

Kumaun University Nainital

ORDINANCES

Bachelor of Computer Applications (BCA)

1. Admission.

- 1.1 Admission to BCA Course (First Semester) will be made as per rules prescribed by the Kumaun University Government of Uttarakhand from time to time.
- 1.2 No admission will be made through migration or transfer from other University or Institute.

2. Eligibility

To be eligible for admission to BCA Course candidate should have passed 10+2 examination with Mathematics as one of the subjects and minimum of 45% marks in aggregate (40% for reserved category)

3. Abundance

- 3.1 The student will be required to have minimum 75% attendance in lectures, tutorials, practical & other prescribed curricular & co-curricular activities.
- 3.2 In special circumstances Dean/Principal/Director of the Institute can allow relaxation of attendance upto 10% for reasons acceptable to him. A further relaxation of 5% can be sanctioned by the V.C. of the University in very special circumstances, on the recommendations of the Dean/ Principal/ Director.
- 3.3 No candidate will be allowed to appear in the end semester examination if he/she does not satisfy the attendance requirements.

4. Duration

- 4.1 Total duration of the BCA Course shall be 3 years and each year will comprise of two semesters.
- 4.2 Each shall have teaching for minimum prescribed working days including holidays as per AICTE norms.

- 4.3 A student failing more than two times in 1 and/or 2 semester (of First year) and ineligible for the carry over system (Clause 9) shall not permitted to continue studies further.
- 4.4 Maximum period allowed to be a candidate for completion of BCA Course will be 5 (five) academic years from and including the Admission Session.

5. Curriculum

- 5.1 The 3 (Three) years curriculum will be divided into 6 (Six) Semester as given in scheme of examinations (Annexure-IV) or as prescribed from time to time by the university.
- 5.2 The curriculum from Semester I to VI will include lectures. Tutorials, Practical & Seminars as specified in scheme of examination (Annexure-IV). It may also include co-curricular and extra curricular activities as prescribed by the university Institute.

6. Examination

- 6.1 Student's performance will be evaluated through continuous assessment in the form of class tests assignments Quizzes, Viva-Voce/Practical etc.
- 6.2 There will also be an examination in theory subjects, practical and projects conducted by the university at the end of each semester.
- 6.3 The distribution of marks for the internal (Institute) assessment end Semester theory practical and other examination shall be as per the prescribed scheme of examination (Annexure IV)
- 6.4 Maximum marks for theory subject's practical and project shall consist of marks allotted for end semester examination and internal assessment (Seasonal Work) put together.
- 6.5 Pass/fail in a subject shall be declared on the basis of total marks obtained in theory/practical examination and sectional marks put together.
- 6.6 To pass in a subject the candidate should score minimum 25% marks in end Semester theory examination 40% marks in practical/Viva Voce/Project but the aggregate of each subject should be at least 40% including seasonal marks.
- 6.7 For a clear pass in a semester examination the candidate should score atleast 50% marks of the total of all the subjects.

- 6.8 If a candidate passes in all the subjects under clause 6.6 but does not satisfy clause 6.6 i.e. aggregate of 50% marks of the total, then he/she would be required to appear as per the carry-over system (Clause 9) in maximum of three subjects (3 T/P) as back papers.
- 6.9 The marks of previous semester (S) will be added in declaring the result of other semester examination pass/fail/promotion in a particular semester shall be decided purely on the basis of marks obtained in that semester.

7. General Proficiency (GP)

- 7.1 The G.P. marks will be awarded by the Institute on the basis of students overall performance in various activities.
- 7.2 There are no passing marks in General Proficiency (G.P.). However, these marks will be added for deciding the division of a student.

8. Promotion Rules

- 8.1 A candidate satisfying the conditions of clause 6.6 & 6.7 shall be promoted to the semester.
- 8.2 A candidate failing in not more than 3 subjects (3 T/P) of a Semester examination and candidates failing under clause 6.8 shall be governed by Clause 9.
- 8.3 Such students (Clause 8.2) will be shown as “PROVISIONALLY PROMOTED WITH CARRY-OVERS).
- 8.4 All other candidates who fail in more than subjects (3 T/P) will be required to repeat the semester either as regular student after re-admission (depending upon the availability of seat) or as ex-student. This facility is however subject to the time limit stipulated in clause 4.4 .

9. Promotion under carry-over System

- 9.1 A candidate who falls under clause 8.2 shall become eligible for provisional promotion to the next semester and to the carry over system as per the following table.

For Promotion to Next Semester	Maximum permitted no. of carry over subjects of semester					
	I T/P	II T/P	III T/P	IV T/P	V T/P	VI T/P
II	3	-	-	-	-	-
III	3	3	-	-	-	-
IV	3	3	3	-	-	-
V	-	-	3	3	-	-
VI	-	-	3	3	3	-

Note: T- theory P-Practicals

- 9.2 No Separate carry over examination will be held for any subject except for final year (V & VI) Semesters). Candidates eligible for the carry over system will have to appear in the carry over subjects in subsequent University Examination for the same semester.
- 9.3 Marks obtained in the carry over examination shall replace the original theory/practical marks and the marks of internal assessment (sessional) will remain unchanged

10. Result & Award of Division

10.1 At the end of VI Semester successful candidates will be awarded division and degree on the basis of total marks obtained (combined result) of all the Semesters put together as under:

- (a) 75% and above : First Division with honors (to be awarded to only those candidates who pass all semester examinations in one attempt)
- (b) 60% & above but less than 75% : First Division
- (c) 50% & above but less than 60% : Second Division

A Candidate who passes I & II year & is eligible for carry over examination (for V and VI Semesters) at the end of III year, will be allowed special examination in the carry-over subjects by the University after one month from the date of declaration of results of the VI Semester examination.

11. Grace Marks

A maximum of 5 grace marks can be awarded in each semester examination in ONE subject to only those candidates who by virtue of this award can be declared to have passed in that semester. However, these marks will not be added to the total.

12. Serutiny

Serutiny will be allowed as per the rules of the University.

ANNEXURE-IV

SCHEME OF EXAMINATION FOR BCA FIRST SEMESTER

S.No.	Subject No.	Subject Name	Periods			Evaluation Scheme		Subject Total
			L	T	P	IA	ESE	Total
1	BCA 101	Communication English	3	1	0	30	70	100
2	BCA 102	Mathematics	3	1	0	30	70	100
3	BCA 103	Introduction to Computing	3	1	0	30	70	100
4	BCA 104	Prodecure Oriented Programming	3	1	0	30	70	100
5	BCA 105	Computer Lab	1	0	4	50	50	100
6		General proficiency	-	-	-	-	-	50
		Total						550

L : Lectrurer T : Tutorial IA : Institute Assessment ESE : End Semester Examination

SCHEME OF EXAMINATION FOR BCA SECOND SEMESTER

S.No.	Subject No.	Subject Name	Periods			Evaluation Scheme		Subject Total
			L	T	P	IA	ESE	Total
1	BCA 201	Advance Mathematics	3	1	0	30	70	100
2	BCA 202	Discrete Mathematics	3	1	0	30	70	100
3	BCA 203	Introduction to Data Structure	3	1	0	30	70	100
4	BCA 204	Business Data Processing	3	1	0	30	70	100
5	BCA 205	Financial Accounting	3	1	0	30	70	100
6	BCA 206	Computer Lab	0	0	4	50	50	100
7		General Proficiency	-	-	-	-	-	50
		Total						650

L : Lectrurer T : Tutorial IA : Institute Assessment ESE : End Semester Examination

SCHEME OF EXAMINATION FOR BCA THIRD SEMESTER

S. No.	Subject No.	Subject Name	Periods			Evaluation Scheme		Subject Total
			L	T	P	IA	ESE	Total
1	BCA 301	Optimization Techniques	3	1	0	30	70	100
2	BCA 302	Management Information System	3	1	0	30	70	100
3	BCA 303	Digital Electronics	3	1	0	30	70	100
4	BCA 304	Data Base Management System	3	1	0	30	70	100
5	BCA 305	System Analysis & Design	3	1	0	30	70	100
6	BCA 306	Computer Lab	0	0	4	50	50	100
7		General Proficiency	-	-	-	-	-	50
		Total						650

L : Lecturer T : Tutorial IA : Institute Assessment ESE : End Semester Examination

SCHEME OF EXAMINATION FOR BCA FOURTH SEMESTER

S. No.	Subject No.	Subject Name	Periods			Evaluation Scheme		Subject Total
			L	T	P	IA	ESE	Total
1	BCA 401	Numerical & Statistical Techniques	3	1	0	30	70	100
2	BCA 402	Operating System	3	1	0	30	70	100
3	BCA 403	Computer Organization & Architecture	3	1	0	30	70	100
4	BCA 404	Object Oriented Programming	3	1	0	30	70	100
5	BCA 405	Computer Graphics	3	1	0	30	70	100
6	BCA 406	Computer Lab	0	0	4	50	50	100
7		General Proficiency	-	-	-	-	-	50
		Total						650

L : Lecturer T : Tutorial IA : Institute Assessment ESE : End Semester Examination

SCHEME OF EXAMINATION FOR BCA FIFTH SEMESTER

S. No.	Subject No.	Subject Name	Periods			Evaluation Scheme		Subject Total
			L	T	P	IA	ESE	Total
1	BCA 501	Software Engineering	3	1	0	30	70	100
2	BCA 502	Internet Techniques & Applications	3	1	0	30	70	100
3	BCA 503	Visual Language Programming	3	1	0	30	70	100
4	BCA 504	Digital Communication Network	3	1	0	30	70	100
5	BCA 505	Environmental Science	3	1	0	30	70	100
6	BCA 506	Minor Project	0	0	4	50	50	100
7	BCA 507	Computer Lab	0	0	4	50	50	100
		Total						700

L : Lecturer T : Tutorial IA : Institute Assessment ESE : End Semester Examination

SCHEME OF EXAMINATION FOR BCA FIRST SEMESTER

S. No.	Subject No.	Subject Name	Periods			Evaluation Scheme		Subject Total
			L	T	P	IA	ESE	Total
1	BCA 601	Multimedia & Applications	3	1	0	30	70	100
2	BCA 602	Introduction to Artificial Intelligence	3	1	0	30	70	100
3	BCA 603	Network Operating Systems	3	1	0	30	70	100
4	BCA 604	Computer Lab	0	0	4	50	50	100
5	BCA 605	Project Work	0	0	6	100	100	200
		Total						600

L : Lecturer T : Tutorial IA : Institute Assessment ESE : End Semester Examination

SUMMARY OF MARKS

S.No	Semester	Semester Total
1	First	550
2	Second	650
3	Third	650
4	Fourth	850
5	Fifth	700
6	Sixth	600
Total for BCA Course		3800

BCA SYLLABUS

BCA 101 Communicative English

English Grammar : Use of Articles, Propositions & Tenses.

Communication: Oral Communication, Conversation, Business letters, Pronunciation & Transcription of words.

Presentation Skills: Précis writing, Essay writing, presentation skills related to Seminars and Conferences.

Suggested Books:

Written, P.C. & Martin, H. "English Grammar & Composition", S.Chand. T. Seth, Agarwal "The Art of English Grammar & Composition", Ratan Prakashan, Agra. Sinha, K.K., "Business Communication", Gaigotla.

W.E. Allen, Living English Structure" "Business Communication" Irwin Mc Graw Hill.

BCA 102 – Mathematics

Integral Calculus: Integral as a Inverse of differentiation, Integration By parts, Methods of Substitution and use of partial fractions, standard forms and simple examples definite integral and their applications to areas and length of curves.

Real number and Functions: Basic properties of Ft. Absolute value , interval on the real line. Functions inverse, functions Graph of Functions, Operation on function, Composite of functions, Even and odd functionsPeriodic functions.

Limit & Continuity: Definition of Limit, Algebra of limits, Right & left hand limit, Infinite limits, Continuity (Definitions & example, Algebra of continuous functions), Differentiability, Rolle's Mean value theorem with numerical problems.

Sequences: Definitions, Convergent sequence, Cauchy Sequences, Monotonic sequences. Sub sequences, Limit superior & Limit inferior of a sequence.

Co-ordinate Geometry: System of lines, system of circles, standard equations and properties of parabola of ellipse.

Suggested Reading:

Bansi Lal & S. Arora "Two Dimensional Co-ordinate Geometry" S. chand.

R.S. Agarwal, "Differential Calculus" S. Chand.

S.C. Gupta "Matrices", S.Chand

BCA – 103 : Introduction to Computing

Introduction to computer and uses, Computer generations and classifications (Micro, Mini, Mainframes and Supercomputers)

Number Systems – Introduction Decimal, Binary, Octal, Hexadecimal and men conversions.

Binary Arithmetic – Binary, Additions, Binary Subtraction, signed Number, Tow’s Compliment representation of numbers, Fixed and Floating point representation of numbers.

Basic Computer Organisation – Input Unit, Output Unit, Storage Unit, Arithmetic and Logic Unit, Control Unit, Central Processing Unit.

Primary Storage – Storage Locations and addresses, storage capacity, RAM, ROM, PROM, EPROM, and Cache Memory.

Secondary Storage Devices – Sequnetial & Direct a ccess devices, Punched paper tape, Magnetic tape, magnetic Disk, Floppy Disk, Winchester Disk, Magnetic Drum, Optical Disk, Magnetic bubble Memory.

Input Output Devices – Punched Hole Devices, Magnetic media devices, printers, keyboard devices, Scanners, Computer output Microfilm, Digitizers, plotters.

CPU Organization - Accumulator and General and Special purpose registers.

DOS – External and Internal command.

Window O.S. – Introduction & Features

Trends in Computing.

Suggested Reading :

Rajaraman, V. “Fundamental of Computers”, Prentice of India, New Delhi.
Trainer, “Computer” Mc Graw Hill, 1994.

BCA 104 – Procedure Oriented Programming

Programming fundamentals: Introduction to algorithm, Flow Charts, C. Character set. identifiers and keywords, Data types declarations, expressions, statement and symbolic constants, input, Output statements, Getchar, putchar, scanf, printf, gets, puts functions.

Pre-processor command: include define.

Prepaing & running a complete C program.

Operators & expressions : Arithmetic, unary, logical, bit-wise, assignment & conditional operators, Library functions.

Control Statements : while do-while, for statements, nested loops, if-else, switch, break, continue & goto statements, comma operator.

Arrays : single & multi dimensional arrays.

Functions : Function prototypes, recursion, storage classes, automatic, external and static variable, passing value to a function.

String : Introduction & operations on strings.

Structure : applications in program

Suggested Readings

Programming in ANSL 'C'	E.Balaguruami	TMH
Computer Programming in 'C'	V. Rajaraman	PHI
Let us C	Yashvant kanetkar	BPB

BCA 105 : Computer Lab

Practical Based on DOS 'C', Windows based, Word Processing, Electronics spread Sheets, Presentations

BCA 201: Advance Maths

Matrices: Definition, Types of Matrices, Laws of operations on matrices, Transpose, adjoint and inverse of matrices, solution of linear system of equation and cramer's rule. Rank of matrices, square matrices, Eign values and eigen vectors, characteristics polynomisis, Cayley Hamilton theorem.

Differential Equations: First order and first degree differential equations, separation of variables, Homogeneous, linear & exact differential equations, second order linear equations with constant coefficients, orthogonal Trajectories.

Vectors : Dot & cross product of two vectors, Gradient, Curl & divergent, gauss's and stokes theorems.

Determinants : Determinants & their properties.

Suggested Reading :

R.S. Agarwal “Differential Calculus”

S.Chand

Harikrishna “Real Analysis”

S.Chand

Sharma & Seth “Vector Analysis”

Ram Prasad & Sons

Goyal & Bhargava “Integral Calculus”

BCA 202: Discrete Mathematics

Introduction : Introduction to Discrete structure & its significance for computer science. counting, permutation, combination, pigeonhole, Recurrence Relation Sets, operation on sets, cordinality, product sets partitions.

Functions : Funtion for computer science, permutation functions, Boolean function, growth of functions.

Relations : Properties of relation. Equivalence relations, relations and Diagraph, Transitive closure & Warshall algorithms.

Logic : Statements, Negation operation, Logic connectivities and compound statements. Conjunction, disjunction truth tables. Duality conditional and unconditional statement valid arguments.

Graph Theory : Definition of Graph theory finite & infinite graphs, Incidence & degree, null graph, Sub graph, walks, Path and circuit in a graph, Trees properties of trees, cut sets and cut vertices, planner graphs, incidence matrix, directed graphs.

Introduction to predicate calculus : Predicates, the statement, the function variables & quantifiers, predicate formulas, free & bond variables. The universeof discourse.

Suggested Reading:

Elements of discrete mathematics: C.L. Lieu (McGraw Hill International)

Discrete mathematical structure with Applications to Computer Science: Tremblay J.P. (McGrwa Hill)

BCA 203 Introductions to Data Structure

1. Structured Programming, Arrays (Single, Double, Triangular, Sparse), Row Major, Column Major, address calculation of Single dim and double dim array [ith, jth] element, Pointers, Structures. Memory Management in C [calloc(), malloc(), free()].
2. Simple graphics programme in 'C' (Line, Circle, Rectangle).
3. Data Structures (Definition, Application, Uses, importance),
4. Stacks queues and list: Simple list, Operation on all these structures and applications.
5. Tree structures: Binary tree, tree traversal algorithms.
6. Case studies on Polish notation: manual operation only. Searching (Linear, Binary) & sorting techniques (Bubble, Selection, Insertion). Recursion: Principle and application.

Books:-

1. Wirth, Niclus: Algorithms_ Data Structures + Programs, PHI
2. Horwith, E. And Sahni, S. Fundamentals of Data Structures, Computer Science Press.
3. Knutz, D: The art of Computer Programming, Vols 1-2, Addition- Wesley.
4. Aho, A.V. Hopcroft, and Ullman, J.E. Data Structures and Algorithm, Addition.

BCA – 24
BUSINESS DATA PROCESSING

DATA PROCESSING FUNDAMENTALS: Data, information, Data Processing, Need for Data processing, Data processing Cycle And Functions, Methods of Data processing, Applications of Data Processing Systems, Functional Areas of Data Processing.

ELECTRONIC DATA PROCESSING: Essentials of Electronic Data Processing Advantages and Disadvantages of Electronic Data Processing, Evolution of Data Processing Systems, Data processing n standard, EDP Department.

COMPUTER HARDWARE: Input-Output Devices, Central Processing System, Storage Devices.

COMPUTER SOFTWARE: Introduction, Types of Software, Operating System,

COMPUTING ENVIRONMENT: Batch Processing, Multiprogramming, Multiprocessing, Distributed processing, Real time processing, online processing, Multitasking.

FILE ORGANISATION: Introduction, Files, File Types, Sequential, Direct, Index File Organisation, Database and Database Management System.

SYSTEM ANALYSIS AND DESIGN: Introduction, Brief Introduction to Specific phases in Development.

PROGRAMMING METHADODOLOGY: Introduction to computer program, Programming Functions, Low level, High level languages, Compiler Interpreter, Translator, Program Error n Debugging Difference between oriented programming and object oriented programming.

SUGGESTED READINGS:

Introduction to Computers: P.K. Sinha

Introduction to Computer Data Processing: V.K. Kapoor

Fundamental of EDP: V.K. Kapoor

System Analysis And Design: Awad

Suggested Readings:

V.K. Kapoor “ Introduction to Computer Data Processing”	S. Chand
V.K. Kapoor “ Fundamental of EDP”	S. Chand
Govind Raju “ Programming Techniques for PC’s”	BPB

BCA 205- FINANCIAL ACCOUNTING

Introduction to Accounting: Meaning & Advantage of Accounting, Use of Financial Statements, Double Entry System of Financial Accounting, Generally accepted accounting standards in India.

Accounting Mechanic: Cash book, Special Journals, Rules of Debit & Credit, General Ledger, Bank Reconciliation Statement.

Preparation of Financial Statement: Preparation & Reconciliation of Trial Balance, Preparation of Financial Statements (Including Adjustments)

Familiarity with use of Standard Accounting Package (Ex tally)

Capital Budgeting: Basic Principles & Techniques.

Working Capital Management: An Overall view

Analysis of Financial Statement: Meaning concepts and scope, Ration Analysis, Fund Flow Statement.

Fundamentals of Computerized accounting system

Suggested Reading:

Grewel, TS, “ Introduction to Accounting”, S Chand & Sons, New Delhi.

Greal, TS, “ Double Entry Book Keeping”, S Chand & Sons, New Delhi.

Gupta, RL & Radhaswamy” Advanced Accountings” S Chand & Sons, New Delhi.

Maheshwari SN, “ Principles of Management Accounting.

BCA 206- Computer Lab

Practical Based on Data Structure in C, Simple Graphics in C, Database development using Foxpro.

BCA 301- Optimization Techniques

Introduction: Formulation and graphical solution of L.P.P. (Two variables), limitations and advantages of L.P.

Simplex Method: Slack and surplus variables, B.F.S. from F.S. Simplex method for L.P.P. (three variables)

Replacement Problem: Replacement of items when time is continuous and discrete.

Queuing Theory: Queuing process input process, Servicing facility, distribution of arrivals & service time, M/M/ 1, M/M/C

Transportations & Assignment Problem: Mathematical formulation, North-West corner rule, Lower cost entry method, Unit cost penalty method, Assignment problem.

Games Theory: Pay off matrix, pure & mixed strategy saddle point, 2x2 game without saddle point, 2xn game, graphical method for 2xn & n x 2 game.

Suggested Readings:

Tara, H.A.	Operation Research	Mc Millan
Srinath, L.S. :	Linear Programming	East West Pub.

BCA 302- Management Information System

Introduction: Definition of MIS, Evolving concept of MIS and Academic Discipline, System of MIS.

Structure of MIS: Operating elements MIS structure based on Management Activity and Organizational Function.

Transaction Processing Office Automation and Information Process: Transaction Processing Document Preparation, Information Processing, Information System Availability Controls.

Decision- Making Process: Intelligence and Designed Phase, Concepts of Decision Making, Behavioral Model of Decision Maker, Behavioral Model of Organization Decision Making Decision Making under the Psychological Stress, Information System Design.

Organization Structure and Management Concepts: basis Model of Organization Structure, Modifications of Basic organization Structure, information Processing Model of Organizational Structure Organizational Culture and power, Organizational Change, Management Theories, Theory of MIS.

Decision Support System: Decision Support System, Expert System, Decision-Making Phase, Development of Decision Support system, Planning Support System.

Knowledge Base System: Definition of Knowledge Work, Type of Knowledge work, Technology in Knowledge work, Software Support for Knowledge work, End- User computing.

Suggested Readings:

Davis, Olgon	Management Information System	TMH
James A. O Biran	Management Information System	TMH
W.S. Jawadekar	Management Information System	TMH

BCA 303 Digital Electronics

Number System Number basis Binary, Octal & hexadecimal, Representation of numbers, conversion between bases, negative number representation, BCD Number.

Truth Tables & Boolean Algebra: Truth Tables, evaluations of truth functions, Boolean variables, Boolean functions, Duality and fundamental theorems of Boolean algebra, Canonical & Standard form.

Simplification of Boolean function: The Map method, Two three & Four variables Map, Product of Sum implementations Nand and Nor implementations Don't care Conditions.

Combinational logic: Introduction, Design Procedure, Adders, Subtractors, Code conversions, parity bit, Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoders, Multiplexer, Rom, PLA

Sequential Logic: Introduction, Flip- Flops, Analysis of clocked Sequential Circuit (R-S, D,J-K, T Flip Flop) Design of Counters.

Suggested Reading :

Mano M: "Digital Logic & Computer Design" PHI

Malvino & Leach: "Digital Principles and Application", TMH

BCA 304: DATABASE MANAGEMENT SYSTEMS

Overview of DBMS: Elements of database system, DBMS & Its architecture, advantage of DBMS, data independence, Types of database users, Role of database administrator.

Data Models: Brief overview of Hierarchical and network model. Relations model (Relations, Properties of Relational Model, keys and Entity integrity & Referential Integrity rules), CODD's rules for Relational Model.

Entity Relationship Model: Entity sets, Relationship Sets, Design Issues, Mapping Constraints, E-R diagram, weak entity sets, specialization & General.

Normalization: Normalization concepts and update anomalies, Functional dependencies, Normal forms (1NF, 2NF, 3NF, BCNF)

SQL: SQL constructs; SQL join, multiple table queries, Built-in functions; Views and their use.

Database System architectures: Centralized System, Client Server Systems, (Transaction server, Data server), Parellel system (Speedup & Scaleup), Parallel Database Architecture (Shared Memory, Shared Disk. Shared Nothing), Distributed System (Structures, Tradeoffs Network types (LAN, WAN)

Suggested Reading:

C.J. Date	An Introduction to Data Base System	Narosa Pub.
Bipin Desai	An Introduction to Data Base System	Galgotia Pub
Silberschatz & Korth	Database System Concept	TMH

BCA 305- System Analysis and Design

System Concept and the Information System Environment: Introduction to System analysis & Design. The system concept, characteristic of system: Organization, Interaction, Interdependence, and Interaction. Element of System, Types of System development Life cycle, Prototyping Role of System Analysts: Introduction, Academic and Personal qualification, Place of analysts in MIS Organization.

System Analysis: Information Requirement Analysis Introduction, Types of Information, Diagram (Both Logical & Physical DFD's) Data Dictionary, Decision Table, Pros & Cons of each tools.

Developing a Proposal: Feasibility Study, Cost/ Benefit Analysis

System Design: Process and Stages of System Design Input/Output and Form Design. file Organization. The Role of Database Administrator.

Design and Implementation on OO Platform: Introduction to OOP's, Object Oriented Analysis and Design, Dynamic & Functional modeling, Object Oriented Database.

Suggested Reading:

Elias M.A. wad: "System Analysis & Design". Galgotia Publication (P) Ltd. New Delhi V.

Rajaraman: "Analysis & Design of Information System". PHI New D

BCA 306 Computer Lab

Practical based on Foxpro Programming & Oracle Fundamentals.

BCA-401 Numerical and Statistical Techniques

Introduction: Raw materials of statistics ungrouped and grouped frequency distribution, diagrammatic presentation: Bar-diagram, Pie- diagrams.

Graphical presentation: Histogram, Frequency polygon, frequency curve, cumulative frequency curve.

Measures of Central Tendency and Dispersion. Characteristics of good average, Arithmetic mean, mode, median, Geometric mean, Hermonic mean, Range, Mean deviation, Standard deviation, Skewness and Kurtosis.

Correlation and Regression Analysis : Scatter diagram, Karlpearson, Sperman and Concurrent deviation methods, Regression lines, Method of least square Probability and Probability Distribution. Classical, Empirical and axiomatic approach to probability, Addition and multiplication law of probability, Binomial, poisson & **Normal distributions.**

Numerical Methods:

Interpolation: Finite Differences, Operators E, Newton Gregory Interpolation for equal intervals, divided difference, Newton's Lagrange's Interpolation for unequal intervals.

Central Differences: Gauss forward, back work third formula due to gauss, Strilling & Bessel's formula.

Numerical Differentiation & Integration: Numerical Differentiation by Newton Gregory formula, General quadrature formula, Trapezoidal Rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Euler- Machlaurim's summation formula.

Suggested Readings:

Fundamental of Mathematical statistics	Gupta & Kapoor	S. Chand
Introduction to Numerical Methods	S.S. Shastri	PHI
Computer based numerical methods	V. Rajaraman	PHI

BCA 402& Operating System

Introduction: Definition Simple system, Multiprogrammed batched system, Time sharing system, Process, Files, System Calls, The Shell

Operating System Structure: Monolithic system Virtual Machines, Client Server Model.

Processes: Definition, Process Control Block, Long term & Short term scheduler, Indirect communication, Buffering) Exception condition (Process termination, Last

message, scrambled message), Process scheduling (Scheduling criteria, FCFS Scheduling Shortest Job First, Priority Scheduling, Round Robin Scheduling)

File System: File Concept (Naming, Structure, types Access, attributes, operations,), Directory structure (Single level, two level, tree structured directories, Path names, directory operations)

Memory Management: Swapping, contiguous allocation, single partition allocation, multiple partition allocation, External & Internal fragmentation Paging (Basic Method), each type, recovery through process termination & resource preemption.

Protection & Security: Goals of protection, Domain of protection (Domain Structure), Security problem, One time passwords, program threats (Trojan horse, Trap Door) system Threats (Warms, Viruses)

Suggested Readings:

Operating System concepts	S. Galvin	AWL
Modern Operating System	A.S. Tanenbaum	PHI

BCA 403- Computer Organization & Architecture

Principles of Computer Design: Software hardware, Interaction layers in computer architecture Central Processing unit, Machine Language Instructions, addressing modes, Instruction types instruction set election, instruction cycle & execution cycle. Control Unit, data path & control patg design, micro programming Vs Handwired control, RISC Vs CICs, Pipelining in CPU design.

Memory system, Storage technologies, memory arrrary organizationm memory hierarch, interliving, cache & virtual memories, Input output devices & chracterstics, Input output processing, Bus interface, Data transfer techniques

Suggested reading:

Mano, M. “ Computer System & Architecture” Prentice Hall of India New Delhi
Carl, V. “ Computer Organization”. Tata Me graw Hill Book Company Delhi.
Stalling. W. “ Computer Organization & Architecture”. Prentice Hall of India. New Delhi.

BCA 404& OBJECT ORIENTED PROGRAMMING

Object Oriented Programmings: Procedural vs. Object Orented Programming. The main function C++ Preprocessors and the < iostream.h> file, C++ input and output with cin and cout.

C++ Data Types: Simple variable’s naming simple variables, Integer Types, Floating Types, Operators, Operator’s precedence and associativity, type conversions symbolic

constant Derived Data Types; Arrays, Strings, Structure, Reference Variables, New and Delete Operators.

Loops and Branching Statement: Relational expressions in C++ Relational operators, for loop, while loop, do while loop, if else statement, logical operator's conditional operations, switch statement, break and continue statements.

Functions: Deferring a function, Function prototyping and function calls, Function arguments; Passing by reference, Inline function, default arguments.

Object and Classes: Defining classes, Implementing member functions, class Constructor and Destructors, This pointer, Friends function, Examples based on Class and Object Problems.

Class Inheritance: Base classes, derived classes, implementing and using derived classed, virtual base classes, Types of Inheritance, Problem based on multiple inheritances.

Input, Output and Files: Stream classes, output with cout ostream class methods, input with cin, Introduction to file handing.

Suggested Readings:

- 1- E. Balaguruswamy: Object Oriented Programming with C++, TMH, New Delhi.
- 2- K.R. Venugopal : Mastering C++, TMH, New Delhi.
- 3- Bjarne Stroustrup: The C++ Programming Language Addison Wesley.

BCA- 405 Computer Graphics

Introduction: Origins of Computer Graphics, New Display Devices, General purpose graphics software.

Point- Plotting Display: Coordinate system, incremental method lines drawing Algorithms, Circle generation.

Line Drawing Display:- Display devices and controllers, display Devices CRT.

Two- Dimensional Transformation:- Transformation principles concatenation, matrix representation.

Clipping and Windowing: - A : Line clipping algorithm, midpoint sub division, clipping other graphic entities polygon clipping.

Graphical Input Techniques: Positioning techniques pointing and selection inking and painting on-line character recognition.

Event Handling:- Polling interrupts, the event queue function for handling events. light – pen interrupts.

Raster Graphics Fundamentals:- The frame buffer display representing a raster image, scan conversion natural images.

Solid- Area Scan Conversion:- Geometric representations of areas scan-converting polygons, the X-Y Algorithm properties of scan conversion algorithms.

Raster- Graphics Systems:- Representation. Raster manipulation. Functions. Systems using Raster Representations. System using Geometric Representations.

Heam D. Bajer P.M.	computer Graphics	PHI
Rogers, D.F.:	Prcedural elements for Computer Graphics	TMH
Giloi, W.K.:	Interactive Computer Graphics	PHI

BCA 406- Computer Lab

Practical based on Object Oriented Programming in C++

BCA 501& Software Engineering

Software Engineering: Definition & Programms, A generic view of software engineering

Requirement Analysis: Statement of system scope, isolation of top level processes & their allocation to physical elements, refinement & review.

analyzing a problem, creating a software specification documents, review for correctness, consistency & completeness.

Designing Software Solution: Refining the software specification, application of fundamental design concept for data, architectural & procedural design using software blue print methodology & object oriented design paradigm.

Creating design document: Review of conformance to software requirements & quality.

Software Implementation: Relationship between design & implementation. Implementation issues & programming support environment, coding the procedural design, good coding style & review of correctness & readability.

Software Maintenance: Maintenance as part of software evaluation reasons for maintenance, types of maintenance (perfective, adoptive, corrective), designing for maintainability, techniques for maintenance.

Comprehensive examples using available software platform/ case tools, configuration management.

Suggested Reading:

Pressman, R.S. “ Software Engineering a practioner’s approach “ Mc Graw Hill international Edition.

Jalote, P. “ An Integrated Approach to Software engineering” Narosa Publishing house. New Delhi.

BCA 502- Internet ‘Technique and application

Description of Internet: Definition Role of Internet (Social point on view, Technical point of view, Practical / Commercial point of view) Internet History/ Development, working, Domain name, Address concept, How to conned with net (Hardwar, Software, Communication requirements), Internet account, ISP, Role of ISP, Internal & National ISP’S (Like AOL, MSN, Copmu Serve, VSNL, BSNL, Stayam etc.) Types of accounts, WWW Application areas of internet.

Surfing the net: Surfing, Concepts of Web Browser (Internet Explorer, Netscape Navigator etc.) URL, HTTP, Browsing Web page, Home page, Hyper link, Search Engines (Yahoo Hotmail, VSNI, Khoj Rediff)

E-mail Basic E-mail, How E-mail works.

Other Communication tools on Internet: Ap. TELNET, News groups, News bulletin board.

E- Commerce on Internet: Definition, History of E-Commerce, Type of E-Commerce (B2B, B2C, C2B etc.) Electronic Payment System (wallet, E-cash, E-Cheque, Digital Signature), Application areas of E-Commerce, Legal V/s Security issues.

Electronic Security: Security Principles, threats to a site, groups that attack sites, Computer Security, firewalls & network security, encryption, cryptography.

Internet Application Development: Fundamental Programming in JAVA HTML, DHTML, and Front Page & Other web Design Tools, Creation of Home page/ Web page.

Suggested Reading:-

Lcarning to use the internet	Ernest Ackermann	BPB
ABC of the Internet	Christian Crumilsh	BPB
Electronic Commerce	RAvi Kalakota, Andrew B	Addsion- Wesley

BCA 503- Visual Language Programming

Introduction: Introduction to Visual Language, Environment and Application areas of Visual languages, Introduction to Project, forms, Objects, Properties, Method, Events. Overview to Main screen, Title bar, Tool Box, customize the form, use of Visual objects on the form (Command Button, Check boxes, Option button, text boxes etc.

Program Elements: Data Types, Variable, Constants, Statements, Writing codes behind visual objects, use of procedures and function (In built/user defined), decision making, looping, branching, switching arrays, modules.

Visual Programming: Creating forms, Add objects to form, writing codes behind the objects, Compile & run the program, convert to exe form, Use of menu bars with form, Developing MDI forms in project.

Data base programming: Use of data source object to link form with tables, attach data base objects with table, perform, append, deletion, editing, searching, querying operation on Database, use of SQL.

Simple programs in Visual Language with any one VC++ OR VB

Suggested reading:-

BCA 505- Java Programming

Unit 1: Introduction Java

Procedure Vs Object Oriented Programming with reference to OOPS Principles, History of Java, Java Features, JDK, JVM, Hello works program in java, Compilation using java and execution using java.

Unit 2: Data Types, Tokens in Java

Tokens of Java, Data Types in Java with size and range, simple, floating, Boolean etc. Type conversion, Type casting, declaring variables, arrays in java
Simple programs in java base on variables, constants.

Unit 3: Java Operators

Aritmetic Operators, Relational, logical, Bitwise, Boolean operators and their use in Java programs.

Unit 4: Control Statements in Java

Loops (for, while, do while), Decision making statements (If-then-end if) Nested If, Nested loops, Switch-case and sample programs.

Unit 5: Object Oriented Programming in Java

Concept of class and Objects in Java, Java class creation, scope identifier, java methods, Object and use of methods by objects, sample class based programs in Java, method overloading in java, Abstract class and its use, Java Constructors.

Unit 6: Inheritance & Multithreading in Java

Define Inheritance, Types of Inheritance in Java and use in programs, Super class, Method overriding, Java Thread Model, Native methods of Thread class, Implementation of Thread in java, Simple Applet programming in Java.

References:

Java 2.0	E. Balaguruswami
Java 2.0 Complete Reference	Peter Norton
Java Black Book	
VC The Complete reference Cash Pappas	TMH

BCA 504- Digital communication & Network

Introduction: Networking, Use of Computer Network (Goals and Applications), OSI Reference Model & TCP-IP Terence Model, Novel Netware, ARPANET, NSFNET, The Internet.

Network: OSI- Reference Model, Topology, Selection Design. Local Area Technique, Protocols, Medium Access Control (MAC) Protocol, Physical Layer Description (X.21), Data Link Layer Protocols, HDLC Analysis of Protocols,

Introduction to **Network Layer**: Network Security, Electronic Mail, Switching Technique, Routing methods, TCP-IP, ISDN

Communication: Introduction, Concept of data transmission, Signal encoding, modulation methods, multiplexing, cryptography.

Suggested Reading:-

1. Tannanbaum, A.S: Computer Networks, Prentice Hall.
2. Stallings, William: Data & Computer Communication PHI
3. Corner: internetworking with TCP/IP Volume I, PHI,

BCA 6017 Multimedia & Application

MULTIMEDIA: AN INTRODUCTION

Multimedia- Definition, Multiple Facets of Multimedia Various Classifications.

MULTIMEDIA: HARDWARE/SOFTWARE ESSENTIALS

Multimedia Hardware- Introduction A typical Multimedia System Configuration.
Multimedia Upgrade Kits Standardizing Multimedia Hardware. The MPC Standards, MMX Technology Premiere

Multimedia Software – Introduction Various types of Multimedia software Driver, Players, Tools and application.

MULTIMEDIA AUDIO

Digital Audio Technology- Computers and Sound, Digital Audio, Definition, Digital Audio parameters Audio Channelising, Digital Recording Pitfalls, digital Audio Playback.

The Sound Card fundamental- The Audio Card Family: Sound Cards, MIDI interface Cards and Wave Synthesis Cards, The sound Card Fundamentals: Audio Synthesis Technology- FM Synthesis and Wavetable Synthesis, Sound Card Functionalities, Configuration the Sound Card under MS- Windows 95 and Windows 3.11

Digital Audio Playback and Recording- Digital Audio Playback : Window Media Player Program, Creative's Group of Audio Software Multimedia Deck, Player and Editing Programs, Digital Audio Recording Techniques, Digital Audio Editing Techniques, Creative's Wave Studio software

MIDI Fundamentals- Introduction, Concept of MIDI, MIDI vs, Digital Audio, General **MIDI Standards**: Base Level and Extended Level MIDI, General MIDI Channel Assignments, General MIDI Instrument Assignments, Creative's Wave Blaster Cards.

Working with MIDI- MID Playback, MIDI Recording vs. MIDI Gallery, building up a MIDI Musci Studio, Recording the MIDI Music Data, Editing MIDI Music Files: Music Sculptor.

MULTIMEDIA TEXTS

Texts in Multimedia- Introduction, Text as a Part of Multimedia Project, Designing Taxts for Multimedia, Multimedia Texts- Display Design Consideration- (a) Fonts and their Management (b) Titling: Anti-aliasing Texts and Special Effects, Multimedia Texts- Content Design Considerations, Hypermedia, Hypertexts, Text Editing Software Tools.

MULTIMEDIA GRAPHICS

The world of color – Introduction, Basic Concepts of Color Displays, Monitor video Modes, Color Monitors, Color Montor Parameters, Switching on to Difference Video Modes, The Public Information Display system (PIDS), Presentation Display Systems (PDS)

Digital Imaging Fundamentals- Introduction, Graphics in Multimedia Projects- Interface Design Graphics and Content Design Graphics, Source of images: Photographic Images, Clip Arts and others, 3 Dimensional Graphic Images, Rastor and Vector Graphics, Hyper graphics, Digital Imaging Software Tools.

Digital Image Development and Editing- Scanning Techniques, Digital Photographic Editing/ Manipulation Terminology, Anti aliasing Pictures Image Processing Software Tools, Photo Gallery CD-ROMs, Clip Arty Libraries and other Sources of Images.

MULTIMEDIA ANIMATION

Computer Animation Fundamentals- Introduction, Animation in Multimedia Projects, Object and Cel Animation, Two Dimensional and three Dimensional Animation. Animation Software Tools and Techniques- Introduction, Decision between two Dimensional and Three Dimensional Animations, Two Dimensional and Three Demensional Animation Techniques, Preliminary Procedures, Animation Development Animation Environment, Two Dimensional Animation Software Tool Kinetix's Animator Studio, Three Dimensional Animation Software Tools Kinetix's 3 Studio Max.

MULTIMEDIA VIDEO

Digital Video Fundamentals- Introduction, video in Multimedia Projects, Digital video Fundamentals, Full Motion and Full Screen Videos, Digital Video File Sizes, MPEG Revolution, APPIE's Quick Time Video for Window.

Digital Video Production Techniques- Introduction, video Production in Multimedia, Shooting the Sequences, video Capture Techniques, video Capture Board, The Connection Jacks, Setting up the Digital Video Studio, video Capture Software, Editing Out the Video Stuff, cut, Copy and Paste Operations, Zooming, Digital Painting Process, Chroma Keying Embedding Sound Clipses.

Suggested Readings:

“ Multimedia Magic: By S. Gokul, BPB Pub.

“ An Introduction of Multimedia : by John villamil & Louis Molina, PHI Pub.

BCA 602- ARTIFICIAL INTELLIGENCE

Overview of Artificial Intelligence: Introduction of AI, The Importance of AI, Early works in AI, AI and related fields.

Problem Solving: State State space search, production system: BPS, DFS, Problem characteristics, heuristic search- Generate and Test, Simple Hill Climbing, BFS.

Knowledge Representation: Introduction, Definition and Importance of Knowledge, Knowledge based system, Representation of knowledge, Predicate Logic, Well formed Formula, Inference Rules, The Resolution principle, Representation using Rules.

Object Oriented Representation: Introduction, Overview of Object Oriented System, Object, class, Message and methods, Simulation Example, Object Oriented Language and system, Use of AI in OOP's.

Learning: Introduction, Basic Concept, Genetic Algorithm, Learning by Induction.

Expert System: Need and Justification for expert system, Knowledge acquisition, Knowledge Building Tools.

Suggested Readings:

Dan W. Patterson: Introduction to AI and Expert System PHI

Rich, Knight: Artificial Intelligence, TMH

BCA 603- Networking Operating system

Introduction: Background, UNIX philosophy. On line help facility, man command The File System The file Structure of File System, Interacting with file system, Pwd, Cd, Is, cat, mkdir, rmdir commands, relative path names, chmod, cp. rm and mv command, special device files.

General Purpose Utilities: More, file, we, cmp, comm., diff, lp, banner, cal, date, who, tty and commands.

The Vi Editor: Three modes, input mode, operators, handling multiple files, customizing vi.

Filters: Three standard files connecting command with a pipe, trees pr. head, tail, cut, paste, sort, filters grep, egrp, fgrep filters.

Shell Programming: The Shell and Kernal, Bourne, C and Korn shells, Sh command, cobining command, wild cards, escaping, quoting, command substitution, shell variables, system variables, positional parameters, logical operators, if condition, read, exit, case while, until, set, shift and trap statements, looping with for Simple shell programs.

Win NT: Introduction to Windows NT.

Suggested Reading

1. Stephen Prata (SAMS Pub)- Advanced UNIXP Programming.
2. Kernighan and Pike- The UNIX Programming Environments.
3. Lowell Jay Arthur and Ted Burns – UNIX Shell Programming.
4. Yashwant P. Kanetkar- UNIX Shell Programming.
5. Sportack, M Windows NT. Techmedia

BCA 604- Computer

Practical based on UNIX Operating system.

BCA 605- Project Work