CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT
THREE YEARS BACHELOR OF COMPUTER APPLICATION PROGRAMME

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

SEMESTER IV

COURSE CODE	COURSE NAME
BCA-401	Computer Graphics & Multimedia Application (CGMA)
BCA-402	Operating System (OS)
BCA-403	Software Engineering (SE)
BCA-404	Optimization Techniques (OT)
BCA-406	Mathematics-III (MATHS)
BCA-405	Computer Laboratory and Practical Work of CGMA

CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

THREE YEARS BACHELOR OF COMPUTER APPLICATION PROGRAMME

COURSE CONTENT FOR SEMESTER – IV

BCA-401   Computer Graphics & Multimedia Application

Unit – I   Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Application Development of Hardware and software for computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan: Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

Unit – II   Hardcopy Technologies, Display Technologies, Raster-Scan Display System, Video Controller, Random-Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc,
Clipping
Southland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm

Unit– III   Geometrical   Transformation: 2D   Transformation,   Homogeneous Coordinatesand Matrix Representation of 2D Transformations, composition of 2D Transformations, the Window-to-Viewport Transformations, Introduction to 3D Transformations Matrix.

Unit– IV   Re   presenting Curves & Surfaces: Polygon meshes parametric, Cubic Curves, Quadric Surface.
Solid Modeling: Representing Solids, Regularized Boolean Set Operation primitive Instancing Sweep Representations, Boundary Representations, Spatial   Partitioning   Representations,   Constructive   Solid   Geometry Comparison of Representations.

Unit – V   Introductory Concepts: Multimedia Definition, CD-ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions)

Unit – VI   Uses of Multimedia, Introduction to making multimedia - The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage

Referential Books:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles& practice,2000.
2. D.J. Gibbs & D.C. Tsichritzs: Multimedia programming Object Environment & Frame woork , 2000.
3. Ralf Skinmeiz and Klana Naharstedt, Multimedia: computing, Communication and Applications, pearson, 2001.
4. D.Haran & Baker. Computer Graphics Prentice Hall of India,1986

BCA-402   Operating System

Unit – I   Introduction, What is an operating system, Simple Batch Systems, Multi-programmed Batch systems, Time- Sharing Systems, Personal - Computer Systems, Parallel systems, Distributed systems, Real- Time Systems. Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations

Unit – II Processes: Process Concept, Process Scheduling, Operation on Processes. CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple - Processor Scheduling.
Process Synchronization: Background, The Critical - Section Problem, Synchronization   Hardware,   Semaphores,   Classical   Problems   of Synchronization

Unit– III Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

Unit– IV Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability

Unit – V   Information Management: Introduction, A Simple File system, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System.

Physical File system File - System Interface; File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File - System Implementation: File- System Structure, Allocation Methods, Free-Space Management

Referential Books:

1. Silbersachatz and Galvin, " Operating System Concepts", Person, 5 Ed.[th] 2001
2. Madnick E., Donovan J., " Operating Systems:,Tata McGraw Hill,2001
3. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

BCA-403   Software Engineering

Unit – I   Software Engineering Definition and paradigms, A generic view of software are engineering.

Unit – II   Requirements Analysis:
            Statement of system scope, isolation of top level processes and entitles and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency, and completeness.

Unit– III   Designing Software Solutions: Refining the software Specification;
            Application of fundamental design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; Creating design document: Review of conformance to software requirements and quality.

Unit– IV   Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and review of correctness and readability.

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

Unit – VI   Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:
1. K.K.Aggarwal & Yogesh Singh "Software engineering", 2nd Ed., New Age International 2005.
2. I.Sommerville, "Software Engineering", Addison Wesley, 2002.
3. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach" John Wiley & Sons.

BCA-404   Optimization Techniques

Unit – I   Linear programming: Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

Unit – II   Queuing Theory: Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models(Model-I, Model-II).

Unit– III   Replacement Theory: Replacement of   item that deteriorates replacement of items that fail. Group replacement and individual replacement.

Unit– IV   Inventory Theory: Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

UNIT-V   Job Sequencing: Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines.

Referential Books:
1. Gillet B.E. "Introduction to Operation Research"
2. Taha,H.A. "Operation Research - an introduction"
3. Kanti Swarup "Operation Research"
4. S.D.Sharma "Operation Research"
5. Hira & Gupta "Operation Research"

BCA-406   Mathematics III

Unit – I   COMPLEX VARIABLES: Complex Number System, Algebra of
            Complex Numbers, Polar Form, Powers and Roots, Functions of
            Complex Variables, Elementary Functions,   Inverse Trigonometric
            Function.

Unit – II   SEQUENCE, SERIES AND CONVERGENCE: Sequence, Finite and

            Infinite Sequences, Monotonic Sequence, Bounded Sequence, Limit of
            a Sequence, Convergence of a Sequence, Series, Partial Sums,
            Convergent Series, Theorems on Convergence of Series (statement,
            alternating series, conditional convergent), Leibnitz Test, Limit
            Comparison Test, Ratio Test, Cauchy's Root Test, Convergence of
            Binomial and Logarithmic Series, Raabe's Test, Logarithmic Test,
            Cauchy's Integral Test (without proof)

Unit– III   VECTOR CALCULUS: Differentiation of Vectors, Scalar and Vector

            Fields, Gradient, Directional Derivatives, Divergence and Curl and their
            Physical Meaning.

Unit– IV   FOURIER SERIES: Periodic Functions, Fourier series, Fourier Series
            of Even and Odd Functions, Half Range Series.

Unit – V ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER:
Variable- Separable Method, Homogeneous Differential Equations, Exact
Differential Equations, Linear Differential Equations, Bernoulli's Differential
Equations, Differential Equations of First Order and First Degree by Integrating
Factor.

Unit – VI ORDINARY DIFFERENTIAL EQUATIONS OF SECOND ORDER:
Homogenous Differential Equations with Constant Coefficients, Cases
of Complex Roots and Repeated
Roots, Differential Operator, Solutions by Methods of Direct Formulae
for Particular Integrals, Solution by Undetermined Coefficients, Cauchy
Differential Equations, (only Real and Distinct Roots) Operator Method
for Finding Particular Integrals, (Direct Formulae).

Referential Books:
1. A.B. Mathur and V.P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers,
1999.
2. 2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Co., 9th Revised Ed.

Course Code Course Name
BCA-405 Computer Laboratory and Practical Work of Computer Graphics &
            Multimedia Application

Practical will be based on Paper Computer Graphics & Multimedia Application: Covers

UNIT-II, UNIT-III, UNIT-V of Syllabus