

IFTM University N.H.-24, Lodhipur Rajput, Delhi Road, Moradabad, Uttar Pradesh-244001 www.iftmuniversity.ac.in

Study & Evaluation Scheme of Bachelor of Computer Applications [Session: 2019-20]

Programme:	Bachelor of Computer Applications
Course Level:	UG Degree
Duration:	Three years (six semesters) Full Time
Medium of Instruction:	English
Minimum Required Attendance:	75%
Maximum Credits:	146

Programme Outcomes (POs):

Students completing this programme will be able to:

- An ability to apply knowledge of computer science, mathematics in practice.
- An ability to enhance not only comprehensive understanding of the theory but its application too in diverse field.
- The program prepares the young professional for a range of computer applications, computer organization, techniques of computer networking, software engineering, e-commerce, Web development, Big Data, IOT, Python and Advance JAVA.
- An ability to design a computing system to meet desired needs within realistic constraints.
- In order to enhance programming skills of the young IT professionals, the program has introduced the concept of project development in each language/technology learnt during semester.

S.	Subject		Periods/Wee				Credit					
No	Code	Subject Name	L	Т	Р		Se	essional		ESE	Total	
						TA	AT	СТ	Total			
1.	BCA-111	Fundamental of Computer Science	3	1	0	5	5	10 + 10	30	70	100	4
2.	BCA-112	Digital Electronics and Computer Organization	3	1	0	5	5	10 + 10	30	70	100	4
3.	BCA-113	Mathematics -I	3	1	0	5	5	10+10	30	70	100	4
4.	BCA-114	Principles of Management	3	1	0	5	5	10+10	30	70	100	4
5.	ECO-105	English Communication-I	3	1	0	5	5	10+10	30	70	100	4
	Practicals/S	eminar/Projects										
6.	BCA-11P	Basic Computer Lab Based on BCA-111	0	0	3	10	10	30	50	50	100	2
7.	BCA-12P	Digital Electronics Lab Based on BCA-112	0	0	3	10	10	30	50	50	100	2
8.	BCA-11G	G.P							100		100	1
		Total	15	5	6				350	450	800	25

BCA I-Year Semester-1

BCA I-Year Semester-II

S.	Subject		Periods/Week				Credit					
No	Code	Subject Name	L	Т	Р		Se	essional		ESE	Total	
						TA	AT	СТ	Total			
1.	BCA-211	Advanced Programming in C	3	1	0	5	5	10+10	30	70	100	4
2.	BCA-212	Data Structure and Algorithms	3	1	0	5	5	10+10	30	70	100	4
3.	BCA-213	Business Data Processing	3	1	0	5	5	10 + 10	30	70	100	4
4.	BCA-214	Organisational Behavior	3	1	0	5	5	10+10	30	70	100	4
5.	BCA-215	Mathematics - II	3	1	0	5	5	10+10	30	70	100	4
	Practicals /S	Seminar/Projects										
6.	BCA-21P	Programming in C Lab Based on BCA-211	0	0	3	10	10	30	50	50	100	2
7.	BCA-22P	Data Structure Lab Based on BCA-212	0	0	3	10	10	30	50	50	100	2
8.	BCA-22G	G.P							100		100	1
		Total	15	5	6				350	450	800	25

S.	Subject		Periods/Week		'eek		Credit					
No	Code	Subject Name	L	Т	Р		Se	essional		ESE	Total	
						TA	AT	СТ	Total			
1.	BCA-311	Object Oriented Programming in C++	3	1	0	5	5	10+10	30	70	100	4
2.	BCA-312	System Analysis & Design	3	1	0	5	5	10+10	30	70	100	4
3.	BCA-313	Discrete Mathematics	3	1	0	5	5	10+10	30	70	100	4
4.	BCA-314	Database Management System	3	1	0	5	5	10+10	30	70	100	4
5.	BCA-315	Operating System	3	1	0	5	5	10+10	30	70	100	4
	Practicals /	Seminar/Projects										
6.	BCA-31P	Programming in C++ Lab Based on BCA-311	0	0	3	10	10	30	50	50	100	2
7.	BCA-32P	DBMS Lab Based on BCA-314	0	0	3	10	10	30	50	50	100	2
8.	BCA-33G	G.P							100		100	1
		Total	15	5	6				350	450	800	25

BCA II-Year Semester-III

BCA II-Year Semester-IV

S.	Subject		Periods/Week			Evaluation Scheme						Credit
No	Code	Subject Name	L	Т	Р		Se	essional		ESE	Total	
						TA	AT	CT	Total			
1.	BCA-411	Web Designing & Applications	3	1	0	5	5	10+10	30	70	100	4
2.	BCA-412	Visual Programming	3	1	0	5	5	10+10	30	70	100	4
3.	BCA-413	Data Communication & Computer Networks	3	1	0	5	5	10+10	30	70	100	4
4.	BCA-414	Information & Cyber Security	3	1	0	5	5	10+10	30	70	100	4
5.	BCA-415	Management Information System	3	1	0	5	5	10+10	30	70	100	4
	Practicals /S	Seminar/Projects										
6.	BCA-41P	Web Designing Lab Based on BCA-411	0	0	3	10	10	30	50	50	100	2
7.	BCA-42P	Mini Project Work Based on BCA-412	0	0	3	10	10	30	50	50	100	2
8.	BCA-44G	G.P							100		100	1
		Total	15	5	6				350	450	800	25

S.	Subject		Periods/Week				Credit					
No	Code	Subject Name	L	Т	Р		Se	essional		ESE	Total	
						TA	AT	СТ	Total			
1.	BCA-511	Java Programming	3	1	0	5	5	10 + 10	30	70	100	4
2.	BCA-512	Computer Graphics and Animation	3	1	0	5	5	10 + 10	30	70	100	4
3.	BCA-513	Software Engineering	3	1	0	5	5	10 + 10	30	70	100	4
4.	BCA-514	Fundamental of E-Commerce	3	1	0	5	5	10 + 10	30	70	100	4
5.	Elective-I	(any one of the following)	3	1	0	5	5	10 + 10	30	70	100	4
		BCA-515/516/517/518/519										
	Practicals /S	Seminar/Projects										
6.	BCA-51P	Java Programming Lab Based on BCA-511	0	0	3	10	10	30	50	50	100	2
7.	BCA-52P	Computer Graphics Lab Based on BCA-512	0	0	3	10	10	30	50	50	100	2
8.	BCA-55G	G.P							100		100	1
		Total	15	5	6				350	450	800	25

BCA III-Year Semester-V

BCA III-Year Semester-VI

S.	Subject		Periods/Week			Evaluation Scheme						Credit
No	Code	Subject Name	L	Т	Р	Sessional				ESE	Total	
		, and the second s				TA	AT	СТ	Total			
1.	BCA-611	Framework with ASP.Net Programming	3	1	0	5	5	10+10	30	70	100	4
2.	BCA-612	Web Technology and Applications	3	1	0	5	5	10+10	30	70	100	4
3.	Elective-II	(any one of the following)		1	0	5	5	10+10	30	70	100	4
		BCA-613/614/615/616/617										
	Practicals /S	Seminar/Projects										
4.	BCA-61P	Web Tech Lab Based on BCA-611 & BCA-612	0	0	3	10	10	30	50	50	100	2
5.	BCA-62P	Project Work	0	0	6	10	10	30	50	50	100	4
6.	BCA-63P	Seminar	0	0	3	10	10	30	50	50	100	2
7.	BCA-66G	G.P							100		100	1
		Total	9	3	9				340	360	700	21

List of Electives

Sr. No.	Code	Elective- I (any one of the following)
1.	BCA-515	Artificial Intelligence
2.	BCA-516	Multimedia And Applications
3.	BCA-517	Enterprise Resource Planning
4.	BCA-518	Client Server Computing
5.	BCA-519	Mobile Computing
Sr. No.	Code	Elective- II (any one of the following)
1.	BCA-613	Data Warehousing and Mining
2.	BCA-614	Data Compression
3.	BCA-615	Software Testing
4.	BCA-616	Introduction to System Software
5.	BCA-617	Cloud Computing

There must be at least 15 students for any elective paper

BCA-111: FUNDAMENTALS OF COMPUTER SCIENCE

Course Objective:

The subject aims to provide the student with:

- > An understanding of basic concepts of computer science and engineering.
- > An introduction to the fundamentals of hardware, software and programming.
- > An introduction to mathematical software.
- > An understanding of cyber laws and computer security.

Unit I

(10 Sessions)

Knowing computer: What is Computer, Basic Applications of Computer; History of Computers, Components of Computer System, Central Processing Unit (CPU), VDU, Input/output Devices, Computer Memory, Concepts of Hardware and Software; Concept of Computing, Data and Information; Connecting keyboard, mouse, monitor and printer to CPU and checking power supply.

Unit II

(10 Sessions) Understanding Word Processing: Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document Mail merge.

Using Spread Sheet: Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread Sheet.

Unit III

(10 Sessions)

Basic of Computer networks; LAN, WAN; Introduction to Internet, WWW and Web Browsers, Applications of Internet; Connecting to internet; What is ISP; Knowing the Internet; World Wide Web; Web Browsing software, Search Engines; Understanding URL; Domain name; IP Address; Using website.

Unit IV

(10 Sessions)

Programming Fundamentals: Algorithm Development, Techniques of problem solving. Flowcharting, Stepwise refinement, Structured programming concepts; Top down Design, Development of efficient programs, Program Correctness, Debugging and testing of Programs. Data Type, Storage Classes, Variable, Constant, Keyword, Identifier, Operator & expression, Type Conversion.

Course Outcomes:

On completion of the course students will be able to

- Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming
- Write, compile and debug programs in C language and use different data types for • writing the programs.
- Design programs connecting decision structures, loops and functions. •
- Explain the difference between call by value and call byaddress. •
- Understand the dynamic behavior of memory by the use of pointers.
- Use different data structures and create / manipulate basic data files and developing • applications for real world problems.

Suggested Reading:

- 1. "Computer Fundamentals" by P K Sinha.
- 2. Computer Fundamental and Concepts by V. Raja Raman
- 3. Let Us C by Yaswant P. Kanetkar
- 4. Programming in C by Dennis and Ritche
- 5. "Computer Fundamentals" by Goel.
- 6. "Fundamentals of Natural Computing: Basic Concepts, Algorithms, and Applications (Chapman & Hall/CRC Computer and Information Science Series)" by de Castro and Leandro Nunes.

- https://www.livescience.com/20718-computer-history.html
- http://people.bu.edu/baws/brief%20computer%20history.html
- https://web.cs.wpi.edu/~emmanuel/courses/cs513/S10/pdf_slides/intro1.pdf
- https://en.wikipedia.org/wiki/Local_area_network
- https://sites.google.com/site/vandangcdth10/introduction
- https://www.w3schools.com/

BCA-112:

DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION

Course Objective: This course is intended to teach the basics involved in data representation and digital logic circuits used in the computer system. This includes the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. This course will also expose students to the basic architecture of processing, memory and I/O organization in a computer system.

UNIT-I

(10 Sessions)

Fundamental of Digital Electronics: Number systems, Logic gates and their truth tables, Combining logic circuits for expressions using NAND and NOR gates. Boolean Algebra Basics Laws of Boolean Algebra, Simplifications of Boolean equations using K-maps, Circuit Designing techniques (SOP, POS, K-Map). Combinational and sequential circuits: (Simple block diagrams, truth tables and IC packages only required). Adders, decoders, multiplexers, encoder circuits, Flip-flops: RS, clocked RS, JK, D and T flip flops, Master slave flip flops.

Unit –II

(10 Sessions)

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Microoperations, Arithmetic logic shift unit

Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members.

Unit –III

(10 Sessions)

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Difference between RISC and CISC.

Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA)

UNIT-IV

(10 Sessions)

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Course Outcomes:

The student will be able to:

- •Identify, understand and apply different number systems and codes.
- •Understand the digital representation of data in a computer system.
- •Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
- •Understand computer arithmetic formulate and solve problems, understand the performance requirements of systems

Suggested Reading:

- 1. M.M. Mano, "Computer Architecture", PHI 1998.
- 2. Malvino and Leach, "Digital Electronics", TMH, 1998.
- 3. Computer System Architecture, Naush Jotwani-7MM.
- **4.** Digital Electronics, James W Bignel, Robert Donovan, 5th Edition, Cengage Learning Publications.
- 5. Digital Design Morris Mano, PHI, 3rd Edition, 2006.

- 6. Taub & Schilling: Digital integrated electronics, McGraw-Hill
- 7. R P Jain : Digital Electronics, 4th Edition TMH.

- https://www.geeksforgeeks.org/digital-electronics-and-computer-organisation/
- https://bcastudyguide.wordpress.com/digital-electronics-and-computerorganisation/
- http://www.birzeit.edu/en/content/encs211-digital-electronics-and-computerorganization-lab-0
- https://www.javatpoint.com/digital-computers
- https://www.w3schools.com/

BCA-113: MATHEMATICS-I

Course Objective: The main aims of this course are to encourage and enable students to: recognize that mathematics permeates the world around us. Appreciate the usefulness, power and beauty of mathematics. Enjoy mathematics and develop patience and persistence when solving problems, study of fundamental and basic applications and logics of Mathematics. The ability to conceptualize, inquire, reason and communicate mathematically, and to use mathematics to formulate and solve problems in daily life as well as in mathematical contexts.

UNIT 1

Matrix: Definition, Type of Matrices, Algebra of Matrices, Transpose of a matrix, Adjoint of a square matrix and Solution of linear equations, Cramer's Rule, Determinants.

UNIT 2

(8 Sessions) Differential Calculus: Successive differentiation, Leibnitz theorem, Partial differentiation, Euler's theorem, Change of variable, Jacobian and theorems.

UNIT 3

Integral Calculus: Integration of Rational and Irrational functions, Reduction formulae, Definite integral, Simple problems of double and triple integrals.

Differential Equation: Differential equations of first order. Differential equations of second order and Differential of second order with constant coefficients.

UNIT 4

(8 Sessions)

(8 Sessions)

(8 Sessions)

(8 Sessions)

Vector Calculus and Algebra: Vectors, Differentiation and Partial differentiation of vector functions, Derivative of sum, Dot product and cross product of two vectors, Gradient, Divergence and Curl.

UNIT 5

Coordinate Geometry: Straight Line, Circles and the system of Circles; Standard equations and Properties of Parabola, Ellipse and Hyperbolas, General equation of second degree in two variables.

Course Outcomes:

The student is able to

- Solve a system of linear equations by row-reducing its augmented form.
- Perform the matrix operations of addition, multiplication and transposition and express a system of simultaneous linear equations in matrix form.
- Determine whether or not a given matrix is invertible and if it is, find its inverse. •

Suggested Readings:

- 1. E. Kreyszig: "Engineering Mathematics", wiley Editorial Ltd.
- 2. B.S.Grewal: "Higher Engineering Mathematics", Khanna Publications.
- 3. H.K.Das: "Engineering Mathematics", S. Chand Publication.
- 4. Gorakh Prasad: "Differential Calculus", Pothishala Private Ltd.
- 5. A. R. Vasishtha: "Vector Calculus", Krishna Prakashan Media (P) Ltd, Meerut.
- 6. 6. Ajay Kumar, Usa Gupta: "Coordinate Geometry", Mcgraw hill Publication.

- www.pdfdrive.com
- www.dmi.gov.in

- www.yourarticlelibrary.com
- onlinecourses.nptel.ac.in
- en.wikipedia.org

BCA-114: PRINCIPLES OF MANAGEMENT

Course Objective:

- To help the students gain understanding of the functions and responsibilities of managers.
- To provide them tools and techniques to be used in the performance of the managerial job.
- > To enable them to analyze and understand the environment of theorganization.
- To help the students to develop cognizance of the importance of management principles.

Unit I

(10 Sessions)

(10 Sessions)

Conceptual frame work of management, Evolution and Foundation of management Theories. Evolution of Management: Early contributions, Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach.

Unit II

Introduction to Functions of Management Planning: Nature, Scope, Objectives and Significance of Planning, Types of Planning, Process of Planning, Barriers to Effective Planning. Organizing: Concept, Organization Theories, Forms of Organizational Structure. Span of Control, Delegation of Authority, Authority & Responsibility, Organisational Design. Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development, Performance Appraisal, Directing: Concept, Direction and Supervision, Motivation: Concept, Motivation and Performance, Theories Of Motivation, Approaches for Improving Motivation.

Unit III

(10 Sessions)

Communication: Communication Process, Importance of Communication, Communication Channels, Barriers to Communication. Controlling: Concept, Types of Control, Methods: Precontrol: Concurrent Control: Post-control.

Unit IV

(10 Sessions)

Relevance of Computer Applications in Different Functional Areas of Management Viz: Financial Management, Production Management, Human Resources Management and Marketing.

Course Outcomes:

- Understand the concepts related to Business.
- Demonstrate the roles, skills and functions of management.
- Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions.
- Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.

Suggested Readings:

- 1. Parag Diwan & L.N. Agarwal, "Management Principles & Practices."
- 2. Frad Luthans, "Organizational Behavior" L.M. Prasad, "Principles and Practices"
- **3.** Stephen P. Robbins and Mary Coulter, 'Management', Prentice Hall of India, 8th edition.
- 4. Charles W L Hill, Steven L McShane, 'Principles of Management', Mcgraw Hill Education, Special Indian Edition, 2007.

- 5. Hellriegel, Slocum & Jackson, 'Management A Competency Based Approach', Thomson South Western, 10th edition, 2007.
- 6. Harold Koontz, Heinz Weihrich and Mark V Cannice, 'Management A global

- http://cbseacademic.nic.in/web_material/Curriculum21/publication/srsec/UNIT3_ BA_XII.pdf
- https://www.managementstudyhq.com/functions-of-management.html
- https://www.tutorialspoint.com/effective_communication/effective_communication n_process.htm
- https://web.njit.edu/~lipuma/352comproc/comproc.htm
- https://open.lib.umn.edu/communication/chapter/1-2-the-communication-process/

ECO-105: ENGLISH COMMUNICATION-I

Course Objective:

- To train and prepare the students to seek and find employment in the corporate, media, English language teaching and content writing sectors
- To develop communicative competence in students •
- To impart knowledge, ideas and concepts in the technicalities of proper • pronunciation, structure, appropriate use and style of the English Language as well as the application areas of English communication
- To expose the students to the employment opportunities, challenges and job roles. •
- To enable the students to conduct independent surveys, collect and analyze data, • prepare and present reports and projects
- To guide the students to establish self-employment strategies •

UNIT I:

Basic Applied Grammar and Usage

Memo Writing Guided Story Writing

Speeches Extempore Group Discussion

Role Play

(8 Sessions)

The Sentences: Kinds; Parts; Phrases & Clauses; Transformation; Ouestion Tags. A General Introduction of Parts of Speech (definition and kinds of each) Articles: Kinds, Omission of Articles, Repetition of Articles Punctuation

UNIT II:

(10 Sessions) **Basic Applied Grammar Continued** Tenses: Kinds: Usage Active Passive Voice **Direct- Indirect Speech** Syntax UNIT III: Writing Skills Paraphrasing Expansion

(8 Sessions)

UNIT V:

Speaking Skills

UNIT IV:

Interpersonal Skills

Team: Concepts, Elements, Types, Stages Presentation Skills & strategies Interview: Concepts, Types, Process, Interview Preparation Checklist Common Interview mistakes, Interview Handling Skills

Course Outcomes:

To impart knowledge about the appropriateness, grammaticality and acceptability of the • English language

(12 Sessions)

(10 Sessions)

• To assist the students in learning the concepts of register, style and jargon as well as the various varieties of English

Suggested Readings:

- 1. Professional Communication by Malti Agarwal, Krishna Publications.
- 2. High School English Grammar & Composition by Wren & Martin, S. Chand & Company LTD., New Delhi.
- 3. Introduction to Socio-Linguistics- Ronald Wardough
- 4. Oxford Introduction to Language Study: Sociolinguistics Bernard Spolsky OUP
- 5. A Glossary of Sociolinguistics Peter Trudgill Oxford University Press

- https://www.scribd.com/presentation/335390974/Applied-Grammar-and-Usage
- https://hbrascend.org/topics/a-dozen-grammatical-rules-you-absolutely-need-toknow/
- https://grammar.yourdictionary.com/grammar-rules-and-tips/11-rules-of-grammar.html
- https://www.skillsyouneed.com/interpersonal-skills.html
- https://www.indeed.co.in/career-advice/resumes-cover-letters/interpersonal-skills

BCA-11P: Basic Computer Lab Based on BCA-111

Course Objective:

To produce programmers equipped with an understanding of

- fundamental computational concepts underlying most programming languages
- a range of problem solving techniques using computers
- the role of programming within the overall software development process
- attitudes and working practices appropriate for a professional programmer
- the solution of small problems using a programming language
- the clear expression of solutions at different levels of abstraction
- Independent and self-motivated study in Computing Science.

List of Programs:

- 1. Write a C "Hello, World!" Program.
- 2. Write a C program to Add Two Integers.
- 3. Write a C Program to Multiply Two Floating-Point Numbers.
- 4. Write a C Program to Swap Two Numbers.
- 5. Write a C Program to Display Fibonacci Sequence.
- 6. Write a C Program to Display Characters from A to Z Using Loop.
- 7. Write a C Program to Display Factors of a Number.
- 8. Write a C Program to Find Factorial of a Number Using Recursion.
- 9. Write a C Program to Add Two Matrices Using Multi-dimensional Arrays.
- 10. Write a C Program to Find the Length of a String.
- 11. Write a C Program to Display its own Source Code as Output.

Course Outcomes:

- Understands the concept of Computer's Input/output devices, the concept of dynamic memory, data types, loops, functions, array, pointers, string, structures and files.
- Design program logic on real-world problems.
- Analyze problems, errors
- Applying programming concepts to compile and debug c programs to find solutions.
- Understand the concept of data types, loops, functions, array, pointers, string, structures and files.
- Design flow-chart, algorithm and program logic.
- Analyze problems, errors and exceptions.
- Apply programming concepts to compile and debug c programs to find solutions.

BCA-12P: Digital Electronics Lab Based on BCA-112

Course Objective:

The objectives are to study

- To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits.
- To prepare students to perform the analysis and design of various digital electronic circuits.

List of Experiments:

- 1. Realization of basic gates using Universal logic gates.
- 2. Code conversion circuits- BCD to Excess-3 and vice-versa.
- 3. Four-bit parity generator and comparator circuits.
- 4. Construction of simple Decoder and Multiplexer circuits using logic gates.
- 5. Design of combinational circuit for BCD to decimal conversion to drive 7segment display using multiplexer.
- 6. Construction of simple arithmetic circuits-Adder, Subtractor.
- 7. Realization of RS-JK and D flip-flops using Universal logic gates.
- 8. Realization of Universal Register using JK flip-flops and logic gates.
- 9. Realization of Universal Register using multiplexer and flip-flops.
- 10. Realization of Asynchronous Up/Down counter.
- 11. Realization of Synchronous Up/Down counter.
- 12. Realization of Ring counter and Johnson's counter.
- 13. Construction of adder circuit using Shift Register and full Adder.
- 14. Code conversion circuits Binary to Gray & Vice-Versa. (Innovative)
- 15. Design of Sequential Counter with irregular sequences. (Innovative)

Course Outcomes:

After studying this course the students would gain enough knowledge

- Have a thorough understanding of the fundamental concepts and techniques used in digital electronics.
- To understand and examine the structure of various number systems and its application in digital design.
- The ability to understand, analyze and design various combinational and sequential circuits.
- Ability to identify basic requirements for a design application and propose a cost effective solution.
- The ability to identify and prevent various hazards and timing problems in a digital design.
- To develop skill to build, and troubleshoot digital circuits.

BCA-211: ADVANCED PROGRAMMING IN C

Course objective: This course is designed to explore computing and to show students the art of computer programming. Students will learn some of the design principles for writing good programs.

Unit I

Introduction of data types, Storage classes, Operators, Operator precedence and associativity, Input/Output Functions, Sequential approach problems, If-else statement, Nesting of if, if_else statement, compound conditional if statement, switch statement, nesting of switch statement, selected approach problems, goto statement, loop statements(while statement, do-while statement and for statement), repetitive structure problems. Nesting of while statement, Nesting of do-while statement, Nesting of for statement, break and continue statement, Multiple loop variable, comma operator.

Unit II

Introduction of One Dimensional and Multi dimensional array, Declaration, Initialization, manipulation of one dimensional array, Insertion, deletion of new element in array, sorting, searching and merging of one dimensional array. Matrix manipulation of Two Dimensional Arrays.

Unit III

(10 Sessions)

(10 Sessions)

User defined function, passing arguments by value and array parameter, local and global variable, nesting of function, Recursion, Tail recursion. String manipulation by string handling functions. Structure and Union data type, nested structure, array of structure, passing structure to the function.

Unit IV

(10 Sessions)

Introduction to Pointers, declaration, address arithmetic, pointer arithmetic, using pointer as function argument (call by reference). File handling in C : creation of file, open a file, accessing, appending and deleting data of a file, updating data file, Defining and calling macros, standard c library and other standard c functions.

Course Outcomes:

On completion of this course, the students will be able to:

- . Comprehend concepts related to computer hardware and software, draw flowcharts and write algorithm/ pseudocode.
- Write, compile and debug programs in C language, use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements, case control structures, arrays, strings, pointers, functions and implement the dynamics of memory by the use of pointers.
- Comprehend the concepts of linear and Non-Linear data structures by implementing linked lists, stacks and queues.

Suggested Readings:

- **1.** "Concept of 'C" by Robert laffore, TMH Publication.
- 2. "Programming in 'C" by E. Balaguruswami, TMH Publication
- 3. "Let Us C" by Yaswant P. Kanetkar, Narosa Publication
- **4.** "Magic in C" AB Publication.
- 5. Programming in C by Dennis and Ritche.

(10 Sessions)

- 6. Silverschatz A., Korth F. H. and Sudarshan S., Database System Concepts, Tata McGraw Hill (2010) 6th ed.
- 7. Elmasri R. and Navathe B. S., Fundamentals of Database Systems, Pearson (2016) 7th ed
- 8. Hoffer J., Venkataraman, R. and Topi, H., Modern Database Management, Pearson (2016) 12th ed.

- https://www.bmu.edu.in/social/best-books-for-c-programming/
- http://ce.sharif.edu/courses/95-96/1/ce153 12/resources/root/Books/Advanced%20C%201992.pdf
- https://www.w3schools.com/

IFTM University, Moradabad Bachelor of Computer Applications (B.C.A) Programme B.C.A.- I Year (Second Semester) BCA-212: DATA STRUCTURE AND ALGORITHMS

Course Objectives: To become familiar with different types of data structures and their applications and learn different types of algorithmic techniques and strategies.

Linear Data Structures: Arrays, Records, Strings and string processing, References and aliasing, Linked lists, Strategies for choosing the appropriate data structure, Abstract data types and their implementation: Stacks, Queues, Priority queues, Sets, Maps.

UNIT-I:

(10 Sessions)

Introduction to Algorithm Design and Data Structure: Introduction to Data Structure, Classification data Structure, Characteristics of an Algorithm; Building Blocks of Algorithms, Complexity of Algorithms: Notations for the Growth Rates of Functions. Procedure and Recursion, Array: Single and Multidimensional.

UNIT-II:

(10 Sessions)

(10 Sessions)

List, Stacks and Queues: List ADT: Implementation using arrays, linked list, cursor based linked lists, applications of lists, Stack ADT: Concept and Applications, Queue ADT: Concept and Applications

UNIT-III:

Trees and Graphs: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Sequential and Other Representations of Trees, Tree Traversal. Graphs: Matrix Representation of Graphs, List Structures, Other Representations of Graphs, Spanning Trees, Traversal in graph: Breadth First Search, Depth First Search

UNIT-IV:

(10 Sessions)

Sorting and Searching: Sorting: Insertion Sort, Shell Sort, Heap Sort, Merge Sort, Quick Sort, Linear search and Binary Search, Balanced Search Trees: AVL trees, B-Tree. Indexing & hashing: Hash Function – Separate Chaining – Open Addressing.

Divide and Conquer Strategy: Binary Search, Merge sort, Quick sort. Greedy Strategy: Knapsack Problem.

Course Outcomes:

On completion of this course, the students will be able to

- Implement the basic data structures and solve problems using fundamental algorithms.
- Implement various search and sorting techniques.
- Analyze the complexity of algorithms, to provide justification for that selection, and to implement the algorithm in a particular context.
- Analyze, evaluate and choose appropriate data structure and algorithmic technique to solve real-world problems.

Suggested Readings:

- 1. AV Aho, J Hopcroft, JD Ullman, Data Structures and Algorithms, Addison-Wesley, 1983.
- 2. TH Cormen, CF Leiserson, RL Rivest, C Stein, Introduction to Algorithms, 3rd Ed., MIT Press, 2009.
- **3.** AV Aho, J Hopcroft, JD Ullman, The Design and Analysis of Algorithms, Addison-Wesley, 1974.
- **4.** MT Goodrich, R Tamassia, DM Mount, Data Structures and Algorithms in Java, 5th Ed., Wiley, 2010. (Equivalent book in C also exists.)
- 5. Corman, Leiserson&Rivest, Introduction to Algorithms, MIT Press (2009).

6. Narasimha Karumanchi, Data Structures and Algorithms Made Easy (2014).

- https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf
- https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf
- https://www.w3schools.com/
- •

BCA-213: BUSINESS DATA PROCESSING

Course Objective: Provide insight into methods and tools for analysis and processing of the data generated by modern information systems. This course will expose you to the data analytics practices executed in the business world. We will explore such key areas as the analytical process, how data is created, stored, accessed, and how the organization works with data and creates the environment in which analytics can flourish.

UNIT-I

Data Processing: Concepts, Data processing Cycle, Methods of Data Processing, Major functional areas, Need of Data and Information, Online Processing, Batch Processing, Real-time Processing, Time-Sharing, Multiprogramming Systems, Multiprocessing Systems, Distributed Data Processing

UNIT-II

Data storage Devices and Hierarchy: Tape Cartridge, Circular Disk (Floppy), Hard Disk, And CD-ROM Disk. Fields, Records, Fixed & Variable length records, Primary & Secondary Key, Disk Structure.

UNIT-III

File Organization and Operations: Sorting, Searching and Merging, Sequential, Direct or relative Access, Index Sequential File, Heap File Organization, Hash File Organization, B+ Tree File Organization, Clustered File Organization.

UNIT-IV

(10 Sessions)

Programming Methodologies: Structured And Object oriented programming concepts. Programming principles, Coding Style, DBMS Concepts, Relational Database Management Applications, Types of Database Models - Network Model, Hierarchical Model, RDBMS -ORDBMS, Creating Databases, Tables, Views, Queries, Forms, Reports, Fields & Its Properties, Data Types, Normalization overview.

Course Outcomes:

- Describe the fundamentals of information technology concepts hardware, software, security, and privacy.
- Demonstrate proper file management techniques to manipulate electronic files and folders in local, network, and online environments.
- Create business documents with word processing software using spelling and grammar check, format and layout, tables, citations, graphics, and mail merge.
- Create business documents and analyze data with spreadsheet software using (1) tables, sorting, filtering, charts and graphics, pivot tables, macros; (2) statistical, financial, logical and look-up functions and formulas; and (3) add-ins.
- Create business multimedia presentations with presentation software using templates. lists, groups, themes, colors, clip art, pictures, tables, transitions, animation, video, charts, and views.
- Create databases and manage data with database software using tables, fields, relationships, indexes, keys, views, queries, forms, reports, and import/export functions.

Suggested Readings:

Arnold, Robert R., Hill, Harold C., and Nichols, Aylmer V. Introduction to Data 1. Processing. Wiley.

(10 Sessions)

(10 Sessions)

(10 Sessions)

- **2.** V. K. Kapoor, Introduction to Computer Data Processing & System Analysis, Sultan Chand & Sons.
- 3. Theory and Problem of Data Processing Schaum Series Martin M. Lipschutz.
- **4.** Computer And Data Processing with Basic Sharma, A. K. & Emdad H. Khan, Oford and IBH Publications.
- 5. John Shelly and Roger Hunt, Computer Studies : A first course, PHI.

- http://www.ddegjust.ac.in/studymaterial/pgdca/ms-09.pdf
- https://static1.squarespace.com/static/5a707ed890bcce204deb229f/t/5b3d20b4758d46435 998ba93/1530732729195/Management+Information+Systems.pdf
- http://bitsavers.trailing-edge.com/pdf/ibm/generalInfo/C20-1638-1 Data File Handbook Mar66.pdf
- https://www.w3schools.com/

BCA-214: ORGANISATIONAL BEHAVIOR

Course Objective:

- To help the students to develop cognizance of the importance of human behaviour.
- To enable students to describe how people behave under different conditions and understand why people behave as they do.
- To provide the students to analyse specific strategic human resources demands for future action.
- To enable students to synthesize related information and evaluate options for the most logical and optimal solution such that they would be able to predict and control human behavior and improve results.
- To enable the students to understand the impact that individual, group & Structures have on behavior within the organizations and such knowledge towards improving organizational effectiveness.

Unit I

Organizational Behaviour: Concept, Nature, Characteristics, Conceptual Foundations, Models of Organizational Behaviour, Management Challenge, A Paradigm Shift, Relationship with Other Fields, Organisational Behaviour: Cognitive Framework, Behaviouristic Framework and Social Cognitive Framework.

Unit II

(10 Sessions)

(10 Sessions)

Perception and Attribution: Concept, Nature, Process, Importance of Perception. Attitude: Concept, Process and Importance, Attitude Measurement. Personality: Concept, Nature, Types and Theories of Personality Shaping. Learning: Concept and Theories of Learning. Motivation: Concepts and Their Application, Principles, Motivation Theories.

Leadership: Concept, Function, Leadership Theories, Leadership Style.

Unit III

(10 Sessions)

Organisational Culture : Concept, Charactersitics, Elements of Culture. Organisational Power and Politics: Concept, Sources of Power, Distinction Between Power, Authority.

Unit IV

(10 Sessions)

Organisation Change : Concept, Nature, Resistance to change, Managing resistance to change, Kurt Lewin Theory of Change. Meaning and Types of Grievance and Process of Grievance Handling. Stress: Understanding Stress and Its Consequences, Causes of Stress, Managing Stress.

Course Outcomes:

- Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.
- Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.
- Analyze the complexities associated with management of the group behavior in the organization.
- Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization.

Suggested Readings:

- **1.** Davis, Keith Human Behaviour at Works Tata Mc Graw Hill, New Delhi.
- 2. Luthans Fred Organizational Behaviour (Tata Mc Graw Hill)

- **3.** Newstrom John W. Organizational Behaviour: Human Behavour at Work (Tata Mc Graw Hill, 12th Edition)
- 4. Robbins Stephen P. Organizational Behaviour (Pearson Education, 12th Edition)
- **5.** Greenberg Jerald and Baron Robert A. Behavior In Organisations: Understanding and Managing the Human Side of Work (Prentice Hall of India)
- **6.** Hersey Paul, Blanchard, Kenneth H and Johnson Dewey E. Management of Organsational Behavior: Leading Human Resources (Pearson Education, 8th Edition)

- https://2012books.lardbucket.org/pdfs/an-introduction-to-organizational-behaviorv1.1.pdf
- http://www.tmv.edu.in/pdf/Distance_education/BCA%20Books/BCA%20VI%20SEM/B CA-629%20OB.pdf
- https://ebs.online.hw.ac.uk/EBS/media/EBS/PDFs/Organisational-Behaviour-Course-Taster.pdf
- https://www.macmillanihe.com/resources/sample-chapters/9781137429445_sample.pdf
- https://www.w3schools.com/

BCA-215: MATHEMATICS-II

Course Objective: The main aims of this course are to encourage and enable students to: recognize that mathematics permeates the world around us. Appreciate the usefulness, power and beauty of mathematics. Enjoy mathematics and develop patience and persistence when solving problems, study of fundamental and basic applications and logics of Mathematics.

UNIT 1

Real numbers: The sets of natural numbers, Integers, Rational and Irrational numbers, Real numbers, Intervals, Absolute value of a real number, Bounded set, Complete ordered filed, Neighborhood, Open and Closed sets.

UNIT 2

(10 Sessions)

(8 Sessions)

(8 Sessions)

Limits and Continuity: Definition, Algebra of limits, Right hand and Left hand limits, Definition of Continuity, Discontinuity and Types of Discontinuity.

UNIT 3

Indeterminate Forms: Definition and Types of Indeterminate forms. **Maxima and Minima:** Definition, Conditions for maxima and minima and its simple problems.

UNIT 4

Mean Value Theorems: Rolle's theorem, Lagrange's Mean Value theorem, Cauchy's Mean Value theorem, Taylor's series and Maclaurin series.

UNIT 5

Infinite Series: Introduction, Convergent series, Divergent series, Oscillatory series, Positive term series test, Alternating Series test, p-series test, Comparison test, D'Almberts ratio test, Cauchy's nth root test and Rabbe's test.

Course Outcomes:

The student is able to

- Solve a system of linear equations by row-reducing its augmented form.
- Perform the matrix operations of addition, multiplication and transposition and express a system of simultaneous linear equations in matrix form.
- Determine whether or not a given matrix is invertible and if it is, find its inverse.

Suggested Readings:

- 1. E. Kreyszig: "Engineering Mathematics", wiley Editorial Ltd.
- 2. B.S.Grewal: "Higher Engineering Mathematics", Khanna Publications.
- 3. H.K.Das: "Engineering Mathematics", S. Chand Publication.
- 4. Gorakh Prasad: "Differential Calculus", Pothishala Private Ltd.
- 5. A. R. Vasishtha: "Vector Calculus", Krishna Prakashan Media (P) Ltd, Meerut.
- 6. 6. Ajay Kumar, Usa Gupta: "Coordinate Geometry", Mcgraw hill Publication.
- 7. A. R. Vashishitha, "Real Analysis".

Website Sources:

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- www.yourarticlelibrary.com
- onlinecourses.nptel.ac.in
- en.wikipedia.org

(**10 Sessions**) Cauchy's Mee

(8 Sessions)

BCA-21P: Programming in C Lab Based on BCA-211

Course Objective:

- To introduce students to the basic knowledge of programming fundamentals of C language.
- > To impart writing skill of C programming to the students and solving problems.
- > To impart the concepts like looping, array, functions, pointers, file, structure.

List of Experiments:

- 1. Find the area of a Triangle.
- 2. Find greatest among 3 numbers.
- 3. Perform the arithmetic expression using switch statement.
- 4. Find the factorial of a given number.
- 5. Generate all prime numbers up to nth number
- 6. Print Fibonacci series
- 7. Find total of even integers
- 8. Print product of two matrices
- 9. Concatenate two strings without using library functions
- 10. Print the elements of array using pointers
- 11. Find factorial of a given number using function.
- 12. Find total mark of n students

Course Outcomes:

After completing this lab course you will be able to:

- 1. Understand the logic for a given problem.
- 2. Write the algorithm of a given problem.
- 3. Draw a flow chart of a given problem.
- 4. Recognize and understand the syntax and construction of C programming code.
- 5. Gain experience of procedural language programming.
- 6. Know the steps involved in compiling, linking and debugging C code.
- 7. Understand using header files.
- 8. Learn the methods of iteration or looping and branching.
- 9. Make use of different data-structures like arrays, pointers, structures and files.
- 10. Understand how to access and use library functions.
- 11. Understand function declaration and definition.
- 12. Understand proper use of user defined functions.
- 13. Write programs to print output on the screen as well as in the files.
- 14. Apply all the concepts that have been covered in the theory course, and
- 15. Know the alternative ways of providing solution to a given problem.

BCA-22P: Data Structure Lab Based on BCA-212

Course Objective:

The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures

List of Experiments:

- 1. Design and Implement List data structure using i) array ii) singly linked list.
- 2. Design and Implement basic operations on doubly linked list.
- 3. Design and Implement stack using i) array ii) singly linked list
- 4. Design and Implement Queue using i) array ii) singly linked list
- 5. Design and Implement basic operations on Circular Queue
- 6. Design and Implement basic operations(insertion, deletion, search, findminand findmax) on Binary Search trees.
- 7. Implementation of Breadth First Search Techniques.
- 8. Implementation of Depth First Search Techniques.
- 9. Implementation of Dijkstra's Algorithm.
- 10. Implementation of Kruskal's Algorithm.
- 11. Implementation of MergeSort.
- 12. Implementation of Binary Search using arrays.

Course Outcomes:

Course Outcomes: At the end of this lab session, the student will

- > Be able to design and analyze the time and space efficiency of the data structure ·
- > Be capable to identity the appropriate data structure for given problem
- > Have practical knowledge on the applications of data structures.

Suggested Readings:

- Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
- E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill.
- Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.
- Seymour Lipschutz, Data Structures, Schaum's Outlines Series, Tata McGraw-Hill.
- Ellis Horowitz, Satraj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, W. H. Freeman and Company.
- R. G. Dromey, How to Solve it by Computer, Prentice-Hall of India.

BCA-311: OBJECT ORIENTED PROGRAMMING IN C++

Objective: The objective of course is to develop programming skills of students, using object oriented programming concepts, learn the concept of class and object using C++ and develop classes for simple applications.

UNIT- I

Introduction to OOP: Advantages of OOP, Need of object-oriented programming, Procedure Oriented Vs Object Oriented Programming. Introduction to C++: C++ Programming Basics, Basic Program Construction of C++, Key words in C++, Input/Output in C++, Variables, Constants, Data Types and Operators in C++, Precedence of Operators, Characteristics of object oriented languages, C++ and C.

UNIT-II

Decision Making and Loops in C++ : Conditional statement, Switch Statement, Break Statement, Continue Statement, Go to Statement Loops in C++, While, Do-While, For loop.

UNIT-III

Functions : User Defined Functions, library functions, General form of a function, scope rules of functions, function arguments(Call by value, Call by Reference), Recursion Calling Functions with arrays, Returning by reference, Friend Functions, Inline Functions.

UNIT- IV

(10 Sessions)

(10 Sessions)

(10 Sessions)

(10 Sessions)

Objects and classes : Structure and Classes, friend classes, Scope resolution operator, specifying and using class and object, Constructors, objects and function arguments. Inheritance: Base Class, Derived Class, access specifies Single Inheritance, Multiple Inheritance, Multilevel Inheritance. Polymorphism: Compile time, Run time, Operator Overloading, Function Overloading, Virtual functions, Dynamic Binding, Static Binding. File Processing, Templates.

Learning outcomes:

On completion of the course students should be able to

- Identify importance of object oriented programming and difference between structured oriented and object oriented programming features.
- Understand the relative merits of C++ as an object oriented programming language.
- Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.
- Understand advanced features of C++ specifically stream I/O, templates and operator overloading.
- Able to make use of objects and classes for developing programs.

Suggestive Readings:

1. Herbort Schildt "The Complete Reference C++" TMH Publication.

- 2. E. Balaguruswami "Object Oriented Programming with C++" TMHPublication.
- 3. James Rambaugh "Object Oriented Modeling and Design" Pearson Publication.

- www.codementor.io/@michaelsafyan/object-oriented...
- www.w3schools.com/cpp/cpp_oop.asp
- stackoverflow.com/questions/351733
- www.tutorialspoint.com
- www.sathyabama.ac.in

BCA-312: SYSTEM ANALYSIS & DESIGN

Objectives: This module aims to as to introduce variety of new software used by analysts, designers to manage projects, analyze and document systems, design new systems and implement their plans. It introduces also a recent coverage of UML, wireless technologies and ERP; web based systems for ecommerce and expanded coverage on RAD and GUI design.

Unit I:

Introduction, Definition of a System, Characteristics of a system, Elements of Systems Analysis, Role of Systems Analyst, Systems Development Life Cycle, Phases of SDLC, Approaches to Development, Concepts and Process of Documentation, Types of Documentation,

Unit II:

(10 Sessions) Introduction to planning and Designing, Fact Finding Techniques Issues involved in Feasibility Study, Cost Benefit Analysis, Gathering Requirements of System, Design Principles, Structure Charts, Modularity, Logical and Physical Design, Process Modeling, Data Modeling, Data Dictionary

Unit III:

Forms, Reports, Process of Designing Forms and Reports, Types of Information, Criteria for Form & Report Design, Introduction to Database design, Design of Database fields, Design of Physical Records, Design of Database, Use of CASE Tools by Organizations, Components of CASE, Visual and Emerging CASE Tools.

Unit IV:

(10 Sessions)

(10 Sessions)

(10 Sessions)

Implementation of Systems, Maintenance of Systems, Definition of Audit, Audit of Transactions on Computer, Computer Assisted Audit Techniques, Computer System and Security issues, Concurrent Audit Techniques, Role of MIS in an Organization, Different kinds of Information Systems, Summary.

Learning outcomes:

On completion of the course students should be able to

- Solve a wide range of problems related to the analysis, design and construction of information systems.
- Plan and undertake a major individual project, prepare and deliver coherent and structured verbal and written technical reports.
- Understand that the successful systems analyst needs to have a broad understanding of organizations, organizational culture, organizational change, organizational operations, and business processes.
- Understand that IT strategy must be conceived in an interaction with overall organizational • strategy.

Suggestive Readings:

1.SystemsAnalysisandDesignbyJames.A.Senn 2. Systems Analysis and Design by Elias M. Awad

- www.tutorialspoint.com
- lecture-notes-forstudents.blogspot.com

- www.bcanotes.com
- www.systemanalysisanddesign

BCA-313: DISCRETE MATHEMATICS

Objective: - The main aims of this course are to prepare the students to develop and understand the mathematical foundations and create mathematical arguments require in learning many mathematics and computer sciences courses. To motivate students how to solve practical problems using discrete mathematics. Also, in this course basic concepts of Graph theory such as Trees, Eulerian Graphs, Vertex colourings and learn about the basic knowledge of prepositions.

UNIT I

Mathematical Logic: Statement, Simple and Compound Statements, Logical connectives, Truth Tables, Duality. Conditional and Bi- Conditional Statements, Tautologies, Contradiction, Algebra of propositions, Logical equivalence, Normal forms, Arguments and Validity of arguments.

UNIT II

(10 Sessions) Boolean Algebra: Definition, Laws of Boolean algebra, Duality, The AND, OR and NOT gates and others, Boolean Expressions, Logic diagrams, Normal forms and K-maps for two, three and four variables.

UNIT III

Functions: Introduction, Functions, Identity function, One to one, Onto and Invertible functions, Composition of functions, Mathematical functions, Exponential and Logarithmic functions, Recursively defined function.

UNIT IV

Relations: Introduction, Ordered pair, Cartesian product, Relations, Domain and Range, Pictorial representation of relations, Inverse relation, Identity relation, Universal relation, Composition of relations, Types of relations, Equivalence relations and Partial order relations.

UNIT V

Graph Theory: Definitions, Finite and Infinite graphs, Incidence and degree, Null graph, Subgraph, Connected and Disconnected graphs, Planar graph, Regular graph, Graph coloring, Chromatic number, Adjacency matrix and Incidence Matrix.

Trees: Definition, Properties of Trees, Rooted tree, Binary tree and Pathlength of tree.

Course Outcomes:

The student is able to

- Write an argument using logical notation and determine if the argument is or is not valid. •
- Demonstrate the ability to write and evaluate a proof or outline the basic structure and give • examples of each proof technique described.
- Understand the basic principles of sets and operations in sets. •
- Apply counting principles to determine probabilities. •
- Demonstrate an understanding of relations and functions and be able to determine their • properties.
- Demonstrate different traversal methods for trees and graphs.

(10 Sessions)

(10 Sessions)

(10 Sessions)

(10 Sessions)

Suggestive Readings:

1. Schaum's (Seymour Lipschutz, Marc Lipson): "Discrete Mathematics" TMH Publication.

2. N. Deo, "Graph Theory with application to Engineering and Computer Science," PHI Publication.

- 3. B.Colman and Robert C. Busby, "Discrete Mathematical structure for Computer Science," PHI.
- 4. Olympia Nicodemi, "Discrete Mathematics" CBS Publication, Delhi.

5. C.L.Liu, "Element of Discrete Mathematics" Mc Graw Hill Book Co., 1985.

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- www.dmi.gov.in
- www.yourarticlelibrary.com
- onlinecourses.nptel.ac.in
- en.wikipedia.org

BCA-314: DATABASE MANAGEMENT SYSTEM

Objectives: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS. Also To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and to design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

UNIT-I

Introduction: An overview of database management system, Database System Vs File System, Database system concepts and architecture, Data definitions language, DML, Overall Database Structure. Data Modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys.

UNIT-II

Relational data Model, integrity constraints, entity integrity, referential integrity, Keys constraints. Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations.

UNIT-III

Sessions)

Data Base Design & Normalization: Functional dependencies, normal forms, first, second, third normal forms, inclusion dependence, loss less join decompositions. Transaction Processing Concepts: Transaction system, Testing of Serializability, Serializability of schedules, conflict & view serializable schedule. Recovery from transaction failures.

UNIT-IV

Concurrency Control Techniques: Concurrency control, locking Techniques for concurrency control, Time stamping protocols for concurrency control, validation based protocol, multiple granularity, Recovery with concurrent transaction. Transaction Processing in Distributed system, data fragmentation. Replication and allocation techniques for distributed system, overview of concurrency control.

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Describe the fundamental elements of relational database management systems
- Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
- Design ER-models to represent simple database application scenarios
- Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
- Improve the database design by normalization.
- Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing

(10 Sessions)

(10 Sessions)

(10 Sessions)

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Suggestive Readings:

1 Date C J, "An Introduction To Database System", Addision Wesley

2 Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill

3 Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley

4 Paul Beynon Davies, "Database Systems", Palgrave Macmillan

5 Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication

- beginnersbook.com
- www.smartzworld.com
- lecturenotes.in/.../database-management-system-dbms
- lecturenotes.in/notes/5536-notes-for-database.

BCA-315: OPERATING SYSTEM

Objectives: The objective of the course is to recognize the concepts and principles of operating systems. Provide comprehensive introduction to understand the underlying principles, techniques and approaches which constitute a coherent body of knowledge in operating systems. To teach understanding how the various elements that underlie operating system interact and provides services for execution of application software.

UNIT- I

Sessions)

Introduction: Definition and types of operating systems and function, the evolution of OS, Operating System services, OS Components. Operating Systems Types: Batch, Time Sharing, Multiprogramming, Multitasking, Multiprocessor, Distributed, Real Time, Network.

UNIT- II

Sessions)

CPU Scheduling: Process concept, Process state transitions, schedulers (long term, short term, mid term), Scheduling concept, Performance criteria, Scheduling algorithms, multiple processor scheduling.

UNIT- III

Sessions)

Deadlocks: System model, Deadlock characterization, prevention, avoidance detection and recovery from deadlock. Memory Management: Resident monitor, multiprogramming with fixed Partition, multiprogramming with variable partition, paging, segmentation, paged segmentation, virtual memory, demand paging, thrashing.

UNIT- IV

Sessions)

File System: File support, access methods, allocation methods (Contiguous, linked and index allocation), Directory system (Single level, tree structured, acyclic graph and general graph directory), file protection. Disk Scheduling: FCFS, C-Scan etc.

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Identify basic components of operating system.
- Conceptualize synchronization amongst various components of a typical operating system.
- Understand and simulate activities of various operating system components.
- Correlate basic concepts of operating system with an existing operating system.

Suggestive Readings:

1. . Peterson & Silberschatz, "Operating System Concepts", Addison-Wesley company

2. Tenenbaum, A.S., "Modern Operating System", PHI Publication

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- www.tutorialspoint.com/operating_system/os
- lecturenotes.in/subject/56/operating-systems-OS
- crectirupati.com/sites/default/files/lecture_notes
- www.cse.iitb.ac.in/~mythili/os

BCA-31P: Programming in C++ Lab Based on BCA-311

Course Objective:

Objective: The objective of course is to develop programming skills of students, using object oriented programming concepts, learn the concept of class and object using C++ and develop classes for simple applications.

List of Programs:

- 1. WAP to print a single statement.
- 2. WAP to print more than one statement.
- 3. WAP to calculate the arithmetic multiplication
- 4. WAP which demonstrate the use of if else statement.
- 5. WAP which demonstrate the use of while loop.
- 6. WAP which demonstrate the use of do_ while loop.
- 7. WAP which demonstrate the use of for loop.
- 8. WAP to get the area of square, circle & rectangle according the choice of user by using a case.
- 9. WAP to demonstrate the break statement.
- 10. WAP to demonstrate the continue.
- 11. WAP to get Sum of two integer type value by call by value method of function call.
- 12. WAP to swap the values by using call by value method of function call.
- 13. WAP to get the address of all type of variable & gets the value by pointer type.
- 14. WAP to swap two values by using the call by reference method.
- 15. WAP to find the factorial of a number using recursion.
- 16. WAP to demonstrate the inline function.
- 17. WAP to expose the use of simple class with an object.
- 18. WAP to expose the use of simple one class with two object.
- 19. WAP to expose the use of simple friend class.
- 20. WAP to expose the use of constructor.

BCA-32P: DBMS Lab Based on BCA-314

Objectives: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS. Also To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency and to design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

List of programs:

- 1. Create a table in SQL
- 2. Insert a new row in table
- 3. Insert a new value in table
- 4. Update a value in table
- 5. Delete a value from a table
- 6. Search a value from table
- 7. Select the given item from table
- 8. Modify the data item from table
- 9. Alter the table structure
- 10. Create a stored procedure
- 11. Create a trigger
- 12. Create index

BCA-411: WEB DESIGNING & APPLICATIONS

Objectives: The objective of the course is to understand the principles of creating an effective web page, including an in-depth consideration of information architecture. Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice. Develop skills in analyzing the usability of a web site. Develop basic programming skills using Javascript and jQuery.

Unit-I

Web Designing: Basic principles involved in developing a web site, Planning process, Designing navigation bar, Design Concept, Brief History of Internet, What is World Wide Web, Growth of the Web, Protocols- HTTP, FTP, SMTP, POP3, MIME, IMAP, Choosing an ISP, Introduction to Internet Services, E-mail concepts.

Unit-II

HTML: What is HTML, History of HTML, HTML Documents, Structure of HTML document, Mark up Tags, HTML Tags, elements of HTML, Lists, Hyperlinks, Images, Tables, Forms and Frames. CSS: Concept of CSS, CSS Properties, Generating Internal and External Style Sheets, CSS Id and Class, Background images, colors and properties, manipulating texts

Unit-III

Scripting Programming: The principal of scripting language, Difference between scripting languages and non- scripting languages, Types of Scripting Languages. JavaScript Programming: Introduction to JavaScript: Utility and Evolution of the JavaScript Language, Data Types, Statements and Operators, Variable Declarations, Conditional Statement, Function, Objects.

Unit-IV

Photoshop: Objective of graphic design, differentiate between raster and vector graphics, Basic of Photoshop, Navigation and All tools, working with basic selections, Color theory, working with layer, Importing and Exporting images. Flash: Fundamental concepts of Animation with Flash, Basic Tools, Different Tween Techniques, Frame Animation, Various Flash Effect, Adding Action Script. Dreamweaver: Fundamental of Dreamweaver, Creating a Page Layout, working with forms and Navigation.

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Students are able to develop a dynamic webpage by the use of java script and DHTML.
- Students will be able to write a well formed / valid XML document.

• Students will be able to connect a java program to a DBMS and perform insert, update anddelete operations on DBMS table.

• Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.

• Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.

Suggestive Readings:

- 1. Internet & Word Wide Web, 4e by Deitel, Pearson
- 2. Magic with HTML, DHTML and Javascript", Laxmi Publication
- 3. Web Designing and Development Training Guide, by Satish Jain, Ambrish K Rai and M. Geeta, BPB Publication.

(10 Sessions)

(10 Sessions)

(10 Sessions)

- 4. Java script programming by Deitel, pearson
- 5. Sams Tech Yourself Adobe creative suit 3 all in one by Golding, pearson
- 6. Adobe Fireworks CS4 by Babbage, pearson Adobe flash CS4 Professional by Schaeffer, pearson
- 7. The Dreamwaver CS 4 by David Sawyear McFarland, Oreilly

Web Resources:

- www.journaldev.com
- www.itdesk.info
- nielit.gov.in/chuchuyimlang/sites/default/files..
- www.tutorialspoint.com

BCA-412: VISUAL PROGRAMMING

Objectives: The objective of the course is to understand the concepts of windows Programming. To develop applications using Visual Basic and to develop applications using VC++.

Unit I

Introduction to Visual Basic: Getting started in Visual Basic - Adding an event procedure - Adding controls - Adding additional event procedures; Data and Operations; Data values and operators -Variables and declaration statements – Assignment statements – Using intrinsic functions.

Unit II

(10 Sessions)

(10 Sessions)

(10 Sessions)

Controlling i/o: Interactive user input –Formatted output – Named constants: Selection; Repetition structures; Sub procedures and functions; Structured data: 1-Dimensional arrays - Control arrays.

Unit III

Basic graphical user interface concepts; Advanced graphical user interface concepts; Windows common dialogs; The chart and grid controls; The timer, shape, line and toolbar controls; Tree views and list views.

Unit IV

Oracle sql: DDL, DML, DCL operations – integrity constraints – string functions – number functions – data arithmetic – transformation functions – grouping and ordering data – subqueries – joins – union, intersect and minus - indexes - clusters - views - sequences - synonym - privileges - grant and revoke permission – locks- pl/sql structure – conditional and unconditional controls – loops – cursors – exceptions, Database programming with VB.

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Students are able to develop a dynamic webpage by the use of java script and DHTML.
- Students will be able to write a well formed / valid XML document.

• Students will be able to connect a java program to a DBMS and perform insert, update anddelete operations on DBMS table.

• Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.

• Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.

Suggestive Readings:

1. Gary Bronson, Introduction to programming Using Visual Basic 6. Dreamtech publications, IIEdition.

- 2. Treitch, Visual Basic Oracle 8 Programmer's Reference, Wrox publication.
- 3. Deitel & Deitel, Visual Basic 6 How to Program, Pearson Education.
- 4. Nick Showdon, Oracle Programming with Visual Basic, Sybex publication.

Web Resources:

- www.edunotes.in/visual-programming
- ecomputernotes.com/visual-basic
- www.studocu.com/in/document/bangalore-university/..
- www.studynama.com/community/threads/visual...

BCA-413: DATA COMMUNICATION & COMPUTER NETWORKS

Objectives: The objective of the course is to build an understanding of the fundamental concepts of computer networking. Familiarize the student with the basic taxonomy and terminology of the computer networking area. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

UNIT- I

(10 Sessions)

Introduction to Computer Networks: Definition of Computer networks, Applications of Computer Networks, Kinds of Computer Networks-Local Area Network, Metropolitan Area Network, Wide Area Network, topologies of networks, Layered architecture of networks.

UNIT-II

(10 Sessions) Fundamentals of Data Communication: Types of signals, Types of Transmission, Modes of Transmission, Serial transmission (Asynchronous Transmission, Synchronous Transmission and Isochronous) Parallel transmission, Basic Transmission Categories – Simplex, Half Duplex, Full Duplex.

UNIT- III

(10 Sessions) Fundamentals of Networks: Point to Point Networks, Broadcast Networks, Multicast Networks, Physical Layer Coding Techniques-RZ, NRZ, Differential NRZ, Manchester, Differential Manchester coding, Switching-Circuit Switching, Message Switching, Packet Switching, Confirm and unconfirm services, Framing-Time Based, Character Based, BIT Based, violation of encoding technique & combined approach, Error detection & correction codes – Hamming code, CRC.

UNIT-IV

(10 Sessions)

Lavered Architectures, TCP/IP model, OSI model. Overview of Physical laver, Data Link Laver, MAC, Network Layer, and Transport Layer functions.

UNIT- V

(10 Sessions)

LAN Technologies: CSMA/CD or Ethernet & IEEE 802.3 Standard, Token Bus and IEEE 802.4 Standard, Token Ring and IEEE 802.5 Standard. Overview of DNS, FTP, TELNET, HTTP, SMTP and client/ server computing.

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Independently understand basic computer network technology. •
- Understand and explain Data Communications System and its components.
- Identify the different types of network topologies and protocols. •
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Identify the different types of network devices and their functions within a network •
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Suggestive Readings:

- 1. Stallings William, Data and Computer Communications. Prentice Hall of India, 5th Edition.
- 2. Forouzon, A. Behrouz, Data communications & Networking, McGraw Hill, 4th Edition.
- 3. Tanenbaum, A. S, Computer Networks. Prentice Hall of India, 3rd Edition.

- 4. Ross, Kurose, Computer Networking, Pearson Education, 3rd Edition..
- 5. Prakash C. Gupta, Data Communications, Prentice Hall of India, New Delhi, 1996.
- 6. Leon W. Couch-II, Modern Communication Systems, Prentice Hall of India, New Delhi, 1998

Web Resources:

- crectirupati.com/sites/default/files/lecture_notes/DCN...
- ecomputernotes.com/.../what-is-data-communication
- www.tutorialspoint.com/data_communication.
- alphace.ac.in/downloads/notes/ece/10EC71_NOTES.pdf

BCA-414: INFORMATION & CYBER SECURITY

Objectives: The objective of the course is to identify, analyze and remediate computer security breaches by learning and implementing the real-world scenarios in Cyber Investigations Laboratory, Network Security Laboratory and in Security and Penetration Testing Laboratory. Exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.

UNIT-I

Introduction – History of Information Security – defining security – CNSS Security Model – Components of an Information Security – Approaches to Information Security Implementation – System Development Life Cycle - Security Systems Development Life Cycle - Security Professionals and the Organization - Information Security: Is it an Art or a Science?

UNIT-II

Hacking, Types of Hacking/Hackers, what is Cybercrime, Types of cybercrime, Classifications of Security attacks (Passive Attacks and Active Attacks) Essential Terminology (Threat, Vulnerability, Target of Evaluation, Attack, Exploit). Concept of ethical hacking, Phase of Ethical Hacking, Hacktivism

UNIT-III

About Password, Different types of password (Biometric, Pattern based Graphical password, Strong Password technique, Types of Password attacks. Stay Secure in digital World (3L) How to stay secure in digital World, have strong password, encrypt your data, security suit software, firewall setup, update os.

UNIT-IV

(10 Sessions)

Concept of wireless networking, Wireless standards, Common term used in wireless networking (WLAN, Wireless, Wireless Access point, cellular, Attenuation, Antenna, Microwave, Jamming, SSID, Bluetooth, Wi-Fi hotspots) What is Wi-Fi, Wireless attacks(War Driving, War Walking: War Flying, War Chalking, Blue Jacking), How to secure wireless networks

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Analyze and evaluate the cyber security needs of an organization.
- Determine and analyze software vulnerabilities and security solutions to reduce therisk of exploitation.
- Measure the performance and troubleshoot cyber security systems.
- Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
- Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators
- Design and develop a security architecture for an organization.
- Design operational and strategic cyber security strategies and policies.

Suggestive Readings:

- 1. Michael E. Whitman & Herbert J. Mattord, "Principles of Information Security", Course Technology, Cengage Learning, 4thedition, 2011.
- 2. Fundamentals of Cyber Security By Mayank Bhushan, BPB Publications

Web Resources:

- www.vssut.ac.in/lecture_notes/lecture1423183198.pdf
- www.professionalcipher.com/2017/08/information.

(10 Sessions)

(10 Sessions)

- $\bullet \qquad www.uou.ac.in/.../files/slm/Introduction-cyber-security.pdf$
- www.iare.ac.in/sites/default/files/lecture_notes...

BCA-415: MAGAGEMENT INFORMATION SYSTEM

Objectives: The objective of the course is to understand the basic principles and working of information technology. Describe the role of information technology and information systems in business. To contrast and compare how internet and other information technologies support business processes. To give an overall perspective of the importance of application of internet technologies in business administration.

UNIT I

Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, solving business problems with information systems, Types of information systems.

UNIT II

An Overview of Management Information Systems: Definition of a management information system, MIS versus Data Processing, MIS & Decision Support Systems, MIS & Information Resources Management, Concept of a MIS, Structure of MIS.

UNIT III

Concept of planning & Control: Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization.

UNIT: IV

Business applications of information technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Managerial Decision Support. Managing Information Technology: Enterprise & global management, Security & Ethical challenges, Advanced Concepts in Information Systems: Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management and Procurement Management.

Learning Outcomes:

Upon successful completion of this course, students should be able to:

- Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
- Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
- Effectively communicate strategic alternatives to facilitate decision making.

Suggestive Readings:

- 1. O Brian, "Management Information System", TMH.
- 2. Gordon B.Davis & Margrethe H.Olson, "Management Information System", TMH.
- 3. Murdick, "Information System for Modern Management", PHI.
- 4. Jawadekar, "Management Information System," TMH.

Web Resources:

- lecturenotes.in/subject/212/management
- www.slideshare.net/HarishChand5/management
- ebooks.lpude.in/management/mba/term_4/DMGT505_MANAGEMENT.
- www.tutorialspoint.com/management_information

(10 Sessions)

(10 Sessions)

(10 Sessions)

BCA 41P-Web Designing Lab Based on BCA-411

Objectives: The objective of the course is to understand the principles of creating an effective web page, including an in-depth consideration of information architecture. Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice. Develop skills in analyzing the usability of a web site. Develop basic programming skills using Javascript and jQuery.

List of Program

- Installation of XAMPP and WAMP servers.
- Create a table to show your class time table.
- Use tables to provide layout to your HTML page describing your college infrastructure.
- Use and tags to provide a layout to the above page instead of a table layout.
- Use frames such that page is divided into 3 frames 20% on left to show contents of pages, 60% in center to show body of page, remaining on right to show remarks.
- Embed Audio and Video into your HTML web page.
- Develop static pages (using only HTML) of an online book store, the pages should resemble: www.amazon.com, the website should consist the following pages, home page, registration and user login, user profile page, books catalog, shopping cart, payment by credit card, order confirmation.
- Write an HTML page that contains a selection box with a list of 5 countries, when the user selects a country, its capital should be printed next to the list; Add CSS to customize the properties of the font of the capital (color, bold and font size).
- Write a java script program to test the first character of a string is uppercase or not.
- Write a pattern that matches e-mail addresses.
- Write a java script function to print an integer with commas as thousands separators.
- A simple calculator web application that takes two numbers and an operator (+, ,/,*and %) from an HTML page and returns the result page with the operation performed on theoperands.
- Write PHP program how to send mail using PHP.
- Write PHP program to convert a string, lower to upper case and upper case to lower case or capital case. Write PHP program to change image automatically using switch case.
- Write PHP program to calculate current age without using any pre-define function.
- Write PHP program to upload image to the server using html and PHP.

BCA 42P-Mini Project Work Based on BCA-412

Course Objective:

The BCA students are encouraged to involve themselves completely on the project work in their final semester. It is advised to students to develop their project for solving problems of software industry or any research organization. Doing this will give more exposure to handle real life problems of project development.

The courses studied by you during your BCA programme provide you the basic background to work on diverse application domains. The theoretical background of various courses provides you the necessary foundation, principles, and practices to develop effective ways to solve computing problems. The hands on experience gained from the practical courses provide you the knowledge to work with various operating systems, programming languages, and software tools.

This project work is kept in BCA program to give you opportunity to develop quality software solution. During the development of the project you should involve in all the stages of the software development life cycle (SDLC) like requirements analysis, systems design, software development/coding, testing and documentation, with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, and develops good understanding of SDLC.

Students should take this project work very seriously. BCA project should be taken as an opportunity to develop software, which gives exposure to SDLC. Topics selected, should be complex and large enough to justify as a BCA project. The project should be genuine and original in nature and should not be copied from anywhere else. If found copied, the project report will be forwarded to the Exam Discipline Committee of the University as an Unfair means case for necessary action. Students should strictly follow and adhere to the BCA project guidelines.

List of Projects:

- 1. university management system project in php
- 2. college management system project in vb
- 3. online examination system in php
- 4. student information system project in java
- 5. online job portal project in php
- 6. airline reservation system project in asp net
- 7. online doctor appointment system project
- 8. vehicle management system project in java
- 9. online examination system project in php
- 10. hospital management system project in php
- 11. online recruitment system project in java with source code
- 12. mobile shopping project
- 13. blood bank management system project
- 14. social networking scripts
- 15. online voting system project
- 16. college admission system project
- 17. institute management system project
- 18. attendance management system project

BCA-511: JAVA PROGRAMMING

Objective: The objective of this course is to gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts with the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.

UNIT- I

Object oriented programming, Overview of java, java programming design, importance and limitations of java. Java Developer Kit, Data Types: constant and variables, arrays, strings, expression and operators, Reference variables, Conditional and loop statements.

UNIT-II

Classes, packages and interfaces, Encapsulation, Polymorphism, Dynamic Binding, Overloading, Overloading, inheritance, interfaces and Packages, initializing and class loading.

UNIT-III

I/O package, Language package and utilities packages, Introduction to Applet Programming. Programming a Graphical User Interface, Building a Simple User Interface, Laying out a User Interface.

UNIT-IV

Exception handling in java, Event handling, multiple threading and thread control, thread life cycle, Synchronization, daemon threads. I/O handling in java, stream classes, Input stream, Output Stream, Byte Stream, Character Stream, reading a file, writing to a file, I/O exceptions.

Course Outcomes:

At the end of the course, students will be able to:

- Identify classes, objects, members of a class and relationships among them needed for a specific problem.
- Use of Java in a variety of technologies and on different platforms.
- Write Java application programs using OOP principles and proper program structuring.
- Demonstrate the concepts of polymorphism and inheritance.
- Write Java programs to implement error handling techniques using exception handling.

Suggested Readings:

- 1. "Complete reference". By Patric Naughton, Tata McGraw Hill.
- 2. Core Java Volume-I, Horstman and Cornell, Pearson Education
- 3. "Programming in java" by E. Balaguruswamy. TMH Publication.

Website Sources:

- https://www.ncertbooks.guru/java-programming-notes
- https://www.aminotes.com/2017/09/java-programming-notes.html
- https://www.tutorialspoint.com/java/java_tutorial.pdf
- https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf
- http://stanley.edu.in/wp-content/uploads/2015/03/JAVA-PROGRAMMING-LAB.pdf

(10 Sessions)

(10 Sessions)

(10 Sessions)

BCA-512: COMPUTER GRAPHICS AND ANIMATION

Objective: The main objective of this module is to introduce to the students the concepts of computer graphics and animation. It starts with an overview of interactive computer graphics, two dimensional system and mapping, then it presents the most important drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics.

UNIT I

Introduction: Introduction to Computer Graphics, Basic Graphics and Standards. Raster Scan and Random Scan Graphics, continual refresh and storages displays Devices, display processors and character generations. Color display techniques, frame buffer and Bit Operations concepts in raster graphics.

UNIT II

Drawing Techniques: Point, lines and curves, scan conversion, line drawing algorithms, circle and ellipse generation, polygon filling, Ant-Aliasing.

UNIT III

Two- dimensional: Two- dimensional viewing, Basic Transformations Methods, coordinate system, windowing and clipping, segments, interactive picture construction techniques, interactive input and output devices.

UNIT IV

Three-dimensional: Three- Dimensional concepts, 3-D Representation and Transformation, 3-D Viewing, Spline Curves, Bezier Curves.

Course Outcomes:

At the end of the course, students will be able to:

- Be able to create interactive graphics applications.
- Have a knowledge and understanding of geometrical transformations and 3D viewing.
- Have a knowledge and understanding of techniques for representing 3D geometrical objects.
- Have a knowledge and understanding of the structure of an interactive computer graphics System

Suggested Readings:

- 1. Newman W.M. & Spraull R.F. "Principles of Interactive Computer Graphics", Mc Graw Hill.
- 2. Harington, "Introduction to Computer Graphics," Mc Graw Hill.
- 3. Hannen & Backer, Computer Graphics, PHI.
- 4. "Computer Graphics" D. Hearn & M. Baker, Publisher: Prentice Hall, 2000

Website Sources:

- http://www.svecw.edu.in/Docs%5CCSECGLNotes2013.pdf
- https://www.dgp.toronto.edu/~hertzman/418notes.pdf
- https://www.tutorialspoint.com/computer_graphics/index.htm
- https://www.ncertbooks.guru/computer-graphics-notes/
- https://en.wikipedia.org/wiki/Computer_graphics

(10 Sessions)

(10 Sessions)

(10 Sessions)

BCA-513: SOFTWARE ENGINEERING

Objective: This course introduces the concepts and methods required for the construction of large software intensive systems. It aims to develop a broad understanding of the discipline of software engineering.

Unit-I

Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

Unit-II

Requirement engineering, requirement elicitation techniques like FAST, QFD & Use case approach, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.Size Estimation like lines of Code & Function Count, Cost Estimation Models, Static single & Multivariable Models, COCOMO.

Unit-III

Software Design: Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Cohesion & Coupling, Classification of Cohesiveness & Coupling, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design, User Interface Design.

Unit-IV

Software Testing: Testing process, Design of test cases, functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path Testing, Data flow and mutation testing, Unit Testing, Integration and System Testing, Debugging, Alpha & Beta Testing, Regression Testing, Testing Tools & Standards.

Unit-V

Software Reliability: Importance, Hardware Reliability & Software Reliability, Failure and Faults, Reliability Models, Basic Model, Logarithmic Poisson Model, Calendar time Component.Software Quality Assurance (SQA): Verification and Validation, ISO 9000 Models, SEI-CMM Model.

Course Outcomes:

At the end of the course, students will be able to:

- Apply software engineering principles and techniques.
- Develop, maintain and evaluate large-scale software systems.
- Work in one or more significant application domains.
- Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle.

Suggested Readings:

- 1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
- 2. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
- 3.K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
- 4. Pankaj Jalote, Software Engineering, Wiley
- 5. Carlo Ghezzi, M. Jarayeri, D. Manodrioli, Fundamentals of Software Engineering, PHI Publication.
- 6. Ian Sommerville, Software Engineering, Addison Wesley.

(10 Sessions)

(10 Sessions)

(10 Sessions)

(10 Sessions)

- https://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf
- https://www.ncertbooks.guru/software-engineering-notes/
- https://www.geeksforgeeks.org/software-engineering/
- https://www.tutorialspoint.com/software_engineering/index.htm
- https://www.geektonight.com/software-engineering-notes/

BCA-514: FUNDAMENTAL OF E-COMMERCE

Objective: This course focuses on principles of e-commerce from a business perspective, providing an overview of business and technology topics, business models, virtual value chains and social innovation and marketing strategies. In addition, some of the major issues associated with e-commerce—security, privacy, intellectual property rights, authentication, encryption, acceptable use policies, and legal liabilities—will be explored. Students will build their own web presence and market it using an online platform.

UNIT- I

An Overview of E-Commerce: Trade Process & Trade Cycles their linkages with information exchange; Definitions of E-commerce & E-business & their difference; Problems with Manual Systems, Aims of E-commerce, Functions of E-commerce, Applications of E-commerce in business functions, Tools & Technologies for E-commerce, Types of E-commerce,Operational& Strategic benefits of E-commerce, Issues & Challenges in E-commerce ,Introduction to Mobile Commerce.

UNIT-II

Web based E-Commerce: Need for web based business, Choosing the right format of website: Characteristics of PR site, Marketing site, Sales site/web-store and vertical & horizontal portals; Steps in setting up business on Internet: Selection & registration of domain name, Website development-client & server side tools, web authoring tools, catalogue & web store tools, Website hosting considerations-own versus rented server; Website Maintenance Online Promotion tools & techniques: Getting links to your site, banner advertisements & measuring advertisement effectiveness, Web Traffic Analysis: Various measures, structure of log file data at server side & its analysis for promotion and tools for analysis, Search Engine optimization techniques, Payment Gateways for online payment, Security of transactions on Web: Selling through Secure Servers, use of digital certificates and international standards.

UNIT-III

Introduction of EDI, EDI layered Architecture, EDI technology and standards, EDI communications and transactions, Benefits and applications of EDI with example, Electronic Payment Systems.Virtual Private Network (VPN): Architecture of VPN - service provider dependent & service provider independent configurations, VPN Security- User authentication & Data Security.

UNIT-IV

Electronic Payment Systems: E-cash: Purchasing & using of e-cash; Electronic Purses their loading with cash and use; E-cheque payment system; Online Third Party Verified Payment through Credit & Debit Cards & encryption mechanism; ATM based cash disbursement system; Electronic Bill Payment System; 6. Interbank clearing system.,E-Security concerns in E-Commerce: Privacy, integrity, authenticity, non-repudiation, confidentiality, SSL,Digital Signatures and fire walls.

Course Outcomes:

At the end of the course, students will be able to:

- Demonstrate an understanding of the foundations and importance of E-commerce
- Analyze the impact of E-commerce on business models and strategy
- Describe the infrastructure for E-commerce
- Assess electronic payment systems
- Recognize and discuss global E-commerce issues

(10 Sessions)

(10 Sessions)

(10 Sessions)

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Suggested Readings:

1 e-commerce: Strategy, Technologies and Applications, David Whiteley, Tata McGraw Hill

- 2 E-Commerce: The Cutting Edge of Business, KK Bajaj &Debjani Nag, McGraw Hill.
- 3. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
- 4. P. Loshin, John Vacca, "Electronic commerce", Firewall Media, New Delhi

- https://www.ncertbooks.guru/e-commerce-full-notes/
- https://examupdates.in/e-commerce-full-notes/
- https://www.geektonight.com/e-commerce-notes/
- https://irp-cdn.multiscreensite.com/1c74f035/files/uploaded/introduction-to-e-commerce.pdf
- https://en.wikipedia.org/wiki/E-commerce

BCA -515: ARTIFICIAL INTELLIGENCE

Objective: This course is designed to expose students to the frontiers of AI-intensive computing and information systems, while providing a sufficiently strong foundation to encourage further research. Artificial Intelligence (AI) aims to make computers and information systems more "intelligent" to solve complex problems and provide more natural and effective services to human beings.

UNIT – I

Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem. Heuristic search techniques: Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction.

UNIT - II

Knowledge representation: Definition and importance of knowledge, Knowledge representation, various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic: Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT - III

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. LISP and other AI Programming Language

Course Outcomes:

At the end of the course, students will be able to:

- Compare AI with human intelligence and traditional information processing and discuss its strengths and limitations as well as its application to complex and human-centred problems.
- Apply the basic principles, models, and algorithms of AI to recognize, model, and solve problems in the analysis and design of information systems.
- Design AI functions and components involved in intelligent systems such as computer games, expert systems, semantic web, information retrieval, machine translation, mobile robots, decision support systems, and intelligent tutoring systems.
- Analyze the structures and algorithms of a selection of techniques related to searching, reasoning, machine learning, and language processing.

Suggested Readings:

1.E. Rich and K. Knight, "Artificial intelligence", TMH, 2nd ed., 1999.

- 2. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999
- 3. Nils J Nilsson, "Artificial Intelligence A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

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- https://www.vssut.ac.in/lecture_notes/lecture1428643004.pdf
- https://cse.iitk.ac.in/users/cs365/2013/materials.html
- https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificialintelligence-spring-2005/study-materials/
- https://en.wikipedia.org/wiki/Artificial_intelligence
- https://builtin.com/artificial-intelligence

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BCA-516: MULTIMEDIA AND APPLICATIONS

Objective: This course aims to introduce the fundamental elements of multimedia. The emphasis will be on learning the representations, perceptions and applications of multimedia. Software skills and hands on work on digital media will also be emphasized. On completion of the subject, the students will understand the technologies behind multimedia applications and master the skills for developing multimedia projects.

UNIT I

Multimedia concepts, Introduction to basic techniques of multimedia development and delivery, Process of multimedia Production, Hardware/Software requirement for multimedia, Components of multimedia: Textual information, images, Animation, Digital Audio, Digital Video, Planning and Design of Multimedia, Production of multimedia, Distribution of Multimedia.

UNIT II

Multimedia development Tools, Features of Software required for Multimedia: Integrating Multimedia Elements, Script Language Programs, Icon based programs, Hypertext, Cross Platform Capability, Runtime player for distribution, Authoring tools: author ware, Everest Authoring System, Icon author, Image Q, QuickTime

UNIT III

Elements of Hypertext: Nodes, Links, Annotations, Buttons, Editors, Browsers, Trails; Application of Hypertext: Business Applications, Computer Applications, Educational Applications, Entertainment and Leisure Applications; Planning Multimedia Program/Application: Goal, Outlining, Logic Flowchart, Program Story board, Creation of Building blocks, Copyright issue and management

UNIT IV

Developing multimedia building blocks: Text, Graphics, Sound and Video in multimedia applications, Application areas of Multimedia: Entertainment, Edutainment, Business Communications, Public Access, Knowledge transfer; Multimedia- an interactive system for Teaching and Learning: Simulations, Composition; Multimedia- as a technological challenge for developers.

Course Outcomes:

At the end of the course, students will be able to:

- Develop multimedia software skills at an intermediate level to complete projects using audio, text and visual imagery.
- Sketch storyboards and produce timeline based workflows for 2D animations. •
- Assemble various media (audio, type, photographs, graphics and video) into a timeline.
- Animate logos, type, photographs, graphics and video using effective principles of animation at • an intermediate level.
- Produce video and create interactive content at an intermediate level. •

Suggested Readings:

- 1. Tay Vaughan. "Multimedia make it work". 5thed, TMH 2001.
- 2. Buford, "Multimedia Systems", Addison Wesley.
- 3. Mark Nelson, "Data Compression Hand Book", BPB.
- 4. Sleinreitz, "Multimedia System", Addison Wesley.
- 5. Li & Drew, "Fundamentals of Multimedia", Pearson Education, 2009.

Website Sources:

- https://ayomenulisfisip.files.wordpress.com/2018/01/introduction-to-multimedia.pdf
- http://www.universityofcalicut.info/SDE/opencourses/introduction to multimedia open Vsem,p • df
- http://www.ictinedtoolkit.org/usere/library/tech_for_ed_chapters/07.pdf

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 https://www.tutorialspoint.com/basics_of_computer_science/basics_of_computer_science_multi media.htm

BCA -517: ENTERPRISE RESOURCE PLANNING

Objective: This course will introduce students to enterprise systems and show how organizations use enterprise systems to run their operations more efficiently and effectively. Enterprise systems use a single database to integrate business transactions along and between processes, leading to benefits such as efficient and error-free workflows plus accounting, management reporting and improved decision-making.

UNIT-I

Overview of enterprise systems : What is ERP, Why ERP, Need for Enterprise Resource Planning, Definition of ERP, Evolution of Enterprise Resource Planning, Pre material requirement planning (MRP stage), Material requirement planning, MRP- II, ERP, Extended ERP, ERP Planning –II, ERP-A manufacturing perspective, Risks and benefits –Risk implementation, Fundamental technology of ERP, Issues to be consider in planning design and implementation of cross functional integrated ERP systems

UNITE-II

Overview of ERP software solutions:small, medium and large enterprise vendor solutions,, Business process Reengineering, Business process Management: Steps of BPM, Functional Modules: ERP Production planning module, ERP purchasing module, ERP Inventory control module, ERP Sales module, ERP Marketing module, ERP Financial module, ERP HR module

UNIT-III

Planning Evaluation and selection of ERP systems, ERP Implementation life cycle: Pre-evaluation Screening, Package Evaluation, Project Planning Phase, Gap-Analysis, Reengineering, Configuration, Implementation Team Training, Testing, Going Live, End-user training, Post - implementationMethodology.

UNIT-IV

Post Implementation phase of ERP, Maintenance of ERP, Organizational and Industrial impact, Success and failure factors of ERP Implementation, Extended ERP systems and ERP add-ons, Business analytics & Intelligence, Wireless Technology used in ERP, Future trends in ERP: Cloud Computing.

Course Outcomes:

At the end of the course, students will be able to:

- Demonstrate a good understanding of basic issues in Enterprise Systems,
- Explain the challenges associated with implementing enterprise systems and their impacts on organizations
- Describe the selection, acquisition and implementation of enterprise systems
- Use one of the popular ERP packages to support business operations and decision-making,
- Communicate and assess an organization's readiness for enterprise system implementation with a professional approach in written form,
- Demonstrate an ability to work independently and in agroup.

Suggested Readings:

- 1. Alexis Leon, "ERP Demystified", Tata McGraw Hill
- 2. Rahul V. Altekar "Enterprisewide Resource Planning", Tata McGraw Hill,
- 3. Vinod Kumar Garg and Venkitakrishnan N K, "Enterprise Resource Planning –
- Concepts and Practice", PHI

4. Joseph A Brady, Ellen F Monk, Bret Wagner, "Concepts in Enterprise Resource Planning", Thompson Course Technology

5. Mary Summer, "Enterprise Resource Planning"- Pearson Education

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- http://www.brainkart.com/subject/Enterprise-Resource-Planning_118/
- https://en.wikipedia.org/wiki/Enterprise_resource_planning
- http://www.retawprojects.com/uploads/An-Overview-Enterprise-Resource-Planning ERP.pdf
- http://ebooks.lpude.in/management/mba/term_3/DCAP302_DCAP514_ENTERPRISE_RESOUR CE_PLANNING.pdf
- http://www.ddegjust.ac.in/studymaterial/mba/itm-420.pdf

BCA -518: CLIENT SERVER COMPUTING

Objective: The main objective is to provide the basic concepts of client server computing and the new technologies. Client Server Computing Model defines the way successful organizations will use technology during the next decade. As a result knowledge of client server architecture has become an essential part of computer science.

UNIT-I

Introduction to client/server computing, Definition, history, myths, transition to client server computing, database architectures, advantages and disadvantages of client server architecture.

UNIT-II

Components of Client/Server Applications – The Client: Role of a Client – Client Services – Request for Service. Components of Client/Server Applications – The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system.

UNIT-III

Communication in client-server: Using OSI layer, TCP/IP networks. Client/Server processing and application development: transaction processing, remote processing, distributed processing, distributed databases, development tools, Interprocess communication – WAN Technologies.

UNIT-IV

Components of Client/Server Applications–Software: Client/Server System Development Methodology. Components of Client/Server Applications–Hardware: Hadware/Network Acquisition – PC-Level Processing UNITs – Machintosh, notebooks, Pen – UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.

Course Outcomes:

At the end of the course, students will be able to:

- Design and Set up a client /server environment using LAN and WAN Scenarios.
- Describe the concept of middleware, and communication protocols.
- Design and build client server applications with network programming exposure. Understand basic networking concepts using sockets.
- Examine the techniques which are required to develop network application/ internet based application.

Suggested Readings:

- 1. Client server Computing: Patrick Smith
- 2. Client Server survival guide, 3 rd Edition : Robert Orfali
- 3. Client server unleashed

Website Sources:

- https://www.tutorialspoint.com/Client-Server-Computing
- http://saintangelos.com/studentdesk/Download/CLIENT%20SERVER%20ARCHITECTURE.PD F
- https://en.wikipedia.org/wiki/Client%E2%80%93server_model
- https://www.technicalsymposium.com/CLIENT_SERVER_COMPUTING.html

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BCA-519: MOBILE COMPUTING

Objective: To impart fundamental concepts in the area of mobile computing, to provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software and a critical understanding of mobile computing from different viewpoints: infrastructures, principles and theories, technologies, and applications in different domains.

UNIT-I

Issues in Mobile Computing, Wireless Telephony, Digital Cellular Standards, GSM: air-interface, channel structure, location management, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.

UNIT-II

Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

UNIT- III

(10 Sessions) Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

UNIT-IV

(10 Sessions)

(10 Sessions)

(10 Sessions)

Mobile Agents computing, fault tolerance, transaction processing in mobile computing environment. Adhoc Networks, Routing in Wireless Ad-hoc Mobile Networks, Routing scheme based on signal strength, Dynamic State Routing (DSR), Fisheye Routing (FSR), Ad-hoc on Demand Distance Vector (AODV).

Course Outcomes:

At the end of the course, students will be able to:

- Understand fundamentals of wireless communications.
- Evaluate the architecture and principles of operation of computer systems and networks. •
- Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in • wireless networks.
- Demonstrate basic skills for cellular networks design.
- Apply knowledge of TCP/IP extensions for mobile and wireless networking.
- Determine solutions using problem solving principles, logic and systematic methodologies. •
- Manage the development of software systems through a variety of development processes and methodologies.

Suggested Readings:

1. Shambhu Upadhyaya, Abhijeet Chaudhary, Kevin Kwiat, Mark Weises, "Mobile Computing", Kluwer Academic Publishers

2. UWE Hansmann, Lothar Merk, Martin-S-Nickious, Thomas Stohe, "Principles of Mobile Computing", Springer International Edition

- https://www.ncertbooks.guru/mobile-computing-pdf/
- https://studentsfocus.com/cs8601-mc-notes-mobile-computing-notes-csc-6th-sem/
- https://cseexamhacks.files.wordpress.com/2017/01/mobile-computing.pdf •
- https://www.tutorialspoint.com/mobile computing/mobile computing overview.htm#:~:text=Mo • bile%20Computing%20is%20a%20technology,Mobile%20hardware
- https://en.wikipedia.org/wiki/Mobile computing

BCA-51P: Java Programming Lab Based on BCA-511

Course Objectives:

- 1. To build software development skills using java programming for real world applications.
- 2. To implement frontend and backend of an application.
- 3. To implement classical problems using java programming.
- 4. To Write programs using classes, inheritance and abstract classes.
- 5. To Write multi threaded programs with synchronization.

List of Programs:

- 1. Write a Java program to perform basic Calculator operations.
- 2. Write a Java program to calculate a Factorial of a number.
- 3. Write a Java program to calculate Fibonacci Series up to n numbers.
- 4. Write a Java program to find out whether the given String is Palindrome or not.
- 5. Write a Java program to calculate Permutation and Combination of 2 numbers.
- 6. Write a program in Java to find out Alphabet and Diamond Pattern.
- 7. Write a Java Program to reverse the letters present in the given String.
- 8. Write a Java Program to check whether the given array is Mirror Inverse or not.
- 9. Write a Java program to implement a Binary Search Algorithm.
- 10. Write a Java program to remove elements from an ArrayList
- 11. Write a program in Java to implement HashMap.
- 12. Write a Java program to print the nodes present in the Circular LinkedList
- 13. Write a Java program to connect to a SQL DataBase.
- 14. Write a Java Program to find the Transpose of a given Matrix.
- 15. Write a Java program to find whether given no. is Armstrong or not.

BCA-52P: Computer Graphics Lab Based on BCA-512

Course Objectives:

- 1. Understand the need of developing graphics application
- 2. Learn algorithmic development of graphics primitives like: line, circle, polygon etc.
- 3. Learn the representation and transformation of graphical images and pictures.

List of Programs:

- 1. Write a program to draw points on a plane in OpenGL
- 2. Write a program to draw a line on plane in OpenGL.
- 3. Write a program to draw circle on plane in OpenGL.
- 4. Write a program draw a white rectangle on a black background in OpenGL.
- 5. Write a program to draw a square when we click on the mouse button inopenGL
- 6. Write a program to draw a color cube and spin it using open GL transformation matrices in OpenGL.
- 7. Write a program to create a house like figure and rotate it about a given fixed point using OpenGL functions in OpenGL.
- 8. Write a program to implement the Cohen-Sutherland line clipping algorithm. Make provision to specify the input line, window for clipping and viewport for displaying the clipped image in OpenGL
- 9. Write a program to fill any given polygon using scan line area filling algorithm in OpenGL.
- 10. Implementation of line generation using slope's method, DDA, and Bresenham's Algorithm.
- 11. Implementation of Circle generation using Mid Point method and Bresenham's method.
- 12. Implementation of Line Clipping using Cohen- Sutherland Algorithm and Bisection method.
- 13. Implementation of Polygon Clipping using Sutherland- Hodgeman Algorithm.
- 14.Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror reflection and Shearing
- 15. Implementation of Polygon filling using flood fill, boundary fill, and scan linealgorithms.

BCA-611: FRAMEWORK WITH ASP.NET PROGRAMMING

Objective: This course will cover the practical aspects of multi-tier application development using the .NET framework. The goal of this course is to introduce the students to the basics of distributed application development. We will introduce the students to Web Service development and .NET remoting. Technologies covered include the Common Language Runtime (CLR), .NET framework classes, C#, ASP.NET, and ADO.NET. We will also cover service oriented architecture, design, performance, security, content managements systems and deployment issues encountered in building multi-tier distributed applications.

UNIT – I

The Framework of .Net: Building blocks of .Net Platform (the CLR, CTS and CLS), Features of .Net, Deploying the .Net Runtime, Architecture of .Net platform, Introduction to namespaces & type distinction. Types & Object in .Net.

UNIT – II

Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing. Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity, Control constructs in C#: Decision making, loops, Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions.

UNIT – III

Inheritance & polymorphism: visibility control, overriding, abstract class & methods, sealed classes & methods, interfaces. Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams), Delegate and events.

UNIT – IV

The evolution of Web development, Web Application using ASP.NET, ASP.NET Architecture, Controlbased Programming, User Interface Elements, ASP.NET Server Controls. Validation Controls, Introduction to ADO.NET: Comparison between ADO & ADO.NET-The difference between Connection Model & Disconnected Model - difference between the DataSet and RecordSet- The Dataset Model. Accessing Data using ADO.NET: dataset-DataAdapter DataRelation.

Course Outcomes:

At the end of the course, students will be able to:

- Gain a thorough understanding of the philosophy and architecture of .NET
- After completion of the course the student will be able to use the features of Dot Net • Framework along with the features of C#
- Acquire a working knowledge of the .NET programming model and .NET Security
- Learn how to implement database applications using .NET •
- Learn how to debug .NET applications using .NET diagnostic classes and tools

Suggested Readings:

- 1. Introduction to C# using .NET By Robert J. Oberg, PHI, 2002.
- 2. Programming in C# By E. Balaguruswamy, Tata McGraw Hill.
- 3. The Complete Guide to C# Programming by V. P. Jain.
- 4. C# : A Beginner's Guide, Herbert Schildt, Tata McGraw Hill.
- 5. C# and .NET Platform by Andrew Troelsen, Apress, 1st edition, 2001.

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- http://www.tmv.edu.in/pdf/distance_education/bca%20books/bca%20vi%20sem/bca-623%20asp.net.pdf
- https://www.cs.colorado.edu/~kena/classes/5448/f11/presentationmaterials/csharp_dotnet_adnanreza.pdf
- http://www.mentorum.nl/docs/Traindocs/dotNET_Tutorial_for_Beginners.pdf
- https://en.wikipedia.org/wiki/.NET_Framework
- https://www.geeksforgeeks.org/introduction-to-net-framework/
- https://www.tutorialspoint.com/asp.net/index.htm

BCA-612: WEB TECHNOLOGY AND APPLICATIONS

Objective: The focus in this course is on the World Wide Web as a platform for interactive applications, content publishing and social services. The development of web-based applications requires knowledge about the underlying technology and the formats and standards the web is based upon. In this course you will learn about the HTTP communication protocol, the markup languages HTML, XHTML and XML, the CSS and XSLT standards for formatting and transforming web content, interactive graphics and multimedia content on the web, client-side programming using Javascript.

UNIT: I

Web Technology: What is Web, Concepts of Clients and Servers, Protocols Governing the Web, Web project, Web Team, Communication Issues, Multi- departmental & large scale Websites, Quality Assurance and Testing, Overview of Static and Dynamic Web Page, Search engine.

UNIT: II

HTML: What is HTML, History of HTML, HTML, HTML Tags, elements of HTML, Lists, Hyperlinks, Images, Tables, Forms and Frames. CSS: Concept of CSS, CSS Properties, Generating Internal and External Style Sheets, CSS Id and Class, Background images, colors and properties, manipulating texts. **XML**: Introduction to XML, XML key components, DTD and Schemas, Using XML with application.

UNIT: III

Introduction to Java Script: Java Script in web pages, advantage, writing Java Script into HTML, Java Script syntax operator, variables, Control Statements, statements & functions, Objects, Forms, Events, Java Script arrays, Java Script Validation.

UNIT: IV

PHP: Web Servers : IIS, Apache and Wamp Server, Client-Side Scripting versus Server-Side Scripting, Server site programming, Introduction to PHP: syntax, variables, strings, operators, if-else, loop, switch, array, function, form, Validation, session, Database with PHP. Fundamental of ASP and ASP.NET.

Course Outcomes:

At the end of the course, students will be able to:

- Have a Good grounding of Web Application Terminologies, Internet Tools, E Commerce and other web services.
- Formats and languages used in modern web-pages: HTML, XHTML, CSS, XML, XSLT, Javascript, DOM
- Programming web pages with Javascript/DOM (client)
- Design and development of web-pages and web-applications

Suggested Readings:

- 1. Burdman, "Collaborative Web Development", Addison Wesley.
- 2. Sharma & Sharma, "Developing E-Commerce Sites", Addison Wesley.
- 3. Ivan Bayross, "Web Technologies Part II", BPB Publications.
- 4. "ASP.NET 21 Days", TMH.
- 5. "Web Technology", Laxmi Publication.
- 6. DOT NET Framework with ASP.NET & C#", Dhanpat Rai Publication
- 7. Magic with HTML, DHTML and Javascript", Laxmi Publication
- 8. Ullman, "PHP for the Web: Visual QuickStart Guide", Pearson Education

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- https://www.ncertbooks.guru/web-technology-pdf/
- http://www.geethanjaliinstitutions.com/engineering/coursefiles/downloads/cse/wt.pdf
- http://yellaswamy.weebly.com/web-technologiesiiibtech-ii-sem.html
- https://www.cs.uct.ac.za/mit_notes/web_programming.html
- https://en.wikibooks.org/wiki/Introduction_to_Information_Technology/Web_Technologies

BCA-613: DATA WAREHOUSING AND MINING

Objective: This course will introduce the concepts of data ware house and data mining, which gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data ware housing concepts.

Unit- I

Data Mining-Definition, Motivation(for Data Mining), Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data, Inconsistent Data, Data Integration and Transformation. Data Reduction, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation.

Unit- II

Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisions, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi-Dimensional Association rules from Relational Databases.

Unit- III

Classification and Predictions concepts, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Classification methods K-nearest neighbor classifiers. Cluster Analysis:Data types in cluster analysis, Categories of clustering methods, Partitioning methods. Hierarchical Clustering, Density Based Methods, Grid Based Methods, Model Based Method.

Unit- IV

Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting. Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse.

Course Outcomes:

At the end of the course, students will be able to:

- Understand the functionality of the various data mining and data warehousing component.
- Appreciate the strengths and limitations of various data mining and data warehousing models.
- Describe different methodologies used in data mining and data ware housing.
- Compare different approaches of data warehousing and data mining with various technologies.

Suggested Readings:

1.M.H.Dunham,"Data Mining:Introductory and Advanced Topics" Pearson Education

- 2. Jiawei Han, Micheline Kamber, "Data Mining Concepts & Techniques" Elsevier
- 3. Sam Anahory, Dennis Murray, "Data Warehousing in the Real World : A
- 4. Mallach,"Data Warehousing System",McGraw-Hill.

5. Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley

Website Sources:

- http://www.vssut.ac.in/lecture_notes/lecture1428550844.pdf
- http://www.crectirupati.com/sites/default/files/lecture_notes/DWDM%20notes-R15.pdf
- https://www.smartzworld.com/notes/data-warehousing-and-data-mining-pdf-notes-dwdm/

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BCA-614: DATA COMPRESSION

Objective: The comprehensive objective of this course is to make students familiar with the different types of compression techniques used for textual, audio, image and video compression and To develop skills for using recent data compression software to solve practical problems in a variety of disciplines.

Unit - I

Introduction to Compression Techniques: Lossless compression, Lossy Compression, Measures of performance, Modeling and coding, Mathematical Preliminaries for Lossless compression: A brief introduction to information theory, Introduction to Models, Types of Models, Fundamental of Coding.

Unit – II

Introduction to Huffman coding, coding algorithms, Decoding procedure, Applications of Hoffman coding: Loss less image compression, Text compression, Audio Compression.

Arithmetic Coding Coding a sequence, Generating a binary code, Comparison of Binary and Huffman coding, Applications, Bi-level image compression-The JBIG standard, JBIG2, Image Compression.

Unit – III

Mathematical Preliminaries for Lossy Coding Distortion criteria, Models, Scalar Ouantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, Non uniform Quantization.

Unit-IV

Vector Quantization Advantages of Vector Quantization over Scalar Quantization, The Linde-BuzoGray Algorithm, Tree structured Vector Quantizers.

Course Outcomes:

At the end of the course, students will be able to:

- Understand important of data compression. •
- Develop a reasonably sophisticated data compression application. •
- Develop the methods and tools for the given task. •
- understand the statistical basis and performance metrics for lossless compression •
- understand the conceptual basis for commonly used lossless compression techniques, and • understand how to use and evaluate several readily available implementations of those techniques
- understand the structural basis for and performance metrics for commonly used lossy compression techniques and conceptual basis for commonly used lossy compression techniques.

Suggested Readings:

- 1. Introduction to Data Compression, by Khalid Sayood, Morgan Kaufmann Publishers.
- 2. The Data Compression Book Mark Nelson.
- 3. Data Compression: The Complete Reference David Salomon.

Website Sources:

- https://london.ac.uk/sites/default/files/study-guides/data-compression.pdf
- http://www.ws.binghamton.edu/fowler/fowler%20personal%20page/EE523.htm
- http://www.brainkart.com/article/Data-Compression 4498/
- http://rahilshaikh.weebly.com/uploads/1/1/6/3/11635894/data compression.pdf

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BCA-615: SOFTWARE TESTING

Objective: The main objective of the course is to expose the students to different software testing tools and techniques.

UNIT –I

INTRODUCTION : Testing as an Engineering Activity – Testing as a Process – Testing axioms – Basic definitions – Software Testing Principles – The Tester's Role in a Software Development Organization – Origins of Defects – Cost of defects – Defect Classes – The Defect Repository and Test.

UNIT –II

TEST CASE DESIGN :Test case Design Strategies – Using Black Bod Approach to Test Case Design – Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning – State based testing – Cause-effect graphing – Compatibility testing – user documentation testing – domain testing – Using White Box Approach to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional testing – Coverage and Control Flow Graphs.

UNIT –III

LEVELS OF TESTING : The need for Levers of Testing – Unit Test – Unit Test Planning – Designing the Unit Tests – The Test Harness – Running the Unit tests and Recording results – Integration tests – Designing Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination System Testing – Acceptance testing – Performance testing – Regression Testing – Internationalization testing – Ad-hoc testing – Alpha, Beta Tests.

UNIT –IV

(10 Sessions)

TEST MANAGEMENT: People and organizational issues in testing – Organization structures for testing teams – testing services – Test Planning – Test Plan Components – Test Plan Attachments – Locating Test Items – test management – test process – Reporting Test Results – The role of three groups in Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test specialist – Building a Testing Group.

Software test automation – skill needed for automation – scope of automation, challenges in automation.

Course Outcomes:

At the end of the course, students will be able to:

- Understands the Automation Testing Approach.
- Write test suites for software.
- Install Selenium server and demonstrate it using a script in Java/PHP
- Write and test a program to login a specific web page.
- Write and test a program to update 10 student records into table into Excel file.
- Write and test a program to get the number of list items in a list /combo box.

Suggested Readings:

1. Srinivasan Desikan and Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2006.

- 2. Ron Patton, "Software Testing", Second Edition, Sams Publishing, Pearson Education, 2007.
- 3. Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003.
- 4. Edward Kit," Software Testing in the Real World Improving the Process", Pearson Education, 1995.
- 5. Boris Beizer," Software Testing Techniques" 2 nd Edition, Van Nostrand Reinhold, New York, 1990.

6. Aditya P. Mathur, "Foundations of Software Testing _ Fundamental Algorithms and Techniques",

Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008.

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Website Sources:

- https://www.softwaretestingmaterial.com/manual-testing-tutorial/
- https://www.guru99.com/software-testing.html
- https://www.softwaretestinghelp.com/resources/
- https://www.softwaretestinggenius.com/manual-testing-study-material/
- https://www.tutorialspoint.com/software_testing/index.htm
- https://www.geeksforgeeks.org/software-testing-basics/
- http://www.cs.ecu.edu/reu/reufiles/read/1-software_testing_introduction.pdf

BCA-616: INTRODUCTION TO SYSTEM SOFTWARE

Objective: The main objective of the course is to introduce student the fundamental model of the processing of high level language programs for execution on computer system and the process management and information management via different software tools and to understand and implement Assembler, Loader, Linkers, and Macros & Compilers.

UNIT-1

Introduction to System Software and software tools: Language Processors: Introduction, Language Processing Activities, Fundamentals of Language Processing & Language Specification, Language Processor Development Tools. Data Structures for Language Processing: Search Data structures, Allocation Data Structures. Software Tools: Software Tools for Program Development, Editors, Debug Monitors, Programming Environments, User Interface.

UNIT-2

Assemblers: Elements of Assembly Language Programming, A Simple Assembly Scheme, Pass Structure of Assemblers, Design of a Two Pass Assembler, Macros and Macro Processors: Macro Definition and Call, Macro Expansion, Nested Macro Calls, Advanced Macro Facilities, Design of a Macro Preprocessor

UNIT-3

Interpreters and Introduction of Compilers: Interpreters: Use and overview of interpreters, Pure and impure interpreters, Phases of the Compiler, Introduction of scanning and parsing, Aspects of compilation.

UNIT-4

Linkers and Loaders: Introduction to linkers, Relocation and Linking Concepts, Design of a Linker, Self-Relocating Programs, A Linker for MS-DOS, Linking for Overlays and Loaders.

Course Outcomes:

At the end of the course, students will be able to:

- Understand different components of system software.
- Understand intermediate code generation in context of language designing.
- Recognize operating system functions such as memory management as pertaining to run time storage management

Suggested Readings:

- 1. Leland L. Beck, "System Software An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000.
- 2. Santanu Chattopadhyay, "System Software", Prentice-Hall India, 2007
- 3. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers: Principles, Techniques, and Tools", 2nd Edition, Pearson Education Asia
- 4. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.

Website Sources:

- https://www.vidyarthiplus.com/vp/Thread-System-Software-all-units-pdf •
- https://www.ktustudents.in/p/ktu-cs303-system-software-full-note.html •
- https://mywbut.com/syllabus/paper/132/dept/7
- https://sites.google.com/a/edunotes.in/kcg-it/system-software-notes
- https://ecomputernotes.com/fundamental/disk-operating-system/system-software •

(10 Sessions)

(10 Sessions)

(10 Sessions)

(10 Sessions)

BCA-617: CLOUD COMPUTING

Objective: The objective of this course is to provide the depth knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations.

UNIT-I

Introduction to Cloud Computing, Roots of Cloud Computing: Fundamental concepts of Distributed Systems, Cluster Computing, Grid Computing, and Mobile Computing.

UNIT- II

Cloud Models :Basics of Cloud Computing Concepts, Characteristics of Cloud Computing, Need for Cloud, Cloud Deployment models: private, public, hybrid and community cloud, Cloud Services: Resource-as-a-Service (RaaS), Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (PaaS), Examples of each services.

UNIT-III

Cloud Services: RaaS: Usage of Physical resources like servers, networks, data centeretc, IaaS: Virtualization, Virtual Machine provisioning and Migration Services, Scheduling techniques of Virtual machines for resource reservation. PaaS: Integrated lifecycle platform: Google App Engine, Microsoft Azure, Anchored life cycle platform: Salesforce platform, SaaS: Characterizing SaaS, Salesforce's software environment.

UNIT-IV

(10 Sessions)

(10 Sessions)

(10 Sessions)

(10 Sessions)

Cloud Application, Cloud challenges, Cloud Security and privacy issues, Mobile Cloud, Integration of Cloud with Wireless Sensor Network and its application.

Course Outcomes:

At the end of the course, students will be able to:

- Analyze various cloud programming models and apply them to solve problems on the cloud.
- Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
- Explain the core issues of cloud computing such as security, privacy, and interoperability.
- Choose the appropriate technologies, algorithms, and approaches for the related issues.
- Identify problems, and explain, analyze, and evaluate various cloud computing solutions.

Suggested Readings:

1. "Cloud Computing Principles and Paradigms", edited by RajkumarBuyya, James Broberg and Andrzej Goscinski, Wiley Publication.

2. "Cloud Computing for Dummies", Judith Hurwitz, Robin Bloor, Marcia Kaufman and Fern Halper, Wiley Publication.

3. "New frontiers in information and software as a service", Divyakant Agrawal, K. SelcukCandan, Wensyan Li (Eds.), Springer Proceedings.

Website Sources:

- https://www.guru99.com/cloud-computing-for-beginners.html
- https://www.cse.iitb.ac.in/~abhirup09/Docs/cloud_computing_final_report.pdf
- https://www.technicalsymposium.com/Technical_Round_Materials_CloudComputing_4.html
- https://www.smartzworld.com/notes/cloud-computing-pdf-notes-cc/
- https://en.wikipedia.org/wiki/Cloud_computing

BCA-61P: Web Tech Lab Based on BCA-611 & BCA-612

Course Objectives:

This course is intended to teach the basics involved in publishing content on the World Wide Web. This includes the 'language of the Web' – HTML, the fundamentals of how the Internet and the Web function, a basic understanding of graphic production with a specific stress on creating graphics for the Web, and a general grounding introduction to more advanced topics such as programming and scripting. This will also expose students to the basic tools and applications used in Web publishing.

List of Programs:

1. Create a form by using various attributes of the input tags.

- 2. Create a web page multiple types of style sheet used in a single page.
- 3. Write a CGI sample program to send output back to the user.
- 4. Write a Java Script program by using variables.
- 5. Write a java script program to multiply two numbers and display the result in separate text box.
- 6.Write a java script program on Form Validations.
- 7.Write a AJAX program checking the presence of XMLHttpRequest object.
- 8. Write a program to create sales report for our books by using AJAX
- 9. Design a dynamic web page with validation using JavaScript.
- 10 Design an HTML having a text box and four buttons viz Factorial, Fibonacci, Prime.
- 11. Write a java program to connect to a database server using JDBC and insert 10 students information of user choice in to student table.
- 12. Write a java program to display all records in the student table.
- 13. Write JavaScript programs on Event Handling.
- 14. Use frames to Include Images and Videos.
- 15. Add a Cascading Style sheet for designing the web page.

BCA-62P: Project Work

Course Objective:

The BCA students are encouraged to involve themselves completely on the project work in their final semester. It is advised to students to develop their project for solving problems of software industry or any research organization. Doing this will give more exposure to handle real life problems of project development.

The courses studied by you during your BCA programme provide you the basic background to work on diverse application domains. The theoretical background of various courses provides you the necessary foundation, principles, and practices to develop effective ways to solve computing problems. The hands on experience gained from the practical courses provide you the knowledge to work with various operating systems, programming languages, and software tools.

This project work is kept in BCA program to give you opportunity to develop quality software solution. During the development of the project you should involve in all the stages of the software development life cycle (SDLC) like requirements analysis, systems design, software development/coding, testing and documentation, with an overall emphasis on the development of reliable software systems. The primary emphasis of the project work is to understand and gain the knowledge of the principles of software engineering practices, and develops good understanding of SDLC.

Students should take this project work very seriously. BCA project should be taken as an opportunity to develop software, which gives exposure to SDLC. Topics selected, should be complex and large enough to justify as a BCA project. The project should be genuine and original in nature and should not be copied from anywhere else. If found copied, the project report will be forwarded to the Exam Discipline Committee of the University as an Unfair means case for necessary action. Students should strictly follow and adhere to the BCA project guidelines.

List of Projects:

- 1. university management system project in php
- 2. college management system project in vb
- 3. online examination system in php
- 4. student information system project in java
- 5. online job portal project in php
- 6. airline reservation system project in asp net
- 7. online doctor appointment system project
- 8. vehicle management system project in java
- 9. online examination system project in php
- 10. hospital management system project in php
- 11. online recruitment system project in java with source code
- 12. mobile shopping project
- 13. blood bank management system project
- 14. social networking scripts
- 15. online voting system project
- 16. college admission system project
- 17. institute management system project
- 18. attendance management system project

BCA-63P: Seminar

Course Objective:

- To train the students to independently search, identify and study important topics in computer science.
- To develop skills among students to study and keep themselves up to date of the technological developments taking place in computer science.
- To expose students to the world of research, technology and innovation.

List of Seminar Topics:

- 1. Finger Print Authentication
- 2. Big Data Analysis for Customer Behaviour
- 3. IT In Space
- 4. Parasitic Computing
- 5. 4G Wireless System
- 6. Brain-Computer Interface
- 7. Laser & Satellite Guided Strikers
- 8. Managing Data In Multimedia Conferencing
- 9. Global Positioning System
- 10. Face Recognition Technology
- 11. Digital Theatre System
- 12. Radio frequency identification (RFID)
- 13. Internet Security
- 14. Silent Sound Technology
- 15. Hamming Cut Matching Algorithm