RADHA GOVIND UNIVERSITY
RAMGARH, JHARKHAND

Department of Computer Science and Technology

Under Faculty of Computer Science and Technology

Choice Based Credit System Curriculum for
Bachelor of Computer Application

(Effective from Academic Session 2025-26)

REGULATIONS

FOR BACHELOR OF COMPUTER APPICATION (BCA)

(A) Preamble

1. The regulations herein specified applied to Bachelor of Computer Applications (BCA) programme offered by the Radha Govind University, Ramgarh, through the University Department of Computer Applications.

2. The BCA programme covered by these regulations is correlated courses of study, the successful completion of which would enable the participants of the programme to qualify for the award of BCA degree.

3. A participant of the programme is a student who is duly admitted to an institute of the university and who has registered himself/herself for a course of study and attains the same.

(B) Time scale for academic activity

1. The basic units of time for academic activity for the BCA programme shall be a semester (July to December and January to June). A basic contact period is one in which a teacher engages the student for a duration of 60 minutes.

2. If circumstances warrant, the department may schedule a summer programme during long vacation of the department. There will be in general no formal classes in the summer programme.

(C) Courses of study The university shall offer courses during a semester indicated mainly from consideration of minimum enrolment and facilities available. The competent authority comprising of the University/Department shall have the right to cancel any or all course of study if the requirements are not satisfied.

(D) Registration for course of study

1. Every participant of the BCA programmes, shall first register himself/herself for the courses of study he/she intends pursuing provided he/she possesses the minimum qualifications as laid down and his/her plan is approved by the University in the University Department of Computer Applications.

2. Fees payable by the participants including fees payable for examination shall be as laid down in administrative instructions issued from time to time by the University/Department for the purpose.

(E) Audit of the courses All courses offered in the BCA programme will be open for audit in the spirit of offering an opportunity for continuing education for the participants who wish to refresh or update them
knowledge. Audited courses shall neither count for academic credit nor there be any examination requirements. Participants shall be eligible to participate in the courses offered on payment of prescribed fee and due registration.

(F) Measurement of Academic Achievement of the participating student in the BCA programme shall be measured in terms of grade obtained by him/her in the examinations. The overall performance of the students in the semester examination shall be evaluated in terms of grade point average as specified later.

(G) Assessment:

In total 138 credits represent the workload of a session for BCA program.

Total credits=138, 1 credit = 15 lecture Hrs, 100 Marks SUBJECT(L-T-P) = (4-1-0) CREDITS and SESSIONAL (L-T-P) = (0-0-1) CREDITS

Semester – I	23 credits
Semester – II	23 credits
Semester – III	23 credits
Semester – IV	23 credits
Semester – V	23 credits

Semester – VI 23 credits

(H) Scheme of Instruction:

The scheme of instruction in Under-Graduate Programme shall be of the following forms of academic activity:

a) Theory
b) Sessional
c) Practical Training and Project Work
d) Seminar and Tutorial

a) Theory A theory type of academic activity shall involve concepts, fundamental ideas, and techniques, as laid down in text books or literature and which can be grasped through lectures and assignments. A theory type of course with about 60 contact periods in a semester shall enable participating student to earn one unit of academic credit if he/ she fulfils the attendance, and grade requirements as specified herein after.

b) Sessional

The following type of academic work will be covered in sessional:

a) Laboratory Experiment
b) Design Exercise
c) Project
d) Term paper or any other academic work, the purpose of which would be to train the student by practice, repeated use, and hands on experience. A sessional course of 2 contact periods a week and about 30/40 contact period during a semester shall enable a participating student to earn one unit of academic credit provided that he/she fulfils the attendance and grade requirements as specified hereinafter.

c) Practical Training and Project Work:

At the end of the sixth semester of study, a student will be examined in the course" Project Work".

1. Project work may be done individually or in groups in case of bigger projects. However, if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to see the progress of individual modules is independent of others.
2. Students should take guidance from an internal guide and prepare a Project Report on "Project Work" in 2 copies to be submitted to the Director of the Institute by April. Whenever possible, a separate file containing source code listings should also be submitted. Every student should also submit at least 4 typed copies of their project synopsis.
3. The Project Synopsis should contain an Introduction to Project, which should clearly explain the project scope in detail. Also, Data Dictionary, DFDs, ERDs, File designs and a list of output reports should be included.
4. The project Work should be of such a nature that it could prove useful or be relevant from the commercial/management angle.
5. The project report will be duly accessed by the internal guide of the subject and marks will be communicated by the Director to the University along with the marks of the internal credit for theory and practical to be communicated for all other courses.
6. The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation.
7. The project work carry 30 marks for internal assessment and 70 marks for external viva. The external viva shall be conducted by a minimum of two external examiners. The mini project works would be departmental.
8. Project work can be carried out in the Institute or outside with prior permission of the Institute.
9. Project viva-voce by the University panel will be conducted in the month of May.

(I) Attendance Requirement
All students must attend every lecture, practical classes, and other activities of the Department. However, the attendance requirement will be a minimum of 75% of the classes held.

Absence during the semester
a. A student must inform the HOD concerned immediately of any instance of continuous absence from classes.
b. A student who is absent due to illness should approach the teachers concerned for makeup quizzer, assignment, and laboratory work.
c. A student has been absent from a sessional test due to illness approach the teacher concerned for makeup test immediately on return to class. The request should be supported with a medical certificate issued by a registered medical practitioner.
d. If a student is continuously absent from the institute for more than four weeks without permission of the head of the department concerned, his/her name will be removed from institute rolls.

(J) Examination Assessment
1) The examination of each paper shall have two components- External evaluation (End Semester Exam) at the end of the semester carrying 70 marks to be conducted by the university and Internal evaluation of 30 marks to be evaluated by Teachers. Internal evaluation shall comprise written exam carries 20 marks of a paper. Seminars/Cultural activities/NSS be 5 marks and 5 marks for assignment.

Theory Paper---------- 70 marks + 30 marks
70 marks ---------- External evaluation (End Semester Exam)
30 marks---------- Internal evaluation

2) Sessional Exam---------- 50 Marks
There should be one External and one Internal for each sessional Examination.

3) Question Paper Pattern:
The questions papers shall be set and the answer –scripts shall be evaluated by the teachers of the concerned courses. The question paper shall consist of two sections: A & B. Section A will have 08 long questions from the entire units of the syllabus, out of which 04 questions will be required to be answered and will carry 10 marks each. Section B will consist of 10 short answer type questions which will cover the entire syllabus uniformly and will carry 30 marks in all, each short-answer type questions carrying 3 marks. The candidates are required to give answer of each short type question in 50 words i.e 7-10 lines.

(K) Student Discipline
Every student is required to observe a polite and disciplined behavior both inside and outside the campus and should not indulge in any activity which would tend to bring down the prestige of the institute or disturb the peaceful and congenial environment of the campus. An act of indiscipline on the part of the student may result into adequate discredit and a mention in his/her academic grade card and/or transcript.

Note: The department in consultation with the university shall have the right to change/modify any regulation or part thereof in the academic interest of the students.

(L) Duration of Curriculum and Calendar:
1. Bachelor of Computer Applications (BCA) programme is of three years duration. Each year shall be divided into two semesters. First semester shall ordinarily be in July and end in December. Second semester shall ordinarily be in January and end in June.
2. Each year, the university shall draw an academic calendar and the same shall be non-negotiable and strictly adhered to the academic calendar for the first year shall be handed over

to each admitted student along with his/her university registration card. Second year academic calendar shall be made available during registration for third semester and third year calendar during registration for fifth semester.

3. The curriculum and syllabus shall be modified with approval of the academic council ordinarily once in every three years to keep the same up-to-date. However, minor modifications can be done as and when necessary, with the approval of Vice-Chancellor. The modification so done shall be placed to the immediate next academic council meeting for rectification.

4. A candidate may be permitted to complete BCA degree requirements in not more than 5 years i.e. maximum in 10 semesters.

(M) Eligibility Criteria for Admission:-

1. A candidate will be eligible to join First Semester of BCA Course, if he/she has passed 10+2 examinations or Intermediate or any other equivalent examination with a minimum of 45% aggregate in any discipline (Arts/Commerce/Science) with mathematics/Business Mathematics/Computer Science/Information Practices(I.P.) as one of the subjects.

Note: Passed in mathematics/Business Mathematics/Computer Science/Information Practices (I.P.)

2. At the time of the counselling candidates will be required to show their original certificates and marksheet of 10+2/Intermediate or equivalent, caste certificate and any special category certificate, if any and other relevant document

(N) Eligibility for Appearing in Semester Examination

1. A student shall be eligible in an examination provided he/she pursues a regular course of study and attends at least 75% of class in each theoretical and sessional subject during the semester. The attendance shall be considered from the date of admission of the candidate in the institution. Attendance record will be compiled at the time of each test and the students with poor attendance will informed through notification. The guardian will also be informed through a letter before he/she is debarred for appearing university examination due to shortage of attendance.

2. Concessions: A student who has been absent for short periods on medical ground or due to participation in cultural, sports, other academic/official assignments in the interest of the Department/University with prior written permission of the head of the institution shall be permitted a maximum of additional concession of 10% in attendance and shall be eligible for appearing in examination with a minimum 65% of attendance in semester.

3. A student shall be admitted to any examination in a subject only if he/she has been registered for that subject.

4. A candidate shall be allowed in an examination only if he/she is issued an admit card for the relevant examination by the University/Department.

(O) PROMOTION

Advancement to the next Semester shall be permitted only with a maximum of Two Backlog Papers from the preceding Semester. Further, entry to the next Semester shall be regulated at the level of 4th, 5th and 6th Semesters as explained under:

1. Admission to 4th Semester shall be allowed only after clearing First Semester Backlog Paper(s) during Third Semester.
2. Admission to 5th Semester shall be allowed only after clearing Second Semester Backlog Paper(s) during 4th Semester.
3. Admission to 6th Semester shall be allowed only after clearing Third Semester Backlog Paper(s) during 5th Semester.
4. Backlog paper(s) of 4th Semester needs to be cleared during 6th Semester.
5. Backlog paper(s) of 5th and 6th Semesters need to be cleared during subsequent examinations for these semesters within three consequent examinations of the concerned semester with a maximum of only one chance.

Moderation of result: Not withstanding anything contained elsewhere in the Regulations, the University shall have power to moderate the BCA results on the recommendations of the Examination Board and/or the academic council.

(P) Final Result
The Cumulative Grade Point Average (CGPA) will be calculated on the 10-point grading scale as follows:

Grade Point Parentage of Marks Grade Symbol (Letter)

10	91 – 100	O (Outstanding)
09	81 –90	A+ (excellent)
08	71 –80	A (Very Good)
07	61 –70	B+ (Good)
06	51 –60	B (Above Average)
05	41 –50	C (Average)
04	40	P (Pass)
00	Below 40	F (Fail or Absent)

A. For each Semester: Semester Grade Point Average (SGPA)

$$S(j) = \frac{\sum_i C(i).G(i)}{\sum_i C(i)} \qquad \text{(i)}$$

Where C(i) denotes the total credits of the i^{th} course. G(i) denotes the grade point earned by a student in i^{th} course and j indicates the semester.

B. For full course:

$$\text{Cumulative Grade Point Average CGPA} = \frac{\sum_j C(j).S(j)}{\sum_j C(j)} \qquad \text{(ii)}$$

Where C(j) denotes the total credits of the j^{th} semester. S(j) denotes the SGPA of the j^{th} semester.

Other:
a) other provisions not covered under the present regulation shall be governed be the regulation for BACHELOR Examination in Arts, Science and Commerce of the university and may, if needed be reviewed.
b) Any dispute or case not covered under the above regulations shall be referred to the Vice Chancellor whose decision shall be final.

Syllabus of BCA
1st Semester

S.No	Code	Subject Name	Hours/week			Credit	Maximum Marks		
Theory courses			L	T	P		End Sem Exam	Sessional	Total
1.	BCA-101	Introduction to computer science	4	1	--	4	70	30	100
2.	BCA-102	Programming using C	4	1	--	4	70	30	100
3.	BCA-103	Language and Communication Skill	4	1	--	4	70	30	100
4.	BCA-104	Mathematics - I	4	1	--	4	70	30	100
5.	BCA-105	Principal of Management	4	1	--	4	70	30	100
Practical Course									
6.	BCA-106P	Based on BCA-102	--	--	3	3	100	--	100

2nd Semester

S. No	Code	Subject Name	Hours/week			Credit	Maximum Marks		
Theory courses			L	T	P		End Sem Exam	Sessional	Total
1.	BCA-201	Digital Electronics	4	1	--	4	70	30	100
2.	BCA-202	DBMS	4	1	--	4	70	30	100
3.	BCA-203	Programming using C++.	4	1	--	4	70	30	100
4.	BCA-204	E-Commerce	4	1	--	4	70	30	100
5.	BCA-205	Mathematics- II	4	1	--	4	70	30	100
Practical Course									
6.	BCA-206P	Based on BCA-203	--	--	3	3	100	--	100

3rd Semester

S. N	Code	Subject Name	Hours/week			Credit	Maximum Marks		
Theory courses			L	T	P		End Sem Exam	Sessional	Total
1.	BCA-301	Operating System	4	1	--	4	70	30	100
2.	BCA-302	Computer Network	4	1	--	4	70	30	100
3.	BCA-303	Data structure using C/C++	4	1	--	4	70	30	100
4.	BCA-304	Financial Accounting	4	1	--	4	70	30	100
5.	BCA-305	HTML Programming	4	1	--	4	70	30	100
Practical Course									
6.	BCA-306P	Based on BCA-305 & BCA 303	--	--	3	3	100	--	100

4th Semester

S. No	Code	Subject Name	Hours/week			Credit	Maximum Marks		
Theory courses			L	T	P		End Sem Exam	Sessional	Total
1.	BCA-401	Programming in Java	4	1	--	4	70	30	100
2.	BCA-402	System Analysis and Design	4	1	--	4	70	30	100
3.	BCA-403	Design and Analysis of Algorithm	4	1	--	4	70	30	100
4.	BCA-404	Software Engineering	4	1	--	4	70	30	100
5.	BCA-405	Buisness Intelligence	4	1	--	4	70	30	100
Practical Course									
6.	BCA-4016P	Based on BCA-401	--	--	3	3	100	--	100

5th Semester

S. No.	Code	Subject Name		Hours/week			Credit	Maximum Marks		
Theory courses				L	T	P		End Sem Exam	Sessional	Total
1.	BCA-501	Computer Graphics		4	1	--	4	70	30	100
2.	BCA-502	Python Programming		4	1	--	4	70	30	100
3.	BCA-503	Theory of Computation		4	1	--	4	70	30	100
4.	BCA-504	Cloud Computing		4	1	--	4	70	30	100
Practical Course										
5.	BCA-505P	Based on BCA-502		--	--	3	3	100	--	100
6.	BCA-506P	Mini Project		--	--	4	4	100	--	100

6th Semester

S. No.	Code	Subject Name	Hours/week			Credit	Maximum Marks		
Theory courses			L	T	P		End Sem Exam	Sessional	Total
1.	BCA-601	Information Security	4	1	--	4	70	30	100
2.	BCA-602	Artificial Intelligence	4	1	--	4	70	30	100
3.	BCA-603	PHP Programming	4	1	--	4	70	30	100
Practical Course									
5.	BCA-605P	Based on BCA-603	--	--	3	3	100	--	100
6.	BCA-606P	OJT & Project Work/ Dissertation	--	--	8	8	200	--	200

BCA 1st Semester

BCA - 101: Introduction to Comp. Science

UNIT-1 - Input Unit - Output Unit - Storage Unit - Arithmetic Logic Unit - Control Unit - Central Processing **Unit -** System Concept – Memory

Management UNIT-2 - Non-positional Number System - Positional Number System - Binary Number System - Octal Number System - Hexadecimal Number System - Converting from one number system to another - Converting from another base to decimal - Converting from decimal to another base - Converting from a base other than 10 to another base other than 10 - Shortcut Methods for binary to octal conversion - Shortcut method for Octal to binary - Shortcut Method for Binary to hexadecimal - Shortcut Method for hexadecimal to Binary - Conversion examples

UNIT-3 - Boolean algebra - Logic Gates - AND,OR,NOT,NAND,NOR Gate - Logic circuits - Converting expression to logic circuit - Universal NAND gate - Universal NOR gate - Exclusive OR and equivalence function - Design of combinational circuit - Design of Half- adder - Design of Full-Adder

UNIT-4 - Planning the computer programme - Algorithm - Flowcharts - Symbols, Rules, Levels, Sample - Advantages and limitations of Flow Charts - Pseudo code - Examples of Pseudo code and Algorithms

UNIT-5 - Process Management - Multi-programming - Multi-Tasking - Multi-Threading - Multi-Processing - Time Sharing - Memory Management - File Management.

UNIT-6 - Some popular operating Systems - UNIX - MS-DOS - Windows XP - Windows Vista, Linux etc.

Reference Books Computer fundamentals

Computer fundamentals - P.K. Sinha

Computer fundamentals - D.P. Nagpal

Computer fundamentals - B.Ram

Fundamental of computer- V. Rajaraman, B.Ram

Fundamental of computer- V. Rajaraman.

BCA - 102: Programming using C

Course Contents:

Unit 1: Introduction to C Programming: Features of C and its Basic Structure, Simple C programs, Constants, Integer Constants, Real Constants, Character Constants, String Constants, Backslash Character Constants, Concept of an Integer and Variable, Rules for naming Variables and assigning values to variables

Unit 2: Operators and Expressions: Arithmetic Operators, Unary Operators, Relational and Logical Operators, The Conditional Operator, Library Functions, Bitwise Operators, The Increment and Decrement Operators, The Size of Operator, Precedence of operators

Unit 3: Data Types and Input/Output Operators: Floating-point Numbers, Converting Integers to Floating- point and vice-versa, Mixed-mode Expressions, The type cast Operator,The type char, Keywords, Character Input and Output, Formatted input and output, The gets() and puts() functions, Interactive Programming.

Unit 4: Control Statements and Decision Making: The goto statement, The if statement, The if-else statement, Nesting of if statements, The conditional expression, The switch statement, The while loop, The do…while loop, The for loop, The nesting of for loops, The break statement and continue statement.

Unit 5: Functions: Function Basics, Function Prototypes, Recursion, Function Philosophy

Unit 6: Storage Classes: Storage Classes and Visibility, Automatic or local variables, Global variables, Static variables, External variables

Unit 7: Arrays and Strings: One Dimensional Arrays, Passing Arrays to Functions, Multidimensional Arrays, Strings

Unit 8: Pointers – I:Basics of Pointers, Pointers and One-dimensional Arrays, Pointer Arithmetic, Pointer Subtraction and Comparison, Similarities between Pointers and One-dimensional Arrays.

Unit 9: Pointers – II: Null pointers, Pointers as Function Arguments, Pointers and Strings, Pointers and two- dimensional arrays, Arrays of Pointers

Unit 10: Structures and Unions: Basics of Structures, Structures and Functions, Arrays of Structures, Pointers to Structures, Self-referential Structures, Unions.

Unit 11: The Pre-processor: File Inclusion, Macro Definition and Substitution, Macros with Arguments,

Nesting of Macros, Conditional Compilation

Unit 12: Dynamic Memory Allocation and Linked List:Dynamic Memory Allocation,Allocating Memory with malloc,Allocating Memory with calloc,Freeing Memory,Reallocating Memory Blocks,Pointer Safety.

Book Refrence:

1. **"The C Programming Language" by Brian W Kernighan / Dennis Ritchie**
2. **"Let Us C" by Yashavant Kanetkar**
3. **"C in depth "By S.K. Srivastava/Deepali Srivastava**

BCA-103 LANGUAGE AND COMMUNICATION

UNIT: 1

Technical Documentation Presentation : Accuracy and Conciseness in Technical English, Structure Format etc. for Technical Reports & Thesis, Comparing and Contractive other aspects of short reports and long dissertations.

UNIT: 2

Communication Skills: Communication Process: Concept & importance, System of communication: Formal & internal. Barrier to effective communication.

UNIT: 3

Principles of Business Communication: Planning and conduction conversations, interviews and Discussion. The preparation of oral statements, effective listening, telephonic communication.

UNIT: 4

Written Communication: Guides to effective writing for business correspondence including letter and job application Memorandum, Office orders, Reports.

UNIT: 5

Non-Verbal Communication: Importance and Type-Cluster and congruency. Kinetics Voal CUes. Modern Forms of Communication: Telex, Fax, Telegram & Teleconferencing & E-mail.

UNIT: 6

Practical in Business Communication: Report writing, Public Speaking, Seminars, Presentation, Interview, Group Discussion, Effective Listening.

SUGGESTED READINGS:-

1. Lesikar " Business Communication" AITBC
2. S. M. Ray "Business Communication" HP

BCA - 104 MATHEMATICS – 1

Unit 1 BASIC CONCEPTS: Definition of Sets, Number systems, Relations Functions.

LIMIT CONTINUITY: Definition of limit, Limit of a function, Right and Left-hand Limits, Algebra of limits, General principle for existence of limit, limit of inequalities, Method of finding limits, Continuity of functions, Cauchy's definition, graphical meaning of continuity, Kinds of discontinuities.

DIFFERENTIAL CALCULUS: Successive differentiation, Leibnitz theorem, Partial differentiation, Euler's Theorem, change of variables, Jacobian theorem.

UNIT : 2
INTEGRAL CALCULUS: Integration of rational and Irrational functions, Reduction Formulae, Definite Integral, Rectification; Quadrature, volumes and surfaces of Revolution, Simple applications of integration & simple problems of double and triple integrals.

UNIT : 3
DIFFERENTIAL EQUATION: Differential equations of first order, Differential equations of 2nd order, Differential of 2nd order with constant coefficients.

UNIT : 4
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 lines, Circles and the system of circles; standard equations and properties of Parabola. Ellipse and Hyperbolas, General equation of second degree in two variables, tracing of simple conic section.

Suggested Readings :
1.E. Kreyzig, "Engineering Mathematics".
2.B.S. Grewal, "Higher Engineering Mathematics"
3.Shanti Narayan, "Differential Calculus"
4. K.P. Gupta. "Vector Calculus"

BCA-105 : FUNDAMENTALS OF MANAGEMENT

UNIT : 1

Introduction, Concepts, Nature, Scope and Significance of Management, Evolution of Management thought– (Contribution Taylor, Weber and Fayol to Management) and Foundation of Management Theories.

UNIT : 2

Planning : Concept, Objectives, Nature, Limitation, Process of Planning, Importance, Forms, Techniques and Process of decision making.

UNIT : 3

Organising : Concept, Objectives, Nature of Organising, Types of Organisations. Delegation of authority. Authority and responsibilities, Centralisation and Decentralisation, Span of control.

UNIT : 4

Directing : Concept. Principal & Techniques of directing and Coordination, Concept of leadership-Meaning, Importance, Styles, Supervision, Motivation, Communication.

UNIT : 5

Controlling Concept, Principles, Process and Techniques of controlling, Relationship between planning and controlling.

UNIT : 6

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

SUGGESTED READINGS :

1. Parag Diwan & L.N. Agarwal, "Management Principles & Practices".
2. Fred Luthans, "Organisational Behaviour"
3. LM. Prasad, "Principles & Practices of Management"

BCA 2nd Semester

BCA-201 DIGITAL ELECTRONICS

UNIT: 1

Information Representation : Number system, binary, Octal Hexadecimal system, integers and real numbers, Conversion from one number system to another number system, Data representation in a register, Signed and

Unsigned numbers 2's Complement and 1's Complement representation and Operation on numbers(addition and subtraction),Floating point representation of numbers.

UNIT: 2

Switching Circuit Theory & Boolean Algebra: Introduction to digital Electronics, General Switching problems, algebra of relay contacts, Gates (OR, AND, NOR, NAND, XOR & XNOR), Truth tables, converting from Boolean Expression to logic gates. Venn diagrams theorems in Boolean algebra, Demorgan's laws, Boolean laws, Circuit Designing techniques (SOP, POS, K-Map).

UNIT: 3

Boolean Functions and Circuit Elements : Operation on Boolean function, Complementation, K-maps, Relation of NAND –NOR logic to AND-OR Logic, Mixed Logic, Half Adder and Full Adder circuit with truth tables, Binary to Decimal and Decimal to Binary Decoders, Multiplexers, Demultiplexer, Encoders.

UNIT: 4

Flip-Flops : Asynchronous & Synchronous flip-flops, The family of Flip Flop circuits- S-R Flip Flop, D Flip Flop, J-K Flip Flop, T Flip Flop, State table and Excitation Table, Race around condition & Master Slave Flip Flop and Propagation Time delay. Counters (Binary and UP-Down) and Registers (serial & parallel).

SUGGESTED READINGS:-

1. M.M. Mano, "Digital Logic and Computer Design" PHI 1998.
2. M.M. Mano, "Computer Architecture", PHI 1998.
3. Malvino and Leach, "Digital Electronics", TMH, 1998.
4. William Stallings, "Computer Organization and Architecture," PHI 1998.

BCA-202 DBMS

Unit 1.Introduction :
Characteristics of database approach, data models, database system architecture and data independence.

Unit 2.Entity Relationship(ER) Modelling , Entity types, relationships, constraints.

Unit 3.Relation data model, Relational model concepts, relational constraints, relational algebra, SQL queries

Unit 4.Database design, Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normal forms (upto BCNF).

Unit 5. Transaction Processing ,ACID properties, concurrency control

Unit 6. File Structure and Indexing, Operations on files, File of Unordered and ordered records, overview of File organizations, indexing structures for files(Primary index, secondary index, clustering index), Multilevel indexing using B and B+ trees.

Reference Books:

R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6 th Edition, Pearson Education, 2010.
A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6 th Edition, McGraw Hill, 2010.

BCA-203 Programming using C++

Unit 1:
History of C and C++, Overview of Procedural Programming and Object-Orientation Programming, Using main() function, Compiling and Executing Simple Programs in C++.

Unit 2. Data Types, Variables, Constants, Operators and Basic I/O
,Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putcharetc), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (iostream.h, conio.hetc).

Unit 3. Expressions, Conditional Statements and Iterative Statements
,Simple Expressions in C++ (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch- case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

Unit 4. Functions and Arrays, Utility of functions, Call by Value, Call by Reference, Functions returning value, Void, functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments. Creating and Using One-Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two-Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

Unit 5. Pointers and References in C++
Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing
Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions. Pointers vs. References, Declaring and initializing references, Using references as function arguments and function return values

Unit 6. Memory Allocation in C++,differentiating between static and dynamic memory allocation, use of malloc, calloc and free,functions, use of new and delete operators, storage of variables in static and dynamic memory allocation

Unit 7.

File I/O, Preprocessor Directives

,Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes),

Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros

Unit 8 . Using Classes in C++,Principles of Object-Oriented Programming, Defining & Using Classes, Class Constructors, Constructor Overloading, Function overloading in classes, Class Variables &Functions, Objects, as parameters, Specifying the Protected and Private Access, Copy Constructors, Overview of, Template classes and their use.

Unit 9. Overview of Function Overloading and Operator Overloading, Need of Overloading functions and operators, Overloading functions by number and type of arguments, looking at an operator as a function call, Overloading Operators (including assignment operators, unary operators)

Unit 10. Inheritance, Polymorphism and Exception Handling ,Introduction to Inheritance (Multi-Level Inheritance, Multiple Inheritance), Polymorphism (Virtual Functions, Pure Virtual Functions), Basics Exceptional Handling (using catch and throw, multiple catch statements), Catching all exceptions, Restricting exceptions, Rethrowing exceptions.

C++ Practical Lab Work

SECTION-I

1. WAP to print the sum digits of an integer.
2. WAP to print the cube of an integer.
3. WAP to calculate area of triangle, rectangle and sphere.
4. WAP to calculate no. is Armstrong or not.
5. WAP to reverse a number.
6. WAP to compute the sum of the first n terms of the following series S = 1+2+3+4+.....
7. WAP to compute the sum of the first n terms of the following series S =1-2+3-4+5.....
8. Write a function that checks whether a given string is Palindrome or not. Use this function to
9. .find whether the string entered by user is Palindrome or not.
10. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
11. WAP to compute the factors of a given number.
12. Write a macro that swaps two numbers. WAP to use it.
13. WAP to print a triangle of stars as follows (take number of lines from user):

```
*
***
*****
*******
*********
```

14. WAP to perform following actions on an array entered by the user:
    i. Print the even-valued elements
    ii. Print the odd-valued elements
    iii. Calculate and print the sum and average of the elements of array
    iv. Print the maximum and minimum element of array
    v. Remove the duplicates from the array
    vi. Print the array in reverse order

SECTION-II

1. WAP to perform following actions on an array entered by the user:
   i. Print the even-valued elements
   ii. Print the odd-valued elements
   iii. Calculate and print the sum and average of the elements of array
   iv. Print the maximum and minimum element of array
   v. Remove the duplicates from the array
   vi. Print the array in reverse order

2. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
3. Write a program that swaps two numbers using pointers.
4. Write a program in which a function is passed address of two variables and then alter its contents.
5. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
6. Write a program to find sum of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions or new operator.
7. Write a menu driven program to perform following operations on strings:
8. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
9. WAP to display Fibonacci series (i)using recursion, (ii) using iteration
10. WAP to calculate Factorial of a number (i)using recursion, (ii) using iteration
11. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.

Reference

- Herbtz Schildt, "C++: The Complete Reference", Fourth Edition, McGraw Hill.2003
- Bjarne Stroustrup, "The C++ Programming Language", 4 th Edition, Addison-Wesley, 2013.
- Bjarne Stroustroup, "Programming -- Principles and Practice using C++", 2nd Edition, Addison- Wesley 2014.
- E Balaguruswamy, "Object Oriented Programming with C++"
- Programming in C++ By Kamthane

BCA-204 E-Commerce

Unit 1: Introduction to E-Commerce: Defining Commerce; Main Activities of Electronic Commerce; Benefits of E-Commerce; Broad Goals of Electronic Commerce; Main Components of E-Commerce; Functions of Electronic Commerce – Communication, Process Management, Service Management, Transaction

Capabilities; Process of E-Commerce; Types of E-Commerce; Role of Internet and Web in E-Commerce; Technologies Used; E-Commerce Systems; Pre-requisites of E-Commerce; Scope of E-Commerce; E-Business Models.

Unit 2: E-Commerce Activities: Various Activities of E-Commerce; Various Modes of Operation Associated with E-Commerce; Matrix of E-Commerce Types; Elements and Resources Impacting E-Commerce and

Changes; Types of E-Commerce Providers and Vendors; Man Power Associated with E-Commerce Activities;

Opportunity Development for E-Commerce Stages; Development of E-Commerce Business Case; Components and Factors for the Development of the Business Case; Steps to Design and Develop an E-Commerce Website.

Unit 3: Internet – The Backbone for E-Commerce: Early Ages of Internet; Networking Categories;

Characteristics of Internet; Components of Internet – Internet Services, Elements of Internet, Uniform Resource Locators, Internet Protocol; Shopping Cart, Cookies and E-Commerce; Web Site Communication; Strategic Capabilities of Internet.

Unit 4: ISP, WWW and Portals: Internet Service Provider (ISP); World Wide Web (WWW); Portals – Steps to build homepage, Metadata; Advantages of Portal; Enterprise Information Portal (EIP).

Unit 5: E-Commerce & Online Publishing: This unit explains the concept of online publishing, strategies and approaches of online publishing, and online advertising.

Unit 6: XML and Data Warehousing: Definition of eXtensible Markup Language (XML); XML Development

Goals; Comparison between HTML and XML; Business importance in using XML Based Technology; Advantages, Disadvantages and Applications of XML; Structure of an XML Document; XHTML and X/Secure; Data Warehousing; Data Marts and Operational Data Stores.

Unit 7: E-Marketing: Traditional Marketing; E-Marketing; Identifying Web Presence Goals – Achieving web presence goals, Uniqueness of the web, Meeting the needs of website visitors, Site Adhesion: Content, format and access; Maintaining a website; Metrics Defining Internet Units of Measurement; Online

Marketing; Advantages of Online Marketing.

Unit 8: E-Security: Security on the Internet; Network and Website Security Risks – Denial-of-Service attacks,

Viruses, Unauthorized access to a computer network; Vulnerability of Internet Sites; Network and Website

Security – Transaction security and data protection, Security audits and penetration testing; E-Business Risk Management Issues; Firewall – Network policy, Advanced authentication mechanism, Packet filtering, Application gateways; Defining Enterprise-Wide Security Framework.

Unit 9: E-Payment Systems: Electronic Funds Transfer; Digital Token Based E-Payment Systems; Modern Payment Systems; Steps for Electronic Payment; Payment Security; Net Banking.

Unit 10: E-Customer Relationship Management: Customer Relationship Management (CRM) – Marketing automation, Enterprise customer management; Customer Relationship Management Areas; CRM Processes; Architectural Components of a CRM Solution – Customer's information repository, Campaign management, Event triggers, business logic and rules repository, Decision support tools, Higher level statistical analysis, Forecasting and planning tools, True channel management, Workflow management, Collateral management; Electronic Customer Relationship Management; Need, Architecture and Applications of Electronic CRM.

BCA-205: Mathematics II

Unit:1 Mathematical Logic: Proposition & Propositional Form conditional and Bi-conditional Statements, Negation operation, Logic connectives and compound statements, conjunction, disjunction, truth tables, Duality conditional and in-conditional statements.

UNIT: 2 Boolean Algebra : Development of Boolean Algebra, Truth functions, The AND, OR, NOT operators, Laws of Boolean Algebras, Reducing Boolean Expressions, Boolean expressions and logic diagrams Universal Building blocks, Negative Logic Min terms, Truth tables and K-maps, Reduction of K maps Disjunctive normal form.

UNIT: 3 Graph theory: Definition of a graph, finite and infinite graphs, Incidence and degree, null graph, Subgraphs walks, Paths and circuits in a graph, connected graphs, Trees, Properties of Trees, Planner graphs. Incidence Matrix.

UNIT: 4 Function and Relation : Injective and surjective functions, composition of function, Inverse function, Use of function in coding theory, Relation composition of relation, Equivalence relation.

SUGGESTED READINGS:-

1. C.L. Liu, "Elements of Discrete Mathematics" Mc Graw Hill Book Co., 1985
2. N. Deop, "Graph Theory with applications to Engineering and Computer Science", PHI 1993.
3. B. Colman and Robert C. Busby, "Discrete Mathematical structure for Computer Science," PHI.
4. Olympia Nicodemi, "Discrete Mathematics" CBS Publication, Delhi.
5. M.N.S. Swamy and K. Thulasiraman, "Graphs, Networks and Algorithms," Wiley Inter Science, NY, 1989.

BCA 3rd Semester

BCA 301 Operating System

Unit 1. Introduction Basic OS functions, resource abstraction, types of operating systems– multiprogramming systems, batch systems , time sharing systems; operating systems for personal computers & workstations, process control & real time systems.

Unit 2. Operating System Organization Processor and user modes, kernels, system calls and system programs.

Unit 3. Process Management, System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries; Process Scheduling, non-pre-emptive and pre-emptive scheduling algorithms; concurrent and processes, critical section, semaphores, methods for inter-process communication deadlocks.

Unit 4 . Physical and virtual address space; memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory

Unit 5. File and I/O Management, Directory structure, file operations, file allocation methods, device management.

Unit 6. Protection and Security, Policy mechanism, Authentication, Internal access Authorization.

Reference Books:

A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8Edition,John Wiley Publications 2008.
A.S. Tanenbaum, Modern Operating Systems, 3 rd Edition, Pearson Education 2007.
Gagne galvin, Operating Systems: 10th Edition .
W. Stallings, Operating Systems, Internals & Design Principles , 5 th Edition, Prentice Hall of India

BCA 302 Computer Network

Unit 1. Introduction to Computer Networks, Network definition; network topologies; network classifications; network protocol; layered network, architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

Unit 2. Data Communication Fundamentals and Techniques, Analog and digital signal; data-ratelimits; digital to digital line encoding schemes; pulse code modulation; parallel and serial transmission; digital to analog modulation-; multiplexing techniques- FDM, TDM; transmission media.

Unit 3. Networks Switching Techniques and Access mechanisms, Circuit switching; packets witching-connectionless datagram switching, connection-oriented virtual, circuit switching; dial-up modems; digital subscriber line; cable TV for data transfer.

Unit 4. Data Link Layer Functions and Protocol, Error detection and error correction techniques ;data-link control- framing and flow control; error recovery protocols- stop and wait ARQ, go-back-n ARQ; Point to Point Protocol on Internet.

Unit 5. Multiple Access Protocol and Networks, CSMA/CD protocols; Ethernet LANS; connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways.

Unit 6. Networks Layer Functions and Protocols, Routing; routing algorithms; network layer protocol of Internet- IP protocol, Internet control protocols.

Unit 7. Transport Layer Functions and Protocols, Transport services- error and flow control, Connection establishment and release- three-way handshake.

Unit 8. Overview of Application layer protocol, Overview of DNS protocol; overview of WWW & HTTP protocol.

Reference Books:
B. A. Forouzan: Data Communications and Networking, Fourth edition, THM, 2007.
S. Tanenbaum: Computer Networks, Fourth edition, PHI , 2002

BCA-303 DATA STRUCTURES

Unit - I Introduction: Basic Terminology, Elementary Data Organization, Structure operations, Algorithm Complexity and Time-Space trade-off

Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices and Vectors.

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion.

UNIT - II Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, dequeues and Priority Queues.

Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, doubly linked list, Linked List in Array, Polynomial representation and addition.

UNIT – III Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees.

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

UNIT – IV Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST.

UNIT - V Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal.

DATA STRUCTURES

Practical LAB Work

1. Write a program to search an element from a list. Give user the option to perform Linear or Binary search. Use Template functions.
2. WAP using templates to sort a list of elements. Give user the option to perform sorting using Insertion sort, Bubble sort or Selection sort.
3. Implement Linked List using templates. Include functions for insertion, deletion, and search of a number, reverse the list and concatenate two linked lists (include a function and overload operator +).
4. Implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
5. Implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
6. Perform Stack operations using Linked List implementation.
7. Perform Stack operations using Array implementation. Use Templates.
8. Perform Queues operations using Circular Array implementation. Use Templates.
9. Create and perform different operations on Double-ended Queues using Linked List implementation.
10. WAP to calculate factorial and to compute the factors of a given no. (i)using recursion, (ii) using iteration
11. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
12. WAP to calculate GCD of 2 number (i) with recursion (ii) without recursion
13. WAP to create a Binary Search Tree and include following operations in tree: Insertion (Recursive and Iterative Implementation) Deletion by copying Deletion by Merging Search a no. in BST
14. Display its preorder, postorder and inorder traversals Recursively
15. Display its level-by-level traversals Count the non-leaf nodes and leaf nodes Display height of tree Create a mirror image of tree Check whether two BSTs are equal or not

SUGGESTED READINGS:

1. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., New Delhi.
2. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education Asia, Delhi-2002
3. A. M. Tenenbaum, “Data Structures using C & C++”, Prentice-Hall of India Pvt. Ltd., New Delhi.

BCA 304 Financial Accounting

Meaning and Scope of Accounting: Need, development, and definition of accounting; Bookkeeping and accounting; Persons interested in accounting; Disclosures; Branches of accounting; Objectives of accounting.

Accounting Principles: International Accounting Standards (only outlines); Accounting principles; Accounting Standards in India

Accounting transactions: Accounting Cycle; Journal; Rules of debit and credit; Compound journal entry; Opening entry; Relationships between Journal and Ledger; Rules regarding posting; Trial balance; Subdivisions of a journal.

Capital and Revenue: Classification of income; Classification of expenditure; Classification of receipts accounting concepts of income; Accounting concepts and income measurement; Expired costs and income measurement Final Accounts; Manufacturing account; Trading account; Profit and loss account; Balance Sheet; Adjustment entries, Rectification of errors; Classification of errors; Location of errors; Suspense accounts; Effects on profit.

Depreciation Provisions and Reserves: Concept of depreciation; Causes of depreciation; Depreciation, depletion, amortization, and dilapidation; Depreciation accounting; Methods of recording depreciation; Methods for providing depreciation; Depreciation of different assets;

Depreciation of replacement cost; Depreciation accounting as per accounting standard;

Depreciation accounting; Provisions and reserves

Introduction to Company Accounts: Introduction, Kinds of Companies, Formation of

Companies, Share Capital, Issue of Shares, Under Subscription & Oversubscription, Issue of Shares at Premium & Discount, Buyback of Shares and Treasury Stock, Accounting Treatments and Ledger Preparation.

Company Accounts: Introduction, Forfeiture of Shares, Reissue of Shares, Issue of Bonus Shares, Rights Issue, Share Split, Buy Back of Shares, Redemption of Preference Shares, Debentures.

financial accounting book

1.Lal, Jawahar and Seema Srivastava, Financial Accounting, Himalaya Publishing House.
2.Monga, J.R., Financial Accounting: Concepts and Applications, Mayoor Paper Backs, New Delhi.
3.Shukla, M.C., T.S. Grewal and S.C.Gupta. Advanced Accounts. Vol.-I. S. Chand & Co., New Delhi.
4.S. N. Maheshwari, Financial Accounting, Vikas Publication, New Delhi. 5.T.S, Grewal, Introduction to Accounting, S. Chand and Co., New Delhi
6.P.C. Tulsian, Financial Accounting, Tata McGraw Hill, New Delhi.
7.Bhushan Kumar Goyal and HN Tiwari, Financial Accounting, Vikas Publishing House, New Delhi.

BCA-305 HTML Programming

Unit-I: Introduction about HTML, Need of HTML ,Application of HTML.

Unit-II: The Basics (Tags , Attribute, List... etc) The Head, The Body, Colours, Attributes, Lists, ordered and unordered

Unit-III: Links Introduction, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link Within a Document

Unit-IV: Images, Putting an Image on a Page, Using Images as Links, Putting an Image in the Background.

Unit V: – Tables, creating a Table, Table Headers o Captions, Spanning Multiple Columns, Styling Table

Unit VI – Forms, Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where to Go from Here.

Reference Books

1.Virginia DeBolt , Integrated HTML and CSS A Smarter, Faster Way to Learn Wiley / Sybex , 2006
2.Cassidy Williams, Camryn Williams Introduction to HTML and CSS, O'Reilly, 2015

BCA 4th Semester

BCA-401: **Programming using JAVA**

UNIT: 1 Introduction to Java**,** Java Architecture and Features, Understanding the semantic and syntax differences between C++ and ,Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built- in Java Class Methods),

UNIT 2. Arrays, Strings and I/O, Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String ,Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.

UNIT 3. Object-Oriented Programming Overview, Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class ,Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as ,parameters, final classes, Object class, Garbage Collection.

UNIT 4. Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT 5. Exception Handling, Threading, Networking and Database Connectivity Exception types, uncaught exceptions, throw, built-in exceptions, creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT 6. Applets and Event Handling, Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Practical LAB Work

1 To find the sum of any number of integers entered as command line arguments

2 To find the factorial of a given number

3 To learn use of single dimensional array by defining the array dynamically.

4 To learn use of length in case of a two-dimensional array

5 To convert a decimal to binary number

6 To check if a number is prime or not, by taking the number as input from the keyboard

7 To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument

8 Write a program that show working of different functions of String and String Buffer classs like set Char At(, set Length(), append(), insert(), concat()and equals().

9 Write a program to create a ―distance class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer

10 Modify the ―distance class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.

11 Write a program to show that during function overloading, if no matching argument is found, then java

12 will apply automatic type conversions(from lower to higher data type)

13 Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value, and objects are passed by reference and to learn use of final keyword

14 Write a program to show the use of static functions and to pass variable length arguments in a function.

15 Write a program to demonstrate the concept of boxing and unboxing.

SECTION-II

1. Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions(from lower to higher data type)

2. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword

3. Write a program to show the use of static functions and to pass variable length arguments in a function.

4. Write a program to demonstrate the concept of boxing and unboxing.

5. Create a multi-file program where in one file a string message is taken as input from the user

   a. And the function to display the message on the screen is given in another file (make use of Scanner package in this program).

6. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate fibonacii series is given in a different file belonging to the same package.

7. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages

8. Write a program ―Divide By Zero‖ that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.

9. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.

10. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).

Reference Books:

Black book ,java E. Balaguruswamy, "Programming with Java"

BCA-402: System Analysis and Design

Unit 1:

Basic Concept of Systems the System: Definition and Concepts; Elements of a System: Input, Output Processor,

Control, Feedback, Environment, Boundaries, and Interface; Characteristics of a System; Types of systems -Physical and Abstract System, Open and Closed Systems, Man-made Systems; Information and its categories

Unit 2:

Information System and System Analyst Information systems : TPS, OAS, MIS, DSS, ESS; System Analyst: Role and need of system analyst, System Analyst as an agent of change.

Unit 3:

System Development Life Cycle Introduction to SDLC, Various phases: study, analysis, design, development, testing, implementation, maintenance; System documentation: Types of documentation and their importance.

Unit 4:

System Planning and Information Gathering Initial Investigations, Identification of user needs, Project Identification and Selection; Needs of Information Gathering, Determination of requirements, Information gathering tools: interviews, group communication, questionnaires, presentations, and site visits.

Unit 5:

Feasibility Study Definition, Importance of feasibility study, Types of feasibility study, System selection plan and proposal, Prototyping, Cost-Benefit Analysis: Tools and Techniques.

Unit 6:

Tools for System Analysis Data Flow Diagram (DFD), Logical and Physical DFDs, Developing DFD; System Flowcharts and Structured charts, Structured English, Decision trees and Decision tables.

Unit 7:

System Design Module specifications, Module Coupling and cohesion, Top-down and bottom-up design; Logical and Physical design, Structured design.

Unit 8

Input and Output Input design: Input data, Input media and devices; Output design; Form Design: Classification of forms, Requirements of Form design.

Unit 9:

System Implementation and Maintenance Need of System Testing, Types of System Testing, Quality Assurance; System Conversion, Conversion methods, procedures and controls, System evaluation and performance, Maintenance activities and issues.

Unit 10:

System Security and Audit System Security, Security Threats, Risk Analysis, Control measures, System Audit, Disaster Recovery Planning Suggested Readings:

1. Elias m. Awad: System Analysis and Design
2. Perry Edwards: System Analysis & design Mc Graw Hill

BCA 403 : Design and Analysis of Algorithm

Unit 1. Introduction Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm.

Unit 2. Algorithm Design Techniques, Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms.

Unit 3. Sorting and Searching Techniques, Elementary sorting techniques–Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting techniques - Heap Sort, Quick Sort, Sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort, Searching Techniques, Medians & Order Statistics, complexity analysis.

Unit 4. Lower Bounding Techniques, Decision Trees
Unit 5. Balanced Trees ,Red Black Trees
Unit 6. Advanced Analysis Technique
Unit 7. Amortized analysis

Unit 8. Graphs, Graph Algorithms–Breadth First Search, Depth First Search and its Applications, Minimum Spanning Trees.

Reference Books:
T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3rd Edition 2009
Sarabasse & A.V. Gelder Computer Algorithm – Introduction to Design and Analysis, Publisher Pearson 3rd Edition 1999

BCA-404: Software Engineering

Unit 1. Introduction The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI).

Unit 2. Requirement Analysis, Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement, Analysis and Modelling Techniques, Flow Oriented Modelling, Need for SRS, Characteristics and Components of SRS.

Unit 3. Software Project Management, Estimation in Project Planning Process, Project Scheduling.

Unit 4. Risk Management, Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan.

Unit 5. Quality Management, Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.

Unit 6. Design Engineering, Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modeling Component Level Design.

Unit 7. Testing Strategies & Tactics ,Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.

Reference Books:

R.S. Pressman, Software Engineering: A Practitioner‘s Approach (7 th Edition), McGraw-Hill, 2009.
P. Jalote, An Integrated Approach to Software Engineering (2 nd Edition), Narosa Publishing House, 2003.
K.K. Aggarwal and Y. Singh, Software Engineering (2 nd Edition), New Age International Publishers,

BCA 405 Business Intelligence

Course Contents

Unit 1 Business Intelligence an Introduction: Introduction, Definition, History and Evolution, Business Intelligence Segments, Difference between Information and Intelligence, Defining Business Intelligence Value Chain, Factors of Business Intelligence System, Real time Business Intelligence, Business Intelligence Applications

Unit 2 Business Intelligence Essentials: Introduction, Creating Business Intelligence Environment, Business Intelligence Landscape, Types of Business Intelligence, Business Intelligence Platform, Dynamic roles in Business Intelligence, Roles of Business Intelligence in Modern Business-Challenges of BI

Unit 3 Business Intelligence Types: Introduction, Multiplicity of Business Intelligence Tools, Types of Business Intelligence Tools, Modern Business Intelligence, the Enterprise Business Intelligence, Information Workers.

Unit 4 Architecting the Data: Introduction, Types of Data, Enterprise Data Model, Enterprise Subject Area Model, Enterprise Conceptual Model, Enterprise Conceptual Entity Model, Granularity of the Data, Data Reporting and Query Tools, Data Partitioning, Metadata, Total Data Quality Management (TDQM).

Unit 5 Introduction to Data Warehousing: Introduction, Data Warehousing, Advantages and Disadvantages of Data Warehousing, Data Warehouse, Data Mart, Aspects of Data Mart, Online Analytical Processing , Characteristics of OLAP, OLAP Tools, OLAP Data Modeling, OLAP Tools and the Internet, Difference between OLAP and OLTP, Multidimensional Data Model, Data Modeling using Star Schema and Snowflake Schema

Unit 6 Different Ways of Data Warehousing: Introduction, Types of Business Models, B2B Business Intelligence Model, Electronic Data Interchange & E-Commerce Models, Advantages of E-Commerce for B2B Businesses, Systems for Improving B2B E-Commerce, B2C Business Intelligence Model, Need of B2C model in Data warehousing, Different types of B2B intelligence Models Knowledge Management: Introduction, Characteristics of Knowledge Management, Knowledge assets, Generic Knowledge Management Process, Knowledge Management Technologies, Essentials of Knowledge Management Process

Unit 7 Data Extraction: Introduction, Data Extraction, Role of ETL process, Importance of source identification, Various data extraction techniques, Logical extraction methods, Physical extraction methods, Change data capture

Unit 8 Business Intelligence Life Cycle: Introduction, Business Intelligence Lifecycle, Enterprise Performance Life Cycle (EPLC)Framework Elements, Life Cycle Phases, Human Factors in BI Implementation, BI Strategy, Objectives and Deliverables, Transformation Roadmap, Building a transformation roadmap, BI Development Stages and Steps, Parallel Development Tracks, BI Framework

Unit 9 Business Intelligence User Model: Introduction, Evolution of Business Intelligence, Business Intelligence Opportunity Analysis Overview, Content Management System, End User Segmentation, Basic Reporting and Querying, Online Analytical Processing, OLAP Techniques, OLAP Applications, Applying the OLAP to Data Warehousing, Benefits of using OLAP, Dashboard, Advanced/Emerging BI Technologies, Future of Business Intelligence

Unit 10 Business Intelligence Issues and Challenges: Introduction, Critical Challenges for Business Intelligence success, Cross-Organizational Partnership, Business Sponsors, Dedicated Business Representation, Availability of Skilled Team Members, Business Intelligence Application Development methodology, Planning the BI Projects, Business Analysis and Data Standardization, effect of Dirty Data on Business profitability, Importance of Meta-Data, Silver Bullet Syndrome, Customer Pain Points, Creating Cost Effective Enterprise friendly BI solution

Refrence Books

1. **“**Business Intelligence: The Savvy Manager's Guide” by David Loshin
2. “Business Intelligence Roadmap: The Complete Project Lifecycle for Decision-Support Applications” by Larissa T. Moss and Shaku Atr
3. “Hyper: Changing the way you think about, plan, and execute business intelligence for real results, real fast!” by Gregory P. Steffine

BCA 5th Semester

BCA 501- Computer Graphics

Unit 1: Basic elements of Computer graphics, Applications of Computer Graphics.

Unit 2: Graphics Hardware, Architecture of Raster and Random scan display devices, input/output devices.

Unit 3: Fundamental Techniques in Graphics, Raster scan line, circle and ellipse drawing, thick primitives, Polygon filling, line and polygon, clipping algorithms, 2D and 3D Geometric Transformations, 2D and 3D Viewing Transformations (Projections- Parallel and Perspective), Vanishing points.

Unit 4: Geometric Modelling, Representing curves & Surfaces.

Unit 5: Visible Surface determination, Hidden surface elimination.

Unit 6: Surface rendering, Illumination, and shading models. Basic color models and Computer Animation.

Reference Books:

J.D.Foley, A.Van Dan, Feiner, Hughes Computer Graphics Principles & Practice 2 nd edition Publication Addison Wesley 1990.
D.Hearn, Baker: Computer Graphics, Prentice Hall of India 2008.
D.F.Rogers Procedural Elements for Computer Graphics, McGraw Hill 1997.
D.F.Rogers, Adams Mathematical Elements for Computer Graphics, McGraw Hill 2 nd edition 1989

BCA 502- Python Programming

Unit 1 Introduction to Python: Python variables, Python basic Operators, Understanding python blocks. Python Data Types, Declaring and using Numeric data types: int, float etc.

Unit 2 Python Program Flow Control Conditional blocks: if, else and else if, Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, continue, break and else. Programming using Python conditional and loop blocks.

Unit 3 Python Complex data types: Using string data type and string operations, Defining list and list slicing, Use of Tuple data type. String, List and Dictionary, Manipulations Building blocks of python programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, organizing python codes using functions.

Unit 4 Python File Operations: Reading files, writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations. Database Programming: Connecting to a database, Creating Tables,INSERT, UPDATE, DELETE and READ operations, Transaction Control,Disconnecting from a database, Exception Handling in Databases.

Unit 5 Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc. GUI Programming: Tkinter introduction, Tkinter and PythonProgramming, Tk Widgets, Tkinter examples.Python programming with IDE.

TEXT BOOKS / REFERENCES

Head First Python: A Brain-Friendly Guide, by Paul Barry.

1. Python Crash Course: A Hands-On, Project-Based Introduction to Programming, by Eric Matthes.
2. Python Programming: By **John Zelle**

Python Practical Lab work

1. **Python Program to Print Hello world!**
2. **Python Program to Add Two Numbers**
3. **Python Program to Find the Square Root**
4. **Python Program to Calculate the Area of a Triangle**
5. **Python Program to Solve Quadratic Equation**
6. **Python Program to Swap Two Variables**
7. **Python Program to Generate a Random Number**
8. **Python Program to Convert Kilometers to Miles**
9. **Python Program to Convert Celsius To Fahrenheit**
10. **Python Program to Check if a Number is Positive, Negative or 0**
11. **Python Program to Check if a Number is Odd or Even**
12. **Python Program to Check Leap Year**
13. **Python Program to Find the Largest Among Three Numbers**
14. **Python Program to Check Prime Number**
15. **Python Program to Print all Prime Numbers in an Interval**
16. **Python Program to Find the Factorial of a Number**
17. **Python Program to Display the multiplication Table**
18. **Python Program to Print the Fibonacci sequence**
19. **Python Program to Check Armstrong Number**
20. **Python Program to Find Armstrong Number in an Interval**
21. **Python Program to Find the Sum of Natural Numbers**
22. **Python Program To Display Powers of 2 Using Anonymous Function**
23. **Python Program to Find Numbers Divisible by Another Number**
24. **Python Program to Convert Decimal to Binary, Octal and Hexadecimal**
25. **Python Program to Find ASCII Value of Character**
26. **Python Program to Find HCF or GCD**
27. **Python Program to Find LCM**
28. **Python Program to Find the Factors of a Number**
29. **Python Program to Make a Simple Calculator**
30. **Python Program to Shuffle Deck of Cards**
31. **Python Program to Display Calendar**
32. **Python Program to Display Fibonacci Sequence Using Recursion**
33. **Python Program to Find Sum of Natural Numbers Using Recursion**
34. **Python Program to Find Factorial of Number Using Recursion**
35. **Python Program to Convert Decimal to Binary Using Recursion**
36. **Python Program to Add Two Matrices**

BCA 503- Theory of Computations

Unit 1. Languages, Alphabets, string, language, Basic Operations on language, Concatenation, Kleene Star

Unit 2. Finite Automata and Regular Languages, Regular Expressions, Transition Graphs, Deterministic and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.

Unit 3. Context free languages, Context free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.

Unit 4. Turing Machines and Models of Computations, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, recursively enumerable and recursive languages, unsolvability problems.

Reference Books

Daniel I.A.Cohen, Introduction to computer theory, John Wiley,1996

Lewis & Papadimitriou, Elements of the theory of computation, PHI 1997.

Hoperoft, Aho, Ullman, Introduction to Automata theory, Language & Computation –3 rd Edition,

Pearson Education. 2006

Theory of automata by K.L.P Mishra and N Chandrashekharan

BCA 504- Cloud Computing .

Unit 1.

Overview of Computing Paradigm, Recent trends in Computing : Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing,

Unit 2.

Introduction to Cloud Computing, Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits, and limitations of Cloud Computing,

Unit 3.

Cloud Computing Architecture, Comparison with traditional computing architecture (client/server), Services provided at

various, levels, Service Models- Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as ,a Service(SaaS), How Cloud Computing Works, Deployment Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

Unit 4.

Case Studies, Case study of Service model using Google App Engine, Microsoft Azure, Amazon EC2 , Eucalyptus.

Unit 5.

Service Management in Cloud Computing, Service Level Agreements(SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling.

Unit 6.

Cloud Security, Infrastructure Security- Network level security, Host level security, Application-level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data ,location, Authentication in cloud computing.

Reference Books :

Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010

Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011

Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam,

Springer, 2012

Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines,

Wiley-India, 2010

Gautam Shroff, Enterprise Cloud Computing Technology Architecture Applications , Adobe Reader ebooks

available from eBooks.com,2010

BCA 6th Semester

BCA 601- INFORMATION SECURITY

Unit 1. Introduction Security, Attacks, Computer Criminals, Security Services, Security Mechanisms.

Unit 2. Cryptography, Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric, Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

Unit 3.

Program Security, Secure programs, non-malicious Program errors, Malicious codes virus, Trap doors, Salami ,attacks, Covert channels, Control against program

Unit 4.

Threats, Protection in OS: Memory and Address Protection, Access control, File Protection, User

Authentication. Unit 5. Database Security, Requirements, Reliability, Integrity, Sensitive data, Inference,

Multilevel Security.

Unit 6.

Security in Networks, Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails

Unit 7.

Administrating Security, Security Planning, Risk Analysis, Organizational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Reference Books: C. P. Pfleeger, S. L. Pfleeger; Security in Computing, Prentice Hall of India, 2006

W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 201

BCA 602- Artificial Intelligence

Unit 1. Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behaviour, and environment.

Unit 2. Problem Solving and Searching Techniques, Problem Characteristics, Production Systems, Control Strategies, Breadth

First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.

Unit 3. Knowledge Representation, Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs. Programming in Logic (PROLOG)

Unit 4. Dealing with Uncertainty and Inconsistencies, Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic, Inference, Possible World Representations.

Unit 5. Understanding Natural Languages, Parsing Techniques, Context-Free and Transformational Grammars, Recursive and Augmented Transition Nets.

Reference Books: DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.
Russell &Norvig, Artificial Intelligence-A Modern Approach, LPE, Pearson Prentice Hall, 2 nd edition, 2005. Rich & Knight, Artificial Intelligence – Tata McGraw Hill, 2 nd edition, 1991.
Ivan Bratko, Prolog Programming for Artificial Intelligence, Addison-Wesley, Pearson Education, 3 rd edition, 2000.

BCA 603- PHP Programming

Unit 1: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.) PHP with other technologies, scope of PHP Basic Syntax, PHP variables and constant Types of data in PHP , Expressions, scopes of a variable (local, global) PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator. PHP operator Precedence and associativity.

Unit 2: Handling HTML with PHP, Capturing Form Data, GET and POST form methods, Dealing with multi value fields directing a form after submission

Unit 3: PHP conditional events and Loops, PHP IF Else conditional statements (Nested IF and Else) Switch case, while ,For and Do While Loop, Goto , Break ,Continue and exit

Unit 4: PHP Functions, Function, Need of Function , declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local

Unit 5: String Manipulation and Regular Expression: Creating and accessing String, Searching & Replacing String Formatting, joining and splitting String, String Related Library functions, Use and advantage of regular expression over inbuilt function, Use of preg_match(), preg_replace(), preg_split() functions in regular expression Reference

Unit 6. Array,Anatomy of an Array, creating index based and Associative array ,accessing array ,Looping with Index based array, with associative array using each() and foreach(), Some useful Library function

Reference Books:

Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.

Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'reilly, 2014.
Luke Welling, Laura Thompson, PHP and MySQL Web Development", 4th Edition, Addition
Paperback, Addison-Wesley Professsional,2008.

David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014.

SOFTWARE LAB BASED ON PHP PROGRAMMING:

1. Create a PHP page using functions for comparing three integers and print the largest number.

2. Write a function to calculate the factorial of a number (non-negative integer). The function accepts the number as an argument. 3. WAP to check whether the given number is prime or not.

4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string. 5. Write a PHP function that checks if a string is all lower case.

6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)

7. WAP to sort an array.

8. Write a PHP script that removes the whitespaces from a string.

a. Sample string : 'The quick " " brown

b. fox' Expected

Output :

c. Thequick" "brownfox

9. Write a PHP script that finds out the sum of first n odd numbers.

10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.

11. Write a simple PHP program to check that emails are valid

OJT & Project Work/ Dissertation

Full marks -200(Divided into two parts)

A. ON JOB TRAINING (OJT):

1.OJT is ON JOB TRANING, Student have to do two months (OJT two Month) industrial Training from different IT Organization. of must be issued from Concern Department). Student has to produce daily report.

2.Student alone or in a group of not more than three, shall undertake One Project Dissertation approved by the Subject Teacher/H.O.D. of the Department/College concerned. The progress of the Project Dissertation shall be monitored by the faculty members at regular intervals.

Academic Credits for training shall be based on following:

A Power Point presentation (based on the report) for duration of 10 minutes should be make. This will be presented in front of examiners. Marks will be awarded on this presentation and documents submitted to the faculty coordinator at the institute.

Students have to submit the following on completion of training to the concern faculty at the college:

Synopsis submission

1.Synopsis Approval will be given within a week from the date of submission.

2.Synopsis will be approved by concerned department faculty member.

3.Faculty members will be the internal guide of particular group of Students.

4.The group size will be minimum of 1 candidate and maximum of 3 candidates.

5.Group will present power point presentation in front of panel and submit the project

6.status report within the 15 to 20 days from the date of approval.

7.Final Project Submission contains Hard copy, Soft copy & leave letter. 8.Project hard copy contains

a) Front page

b) Certificate of Authenticity

c) Certificate of job Trainings (job1+job2)

d) Declaration

e) Acknowledgement

f) Table of content/index

g) Project guidelines (These points are mandatory)

(i). Introduction with Company profile.

(ii). Vision, mission & objective.

(iii). SWOT Analysis.

(iv). Chronology of Achievements.

(v). Topic introduction & discussion.

(vi). Its relevance & implication in company.

(vii). Findings.

(viii). conclusion

(ix). Further enhancement (Suggestion).

(x).Bibliography

(xi). Reference Website (xii). CD (compact Disc)

h) The file should be Book Binding .One Project Report for office copy and each candidate must have its own copy.

The Training Report will be submitted in the form specified as under:

a.The typing should be done on both sides of the paper(instead of single side printing)

b.The font size should be12 with Times New Roman font.

c.The Training Report may be typed in 1.5 line spacing.

d.The paper should be A-4size.

Two copies meant for the purpose of evaluation may be bound in paper- and submitted to the approved authority.

Guidelines to Examiners for

Evaluation of OJT (By Internal) may be as per the following guidelines:

OJT Project Based Work = 50 marks

Daily Report1 = 10 marks

Presentation Performance = 10 marks

Viva-voce = 30 marks

B. PROJECT WORK/ DISSERTATION

1.The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses.

2.Students must do a complete project, the technologies (front end + back end) should be chosen among the syllabus, where the front end will be designing & coding portion and back end will be database portion.

3.Students must run the code as a live project and submit CD containing supporting software, frontend and backend coding in proper format.

Guidelines to Examiners for

End Semester Examination (ESE Pr):

Project Evaluation (By Internal & External) may be as per the following guidelines:

Assigned by Internal Guide

Pre Submission

Project Work- 50 marks

(Power Point Presentation) = 10 marks

Assigned by External Examiner

Programme Running in system

Project Report (Hard Copy) and Viva-voce= 40 marks
