SECOND SEMESTER

BCA – S201: Problem Solving through C - Programming

UNIT-I

Algorithm and algorithm development:

Definition and properties of algorithm, flow chart symbols, conversion of flow chart to language, example of simple algorithms, Introduction to program design, errors – syntax error, runtime error, logic error.

UNIT-II

Basics of C – Language:

History, Constants – Integer, Real, Character; Variables and Keywords; Data types and size, constants, arrays, pointers, Operators – arithmetic, relational, logical, increment and decrement, bitwise and assignment, Hierarchy of Operators and Operations, Associativity of Operators, creation and evaluation of expressions.

UNIT-III

Control Structure:

Decision Structure: - Simple if, if – else, if – else – if, nested if, switch case; Loop Control Structure: - while, do while and for; Use of break, go to and continue;

UNIT-IV

Functions:

Function definition, declaration and prototypes, Call by Value and Call by Reference, Scope Rule of Functions.

UNIT-V

Complex C-Language:

Variables – external, static, register; Recursive functions; multi – dimensional arrays; Pointers and arrays, pointer arrays, Structures – declaring and accessing elements, array of structure, File Input/Output – Create, Open, Read, Write, Delete, Close;

Recommended Books:
1. **Yashavant Kanetkar, Let us C**
2. **Balaguruswamy, Programming in C**

BCA – S202: Basic Physics

(This paper must be taught to impart basic knowledge of physics to understand principle behind technologies used in Computer Application. Avoid derivations of equations and problem solving. Question paper must be set accordingly)

UNIT-I

Basic Concepts: Definition of Science, engineering and technology. Importance of Mathematics and Physics in ICT. Units and Dimensions, MKSA Units, Idea of order of magnitude scale of Mass, time and length with examples. Measurement of length using vernier caliper and screw gauge, Newton's laws of motion, physical quantities as scalars and vectors, vector addition, scalar and vector product of two vector, Brief idea of types of forces in nature, torque, rotational motion and moment of inertia, simple examples of conservation of energy, momentum and angular momentum.

Optical instruments: Electromagnetic spectrum, frequency, wavelength and energy associated with electromagnetic radiation, formation of image by lens, eye, Sensitivity of eye to electromagnetic radiation, defects of vision, Brief understanding of telescope, microscope and eye pieces.

UNIT-II

Electrostatics: Concept of Potential and field due to a charge, Gauss's law; dielectric constant, capacitance of a parallel plate condenser, energy stored in condenser, series and parallel combination of capacitances, types of capacitances used in electronic circuits, rating of capacitances.

Current Electricity: Electric current, Ohm's law, types of resistances and colour codes, Kirchhoff's laws, analysis of simple circuits, Thevenin, Norton and maximum power transfer theorems, principle of potentiometer, magnetic effect of current, field due to circular current loop.

UNIT-III

Transducers: Thermoelectric effect and thermocouples, thermistors, LDRs, piezo electric effect, speakers and mic electro chemical effect, primary and secondary cells, batteries. Electrical rating of cells and batteries

Interaction of magnetic field and current: for ce on current carrying conductor, moving coil galvanometer, conversion of galvanometer into ammeter and voltmeter, multimeter.

UNIT-IV

Electromagnetic induction: self and mutual inductances, chocks coil and transformers.

AC circuits: peak and rms voltage and current, power factor, L-R, C-R and L-C-R curcuits with their phase diagrams, series and parallel resonant circuits.
AC &DC current, understanding electric power distribution in offices and houses, electrical safety,electric fuse, rating of electrical accessories. Importance of good earthing.

Semiconductors: Qualitative description of energy bands, metals, insulators and semiconductors, n and p types of semiconductors, semiconductor p-n junction, metal semiconductor junction, current voltage characteristics of pn junction diode, half wave and full wave rectifiers, Zener diode and voltage regulation, LEDs, photo diode, and solar cell.

UNIT-V

Transistors: Definition, Current in bipolar junction transistor, Amplifier: Brief idea of CE,CC amplifier and its charactersistics, gain indecibels,Frequency vs gain graph, cascading amplifiers, Oscillator: Brief idea about oscillators of different frequency range, Different types of wave forms. Brief introduction to Integrated circuits with scale of integration, Use of MOS and CMOS Transistors.

Lasers: Basic principle, He-Ne and semiconductor lasers, basic concepts of communication using optical fibers.

Brief idea of working and uses of Cathode ray Oscilloscope, Working principle of LCD and plasma devices, UPS, SMPS**.**

Recommended Books:

1 Physics, Part-I Kumar, Mittal; Nageen Publication, Meerut.
2 Concepts Of Physics, Part 1, H C Verma; Bharati Bhawan.
3 Concepts of Physics, Part2, H C Verma; Bharti Bhawam.

BCA- S203: Discrete Mathematics

Objectives: The aim of this course is to impart basic knowledge of Mathematics and its further application in various disciplines in computational sciences and technology. As Some of the students in BCA come from Arts , Commerce and Biology stream, Level of course is 12th standard.

Unit-I

Sets & Relations : Sets and elements, Equal sets, Universal set & Empty set, Subsets, Venn diagrams, Basic operations on sets, Union & Intersection, Complements, Difference, Symmetric Difference, Finite Sets, Power sets, Cartesian Products of Sets, Relations, Composition of relations, Types of relations, Equivalence Relations, Partial ordering relations.

Unit-II

Functions : Functions, Composition Function, Mathematical Functions , Exponential and Logarithmic Functions, absolute value function, Limit of function, Evaluation of limits of various types of functions(simple cases)

Trigonometric Functions: Definitions, proofs for any angle θ, signs of ratios, ratios of some standard angles.

Unit-III

Quadratic Equation: Solution of Quadratic Equations, Nature of Roots.

Co-ordinates and Loci: Cartesian co-ordinate system, Introduction to Polar co-ordinates, distance between two points, Area of triangle

Straight Line: Equation of straight line, parallel and perpendicular lines, slope- intercept form, slope-point form, two-point form.

Unit-IV

Differential Calculus: Derivative of a Function, Various Formulae-Product and Quotient Rule of Differentiation, Differentiation of Function of Function(chain rule), Trigonometric functions, Inverse Trigonometric functions, Exponential function, Implicit functions, Differentiation of function w.r.t. another function, Higher Derivatives upto order 3

Unit-V

Integral Calculus : Anti-Derivatives, Constant of integration, Indefinite integral, Elementary Integration Formulae, Methods of Integration, Integration by Substitution, Integration by parts, Concept of Definite integral.

Books:
1. Descrete Mathematics . Schaum's Outlines
2. Differential Calculas By Shanti Narayan, P.K.Mittal
3. Integral Calculas By Shanti Narayan, P.K.Mittal
4. Elementary Calculas By Gokhru & Bhargav.
5. Business Mathematics By Quaji Zameeruddin, V.K.Khanna, S.K.Bhambri
6. Comprehencive Mathematics Class XII Part-A by Parmanand Gupta

BCA-S204: Business Communications

UNIT-I
Concepts and Fundamentals : Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication - The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication Formal and Informal communication Barriers of communication.

UNIT-II
Written Communication: Objectives of written Communication, Media of written communication, Merits and demerits of written communication, Planning business messages.

Writing Letters: Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters , Letter styles/ layout.

UNIT-III
Report Writing: Meaning & Definition, Types of report (Business report & Academic report), Format of report, Drafting the report, Layout of the report, Essential requirement of good report writing.

Language Skills: Improving command in English, Choice of words, Common problems with verbs, adjectives, adverbs, pronouns, conjunctions, punctuation, prefix, suffix etc.

UNIT-IV
Oral Communication: Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication.
Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.

Arts of Listening: Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening.

Meetings: Definition, Kind of meetings, Advantages and disadvantages of meetings/ committees, Planning and organization of meetings.

UNIT-V

Job Application: Types of application, Form & Content of an application, drafting the application, Preparation of resume.

Project Presentations: Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation).

Business Negotiation: Definition of negotiation, Factors that can influence negotiation, what skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation).

Recommended Books

1. Communication by C.S. Rayudu, Himalaya Publishing House.
2. Communication Today - Understanding Creative Skill by Reuben Ray, Himalaya Publishing House.
3. Successful Communication by Malra Treece.
4. Business Communication Today by Bovee & Thill, McGraw Hill.
5. Principles of Business Communication by Murphy and Hilderbrandth.
6. Effective Communication Skiils by O. N. Kaul & K. K. Sharma, Creative Publishers
7. Chicago Manual of style PHI.
8. Essentials of Business Communication by Rajendra Pal & J. S. Korlahalli, Sultan Chand & Sons.
9. Business Communication by K. K. Sinha.

PRACTICAL:

Practical-I: BCA-S205: Programming Lab

Practical based on paper BCA S 201

Practical-II: BCA-S206: Basic Physics Lab

Practical based on paper SBCA-202

Practical-III (Audit course): BCA-S207: Communication Skill Lab

Practical based on Paper BCA-S204 using Interactive Learning

software/Language Lab software

BCA-S208: **Seminar**: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars