEGE

DEPARTMENT OF SOCIOLOGY

HUMAN VALUES AND ETHICS

(02 CREDITS)

B.A./B.COM. – I SEMESTER – B.Sc. - II SEMESTER

UNIT – I Definition, Nature and Scope of Ethics; Concept, Definition and Nature of Values; Religious, Cultural and Constitutional Values (Fundamental Duties and Rights, Directive Principles)

UNIT – II Family Values – Role of Family in Character Development; Structure and Functions of Family – Changes and Emerging Trends

UNIT – III Life Skills – The Need for Life Skills during Teenage; Life Skills Perspective; Coping with Life Stresses; Suicidal Tendencies and Peer Pressure

UNIT – IV Environmental Ethics; Professional Ethics (Media, Medical, Public Sector, Business, Legal Ethics, Engineering)

BCA SEM II – THEORY			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA202	**English**	CC-2A	4	-	4	80	20	3	1

Unit - I

SHORT FICTION: " A Visit of Charity" by Eudora Welty-PRONUNCIATION: Plosive-GRAMMAR: Non-finite verbs- VOCABULARY: Simile and metaphor SPELLING: Use of ie and ei - PUNCTUATION: Semicolon -CONVERSATION: Asking for information- READING PASSAGE: Hyderabad-WRITING: Notemaking-SOFT SKILLS: Time management-VALUE ORIENTATION: Time and tide wait for no one

Unit - II

PROSE: "Benares" by Aldous Huxley-PRONUNCIATION: Fricative -GRAMMAR: Adjective-VOCABULARY: Oxymoron and hyperbole-SPELLING: Words ending in -able or -ible-PUNCTUATION: Colon and em-dash-CONVERSATION: Requests-READING PASSAGE: Burrakatha-WRITING: Informal letters- SOFT SKILLS: Leadership-VALUE ORIENTATION: The pen is mightier than the sword

Unit - III

POETRY: 'Stanzas Written in Dejection, Near Naples' by Percy Bysshe Shelley-PRONUNCIATION: Affricate and nasal-GRAMMAR: Article- VOCABULARY: Portmanteau words and loan words- SPELLING: Words ending in -al, -ance, -ence, - ic, -ity, and-ive -PUNCTUATION: Hyphen - CONVERSATION: Conducting a meeting- READING PASSAGE: 'Flower boat' by Sunkara Ramesh-WRITING: Formal letters-SOFT SKILLS: Stress management-VALUE ORIENTATION: Practice makes perfect

Unit - IV

DRAMA: Shakespeare Retold: Julius Caesar (extract)- PRONUNCIATION: Approximant-GRAMMAR: Adverb-VOCABULARY: Palindromes-SPELLING: Derived forms of words-PUNCTUATION: Inverted comma-CONVERSATION: Interview skills- READING PASSAGE: The handicrafts of Telangana-WRITING: Formal letters-SOFT SKILLS: Etiquette and grooming-VALUE ORIENTATION: Necessity is the mother of invention.

Suggested Reading:

English Made Easy- Editors: E. Suresh Kumar, Sumita Roy and A. Karunaker. Orient BlackSwan 2016.

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BCA SEM II – THEORY			Hours /week			Scheme of Examination				
Course Code	Course Title	Type	L	P	Cre-dits	MaxMarks		Duration(hrs)		CIE
						SEE	CIE	SEE		
BCA203	**Fundamentals of Probability and Statistics**	CC-2B	4	-	4	80	20	3		1

UNIT-I

Introduction: Importance of Statistics, Concepts of Statistics, population and a sample; quantitative and qualitative data; Collection of Primary and Secondary data; Classification and Tabulation of data, Diagrammatic and Graphical representation of data.

Descriptive Statistics: Measures of central tendency: Arithmetic Mean, Median, Mode, Geometric mean, Harmonic mean; Measures of Dispersion:Range, Quartile deviation, Mean deviation, Standard deviation.Definition of Moments; Measures of Skewness: Karl pearson's coefficient of skewness, Bowley's coefficient of skewness; Kurtosis.

UNIT-II

Probability: Basic terminology, Mathematical probability, Statistical probability, Axiomatic approach to probability, Theorems on probability.
Conditional Probability, Multiplication theorem of probability, Independent events, Bayes' Theorem.

UNIT-III

Random variable: Definition of a random variable, discrete and continuous random variables, functions of random variables, probability mass function and probability density function and mathematical expectation of a random variable and properties of expectation.
Probability Distributions: Binomial, Poisson and Normal Distribution.

UNIT-IV

Correlation and Regression analysis: Definition of correlation,Karl Pearson's Coefficient of correlation; Definition of Regression, Simple Linear Regression (for 2 variables).
Small Sample Tests: Basic Definitions of testing of hypothesis;**t-Test:** t-test for single Mean, t-test for difference of Means, **CHI-SQUARE Test:**test for single variance(population variance)and test of independence of attributes.

Suggested Reading:
1. William Feller: Introduction to Probability theory and its applications, (Vol-I), Wiley.
2. V. K. Kapoor and S. C. Gupta: Fundamentals of Mathematical Statistics, Sultan Chand & Sons, New Delhi.
3. A.M. Gun, M.K. Gupta, B.Dasgupta, "Fundamentals of Statistics", Vol-1, the world press Pvt.Ltd.,Kolakota.
4. William Mendenhall, Robert J. Beaver, Barbara M.. Beaver, "Introduction to Probability and Statistics", Thomson Brooks / Cole, Eleventh Edition, 2003.
5. Richard A. Johnson, "Probability and Statistics for Engineers", Prentice Hall of India, Seventh Edition 2005.

CHAIRMAN022
Board of Studies (IT)
Dept. of Computer Science & Engg.
University College of Engineering.
Osmania University, Hyd-500 007

23/06/2022
Asst. Professor
Dept of CSE College of Engg
Osmania University, Hyd

BCA SEM II – THEORY and PRACTICAL			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Cate-gory	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA204	**Object Oriented Programming**	DSC-2A	4	3	4+1= 5	80(T) 25(P)	20(T) --	3 2(P)	1 --

Unit - I

Introduction to OOP: Procedure oriented programming, object oriented programming, basic concepts of OOP, benefits and applications of OOP, simple C++ program, namespace scope, structure of C++ Program, creating, compiling and linking a file.

Tokens : Keywords, identifiers, constants, basic data types, user defined data types, storage classes, derived data types, dynamic initialization of variables, reference variables, operators in C++, scope resolution operator, member dereferencing operators, memory management operators.

Unit - II

Control Structures: if, if...else, elseif ladder, nested if, switch, for, while, do...while, break, continue, exit, goto.

Functions in C++: Main function, function prototyping, call by reference, return by reference, inline functions, default arguments, Function overloading.

Classes and Objects: Specifying a class, defining member functions, C++ program with class, private member functions, arrays within class, memory allocation for objects, static data members, static member functions, arrays of objects, returning objects.

More about Functions: friend function, a function friendly to two classes, objects as function arguments.

Unit - III

Constructors & Destructors: Constructors, parameterized constructors, multiple constructors in a class, constructors with default arguments, copy constructors, dynamic constructors, destructors.

Inheritance: Introduction to inheritance, single inheritance, multi-level inheritance, multiple inheritance, hierarchical inheritance, hybrid inheritance.

Operator Overloading: Rules for overloading operators, overloading unary operators, overloading binary operators.

Pointers: Introduction to pointers, declaring and initializing pointers, arithmetic operations on pointers, pointers with arrays, arrays of pointers, pointers to objects, 'this' pointer.

Unit - IV

Polymorphism and Virtual Functions: Compile-time polymorphism, runtime polymorphism, virtual functions.

Templates: Introduction, function templates, class templates.

Exception Handling: Introduction, exception handling mechanism, throwing mechanism, catching mechanism.

Suggested Reading:
1. E. Balagurusamy, Object Oriented Programming with C++, 6/e, McGraw Hill, 2013.
2. Behrouz A. Forouzan and Richard F. Gilberg, Computer Science: A Structured Approach Using C++, 2/e, Cengage Learning, 2003.
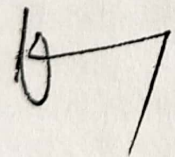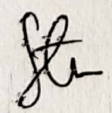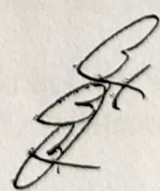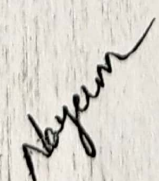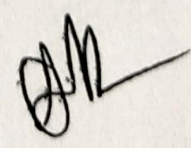
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3. Ashok N. Kamthane, Object Oriented Programming with ANSI and Turbo C++, 1/e, Pearson Education, 2006.

CPP Experiments

1. Write a program to perform arithmetic operations using functions.
2. Write a program on call by value and call by reference using functions.
3. Write a program on inline functions.
4. Write a program to implement function overloading.
5. Write a program to implement a class for student.
6. Write a program to implement friend function.
7. Write a program to implement friend function to two classes.
8. Write a program to implement different types of constructors.
9. Write a program to implement a destructor.
10. Write a program to implement multi-level inheritance.
11. Write a program to implement multiple inheritance.
12. Write a program to implement hierarchical inheritance.
13. Write a program to implement hybrid inheritance.
14. Write a program to implement unary operator.
15. Write a program to implement binary operator.
16. Write a program to implement this pointer.
17. Write a program to implement virtual functions.
18. Write a program to implement function template.
19. Write a program to implement class template.
20. Write a program to implement exception handling.

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Computer Science & Engineering
College of Engineering, Osmania University,
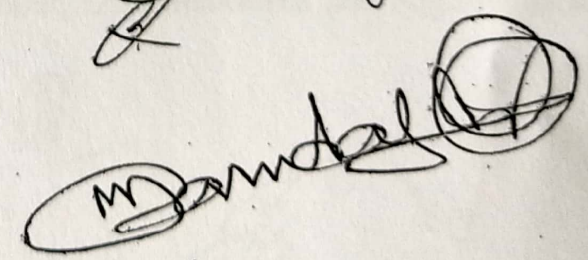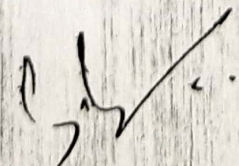HYDERABAD - 500 007.

BCA SEM II – THEORY and PRACTICAL		Type	Hours /week		Cre-dits	Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title		L	P		SEE	CIE	SEE	CIE
BCA205	**Data Structures with CPP**	DSC-2B	4	3	4+1 5	80(T) 25(P)	20(T) --	3 2	1 --

Unit-I

Introduction to Data Structures: Definition, Uses, Types.
Arrays: Abstract Data Types and the C++ Class, Array as an Abstract Data Type, Representation of Arrays, Matrices, Special Matrices Sparse Matrices, Strings.

Unit-II

Stacks and Queues: Representation of Stacks, Representation of Queue, Operations on Stacks, Operations on Queues, Types of Queues.
Linked Lists: Singly Linked Lists, Doubly Linked Lists, Circular Lists.

Unit-III

Hashing: Static Hashing, Hash Tables, Hash Functions, Overflow Handling.
Trees: Introduction, Binary Trees, Representation of Binary Tree, Binary Tree Traversal, Binary Search Tree, Operations on Binary Search Tree, Heap tree, B-tree.

Unit-IV

Graphs: Terminology, Types, Representation of Graph, Elementary Graph operations - DFS and BFS.
Sorting: Bubble, Selection, Insertion sort, Quick sort, Merge sort, Heap sort, shell sort.
Searching Techniques: Linear Search, Binary Search

Suggested Reading:

1. Ellis Horowitz, Dinesh Mehta, S. Sahani. Fundamentals of Data Structures in C++, Universities Press. 2007.
2. Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education 2006.
3. Michael T. Goodrich, Roberto Tamassia, David Mount, Data Structures and Algorithms in C++, Wiley India Pvt. Ltd, 2004.

P. V.
HEAD
Department of
Computer Science & Engineering
llege of Engineering, Osmania University,
HYDERABAD - 500 007.

Data Structures Experiments:

1. Write a C++ program for the implementation of Array.
2. Write a C++ program for the implementation of Special Matrices.
3. Write a C++ program for the implementation of Sparse Matrices.
4. Write a C++ program for the implementation of String.
5. Write a C++ program to implement the Stack using array.
6. Write a C++ program to implement the Queue using array.
7. Write a C++ program to implement the single linked list.
8. Write a C++ program to implement the doubly linked list.
9. Write a C++ program to implement the Circular linked list.
10. Write a C++ program to implement stack using linked list.
11. Write a C++ program to implement queue using linked list.
12. Write a C++ program to implement operations on a binary tree. .
13. Write C++ program to implement Bubble sort.
14. Write C++ program to implement Selection sort.
15. Write C++ program to implement Insertion sort.
16. Write C++ program to implement Quick sort.
17. Write C++ program to implement Shell Sort.
18. Write C++ program to implement Merge Sort.
19. Programs on Linear Search.
20. Programs on Binary Search.

P. V. Sudha

HEAD
Department of
Computer Science & Engineering
of Engineering, Osmania University,
HYDERABAD - 500 007.

BCA SEM II – THEORY		Hours /week			Scheme of Examination				
Course Code	Course Title	Cate-gory	L/T	P	Cre-dits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA206	Advanced Computer Networks	DSC-2C	4	-	4	80	20	3	30min

Unit - I

Network Architecture, Performance: Bandwidth and Latency, High Speed Networks, Network-Centric View, Error Detection, Reliable Transmission, Ethernet and Multiple Access Networks, **Overlay Networks**: Routing Overlays, Peer-to-Peer Networks and Content Distribution Networks, Client-Server Networks, Delay-Tolerant Networks.

Unit - II

Switching: Circuit-Switched Networks, Datagram Networks, Virtual-Circuit Networks, Message-Switched Networks, **Asynchronous Transfer Mode:** Evolution, Benefits, Concepts, Exploring Broadband Integrated Services Digital Network, Layer and Adaptation Layer.**Optical Networking**: SONET/SDH Standards, **Traffic Engineering**: Requirement, Traffic Sizing, Characteristics, Protocols, Time and Delay Considerations, Connectivity, Availability, Reliability and Maintainability and Throughput.

Unit - III

IPv4: Address Space, Notations, Classful, Classless, Network Address Translation, Datagram, Fragmentation and Checksum **IPv6 Addresses**: Structure, Address Space, Packet Format and Extension Headers, ICMP, IGMP, ARP, RARP. **Internetworking**: Intra-Domain and Inter-Domain Routings, Unicast Routing Protocols: RIP, OSPF and BGP, **Multicast Routing Protocols**: DVMRP, PIM-DM, PIM-SM, CBT, MSDP and MOSPF, Spanning Tree Algorithm.

Unit – IV

Congestion Control and Resource Allocation: Congestion Control and Resource Allocation: Problem, Issues, Queuing, TCP, Congestion Control, Congestion-Avoidance Mechanisms and Quality of Service.**Domain Name System**: Name Space, Domain Name Space, Distribution, Domains, Resolutions and Dynamic Domain Name System, SNMP, **Security:** IPSec, SSL/TLS, PGP and Firewalls, Datacenter Design and Interconnection Networks.

Text Books/Reference Books/Online Resources:

1. Larry L. Peterson and Bruce S. Davie, Computer Networks: A System Approach, Fifth Edition, Morgan Kaufmann, Elsevier, 2012.

2. Behrouz A. Forouzan, Data Communications and Networking, McGraw Hill, Fifth Edition, 2017.

3. Chwan-Hwa (John) Wu, J. David Irwin, Introduction to Computer Networks and Cyber Security, CRC press, Taylor & Francis Group,2014

4. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, Pearson, 5th Edition, 2014. 5. G. Wright and W. Stevens, TCP/IP Illustrated, Volume 1 and Volume 2, Addison-Wesley, 1996.

6. Dayanand Ambawade, Deven Shah, Mahendra Mehra and Mayank Agarwal, Advanced Computer Network, Dreamtech Press, 2016. 7. R. Srikant, The Mathematics of Internet Congestion Control, Springer, 2004. 8. J. L. Boudec and P. Thiran, Network Calculus, Springer, 2011.

P. V. Sudha
Dean,
Faculty of Informatics
Osmania University

CHAIRMAN
Board of Studies (IT)
Dept. of Computer Science & Engg
University College of Engineering
Osmania University, Hyd-500 0...

Asst. Professor
Dept of CSE College of Engg.
Osmania University, Hyd

BCA SEM II – PRACTICAL			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA207	Web Programming with PHP	DSC-2D	-	3	1	25	--	2	--

PHP Experiments

1. Introduction to Web server and Server side programming using PHP.
2. Create a PHP Webpage and print "Hello World" using echo and print.
3. Addition of two numbers.
4. Find whether a number is odd or Even.
5. Maximum of three numbers.
6. Swapping of two numbers.
7. Printing 1 to 10 using while loop
8. Printing of Mathematical Table using for loop.
9. Printing of 10 to 1 using for each loop.
10. Program to find whether a number is prime or not.
11. Program on gettype() and settype() functions.
12. Program on isset() and unset() functions.
13. Program on strval() floatval() and intval() functions.
14. Program on print_r() and var_dump() functions.
15. Program on substr() functions.
16. Program on strcmp() functions.
17. Program on strcasecmp() functions.
18. Program on strpos() functions.
19. Program on sizeof(), is_array(), and in_array().
20. Program on associative array.

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Department of
puter Science & Engineering
Engineering, Osmania University,
HYDERABAD - 500 007.

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PROPOSED SCHEME FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA) for A.Y 2020-2021

				Semester - IV			
Course Code	Course Title	Course Type	HrsPerWeek	Credits	Marks CIE+SEE		Duration
BCA401	Disaster Management	SEC-2	2T	2	10I+40E=50		30min+2hr
BCA402	Distributed and Cloud Computing	ETC-4A	4T	4	20I+80E=100		1hr+3hr
BCA403	Artificial Intelligence	ETC-4B	4T	4	20I+80E=100		1hr+3hr
BCA404	Data Science using Python	DSC-4A	4T+3P=7	5	20I+80E=100T 0+50E=50P		1hr+3hr(T) 0+3hr(P)
BCA405	Software Engineering	DSC-4B	4T+3P=7	5	20I+80E=100T 0+50E=50P		1hr+3hr(T) 0+3hr(P)
BCA406	Computer Networks	DSC-4C	4T+3P=7	5	20I+80E=100T 0+50E=50P		1hr+3hr(T) 0+3hr(P)
	Total		22T+9P=31	25	110I+590E= 700		---

Course Title: Professional Elective P.E

	Abbreviations
GE	Generic Elective
DSC	Discipline Specific Course
ETC	Emerging Technological Course
DSE	Discipline Specific Elective
SEC	Skill Enhancement Course
AECC	Ability Enhancement Compulsory Course
T / P	Theory / Practical
CIE	Continuous Internal Evaluation
SEE	Semester End Evaluation
I/E	Internal / External

HEAD
Department of
Computer Science & Engineering
College of Engineering, Osmania University
HYDERABAD - 500 007.

CHAIRMAN
Board of Studies (IT)
Computer Science & Engg.
University College of Engineering,
Osmania University, Hyd-500 007.

Asst. Professor
Dept of CSE College of Engg.
Osmania University, Hyd

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BCA SEM III – THEORY			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA301	Professional Excellence	SEC-1	2	-	2	40	10	2	30 mins

Communication Competence for Computer Professionals:

Unit I

Basics of communication, Barriers of communication, Benefits of communication, Verbal of communication, Non- Verbal of communication, Interpersonal communication, JAM & GDs, Extempore , Ethics & Etiquette
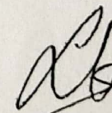
Unit II

Values, Morals, thinking, Planning, Decision Making, Critical thinking, Time management, Wit & Wisdom

Reference Books: 1. Inspiring Speeches and lives by Prof. Yadava Raj and Murali Krishna
2. The story of English in India by N. Krishnaswamy
3. Business etiquette by David Robinson
4. Mastering Motivation by Frazer John
5. Time Management by Treacy Declan

DEPARTMENT OF INFORMATICS
M.C.A, M.Sc (IS), B.C.A.
zam College, (Autonomous), O.U.,
Basheerbagh, Hyderabad-500 001.

(A. SRINIVAS)
Asst. Prof. of English
Nizam College, O.U.

CHAIRMAN
Board of Stu es (IT)
Dept. of Computer Science & Engg.
University College of Engineering,
Osmania University, Hyd-500 007.

BCA SEM III – THEORY			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA303	Applied Mathematics - I	BSC	4	-	4	80	20	3	1

Unit I

Partial Differentiation: Introduction - Functions of two variables - Neighbourhood of a point (a, b) - Continuity of a Function of two variables, Continuity at a point - Limit of a Function of two variables - Partial Derivatives - Geometrical representation of a Function of two Variables - Homogeneous Functions.

Unit II

Theorem on Total Differentials - Composite Functions - Differentiation of Composite Functions - Implicit Functions - Equality of fxy(a, b) and fyz(a, b) - Taylor's theorem for a function of two Variables - Maxima and Minima of functions of two variables.

Unit III

Vector Spaces: vector spaces and subspaces- Null Spaces, Column Spaces, and –Linear Transformations, Linearly Independent and Dependent Sets – Bases – Coordinate System,

Unit IV

The Dimension of a Vector Space – Rank – Change of Basis – Eigen Values and Eigen Vectors – The Characteristic Equations – Determinants

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TextBooks:

1. Shanti Narayan, P.K. Mittal Differential Calculus, S.CHAND, NEW DELHI
2. David C Lay, Linear Algebra and its Applications

References:

1. S Lang, Introduction to Linear Algebra, Spring New York 2012
2. Gilbert Strang, Linear Algebra and its Applications, Thomson Learning Inc. , London
3. Joseph Edwards , Differential calculus for beginners
4. Hari Kishan, Differential Calculus

BCA SEM III – THEORY			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA302	**Computer Architecture**	DSC-3A	4	–	4	80	20	3	1

UNIT I

Basic Structure of Computers

Functional units, Basic operational concepts, Bus structures, Software performance, Memory locations and addresses, Memory operations, Instruction and instruction sequencing, Addressing modes, Assembly language, Basic I/O operations.

UNIT II

Basic Processing Unit

Fundamental concepts, Execution of a complete instruction, Hardwired control, Microprogrammed control, Pipelining, Basic concepts, Data hazards, Instruction hazards, Influence on Instruction sets, Data path and control consideration.

UNIT III

Memory System

Basic concepts, Semiconductor RAMs, ROMs, Speed, size and cost, Cache memories, Performance consideration, Virtual memory, Memory Management requirements, Secondary storage.

UNIT IV

I/O Organization

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

Suggested Reading:

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition "Computer Organization", McGraw-Hill, 2002.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.
3. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware software interface", 2nd Edition, Morgan Kaufmann, 2002.
4. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill, 1998.

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BCA SEM III – THEORY and PRACTICAL		Hours /week			Scheme of Examination			
					MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA304	Java Programming	DSC-3B	4	3	4+1=5	80(T) 50(P)	20(T) --	3 3	1 --

Unit I

OOPS concepts, History of java, Features of java, data types, variables, scope and lifetime of variables, operators, expressions, control statements, type conversion and casting. Defining classes, adding objects & methods, Access Modifiers, Method Overloading, Constructors, Constructor Overloading, use of this, static, final keywords, Arrays-How to create and define.

Unit II

String, StringBuffer classes. Inheritance- basics, Super class object, subclass, member access rules, super uses, Method Overriding, Abstract Classes. Interfaces - Defining and Implementing an Interface, Differences between Classes and Interfaces, Extending interfaces. Packages- Defining, Creating and Accessing a Package, importing packages.

Unit III

Exception handling- Concepts and benefits of exception handling, usage of try, catch, throw, throws and finally, java's built in exceptions. Multi-threading- Difference between multi-threading and multi-tasking, thread lifecycle, Creating threads. Basic I/O- Streams- Byte Streams & Character Streams, Reading Console Input.

Unit IV

AWT- Introduction, the AWT class hierarchy, AWT controls - Buttons, Labels, TextField, Checkbox, Layout Managers. Event handling- Event delegation model, Events, Event classes, Event Sources. Introduction to Swings, Collection Framework. Applet- Introduction, Lifecycle methods, drawing graphics in applet.

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Suggested readings

1. Java The Complete Reference, 8th Edition, Herbert Schildt, Tata McGraw Hill Publications.
2. Understanding OOP with java, updated edition, T.Budd, Pearson education.
3. The Java Programming Language, K.Arnold and J.Gosling.
4. Core Java Volume-I Fundamentals , Cay S. Horstmann, Gary Cornell

Java Programming Lab Programs

1. Programs on if-else, if-else-if
2. Program on switch
3. Program on while
4. Program on for loop
5. Program on do-while
6. Program to demonstrate class concept.
7. Program to demonstrate methods
8. Program to demonstrate method overloading
9. Program to demonstrate constructors
10. Program to demonstrate constructor overloading
11. Program to demonstrate an Array
12. Program to demonstrate multidimensional array
13. Program to demonstrate Strings
14. Program to demonstrate inheritance
15. Program to demonstrate method overriding
16. Program to demonstrate abstract class
17. Program to demonstrate reading console input
18. Program to demonstrate interfaces
19. Program to demonstrate packages
20. Program to demonstrate exceptional handling
21. Program to demonstrate creating a thread by extending Thread class
22. Program to demonstrate creating a thread by implementing Runnable interface
23. Program to demonstrate AWT controls
24. Program to demonstrate Layout Manager
25. Program to demonstrate Events
26. Program to demonstrate applets

BCA SEM III – THEORY and PRACTICAL		Hours /week			Scheme of Examination			
					MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA305	Database Design	DSC-3C	4	3	4+1=5	80(T) 50(P)	20(T) --	3 3	1 --

Unit I

Database System Architecture, overview on database concepts, definitions, Types of databases and models, Advantages and limitations of database, Range of database applications, components of database, data abstraction, data independence, three schema Architecture, database development process, Data Manipulation Language, Data Definition Language. Data Models: E-R Models, Entities, Types of Entities, Attributes, Keys, Relationships, Degree of Cardinality. Enhanced E -R Model: Super type, sub type, specialization, Generalization, super type/ subtype hierarchies, constraints.

Unit II

Relation Model: Definition, Integrity constraints, Transforming EER diagram into relations, merging relations. Normalization: Functional dependencies, normal forms 1NF, 2NF, 3NF, 4NF, BCNF, SQL: Queries, constraints, Set Operators, Aggregate Operators, Procedures and functions, Triggers.

Unit III

Transaction Management: ACID Properties, Transaction and schedules, concurrent execution of transactions, Lock-Based concurrency control, 2PL, Deadlock and dealing with deadlocks. Database Security: Challenges in database security, Authentication, Authorization, Access control DAC and MAC, intrusion detection, Backup and Recovery.

Unit IV

Parallel and Distributed Databases – Introduction, Architectures for Parallel Databases, Introduction to Distributed Databases, Types of Distributed Databases, Distributed DBMS Architectures, Client-Server Systems, Collaborating Server Systems, Middleware Systems.

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Suggested Readings

1. Raghu Ramakrishnan, Johannes Gehrke, "Database Management System", Third Edition
2. Fred R Me Fadden. Jeffrey A Hoffer, Mary B Prescott- Modern Database Management, fifth edition, Addition Wesly 1999

DBMS Lab Experiments

1. Create command for creating a table using primary key
2. Alter command for altering the column name and datatype of a column in the table
3. Alter command to add new column to the existing table
4. Alter command to modify the existing name of the column in the table
5. Drop command of the table
6. Truncate command for the table
7. Insert command for storing the records in the database table
8. Update command for updating a particular record by using where clause
9. Delete command for removing a particular record from the table
10. Select command for selecting data from the table
11. Select command for selecting the specific data from the data by using where clause and select distinct statement
12. Select command for selecting the records by using ORDER BY clause ASC
13. Select command for selecting the records by using ORDER BY clause DESC
14. SQL Built in functions (MIN. MAX, COUNT, AVG, SUM)
15. SQL Query to perform AND Operator and OR Operator
16. SQL Query to perform GROUPBY Clause
17. SQL Query to perform HAVING Clause
18. SQL Queries to perform integrity constraints
19. SQL Query to perform SQL BETWEEN Operator
20. Joins – Equi Join, Non-Equi Join, Outer Join and Self Join
21. Stored Procedures
22. Triggers

BCA SEM I – THEORY and PRACTICAL			Hours /week			Scheme of Examination			
Course Code	Course Title	Type	L	P	Cre-dits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA306	Operating System Concepts	DSC-3D	4	3	4+1=5	80(T) 50(P)	20(T) --	3 3	1 --

Unit I

Introduction: Definition, Computer system Architecture, Operating system Architecture, Operating system services, Types of Operating systems, System Calls, Types of System calls Process and Threads: Process concept, Process scheduling, Operations on process, inter process communication, Threads, Multithreading models, threading issues

Unit II

CPU Scheduling: Scheduling criteria, scheduling algorithms, Process Synchronization: Critical section problem, Mutex Locks, Hardware mutex, Semaphores, Classical problem of synchronization Deadlock: definitions, Deadlock Prevention, Deadlock Avoidance, Deadlock detection, Recovery from deadlock.

Unit III

Main Memory: swapping, contiguous memory allocation, Segmentation, Paging, structure of page tables. Virtual Memory: Demand Paging, Page replacement, Allocations of frames, Thrashing, Memory Mapped files, Mass storage structure, Disk structure, Disk attachment and disk scheduling, Disk formatting.

Unit IV

File System Implementation: File system structure, File system Implementation, Directory Implementation, Allocation methods, Free-Space Management, Efficiency and Performance. Protection and Security: Goals of protection, Principles of protection, Security problem, Program threats, System and network threats, Cryptography as a security tool, User Authentication.

Suggested Readings

1. Abraham Silberschatz, Peter Galvin, Greg Gagne, "Operating system concepts", Ninth edition, john wiley and sons publication 2013
2. William stallings, "Operating Systems", fifth edition, Pearson Education, 2005.
3. A.Tanenbaum, " Modern Operating Systems", Third Edition, Pearson Edeucation, 2008

OS Lab practical programs

1. Process System Calls
2. IO System Calls
3. IPC using Pipe Processing
4. First Come First Serve Scheduling
5. Shortest job first Scheduling
6. Priority Scheduling
7. Round Robin Scheduling
8. Simulate Page Replacement Algorithms FIFO
9. Simulate Page Replacement Algorithms LRU
10. Simulate Page Replacement Algorithms OPTIMAL

PROPOSED SCHEME FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA) for A.Y 2020-2021

Semester - IV

Course Code	Course Title	Course Type	HrsPerWeek	Credits	Marks CIE+SEE	Duration
BCA401	Disaster Managment	SEC-2	2T	2	10I+40E=50	30min+2hr
BCA402	Distributed and Cloud Computing	ETC-4A	4T	4	20I+80E=100	1hr+3hr
BCA403	Artificial Intelligence	ETC-4B	4T	4	20I+80E=100	1hr+3hr
BCA404	Data Science using Python	DSC-4A	4T+3P=7	5	20I+80E=100T 0+50E=50P	1hr+3hr(T) 0+3hr(P)
BCA405	Software Engineering	DSC-4B	4T+3P=7	5	20I+80E=100T 0+50E=50P	1hr+3hr(T) 0+3hr(P)
BCA406	Computer Networks	DSC-4C	4T+3P=7	5	20I+80E=100T 0+50E=50P	1hr+3hr(T) 0+3hr(P)
	Total		22T+9P=31	25	110I+590E= 700	---

(handwritten annotations: "Professional Intelligence" next to BCA401; "Network security" below BCA406)

	Abbreviations
GE	Generic Elective
DSC	Discipline Specific Course
ETC	Emerging Technological Course
DSE	Discipline Specific Elective
SEC	Skill Enhancement Course
AECC	Ability Enhancement Compulsory Course
T / P	Theory / Practical
CIE	Continuous Internal Evaluation
SEE	Semester End Evaluation
I/E	Internal / External

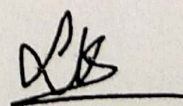| BCA SEM IV-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA401	Professional Intelligence	SEC-2	2	-	2	40	10	2	30min

UNIT-I

Stress management, Conflict management, Confidence Building, Leadership, Grooming, Emotional intelligence, Creativity-& Creative writing –instagram- wickiepedia-social media writing-content development, fitness & wellness

Unit-II

Re'sume', Short Talk, Three Minute Talk, Picture Perceptions, Cross word Puzzling, One Word Substitution-Idiomatic Expressions-Adages-ph Verbs, Public Speaking, PPTs, Be the Game Changer

References:

1. Soft Skills & Life Skills-Nishitesh & Dr.Bhaskar Reddy BSC Publishers
2. Corporate Soft Skills –Sarvesh Gulati, Rupa & co.
3. Business communication-Raymond V Legikar, Marie E Flatley Kathryn Rentz, Neerja Pende, Tata McGraw Hill
4. Communication Skills for Engineers and Communication Skills (for BE students of Rajiv Gandhi Proudhyogika Vishwavidyalaya, Rajasthan) both published by Person Education.
5. Advantage English - Published by Orient BlackSwan.
6. English for Better Performance: A Textbook of English (Prose and Drama) Published by Orient BlackSwan.
7. Skills in English – Published by Orient BlackSwan.

BCA SEM IV – THEORY

Course Code	Course Title	Type	Hours /week			Scheme of Examination			
			L	P	Cre-dits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
ETC402	Distributed and Cloud Computing	ETC 4B	4	-	4	70	30	3	1

Unit I

Distributed Systems: Trends in Distributed Systems – Focus on resource sharing – Challenges. Case study: World Wide Web, System Model – Inter process Communication – the API for internet protocols – External data representation and multicast communication, Overlay Networks, Group Communication, Introduction to RMI, Publish-subscribe systems and Introduction to Corba.

Unit II

Introduction to Cloud Computing: Cloud Computing in a Nutshell, System Models for Distributed and Cloud Computing, Roots of Cloud Computing, Grid and Cloud, Layers and Types of Clouds, Desired Features of a Cloud, Basic Principles of Cloud Computing, Challenges and Risks, Service Models.

Unit III

Virtual Machines and Virtualization of Clusters and Data Centers: Levels of Virtualization, Virtualization Structures Tools and Mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization Data center Automation. Case studies: VMware Features.

Unit IV

Cloud computing architectures over Virtualized Data Centers: Data center design and Interconnection networks, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, GAE, AWS, Azure, Inter-cloud Resource Management.

Suggested Readings

1. Pradeep K Sinha, Distributed Operating Systems: Concepts and Design, Prentice Hall of India, 2007.
2. Tanenbaum A.S., Van Steen M., Distributed Systems: Principles and Paradigms, Pearson Education, 2007.
3. John W. Rittinghouse, Cloud Computing: Implementation, Management, and Security. James F. Ransome, CRC Press 2009.
4. Kai Hwang. Geoffrey C.Fox, Jack J. Dongarra, Distributed and Cloud Computing From Parallel Processing to the Internet of Things, Elsevier, 2012.
5. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, Cloud Computing: Principles and Paradigms (Wiley Series on Parallel and Distributed Computing), Wiley Publisher,2011

Course Code	Course Title	Type	Hours /week			Scheme of Examination			
			L	P	Credits	MaxMarks		Duration(hrs)	
						SEE	CIE	SEE	CIE
BCA403	Artificial Intelligence	ETC-4B	4	-	4	80	20	3	1

BCA SEM IV – THEORY

Unit I

Introduction & Problem Solving: AI problems, AI Technique, Defining problem as a State Space Search, Production Systems, Problem Characteristics. Heuristic Search Techniques: Generate and test, Hill Climbing, Best First Search, Problem Reduction, Constraint Satisfaction.

Unit II

Game Playing: Overview, Min-Max search Procedure, Iterative Deepening. Knowledge Representation Issues: Approaches, Issues, Frame Problem, Using Predicate Logic: Representing simple facts in logic, Representing Instance and ISA Relationships, Computable Functions and predicates, Resolution, Natural Deduction.

Unit III

Uncertainty and Reasoning Techniques: Non monotonic reasoning, Logics for Non monotonic reasoning, Implementation issues, implementation of Depth First Search and Breadth first search. Statistical reasoning: Probability and Bayes theorem, Certainty factors and Rule-based systems, Bayesian Networks.

Unit IV

Learning: What is Learning, Rote learning, Learning by taking advice, Learning in problem solving, Induction, Learning by Decision trees. Expert System: Representing and Using Domain Knowledge, Expert systems shells, Explanation, Knowledge Acquisition.Perception and Action: Real Time Search, Vision, Speech Recognition,

Suggested Readings1. Elaine Rich, Edition.,2008 Kevin Night, Shivashankar 23 BNair,—Artificial Intelligencel,3 rd

BCA SEM IV – THEORY and PRACTICAL			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Cate-gory	L	P	Cre-dits	SEE	CIE	SEE	CIE
BCA404	Data Science using Python	DSC-4A	4	3	4+1= 5	80(T) 50(P)	20(T) --	3 3(P)	1 --

With effect from the academic year 2020-2021

Unit I

Introduction to data science – Introduction to data science, Data Science Components, Data Science Process, Data Science Jobs Roles, Tools for Data Science, Difference between Data Science with BI (Business Intelligence), Applications of Data science, Challenges of Data science Technology. Data analysis – Introduction to data analysis, Data Analysis Tools, Types of Data Analysis: Techniques and Methods, Data Analysis Process Introduction to Python, Python features, Python Interpreter, modes of Python Interpreter, Values and Data types, Variables, Key words, Identifiers, Statements.

Unit II

Expressions, Input & Output, Comments, Lines & Indentation, Quotations, Tuple assignment, Operators, Precedence of operators. Functions: Definition and use, Types of functions, Flow of execution, Parameters and Arguments, Modules. Conditionals: Conditional(if), Alternative(if-else), Chained Conditionals(if-elif-else), Nested conditionals; Iteration/Control statements: while, for, break, continue, pass; fruitful function vs void function, Parameters/Arguments, Return values, Variables scope (local, global), Function composition.

Unit III

Strings: Strings, String slices, Immutability, String functions & Methods, String module; List as array: Array, Methods of array. Lists: List operations, List slices, List methods, List loops, Mutability, aliasing, Cloning list, List parameters; Tuple: Benefit of Tuple, Operations on Tuple, Tuple methods, Tuple assignment, Tuple as return value, Tuple as argument; Dictionaries: Operations on Dictionary, methods in Dictionary, Difference between List, Tuple and Dictionary; Advanced List processing: List comprehension, Nested List.

Unit IV

Introduction to Numpy – The basics of numpy array, computation on numpy arrays, aggregations, computations on arrays, comparisons, masks and Boolean logic, fancy indexing, sorting arrays, structured data. Data Manipulation with Pandas – Introducing pandas objects, data indexing and selection, operating on data in pandas, handling missing data, hierarchical indexing, combining datasets, aggregation and grouping

Suggested Readings

1. Allen B Downey, "Think Python: How to think like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016.
2. Guido van Rossum and Fred L.Drake Jr, - An Introduction to Python - Revised and Updated for Python 3.2, Network Theory Ltd 2011.
3. Grus, Joel. Data science from scratch: first principles with python. O'Reilly Media, 2019.

Python Programming Lab Programs

Python

1. Write a program to demonstrate different numbers data types in python.
2. Write a python program to design simple calculator using functions.
3. Write a python program to check whether a given number is Armstrong number or not.
4. Write a python program to generate prime numbers between different intervals.
5. Write a python program to find factorial of a number using recursion.
6. Write a python program to check whether a string is palindrome or not.
7. Write a python program to count the number of characters present in a word.
8. Write a python program to create, append and remove lists.
9. Write a program to demonstrate working with tuples in python.
10. Write a program to demonstrate dictionaries in python.

Numpy

11. Python program to demonstrate basic array characteristics
12. Python program to demonstrate array creation techniques
13. Python program to demonstrate indexing in numpy
14. Python program to demonstrate basic operations on single array
15. Python program to demonstrate unary operators in numpy

Pandas

16. Python code demonstrate to make a Pandas DataFrame with two-dimensional list
17. Python code demonstrate creating DataFrame from dictionary of narray and lists
18. Python code demonstrate creating a Pandas dataframe using list of tuples
19. Python code demonstrate how to iterate over rows in Pandas Dataframe
20. Python code demonstrate how to get column names in Pandas dataframe

BCA SEM IV – THEORY and PRACTICAL			Hours /week			Scheme of Examination			
						MaxMarks		Duration(hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA405	Software Engineering	DSC-4B	4	3	4+1 5	80(T) 50(P)	20(T) --	3 3	1 --

Unit I

Software Engineering – Introduction, Program Versus Software, Software Engineering, Software Development Process and its Stages, Generic Software Development Process Models, Code of Ethics and Professional Practice, Software Development and Maintenance Cost Breakup. Requirement Engineering Processes – Requirement Engineering Process, Feasibility Study, Cost and Benefit Analysis.

Unit II

Requirement Specification, Characteristics of a Good Requirement and Validation Techniques, Requirements Management Planning, Process of Requirement Change Management. Software Requirement Specifications – Introduction, Stakeholder Analysis, Software Requirements Document, IEEE Standard of Software Requirement Specifications, Organizing Functional Requirements, Traceability and Validation of Specifications.

Unit III

Architectural Styles – Introduction, Architecture Styles, Object Oriented Architecture, Inter-organizational Communication, Cloud Computing Architecture Style, Core, Configurable and Customizable Architecture, Design Models, Architectural Design Principles. Object Oriented System Analysis – Introduction, Object Oriented Design, Object Oriented Design Models, Object Oriented Analysis, Data Modeling, Comparison Between Top Down Structured and Object Oriented Analysis, Description of Logical and Static Modeling, Identification of Class Relationships.

Unit IV

Object Oriented Design Using UML – Introduction, Sequence Diagram, State Machine Diagram, Timing Diagram, Describing Detailed Object Oriented Design, Decision Tree and

Decision Table, Composite Structure Diagram, Generating Test Cases, Moving Towards Physical Design, Structured Methods. Software Development – Introduction, Good Coding Practices, Code Reuse, Design Pattern, Generator Based Reuse, Application/Software Developed on Product Lines Approach, Component Based Software Engineering, Agile Methods. Software Quality Assurance – Introduction, Software Verification and Validation Process, Software Testing, System Testing, Object Oriented Testing Strategy, Test Cases, Equivalence Partitioning (Black Box Testing), Art of Debugging.

Suggested Readings

1. Rajesh Narang, Software Engineering: Principles and Practices
2. Ian Sommerville, Software Engineering
3. R. Mall, Fundamentals of Software Engineering
4. Pankaj Jalote, An Integrated Approach to Software Engineering
5. Frank Tsui, Orlando Karam, Barbara Bernal, Essentials of Software Engineering
6. Roger S Pressman, B R Maxim, Software Engineering – A Practitioner's Approach
7. Grady Booch, The Unified Modeling Language User Guide

Software Engineering Lab

Case Studies
1. Banking System
2. Hotel management system
3. Inventory Control System
4. Library management system
5. Railway Reservation System

Choose any two of above case studies and do the following exercises for that case studies
1. Write the complete problem statement
2. Write the software requirements specification document
3. Draw the entity relationship diagram
4. Draw the data flow diagrams
5. Draw use case diagrams
6. Draw activity diagrams for all use cases
7. Draw sequence diagrams for all use cases
8. Draw collaboration diagram
9. Assign objects in sequence diagrams to classes and make class diagram.

Note - To draw dataflow diagrams using Microsoft Visio Software, SmartDraw
To draw UML diagrams using Rational Rose Software, StarUML

Course Code	Course Title	Category	Hours /week		Credits	Scheme of Examination			
						Max Marks		Duration(hrs)	
			L	P		SEE	CIE	SEE	CIE
BCA406	Network Security	PCC	4	3	4+1=5	80(T) 50(P)	20(T)	3(T) 3(P)	2 --

BCA SEM IV–THEORY

UNIT-I

Cryptography Terminology, Stenography, Subscription ciphers, Cryptographic Protocols-Introduction using crypto systems, Digital Signatures, one way Hash Functions, communication using public-key cryptography and hybrid crypto systems, Digital Signatures, Digital Signatures with encryption, Random and pseudo random sequence generation, Basic protocols-key Exchange, authentication and key exchange, form analysis, secret splitting, secret sharing, cryptographic protection of databases.

UNIT-II

Intermediate protocols-Timestamping, sublimal channel, Signatures, Bit commitment, faircoin flops, mental poker, key Escrow.Advanced Protocols-Zero Knowledge proofs, Blind signatures, identity based Public-key cryptography obvious transfer, simultaneous contract signing, Digital certified main, simultaneous exchange of secrets. Esoteric Protocols-Secret Elections, secure multiparty computation, anonymous Message Broadcast Digital cash.

UNIT-III

Key Length-symmetric key length, public key length Key Management Generation transfer, verification use, Store Backup,lifetime,destruction, public key management.
Algorithm types and modes-Electronic code book,Black replay,Cipher Block clouding,Stream Ciphers, self synchronizing.cipher-feedback,synchronous stream, output feedback ,counter mode, choosing cipher mode, comparison. Using Algorithms-choosing an algorithm, public key versus symmetric encrypting and communicationchannels.Encryptingdataforstoragehardwareencryptionversussoftware Encryption

UNIT-IV

Information theory, complexly theory, number theory, factoring, prime number generation DBS–Background,Description,security of DES,Differential and linear crypto analysis, DB vacancy,pseudo random sequence generators, linear congruential, Linear feedback shift register stream ciphers, Design and analysis, Stream Cipher using LFSRs One way hash functions,Background,MDS,SHA Public key Algorithms-Backgrounders'Digital Signature Algorithm.

Suggested Reading:
1. Bruce Schneier-Applied Cryptography, Wiley 2001.
2. William Stallings –Cryptography and Network Security, PH

Networking concepts demonstration

1. Demonstrations of IP address and ports in computer system.
2. Explanation of settings in network connections
3. Testing of networking connectivity using ping, tracepath
4. Checking network statistics with netstat
5. Demonstration of static and dynamic IP address settings
6. Understanding ethernet cabling and switched networks
7. Comprehension of routers and firewalls

Network programming

1. Implement the following forms of IPC. a) Pipes b) FIFO
2. Implement file transfer using Message Queue form of IPC
3. Design TCP iterative Client and server application to reverse the given input sentence
4. Design TCP iterative Client and server application to reverse the given input sentence
5. Design TCP client and server application to transfer file
6. Design UDP Client and server application to reverse the given input sentence
7. Design UDP Client and server application to reverse the given input sentence
8. Design UDP Client server to transfer a file

Suggested Reading

1. Advance UNIX Programming Richard Stevens, Second Edition Pearson Education
2. Advance UNIX Programming, N.B. Venkateswarlu, BS Publication.

Nizam College (Autonomous)

Department of Informatics

S.Sravanthi
Chairperson, Board of Studies.
Department of Informatics, Nizam College, OU
E-Mail – sravanthireddy@nizam.ac.in
Mobile: 9949954885.

MINUTES OF BOARD OF STUDIES – Informatics

Thursday, 2ND September 2021

11:00 AM in Google Meet

A meeting of the Board of Studies Informatics was held on Thursday, 2ND September 2021 at 11:00 am through ONLINE in Google Meet.

Members Attended

1. Dr. K. SHYAMALA, Professor & Dean of Faculty of Informatics, UCE, OU
2. Mr. L.K SURESH KUMAR, BOS, IT Chairperson, Dept of CSE, OU
3. Dr. B.SUJATHA, Assistant Professor, Dept of CSE, OU
4. Mrs. S.SRAVANTHI, Head, BOS Chairperson, Dept of Informatics, Nizam College
5. Mr. T. RAMDAS NAIK, Assistant Professor Contract, Dept. of Informatics Nizam College
6. Ms .HUMERA SHAZIYA, Assistant Professor Contract, Dept. of Informatics Nizam College
7. Mrs. G.KAVITHA, Assistant Professor Contract, Dept. of Informatics Nizam College
8. Mr. Md. NAYEEM UDDIN, Assistant Professor Contract, Dept. of Informatics Nizam College
9. ANANTH BHASKER, Software Developer, Wells Forgo
10. T. JAYADEEP, Software Developer in Wird

3/9/2021

Asst. Professor
Dept of CSE College of Engi
Osmania University, Hyd.

Dean,
Faculty of Informatics
Osmania University

CHAIRMAN
Board of Studies (IT)
Dept. of Computer Science & Engg
University College of Engineering
Osmania University, Hyd-500 007

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Invitees

1. Mrs. SUBHANI BEGUM, Assistant Professor Contract, Dept. of Informatics Nizam College
2. Mr. SHAIK TANVEER AHMED, Assistant Professor Contract, Dept. of Informatics Nizam College
3. Mr. O.SUBHASH CHANDER GOUD, Assistant Professor Contract, Dept. of Informatics Nizam College
4. Mr. M.PURNACHARY, Assistant Professor Contract, Dept. of Informatics Nizam College
5. Ms P.P. Parmeshwari, Assistant Professor Contract, Dept. of Informatics Nizam College

The Chairperson welcomed the members.

The following resolutions were made:

It was resolved to approve the scheme of instruction and syllabus for V and VI semesters of BCA for the Academic Year 2021-2022 batch as per Osmania University Scheme and Syllabus as follows.

- It was resolved to replace "Object Oriented System Development" Of V Semester with "Data Science with R".

- It was resolved to introduce Mini Project in V Semester

- It was resolved to replace "Internet Protocols" with "Distributed Systems"

- It was resolved to introduce "Big Data Analytics" subject as a core paper in BCA VI Semester, instead of Elective.

- It was resolved to introduce "Technical Seminar" as a Laboratory Professional Course in BCA VI Semester

  - It was resolved to introduce the following subjects as Elective "Network Security, Internet of Things and Information Retrieval System".

The above resolutions were unanimously approved at the meeting.

S.Sravanthi
Chairperson
BOS Informatics
Nizam College

CHAIRMAN
Board of Studies (IT)
t. of Computer Science & Engg.
versity College of Engineering,
mania University, Hyd-500 007

Asst. Professor
Dept of CSE College of Engr
Osmania University, Hyd

I/c. DEPARTMENT OF INFORMATICS
M.C.A, M.Sc (IS), B.C.A.
Nizam College, (Autonomous), O.U,
Basheerbagh, Hyderabad-500 001

Attendance of Members attended to the BOS meeting Friday, 02rd September 2021.

S.No	Member's Name	Signature
1	Dr. K. SHYAMALA Professor & Dean of Faculty of Informatics, UCE, OU	*Dean, Faculty of Informatics Osmania University*
2	Mr. L.K SURESH KUMAR BOS, IT Chairperson Dept Of CSE, OU	CHAIRMAI Board of Studies Dept. of Computer Scier University College of Er Osmania University, Hy
3	Dr. B.SUJATHA, Assistant Professor, Dept of CSE, OU	Asst. Profess Dept of CSE Colleg Osmania Universit
4	Mrs. S.SRAVANTHI Head BOS, Chairperson Dept of Informatics	
5	Mr. T. Ramdas Naik Assistant Professor (contract)	
6	Ms. Humera Shaziya Assistant Professor (contract)	
7	Mrs. G.Kavitha Assistant Professor (contract)	
8	Mr. Md. Nayeem Uddin Assistant Professor (contract)	*Nayeem*
9	ANANTH BHASKER, Software Developer, Wells Forgo	
10	T. JAYADEEP, Software Developer in Wird	
11	Mrs. Subhani Begum Assistant Professor (contract)	
12	Mr. Shaik Tanveer Ahmed Assistant Professor (contract)	
13	Mr. O.Subhash Chander Goud Assistant Professor (contract)	
14	Mr. M.Purnachary Assistant Professor (contract)	
15	Mrs. P.P.Parmeshwari Assistant Professor (contract)	

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PROPOSED SCHEME FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA) For A.Y 2021-2022

Semester – V

Course Code	Course Title	Course Type	HrsPerWeek	Credits	Marks CIE+SEE	Duration
BCA501	Programming using ASP. NET	CC	4T+3P=7	5	20I+80E=100T 0+50E=50P	1hr+3hr(T) 0+2hr(P)
BCA502	Unix Programming	CC	4T+3P=7	5	20I+80E=100T 0+50E=50P	1hr+3hr(T) 0+2hr(P)
BCA503	Data Science Using R	CC	4T+3P=7	5	20I+80E=100T 0+50E=50P	1hr+3hr(T) 0+2hr(P)
BCA504	Software Quality & Testing	DSC	4T	4	20I+80E=100T	1hr+3hr(T)
BCA # Elective -I	BCA505- Mobile application development BCA506 – Distributed System BCA507- Data Mining	DSC	4T	4	20I+80E=100T	1hr+3hr(T)
BCA508	Mini Project	DSC	6P	2	0+50E=50P	0+2hr(P)
	Total		20T+15P=35	25	100I+600E= 700	---

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Asst. Professor
Dept of CSE College of Eng.
Osmania University, Hyd.

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PROPOSED SCHEME FOR
BACHELOR OF COMPUTER APPLICATIONS (BCA) For A.Y 2021-2022

Semester – VI

Course Code	Course Title	Course Type	HrsPer Week	Credits	Marks CIE+SEE	Duration
BCA601	Information Security	CC	4T	4	20I+80E=100	1hr+3hr
BCA602	Advanced JAVA	CC	4T+3P=7	5	20I+80E=100 T 0+50E=50P	1hr+3hr(T) 0+2hr(P)
BCA 603	- Big Data Analytics	ETC	4T	4	20I+80E=100	1hr+3hr
BCA# Elective -III	BCA 604- Internet of Things BCA 605- Network Security BCA 606 – Information Retrieval System	DSC	4T	4	20I+80E=100	1hr+3hr
BCA607	Technical Seminar	LPC	6P	2	0I+ 50E=50P	0hr+2hr
BCA608	Project Dissertation and Presentation	DSC	18P	6	0+100E=50P	0+2hr(P)
	Total		16T+27P= 43	25	80I+520E= 600	---

Asst. Professor
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Osmania University, Hyd

CHAIRMAN
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BCA SEM V-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA501	Programming using ASP. NET	CC	4	3	5	80	20	3hrs	1hr

UNIT-I

Asp.Net Overview- Introduction to ASP.Net, Introduction to web Applications with web servers, web server role-IIS,APACHE etc, Web-browsers, web support languages, understanding http, TCP/IP role in web development.ASP.Net role:-ASP.Net framework, CLR(Common Language Runtime), MSIL, (Microsoft Intermediate Language), Name spaces

UNIT-II

ASP.Net web forms-Introduction to web forms, page directives and its use, separating code & design, new code behind techniques, **ASP.Net server controls**-Working with server controls, applying styles to controls, themes, skins etc.

UNIT-III

Web form validation controls-Required field validation Control, Compare Validation Control, Custom Validation Control, Group Validation and Accounting Validation Control.**ADO.Net Database Services**- Overview of ADO.Net XML, XML to HTML, XML & Databases XML Support in .Net retrieve data with datasets & Data Adapters.

UNIT-IV

Presenting Data Using ASP.Net-Bound Controls- Data Source Controls, Repeater and its uses, Data list control, data grid control view and its importance, form view, detail's view, list view. User controls- Adding member to user controls, registering user control, properties & methods.

Suggested Readings:
1. **C#.NET Black Book** by stevenholzner –dreamtech
2. **ASP.NET** Unleashed
3. **C# programming** – wrox publication
4. **C# programming Black Book** by Matt telles

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Programming Using ASP.NET LAB

1. Program to Install visual studio .Net framework 2017

2. Program to display hello message in ASP.NET

3. Program to demonstrate Sever Controls.

4. Program to demonstrate Login Page

5. Program to demonstrate Design Registration Page

6. Program to demonstrate Checkbox and List box

7. Program to demonstrate Dropdown list Control

8. A Program to bind Drop down list with MS Access Database

9. A Program to Binding a Grid view control with MS Access Database

10. Program to demonstrate Grid view control to Retrieve data from database

11. Program to demonstrate Drop down list control to retrieve data from database

12. Program to demonstrate Require Field validation control

13. Program to demonstrate Compare validation Control

14. Program to demonstrate Regular Expression validation Control

15. Program to demonstrate Range validation control

16. Program to demonstrate Themes and Skins.

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Osmania University, Hyd

BCA SEM V-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA502	Unix Programming	CC	4	3	5	80	20	3hrs	1hr

UNIT I:

Introduction to Unix:-Architecture of Unix, Features of Unix, Unix Commands – Unix Utilities:-, Introduction to unix file system, vi editor, file handling utilities. Security by file permissions, process utilities, disk utilities, networking commands.

UNIT II: Introduction to Shells: Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command- Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

UNIT III:

Grep :Operation, grep Family, Searching for File Content.

Sed :Scripts, Operation, Addresses, commands, Applications, grep and sed.

awk: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String. Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands, in awk, Applications, awk and grep, sed and awk.

UNIT-IV

Introduction to PHP: Overview, syntactic characteristics, primitives, operations and expressions, output, control statements, arrays, functions. pattern matching, form handling files, cookies and session tracking.

TEXTBOOKS   :
1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.
3. Robert W. Sebesta, "*Programming the World Wide Web*", Pearson Education, 2008.

REFERENCES   :
1. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson Education.
2. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
3. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH

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Unix programming lab

a) Shell Programs

1. Perform all arithmetic operations
2. Program to the test type of file
3. Program to copy a file
4. Program to set file permissions
5. Display the no. of lines in each of text file in a given dir

b) AWK Programs

6. Find the total
7. Find sales
8. Find department sales
9. Find the list of items
10. Find the larger value

c) Hypertext PreProcessor (PHP) Programs:

11. Program on data types
12. Program on while, do while and for loops
13. Programs on array, associative array, and multi-dimensional array
14. Program on functions and functions with arguments
15. Program on class and object
16. Program to set a cookie
17. Program on session tracking

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BCA SEM V-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA503	Data Science Using R	CC	4	3	5	80	20	3hrs	1hr

Data Science With R

Unit I:
Getting the hang of R, command packages,some simple maths calculations,reading ad getting Data into R,Types of Data Items.structure of data items.

Unit II:
Working with Objects, manipulating objects – manipulating vectors, manipulating matrix and Data frames, Viewing Objects, rotating data tables, making list, reordering data frames.

Unit III:
Summary statistics for vectors, cummlative statistics, statistics on data frames, Data distributions, histograms, density function, types of data distribution.

Unit IV:
Box-Whisker plots,Scatter plots,Pie charts,Bar charts,simple linear regression,multiple regression, applying kmeans clustering in R using a data set,applying KNN using R.
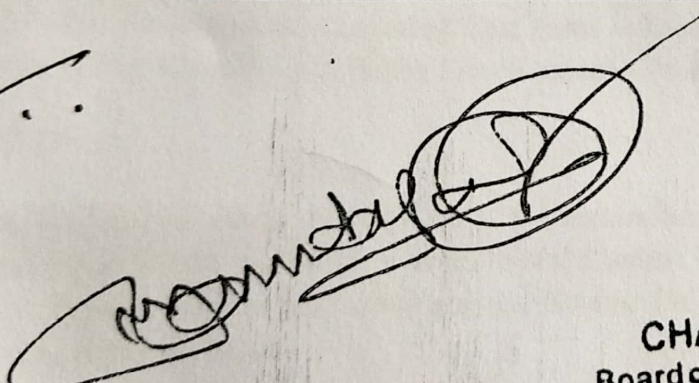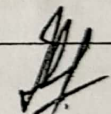
References:
1) Begining R the statistical programming language by Dr Mark Gardener
2) An Introduction to R by W. N. Venables, D. M. Smith

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Data Science With R lab

1. Develop the R program for Basic Mathematical computation –Square, Square root, exponential etc.

2. Create an object X that stores the value then overwrite the object in by itself divided by Y.
   Print the result to the console.

3. read a data file using read.table()

4. create a vector in r and perform operation subsetting

5. create matrix and list in R and perform subsetting both

6. Extract the first and last elements of already created vector from, storing them as a new object

7. Store this vector of 10 values: foo <- c(7,5,6,1,2,10,8,3,8,2).Then, do the following:
   i. Extract the elements greater than or equal to 5, storing the result as bar.
   ii. Display the vector containing those elements from foo that remain after omitting all elements that are greater than or equal to 5.

8. read a .xls file and plot a bar chart

9. read a .xls using data frame and plot a scatter plot

10. read a .csv file using data frames and plot histograms

11. read a .csv file using data frame and plot the poison distribution using a variable in data set.

12. Read a .csv file and perform Kmeans algorithm using k=4 and iterations = 50

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Course Code	Course Title	Type	L	P	Credits	SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
						SEE	CIE	SEE	CIE
BCA504	Software Quality & Testing	DSC	4	-	4	80	20	3hrs	1hr

UNIT I

INTRODUCTION TO SOFTWARE QUALITY Ethical Basis for Software Quality – Total Quality Management Principles – Software Processes and Methodologies – Quality Standards, Practices & Conventions –Improving Quality with Methodologies – Structured/Information Engineering – Measuring Customer Satisfaction– Software Quality Engineering – Defining Quality.

UNIT II

SOFTWARE QUALITY METRICS AND RELIABILITY– Analyzing Software Documents using Inspections and Walkthroughs – Software Metrics – Lines of Code, Cyclomatic Complexity, Function Points, Feature Points – Software Cost Estimation.
TEST CASE DESIGN Testing as an Engineering Activity – Testing Fundamentals – Defects – Test Adequacy Criteria – Evaluating Test Adequacy Criteria – Levels of Testing and different Types of Testing .

UNIT III

TEST MANAGEMENT Testing and Debugging Goals and Policies – Test Planning – Test Plan Components
– Test Plan Attachments – Locating Test Items – Reporting Test Results – The Role of Three Groups in Test Planning and Policy Development – Process and the Engineering.

UNIT IV

CONTROLLING AND MONITORING Measurement and Milestones for Controlling and Monitoring – Status Meetings – Reports and Control Issues – Criteria for Test Completion – SCM – Types of Reviews – Developing a Review Program – Components of Review Plans – Reporting Review Results.

Suggested Readings:

1. Ilene Burnstein, Practical Software Testingl, Springer International Edition, 2003.
2. Stephen Kan, Metrics and Models in Software Qualityl, Addison-Wesley, Second Edition, 2004.
3. Milind Limaye, Software Quality Assurancel, McGraw Hill, 2011.
4. M G Limaye, Software Testing – Principles, Techniques and Toolsl, McGraw Hill, 2011

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BCA SEM V-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						\multicolumn{2}{c}{Max Marks}	\multicolumn{2}{c}{Duration(Hrs)}	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA # Elective-I BCA505	Mobile Application Development	DSC	4	-	4	80	20	3hrs	1hr

UNIT-I

Applications, history of mobile communications, reference model **Wireless transmission -** Frequencies, Signals, Antennas, Signal propagation, Multiplexing ,Modulation, Spread spectrum, cellular systems **Medium access layer** - Motivation, SDMA, FDMA, TDMA, CDMA ,**Wireless LAN** - Infrared vs radio transmission, infrastructure, IEEE802.11, HIPERLAN,Bluetooth.

UNIT-II

Key services for mobile internet. Mobile IP - Goals, assumptions, requirements, entities, IP packet delivery. Agent advertisement and discovery, Registration. Tunneling. Optimization, reverse tunneling, DHCP, Adhoc networks, Mobile transport Layer - Traditional TCP, Indirect TCP .Snooping TCP, Mobile TCP, Fast transmit Fast recovery, Transmission timeout freezing, transaction oriented TCP.

UNIT-III

Wireless Application Protocol - Overview of WAP architecture, components. Network infrastructure Design principles WML - Document model, Basics, basic content, events, tasks and binding, variables, other content, controls, application security, other data, Wireless binary extensible markup language.

UNIT-IV

WML Script - language basics, standard libraries, script libraries, script development User interface design - structured usability methods, design guidelines - user interface, selected WML elements, Tailoring content to client Push messaging ,Wireless telephony applications ,Building and deploying End-to-End WAP services.

Suggested Reading
1. Jochen Schiller - Mobile communications, Addison-Wesley 2001
2. Sundeep Singh etc. Wireless Application Protocal - Addison Wesley 2001

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BCA SEM V-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
Elective-I BCA506	Distributed System	DSC	4	-	4	80	20	3hrs	1hr

With effect from the academic year 2021-2022

Distributed Systems

UNIT-I

Introduction: Goals and Types of Distributed systems Architectures, Self Management in Distributed Systems Processes: Threads, Virtualization, Clients, Servers, and Code Migration. Communication: Fundamentals, Remote Procedure Call, Message Oriented Communication, Stream oriented communication and Multicast communication

UNIT-II

Naming: Names, Identifiers and Addresses, Flat Naming, Structured naming, and Attribute based naming. Synchronization: clock synchronizations, Logical Clocks, Mutual Exclusion, Global Positioning of Nodes and Election Algorithms. Consistency and Replication: Introduction, Data centric consistency Models, Client centric Consistency models, Replica Management and consistency protocols
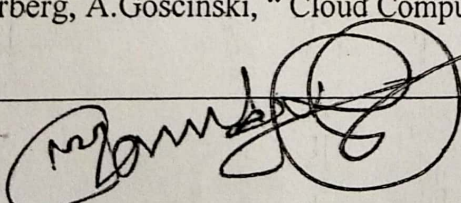
UNIT-III

Fault Tolerance: Introduction to fault tolerance, Process Resilience, Reliable Client-Server communication, Reliable Group communication, Distributed commit and Recovery Distributed Object Based System: Architecture, Processes, Communication, Naming, Synchronization, consistency and replication, Fault tolerance and security
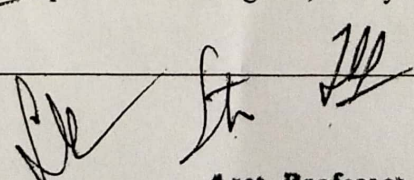
UNIT IV

Distributed File System: Architecture, Processes, Communication, Naming, Synchronization, consistency and replication, Fault tolerance and security. Distributed Web-Based Systems: Architecture, Processes, Communication, Naming, Synchronization, consistency and replication, Fault tolerance and security

Suggested Readings:

1. Andrew S. Tanenbaum and Maarten Van Steen, "Distributed Systems", PHI 2 nd Edition, 2009.

2. R.Hill, L.Hirsch, P.Lake, S.Moshiri, "Guide to cloud computing, Principles and Practice", Springer, 2013.

3. R.Buyya, J.Borberg, A.Goscinski, " Cloud Computing-Principles and Paradigms", Wiley 2013.

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						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
Elective-I BCA507	**Data Mining**	DSC	4	-	4	80	20	3hrs	1hr

DATA MINING

Instruction: (3L) hrs per week
CIE: 30 marks

Credits: 4
Duration of SEE: 3 hours.
SEE: 70 marks.

UNIT I

Introduction: Kinds of Data Can Be Mined, Kinds of Patterns Can Be Mined, Technologies Used– Issues in Data Mining, **Getting to Know Your Data:** Data Objects and Attribute Types, Basic Statistical Descriptions of Data, **Data Preprocessing: An Overview**

UNIT II

Mining Frequent Patterns, Associations And Correlations: Basic Concepts- Market Basket Analysis: A Motivating Example, Frequent Itemsets, Closed Itemsets, and Association Rules, Frequent Item Set Mining Methods- Apriori Algorithm, FP-Growth Algorithm.

UNIT III

Classification: Basic Concepts, Decision Tree Induction, Bayes Classification Methods, Rule Based Classification, Bayesian Belief Networks, Support Vector Machine

UNIT IV

Cluster Analysis- Cluster Analysis, Requirements for Cluster Analysis, Overview of Basic Clustering Methods – Partitioning Methods, Hierarchical Methods, Density-Based Methods
Outliers and Outlier Analysis, Data Mining Trends.

Prescribed Text Book:
1. Jiawei Han and Micheline Kamber, **"Data Mining – Concepts and Techniques"**, Third Edition, Morgan Kaufmann Publishers, 2012.

References:
1. Pang-Ning Tan Michael Steinbach Vipin Kumar **"Introduction to Data Mining"** Second Edition,Pearson Edition.
2. M. H. Dunham, **"Data Mining: Introductory and Advanced Topics"**, Pearson Education. 2001.
3. D. Hand, H. Mannila and P. Smyth, **"Principles of Data Mining"**, PrenticeHall. 2001.

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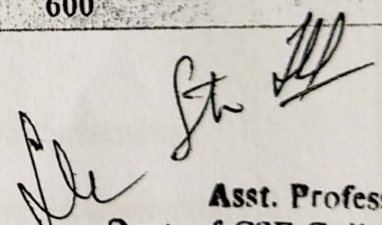| BCA V SEM		HOURS/WEEK			SCHEME OF EXAMINATION			
					Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA508	Mini Project	LPC		6	2	50	-	2hr	-

Visit one of the business organizations and develop an information system or E-commerce Application using Visual modeler from Rational Rose. The student is expected to follow unified process and develop a documentation covering all the stages of the unified process.

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Semester – VI

Course Code	Course Title	Course Type	HrsPer Week	Credits	Marks CIE+SEE	Duration
BCA601	Information Security	CC	4T	4	20I+80E=100	1hr+3hr
BCA602	Advanced JAVA	CC	4T+3P=7	5	20I+80E=100 T 0+50E=50P	1hr+3hr(T) 0+2hr(P)
BCA 603	- Big Data Analytics	ETC	4T	4	20I+80E=100	1hr+3hr
BCA# Elective -III	BCA 604- Internet of Things BCA 605- Network Security BCA 606 – Information Retrieval System	DSC	4T	4	20I+80E=100	1hr+3hr
BCA607	Technical Seminar	LPC	6P	2	0I+ 50E=50P	0hr+2hr
BCA608	Project Dissertation and Presentation	DSC	18P	6	0+100E=50P	0+2hr(P)
	Total		16T+27P= 43	25	80I+520E= 600	---

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BCA SEM VI-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA601	Information Security	CC	4	-	4	80	20	3hrs	1hr

UNIT-I

Introduction: History, Critical characteristics of information, NSTISSC security model, Components of an information system, Securing the components, Balancing security and access, The SDLC, The security SDLC. Need for Security: Business needs, Threats, Attacks- secure software development.

UNIT-II

Legal, Ethical and professional Issues: Law and ethics in information security, Relevant U.S lawsinternational laws and legal bodies, Ethics and information security.
Risk Management: Overview, Risk identification, Risk assessment, Risk control strategies, selecting a risk control strategy, Quantitive versus qualitative risk control practices, Risk management discussion points, Recommended risk control practices.

UNIT-III

Planning for Security: Security policy,Standards and practices, Security blue print, Security education, Continuity strategies. Security Technology:Firewalls and VPNs: Physical design, Firewalls, Protecting remote connections.

UNIT-IV

Security Technology: Intrusion detection, access control and other security tolls: Intrusion detection and prevention systems, Scanning and analysis tools, Access control devices. Cryptography: Foundations of cryptology, Cipher methods, Cryptographic Algorithms, Cryptographic tools, Protocols for secure communications, Attacks on cryptosystems. Security management models, Digital forensics

Suggested Reading:

1. Michel E Withman and Herbert J Mattord, Principles and Practices of Information Security, Cengage Learning, 2009.
2. Thomas R Peltier, Justin Peltier, John Blackley, Information Security Fundamentals, Auerbach Publications, 2010.
3. Detmar W Straub, Seymour Goodman, Richard L Baskerville, Information Security, Policy, Processes and Practices, PHI , 2008.

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BCA SEM VI-THEORY		With effect from the academic year 2021-2022								
		HOURS/WEEK				SCHEME OF EXAMINATION				
Course Code	Course Title					Max Marks		Duration(Hrs)		
		Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA602	Advanced Java	CC	4	3	5	80	20	3hrs	1hr

Unit-I

Introducing JDBC: Describing Components of JDBC , Features of JDBC , JDBC Architecture: Types of Divers, Advantages and disadvantages of Drivers ,Use of Drivers , JDBC Statement and Methods: Statement ,PreparedStatement ,CallableStatement ,Working with Resultset interface , Working with Resultset with metadata

Unit-II

Introducing CGI , Introducing Servlet , Advantages of Servlet over CGI , Features of Servlet , Introducing Servlet API :Javax.servlet package , Javax.servlet.http package ,Servlet life ,Working with GenericServlet and HttpServlet , RequestDispatcher interface ,Use of RequestDispatcher , Session in Servlet: Introducing session , Session tracking mechanism ,Cookies : Advantages & disadvantages ,use of cookies , Hidden form filed ,URL rewritten , HttpSession.

Unit-III

Introduction to JSP :Advantages of JSP over Servlet , JSP architecture , JSP life cycle , Implicit objects in JSP,JSP tag elements☐ Declarative, Declaration, scriplet, expression, Action Tags. Java Bean☐ Advantages & Disadvantages, useBean tag☐ setProperty and getProperty

Unit-IV

JSTL core tag: General purpose tag, conditional tag, networking tag ,JSTL SQL tags , JSTL formatting tags , JSTL xml tags , Introducing internationalization & Java: local class, ResourseBundle class.

Introduction to Frameworks in java: Java Server Faces Struts, Springs, Hibernate.

Suggested Reading:

1. JDBC, Servlets and JSP Black Book, Dreamtech Publication by Santhosh Kumar.k
2. **Programming Jakarta Struts", Second Edition, by Chuk Cavaness, O'Reilly Media, 2004**
3. "Spring Persistence with Hibernate" by Paul Tepper, Apress Publisher, 2010

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ADVANCE JAVA PROHRAMMING LAB

1. Jdbc Program to conncet the Oracle Database
2. Create a new Database table using JDBC.
3. Jdbc program to insert the records into database.
4. Jdbc program to read the data from Database using ResultSet
5. Jdbc program to update the records into database
6. Jdbc program to delete the records into database
7. Jdbc program to demonstrate PreparedStatement
8. Jdbc program to demonstrate PreparedStatement
9. Instalation and configuring Apache Tomcat Server.
10. Instalation and configuring Netbeans, MyEcplice IDEs.
11. Servlet Program to demonstrate Life cycle methods using GenericServlet
12. Servlet Program to demonstrate RequestDispacher
13. Servlet Program to demonstrate Session Tracking
14. Servlet Program to demonstrate Cookies.
15. Servlet Program to demonstrate Filters
16. JSP program to demonstrate JSP tag elements
17. JSP program to demonstrate implecit objects
18. JSP program to demonstrate useBean tag
19. JSP program to demonstrate JSTL
20. JSP program to Process the Form
21. Develop simple application to process the registration form using jsp and jdbc with the help of IDE.
22. Real time application development using MVC architecture.

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						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA603	Big Data Analytics	ETC	4	-	4	80	20	3hrs	1hr

With effect from the academic year 2021-2022

Big Data Analytics

Unit I:

Introduction to Big data, problem with old technologies, key trends with big data, parallel processing in big data, cloud and big data, preditive analytics and big data, big data and hadoop implementation.

Unit II:

A brief history of hadoop, apache hadoop and its eco-system, Map-reduce framework, analysing data with Map reduce, Mapreduce and combiner functionality, Mapreduce jobs.

Unit III:

Jobtracker and Mapreduce jobs, Name Node and Secondary Namenode functionality in job execution, Hadoop Distributed storage, Hadoop Distributed File System, HDFS and Blocks, HDFS and Data Nodes.

Unit IV:

HDFS basic file operation -storing and retrieving data, HDFS and other storages – Hive ,Hbase. Pig and Pig Latin benefits,Data transmission with Scoop and PIG. Executing jobs with Hive and performing Hive DDL.

References:

1. Tom White, Hadoop: The Definitive Guide, O Reily, 4 th Edition, 2015.
2. Alex Homes, Hadoop in Practice, Manning Publications Co, 2012.
3. DT Editorial Services, Big Data Black Book, Dream Tech Press, 2015.

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BCA SEM VI-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
Elective-III BCA 604	Internet Of Things	DSC	4	-	4	80	20	3hrs	1hr

With effect from the academic year 2021-2022

Unit I:

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, Iot Communication APIs, IoT enabled Technologies – Wireless Sensor Networks. Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

Unit II:

IoT Physical Devices and Endpoints - Introduction to Raspberry PI - Interfaces (serial, SPI,I2C). Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.
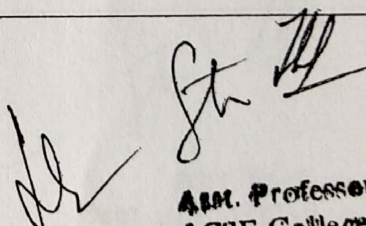
Unit III:

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs. Web server – Web server for IoT, Cloud for IoT, Python web application framework. Designing a RESTful web API

Unit IV:

Getting around Linux on Raspberry pi, using command line and file system, other operating systems and linux distributions for pi, Python on pi, Audrino for pi, programming input and output with python, working with cameras.

References:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

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BCA SEM VI-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
Elective-II 605	Network Security	PEC	4	-	4	80	20	3hrs	1hr

Unit-I

Cryptography terminology, steganography, one time pads, Authenticity, one way hash function, substitution ciphers and transposition ciphers, communication using public-key cryptography, types of attacks, IP spoofing, worms, viruses.

Unit-II

Key length-symmetric key length, public key length Key management Generation transfer, verification use, store backup, lifetime, destruction, public key management. Algorithms types and modes-Electronic code book, block replay, cipher block chaining, stream ciphers, self-synchronizing, cipher feedback, synchronous stream, counter mode.

Unit-III

Secret key cryptography: DES, triple DES, AES, key distribution, Cryptography: digital signature, RSA, key exchange (Deffie Hellman), message Authentication code (MAC), MD5.

Unit-IV

Integrity, Authentication and Non-repudation: Introductory(DSA, Kerberos) ,one way hash functions, SHA , ISDN, ISO Authentication framework, web security protocols(IPSec), Electronic payments, E-cash, Secure electronic transfer(SET).

Suggested reading:
1. Bruce Schneier-Applied cryptography Wiley 2001.
2. William Stallings, Cryptography and Network Security,4th Edition, Pearson, 2009.
3. Joseph Migga Kizza, A guide to computer Network Security, Springer, 2010.
4. Dario Cataiano, Contempory Cryptography, Springer, 2010.

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BCA SEM VI-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
Elective-II 606	Information Retrieval System	PEC	4	-	4	80	20	3hrs	1hr

Information Retrieval System

Unit I:

Introduction and Motivation Basic Concepts – Practical Issues - Retrieval Process – Architecture – Boolean Retrieval –Retrieval Evaluation – Open Source IR Systems.

Unit II:

Web Search – Web Characteristics–The impact of the web on IR —IR Versus Web Search– Components of a Search engine.Searching the Web –Structure of the Web –IR and web search – Static and Dynamic.

Unit III:

Taxonomy and Characterization of IR Models – Boolean Model – Vector Model - Term Weighting – Scoring and Ranking –Language Models.

Unit IV:

Probabilistic Models – Algebraic Models – Structured Text Retrieval Models – Models for Browsing.

References:

1. Christopher D. Manning, Prabhakar Raghavan, Hinrich Schutze, —Introduction to Information Retrievall, Cambridge University Press, First South Asian Edition, 2008.
2. Implementing and Evaluating Search Enginesl, The MIT Press, Cambridge,Massachusetts London, England, 2010.

Asst. Professor
Dept of CSE College of Engg
Osmania University, Hyd

CHAIRMAN
Board of Studies (IT)
Dept. of Computer Science & Engg.
University College of Engineering,
Osmania University, Hyd-500 007

BCA SEM VI THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA607	Technical Seminar	LPC	-	6	2	50	-	2hrs	

Oral presentation is an important aspect of engineering education. The objective of the seminar is to prepare the student for systematic independent study of state of the art topics in broad are his/her specialization. Seminar topics can be chosen by the students with the advice from the faculty members. Students are to be exposed to following aspects of seminar presentation.

Literature Survey

Organization of material

Preparation of Power point Presentation slides and Technical Writing.

Each Student is required to:

1. Submit one page of synopsis of the seminar talk two days before for display on notice board.

2. Give 20 minutes presentation through MS-Power Point presentation slides followed by 10 minutes discussion.

3. Submit a report on the seminar topic with a list of references and slides used within a week.

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Osmania University, Hyd

CHAIRMAN
Board of Studies (IT)
Dept. of Computer Science & Engg.
University College of Engineering,
Osmania University, Hyd-500 007

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BCA SEM VI-THEORY		HOURS/WEEK				SCHEME OF EXAMINATION			
						Max Marks		Duration(Hrs)	
Course Code	Course Title	Type	L	P	Credits	SEE	CIE	SEE	CIE
BCA608	Project Dissertation And presentation	DSC	-	18	6	100	-	2hrs	

Sixth Semester of the BCA Project has to be carried out by each student individually in a period of 15 weeks of duration. Students should submit a synopsis at the end of 2nd week in consultation with the Project Guide. The synopsis should consist of definition of the problem, scope of the problem and plan of action. After completion of eight weeks students are required to present a Project Seminar on the topic covering the aspects of analysis, design and implementation of the project work.

At the end of the semester the students are required to present themselves for a University Vive-voce examination.

A committee consisting of two faculty members of the respective college along with a guide will evaluate the project and award.

Each student will be required to:

1. Submit one page of synopsis on the project work for display on notice board.
2. Give a 20 minutes presentation followed by 10 minutes discussion.
3. Submit a technical write-up on the project.

The project seminar presentation should include the following components of the project:

- Problem definition and specification.
- Literature survey, familiarity with research journals.
- Broad knowledge of available techniques to solve a particular problem.
- Planning of the work, preparation of bar (activity) charts
- Presentation both oral and written.

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Dept. of Computer Science & Engg.
University College of Engineering,
Osmania University, Hyd-500 007

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