SYLLABUS

FOR

Bachelor of Computer Application (BCA) Programme

H. N. B. GARHWAL UNIVERSITY
SRINAGAR (GARHWAL)

S. No	Course No.	Subject	Evaluation – Scheme								Credit
			Period			Sessional			Examination		
			L	T	P	TA	CT	TOT	ESE	Sub. Total	
Theory											
1.	SET/CSE/BCA/C401	Multimedia Systems and Applications	4	1	-	10	20	30	70	100	5

Multimedia System and Applications

Evolution of Multimedia and its objects, Scope of multimedia in business and work, production and planning of Multimedia applications. Multimedia hardware, Memory of Storage Devices, Communication Devices, Multimedia Software, Presentation and object generation tools, Video, sound, Image capturing Authoring Tools, Card and Page Based Authoring Tools.

Production and Planning of Multimedia building blocks, Text, sound (MIDI), Digital Audio, Audio File Formats, MIDI under Windows environment, Audio and Video Capture.

Macromedia products, Basic drawing techniques, Advance animation techniques, Creating Multi layer combining interactivity and multiple scenes, Creating transparency effects using text in Flash, Flash animation.

Digital Audio Concepts, Sampling variables, Loss Less compression, of sound, Lossy compression and Silence compression.

Multimedia monitor bitmaps, Vector drawing , Lossy graphic compression, Image file formatic animations, Image standards, JPEG compression, Zig Zag coding. Video representation, colors, video compression, MPEG standards, MHEG standard, recent development in multimedia. Multimedia Application Planning, Costing, Proposal preparation, and Financing-Case study of a typical industry.

References:

1. Andreas Halzinger, "Multimedia Basics" Vol-I to VOL-III Firewall Media
2. Tay Vaughan, "Multimedia Making It work" Tata McGraw Hill
3. Buford, "Multimedia Systems" Addison Wesley
4. Agarwal and Tiwari, "Multimedia Systems" Excel
5. Rosch, "Multimedia Bible" Sams Publishing
6. Digital Multimedia "Nigel Chapman" Wiley dreamtech India Pvt. Ltd.
7. Sleinreitz, "Multimedia Bible" Sams Publishing
8. Ken Milburn, John Ckroteau, "Flash 4 Web special Effects, Animation and Design Handbook" Dreamtech Press
9. John. Villamil-Casanova and Louis Molina, "Multimedia-Production, Planning and Delivery" PHI
10. Flash MX 2004 Bible: Robert , Wiley dreamtech India Pvt. Ltd.

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Theory											
2.	SET/CSE/BCA/C402	Operating System Organization & UNIX	4	-	-	10	20	30	70	100	4

Operating system Organization & UNIX

Operating system- definition, simple batch system, Time sharing system, Real time system, storage hierarchy, operating system service.

Process concept, process Scheduling, operating on process, co-operating process.

CPU Scheduling concepts, Scheduling algorithms, process synchronization, critical section problem, synchronization hardware, semaphores.

Deadlocks, deadlock characterization, deadlock prevention, avoidance detection and recovery.

Storage management Resident monitor, Logical versus physical address space, swapping, and segmentation, SCM.

Virtual memory, Demand paging, page replacement and page replacement algorithms, allocation of frames, thrashing.

File System: File supports, access methods, allocation methods-contiguous, linked and index allocation, directory system – single level, tree structured, acyclic graph and general graph directory, file protection.

Secondary storage structure: Disk structures, disk scheduling disk management, allocation methods, free space management.

Case study of the UNIX system: design principles, programmer and user interface, process, memory and file management.

References:

1. Peterson Abraham & Silbesschatz, Peter Galvin: Operating system concepts. .
2. Mandnick and Donovan : Operating system (Mc–Graw Hill) 1996.
3. Tanenbaum A.S. : Modern Operating system, (PHI) 1998.
4. Growley, : Operating system a design Approach .

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Theory											
3.	SET/CSE/BCA/C403	Software Engineering	4	1	-	10	20	30	70	100	5

Software Engineering

Introduction: Introduction to software engineering, Importance of software, evolving role of software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software engineering problems, Software Development Life Cycle, Software Process.

Software Requirement Specification: Analysis, Principles, Water Fall Model, The Incremental Model, Prototyping, Spiral Model, Role of management in software development, Role of matrices and Measurement, Problem Analysis, Requirement specification, Monitoring and Control.

Software-Design: Design principles, problem partitioning, abstraction, top down and bottom up-design, Structured approach functional versus object oriented approach, design specifications and verification, Monitoring and control, Cohesiveness, coupling, Forth generation techniques, Functional independence, Software Architecture, Transaction and Transaction and Transform Mapping, Component level Design, Forth Generation Techniques.

Coding: Top-Down and BottomUp programming, structured programming, information hiding, programming style and internal documentation.

Testing principles, Levels of testing, functional testing, structural testing, test plane, test case specification, reliability assessment, software testing strategies, Verification and validation, Unit testing, Integration Testing, Alpha & Beta testing, system testing and debugging.

Software Project Management: The Management spectrum (The people, the product, the process, the project) Cost estimation, project scheduling, staffing, software configuration management, Structured Vs. Unstructured maintenance, quality assurance, project monitoring, risk management.

Software Reliability & Quality Assurance: Reliability issues, Reliability metrics, Reliability growth modeling, Software quality, ISO 9000 Certification for software industry, SEI capability maturity model, comparison between ISO & SEI CMM. CASE (Computer Aided Software Engineering): CASE and its scope, CASE support in software life cycle, documentation, project management, internal interface, Reverse Software Engineering, Architecture of CASE environment.

References:

1. Pressman, Roger S., "Software Engineering: A Practitioner's Approach Ed.Boston: McGraw Hill, 2001
2. Jalote, Pankaj, "Software Engineering Ed.2"New Delhi: Narosa 2002
3. Schaum's Series, "Software Engineering" TMH
4. Ghezzi Carlo and Others "Fundamentals of Software Engineering" PHI

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Theory											
4.	SET/CSE/BCA/SEC2	SEC2A	2	-	-	10	20	30	70	100	2

SEC 2A.1: Modeling and Simulation

Systems and environment: Concept of model and model building, model classification and representation, Use of simulation as a tool, steps in simulation study.

Continuous-time and Discrete-time systems: Laplace transform, transfer functions, state space models, order of systems, z-transform, feedback systems, stability, observability, controllability. Statistical Models in Simulation: Common discrete and continuous distributions, Poisson process, empirical distributions.

Random Numbers: Properties of random numbers, generation of pseudo random numbers, techniques of random number generation, tests for randomness, random variate generation using inverse transformation, direct transformation, convolution method, acceptance-rejection.

References:

1. Narsingh Deo, *System Simulation with Digital Computer*, Prentice Hall of India, 1999.
2. Averill Law, *Simulation Modeling and Analysis*, 3rd Ed., Tata McGraw-Hill, 2007.
3. G. Gordan, *System Simulation*, 2nd Ed., Pearson Education, 2007.
4. A.F. Seila, V. Ceric and P. Tadikamalla, *Applied Simulation Modeling* (International Student Edition), Thomson Learning, 2004.
5. Jerry Banks, *Handbook of Simulation: Principles, Methodology, Advances, Applications and Practice*, Wiley Inter Science, 1998.
6. J. Banks, J.S. Carson, B.L. Nelson, *Discrete Event System Simulation*, 4th Ed., Prentice Hall of India, 2004.
7. N.A. Kheir, *Systems Modeling and Computer Simulation*, Marcel Dekker, 1988.
8. B.P. Zeigler, T.G. Kim, and H. Praehofer, *Theory of Modeling and Simulation*, 2nd Ed., Academic Press, 2000.

SEC 2A.2: Graph Theory

Definition, examples and basic properties of graphs, pseudo graphs, complete graphs, bi-partite graphs, isomorphism of graphs, paths and circuits, Eulerian circuits, Hamiltonian cycles, the adjacency matrix, weighted graph, travelling salesman's problem, shortest path, Dijkstra's algorithm, Floyd-Warshall algorithm..

References:

1. Edgar G. Goodaire and Michael M. Parmenter, *Discrete Mathematics with Graph Theory,* 2nd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint 2003.
2. Rudolf Lidl and Günter Pilz, *Applied Abstract Algebra,* 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.

SEC 2A.3: Boolean Algebra

Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, maximal and minimal elements, lattices as ordered sets, complete lattices, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials, Quinn- McCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

References:

1. B A. Davey and H.A. Priestley, *Introduction to Lattices and Order,* Cambridge University Press, Cambridge, 1990.
2. Rudolf Lidl and Günter Pilz, *Applied Abstract Algebra,* 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.