CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

THREE YEARS BACHELOR OF COMPUTER APPLICATION PROGRAMME

COURSE CONTENT (w.e.f. August 2011)

SEMESTER III

COURSE CODE	COURSE NAME
BCA-301	Object Oriented Programming Using C++ (C++)
BCA-302	Data Structure Using C & C++ (DSC)
BCA-303	Computer Architecture & Assembly Language (CAAL)
BCA-304	Business Economics (BE)
BCA-305	Elements of Statistics (EL)
BCA-306P	Computer Laboratory and Practical Work of OOPS
BCA-307P	Computer Laboratory and Practical Work of DS

CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

THREE YEARS BACHELOR OF COMPUTER APPLICATION PROGRAMME

COURSE CONTENT FOR SEMESTER – III

BCA-301 Object Oriented Programming Using C++

Unit – I	Introduction	Introducing Object- Oriented Approach, Relating to other paradigms {Functional, Data decomposition}.
	Basic terms and ideas	Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.
Unit – II	Classes and Objects	Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behaviour of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass / abstract classes.
Unit– III	Inheritance and Polymorphism	Inheritance, Class hierarchy, derivation - public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism
Unit– IV	Generic function	Template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.
Unit – V	Files and exception Handling	Streams and files, Namespaces, Exception handling, Generic Classes

Referential Books:

1. A.R.Venugopal, Rajkumar, T. Ravishanker “Mastering C++”, TMH, 1997.
2. S.B.Lippman & J.Lajoie, “ C++ Primer”, 3rd Edition, Addison Wesley, 2000.The C programming Lang., Person Ecl - Dennis Ritchie
3. R.Lafore, “Object Oriented Programming using C++”, Galgotia Publications, 2004
4. D.Parasons, “Object Oriented Programming using C++”, BPB Publication.

BCA-302 Data Structure Using C & C++

Unit – I	Introduction to Data Structure and its Characteristics Array	Representation of single and multidimensional arrays; Sprase arrays - lower and upper triangular matrices and Tridiagonal matrices with Vector Representation also.
Unit – II	Stacks and Queues	Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion between prefix, infix and postfix, introduction and primitive operation on queues, D- queues and priority queues.
Unit– III	Lists	Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion searching, Two way lists and Use of headers
Unit– IV	Trees	Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal,
Unit – V	B-Trees	insertion, deletion; Binary Search Tree Introduction, The problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree invention of B-Tree; Statement of the
Unit - VI		Sorting Techniques; Insertion sort, selection sort, merge sort, heap sort, searching Techniques: linear search, binary search and hashing

Referential Books:

1. E.Horowiz and S.Sahani, " Fundamentals of Data structures", Galgotia Book source Pvt. Ltd.2003
2. R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Pblishing Co. (P) Ltd..,2002
3. Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

BCA-303 Computer Architecture & Assembly Language

Unit – I		Basic computer organization and design, Instructions and instruction codes, Timing and control/ instruction cycle, Register/ Types of register/ general purpose & special purpose registers/ index registers, Register transfer and micro operations/ register transfer instructions, Memory and memory function, Bus/ Data transfer instructions, Arithmetic logic micro-operations/ micro-operations, micro-operations, Input/ Output and interrupts, Memory instructions, Memory interfacing memory/ Cache memory.
Unit – II	Central Processing Unit	General Register Organization/ stacks organizations instruction formats, addressing modes, Data transfer and manipulation. Program control reduced computer, pipeline/ RISC/ CISC pipeline vector processing/ array processing. Arithmetic Algorithms: Integer multiplication using shift and add, Booth's algorithm, Integer division, Floating-point representations.
Unit– III	Computer Arithmetic	Addition, Algorithm, subtraction and multiplication divisor algorithms. Floating point, arithmetic operations, decimal arithmetic operations, decimal arithmetic operations.
Unit– IV	Input - Output Organization	Peripheraldevices,Input/outputinterface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct memory Address (DMA), Input/ Output processor (IOP), serial communication.
Unit – V	Evaluation of Microprocessor	Overview of Intel 8085 to Intel Pentium processors Basic microprocessors, architecture and interface, internal architecture, external architecture memory and input/ output interface.
Unit – VI		Assembly language, Assembler, Assembly level instructions, macro, use of macros in I/C instructions, program loops, programming arithmetic and logic subroutines, Input-Output programming.

Referential Books:

1. Leventhal, L.A, "Introduction to Microprocessors", Prentice Hall of India
2. Mathur, A.P., "Introduction to Microprocessors" , Tata McGraw Hill
3. Rao,P.V.S., "Prospective in Computer Architechture" , Prentice Hall of India

BCA-304 Business Economics

Unit – I	The Scope and Method of Economics, the Economic Problem	Scarity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The Concept of Elasticity and it's Applications.
	The Production Process	Output decisions - Revenues Costs and Profit Maximisation
	Laws of returns & Returns to Scale	Economics and Diseconomies of scale.
Unit – II	Market Structure	Equilibrium of a firm and Price, Output Determination under Perfect Competition Monopoly, Monoplastic Competition & Oligopoly
Unit– III	Macro Economic Concerns	Inflalation, Unemployment, Trade-Cycles, Circular Flow upto Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring national Income and Output
Unit– IV	The World Economy	- WTO, Globalisation, MNC's, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of dumping, Export-Import Policy 2004-2009

Referential Books:

1. Ahuja H.L., "Business Economics",S.Chand & Co., New Delhi, 2001
2. Ferfuson P.R., Rothchild, R and Fergusen G.J."Business Economics" Macmillan, Hampshire, 1993
3. Karl E.Case & Ray C. fair , "Principles of Economics" , Pearson Education , Asia, 2000
4. Nellis, Joseph, Parker David, " The Essence of Business Economics",Prentice Hall, New Delhi, 1992.

BCA-305 Elements of Statistics

Unit – I	Population, Sample and Data Condensation	Definition and scope of statistics, concept of population and simple with Illustration, Raw data, attributes and variables, classification, frequency distribution, Cumulative frequency distribution.
Unit – II	Measures of Central Tendency	Concept of central Tendency, requirements of a good measures of central tendency, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric mean for grouped and ungrouped data.
Unit– III	Measures of Dispersion	Concept of dispersion, Absolute and relative measure of dispersion, range variance, Standard deviation, Coefficient of variation
Unit– IV	Permutations and Combinations	Permutations of 'n' dissimilar objects taken 'r' at a time (with or without repetitions). nPr = n!/(n-r)! (without proof). Combinations of 'r' objects taken from 'n' objects. nCr = n!/(r!(n-r)!) (without proof) . Simple examples, Applications.
Unit – V	Sample space, Events and Probability	Experiments and random experiments, Ideas of deterministic and non-deterministic experiments; Definition of sample space, discrete sample space, events; Types of events, Union and intersections of two or more events, mutually exclusive events, Complementary event, Exhaustive event; Simple examples. Classical definition of probability, Addition theorem of probability without Proof (upto three events are expected). Definition of conditional probability Definition of independence of two events, simple numerical problems.
Unit – VI	Statistical Quality Control	Introduction, control limits, specification limits, tolerance limits, process and product control; Control charts for X and R; Control charts for number of defective {n-p chart} ,control charts for number of defects {c - chart}

Referential Books:

1. S.C.Gupta - Fundamentals of statistics - Sultan chand & sons , Delhi.
2. D.N.Elhance - Fundamentals of statistics - Kitab Mahal, Allahabad.
3. Montogomery D.C. - Statistical Quality Control - John Welly and Sons
4. Goon, Gupta And Dasgupta- Fundamentals of statistics- The world press private ltd. , Kolkata.
5. Hogg R.V. and Craig R.G. - Introduction to mathematical statistics Ed 4 {1989} - Macmillan Pub. Co. Newyork.
6. Gupta S.P. - Statistical Methods , Pub - Sultan Chand and sons New Delhi

Course Code Course Name

BCA-306P Computer Laboratory and Practical Work of OOPS

Practical will be based on Paper Object Oriented Programming: Covers UNIT-II, UNIT-III, UNIT-IV, UNIT-V of Syllabus

BCA-307P Computer Laboratory and Practical Work of DS

Practical will be based on Paper Data Structure: Covers UNIT-III, UNIT-IV, UNIT-V, UNITVI of Syllabus