GOVT. COLLEGE OF ENGINEERING, AMRAVATI

CURRICULUM

B. TECH. (Computer Science and Engineering)
VII and VIII Semester

Department of Computer Science and Engineering

Department of Computer Science & Engineering.

Proposed Scheme for B. Tech. (Computer Science & Engineering)

SEM III

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
						Theory				Practical			
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	
SHU304	Engineering Mathematics-III	3	--	---	3	10	15	15	60	---	---	100	3
ETU311	Electronic Devices and Circuits	3	---	---	3	10	15	15	60	---	---	100	3
CSU301	Programming Methodology	3	1	---	4	10	15	15	60	---	---	100	4
CSU302	Computer Organization and Architecture	3	1	---	4	10	15	15	60	---	---	100	4
CSU303	Discrete Mathematics and Graph Theory	3	---	---	3	10	15	15	60	---	---	100	3
SHU305	General Proficiency II	1	---	2	3	---	---	---	---	25	25	50	2
ETU312	Electronic Devices and Circuits Lab	---	---	2	2	---	---	---	---	50	---	50	1
CSU304	Programming Methodology Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU305	Computer Organization and Architecture Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU306	System administration-I Lab	---	---	2	2	---	---	---	---	25	25	50	1
Total		**16**	**2**	**10**	**28**	---	**75**	**75**	**300**	**150**	**100**	**750**	**23**

SEM IV

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
						Theory				Practical			
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	
CSU401	Numerical Method and Computer Programming	3	--	---	3	10	15	15	60	---	---	100	3
CSU402	Data Structure	3	1	---	4	10	15	15	60	---	---	100	4
CSU403	Object Oriented Technology	3	1	---	4	10	15	15	60	---	---	100	4
ETU411	Analog and Digital IC's	3	---	---	3	10	15	15	60	---	---	100	3
ITU402	Data Communication	3	---	---	3	10	15	15	60	---	---	100	3
CSU404	Data Structure Lab	1	---	2	3					50	-	50	2
CSU405	Object Oriented Technology Lab	---	---	2	2	---	---	---	---	25	25	50	1
ETU412	Analog and Digital IC's Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU403	Data Communication Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU406	System administration-II Lab	---	---	2	2	---	---	---	---	25	25	50	1
Total		**16**	2	**10**	**28**	**50**	**75**	**75**	**300**	**150**	**100**	**750**	**23**

TA :Teacher Assessment **CT: Class Tests** **ESE: End Semester Examination** **ICA : Internal Continuous Assessment**

Department of Computer Science & Engineering.

Proposed Scheme for B. Tech. (Computer Science & Engineering)

SEM V

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							
						Theory				Practical			
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
ITU501	System Analysis and Design	3		---	3	10	15	15	60	---	---	100	3
ITU502	Database Management System	3	---	---	3	10	15	15	60	---	---	100	3
CSU501	System Programming	3	---	---	3	10	15	15	60	---	---	100	3
CSU502	Theory of Computation	3	---	---	3	10	15	15	60	---	---	100	3
CSU503	Principle of Management	3	---	---	3	10	15	15	60	---	---	100	3
ITU503	System Analysis and Design lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU504	Database Management System lab	---	---	2	2	---	---	---	---	25	---	25	1
CSU504	System Programming Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU505	Hardware Lab	---	---	2	2	---	---	---	---	25	25	50	1
ITU505	System administration-III Lab	1	---	2	3	---	---	---	---	25	25	50	2
CSU506	Self Study I	---	---	----	---	25	---	---	---	---	---	25	2
Total		**16**		10	**26**	**75**	**75**	**75**	**300**	**125**	**100**	**750**	**23**

Note1: Self study I is based on one class test each on the basis of 20% curriculum of the courses ITU501,ITU502,CSU501,CSU502 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study I and his/her teaching work load shall be considered as one hour per week.

SEM VI

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							
						Theory				Practical			
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	Credits
ITU601	Design and Analysis of Algorithms	3	--	---	3	10	15	15	60	---	---	100	3
CSU601	Switching Theory and Logic Design	3	---	---	3	10	15	15	60	---	---	100	3
CSU602	Operating System Design	3	---	---	3	10	15	15	60	---	---	100	3
CSU603	Computer Network	3	---	---	3	10	15	15	60	---	---	100	3
CSU604	Software Project Management	3	---	---	3	10	15	15	60	---	---	100	3
ITU604	Design and Analysis of Algorithms Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU605	Switching Theory and Logic Design Lab	---	---	2	2	---	---	---	---	25	---	25	1
CSU606	Operating System Design	---	---	2	2	---	---	---	---	25	25	50	1

	Lab												
CSU607	Computer Network Lab	---	---	2	2					25	25	50	1
CSU608	Minor Project	----	----	2	2	---	----	---	----	25	25	50	2
CSU609	Self Study II	---	---	----	---	25	---	---	---	---	---	25	2
CSU610	Industrial Lecture I*	1	---	----	1	---	---	---	---	---	---	---	---
Total		**16**	**---**	10	**26**	**75**	**75**	**75**	**300**	**125**	**100**	**750**	**23**

Note2: Self study II is based on one class test each on the basis of 20% curriculum of the courses ITU601,CSU601,CSU602,CSU603 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study II and his/her teaching work load shall be considered as one hour per week.

TA :Teacher Assessment **CT: Class Tests** **ESE: End Semester Examination** **ICA : Internal Continuous Assessment**

Department of Computer Science & Engineering.

Proposed Scheme for B. Tech. (Computer Science & Engineering)

SEM VII

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
						Theory				Practical			
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	
CSU701	System Software	3	---		3	10	15	15	60	---	---	100	3
CSU702	Microprocessor and Interfacing	3	---		3	10	15	15	60	---	---	100	3
CSU703	Elective –I	3	---		3	10	15	15	60	---	---	100	3
CSU704	Interdisciplinary Elective	3	---		3	10	15	15	60	---	---	100	3
CSU705	System Software Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU706	Microprocessor and Interfacing Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU707	Elective –I Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU708	Project Phase I	---	---	4	4	---	---	---	---	50	--	50	2
CSU709	Seminar	---	---	2	2	---	---	---	---	50	---	50	2
CSU710	Industrial Training / Visit	---	---	---	---	---	---	---	---	50	---	50	1
CSU711	Industrial Lecture II*	1	---		1	---	---	---	---	25	---	25	1
CSU712	Self Study III	---	---	---	----	25	---	---	---	---	---	25	2
Total		13	---	12	25	65	60	60	240	250	75	750	23

***Note4:** Credit shall be awarded on the basis of combined assessment of Industrial Lecture I & Industrial Lecture II

Note5: Self study III is based on one class test each on the basis of 20% curriculum of the courses CSU701,CSU702, CSU703 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study III and his/her teaching work load shall be considered as one hour per week.

SEM VIII

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
						Theory				Practical			
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	TA	CT1	CT2	ESE	ICA	ESE	Total	
CSU801	Operation Research and Management	3			3	10	15	15	60	---	---	100	3
CSU802	Digital Signal Processing	3	---	---	3	10	15	15	60	---	---	100	3
CSU803	Elective -II	3	---	---	3	10	15	15	60	---	---	100	3
CSU804	Elective-III	3	---	---	3	10	15	15	60	---	---	100	3
CSU805	Operation Research and Management Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU806	Digital Signal Processing Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU807	Elective –II Lab	---	---	2	2	---	---	---	---	25	25	50	1
CSU808	Project phase - II	---	---	6	6	---	---	---	---	75	100	175	6

CSU809	Self Study IV	---	---	---	---	25	---	---	---	---	----	25	2
Total		12		12	24	65	60	60	240	150	175	750	23

Note6: Self study IV is based on one class test each on the basis of 20% curriculum of the courses CSU801,CSU802 ,CSU803,CSU804 declared by respective course coordinator at the beginning of semester. One faculty member shall be appointed as course coordinator for self study IV and his/her teaching work load shall be considered as one hour per week.

Note7: Students of this department shall select any one Interdisciplinary Elective offered by other department. Interdisciplinary Elective shown below will be offered to students of other department.

TA :Teacher Assessment CT: Class Tests ESE: End Semester Examination ICA : Internal Continuous Assessment

Elective I CSU703	**Interdisciplinary Elective CSU704**	**Elective II CSU803**	**Elective III CSU804**
A) Advanced Computer Architecture	A) Nanotechnology	A) Modeling and Simulation	A) Distributed Operating Systems
B) Embedded System	B) Software Engineering	B) Parallel Computing	B) Natural Language Processing
C) Multimedia Technology	C) Network Security	C) Advanced Database Management System	C) Robotics
D) Internet Technology		D)Artificial Neural Network	D) Advanced Web Technology
E) Artificial Intelligence		E) Bioinformatics	E) Computer Graphics

CSU701 SYSTEM SOFTWARE

Teaching Scheme: 03 L + 00 T **Total-03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Compiler structure: analysis-synthesis model of compilation, various phases of a compiler, tool based approach to compiler construction.

Lexical analysis: interface with input, parser and symbol table, token, lexeme and patterns, difficulties in lexical analysis, error reporting, and implementation. Regular definition, Transition diagrams, LEX.

Syntax analysis: context free grammars, ambiguity, associativity, precedence, top down parsing, recursive descent parsing, transformation on the grammars, predictive parsing. Bottom up parsing, operator precedence grammars, LR parsers (SLR, LALR, LR), YACC. Syntax directed definitions: inherited and synthesized attributes, dependency graph, evaluation order, bottom up and top down evaluation of attributes, L- and S-attributed definitions.

Intermediate code generation : intermediate representations, translation of declarations, assignments. Intermediate Code generation for control flow, boolean expressions and procedure calls, implementation issues.

Code generation and instruction selection: issues, basic blocks and flow graphs, register allocation, code generation. DAG representation of programs, code generation from dags, peep hole optimization, code generator generators, specifications of machine.

Code optimization: source of optimizations, optimization of basic blocks, loops, global dataflow analysis, solution to iterative dataflow equations. Code improving transformations, dealing with aliases, data flow analysis of structured flow graphs.

Text Books :

1. Compilers: Principles, Techniques & Tools, V. Aho, R. Sethi, & J. P. Ullman, Second Edition, Addision Wesley.

Reference :

1. NPTEL,IIT, Kanpur.
2. Systems Programming and Operating Systems, Dhamdhere, Second Edition, Tata McGraw Publication,2009.
3. Operating System, A.S. Godbole, A. Kahate, Third edition, Tata McGraw Publication,2010.

CSU702 MICROPROCESSOR AND INTERFACING

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

8086: Pin configuration, Physical memory organization, general bus organization, I/O addressing, 8086 minimum mode system & timings, Memory interfacing, static RAM Interfacing, dynamic RAM interfacing.

I/O interfacing: methods of I/O interfacing, 8255 PPI**:** Pin configuration, internal organization, modes of operation, interfacing with 8086**.**Programmable Interrupt Controller 8259: Pin Configuration, various control & command words and internal organization, modes of operation, interfacing with 8086.

USART 8251: pin configuration, internal organization, control word formats for synchronous & Asynchronous modes of operation, 8251 interfacing with 8086.DMA controller 8237: pin Configuration, internal organization, modes of operation, 8237 interfacing with 8086.

Programmable Timer/counter 8254:pin configuration, Internal organization, all the modes of Operation, 8254 interfacing with 8086.Programmable Keyboard/display Controller 8279:pin Configuration, internal organization, modes of operation, interfacing with 8086.

ADC 0800/0809 :Its working, interfacing with 8086 and programming in polled mode, in interrupt-driven mode. DAC 0800/0808 its working, interfacing with 8086 and programming in polled mode, in interrupt-driven mode. Measurement of temperature, speed and frequency using ADCs/DACs

8086 maximum mode system & timings, bus controller 8288: Its architecture, operation and Interfacing with 8086. 8289 bus arbiter its architecture, operation and interfacing with 8086, Coprocessor configuration. ESC prefix, system bus mode, semaphores & LOCK prefix.

Text Book :

1. 8086/8088 Families: Design, Programming& Interfacing, Uffenbeck John. P.,3rd Edition, Prentice-Hall Publication, 2001.

References Books:

1. Intel Microprocessors, Bray B, 4th Edition, PHI Publication, 1997.
2. Intel Processors: Programming, Interfacing & Applications, Walter A. Triebel, Avtar Singh, 3rd Edition, Prentice-Hall Publication, 2000.
3. Microprocessors Systems: The 8086/8088 Family, Liu & Gibson 2nd Edition.
4. Advanced Microprocessor & Interfacing, Badri Ram Tata McGraw Publication, 2006.
5. Microprocessor Architecture, Programming, and Applications with the 8085, Ramesh S. Gaonkar, Prentice Hall, 2002.
6. Microprocessors and Interfacing, Douglas V. Hall, Andrew L. Rood, Eight Reprint, Tata McGraw Publication, 2006.

CSU703 ELECTIVE - I
(A) ADVANCED COMPUTER ARCHITECTURE

Teaching Scheme: 03 L + 00 T Total-03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

Fundamentals: Technology & Computer usage trends, costs, Performance measurements, Quantitative principles of Computer design, Concepts of memory hierarchy, Instruction set architectures, Memory addressing, Operations in the instruction set, Encoding, Role of compilers, DLX architecture.

Pipelining: Basic principles & DLX. Various hazards: Pipelines, data, control hazards, Implementation issues, Multicycle operations, Crosscutting issues, Instruction set design and pipelining, MIPS R4000 pipeline architecture.

Advanced Pipeline And Instruction-Level Parallelism: Concepts & challenges, Data hazards & dynamic scheduling, Dynamic Hardware prediction, Compiler support for ILP, Hardware support for parallelism, Studies of ILP, Power PC620.

Memory-Hierarchy Design: Basics of caches, reducing cache miss & hit time, Main memory, Virtual memory, Protections Examples of virtual memory, Issues in the design of memory hierarchies, Alpha APX 21064 Memory hierarchy.

Interconnection Networks: Introduction & basic concepts, Computer connection to interconnection network, Interconnection network media, Practical issues, Examples of interconnection networks, Issues for interconnection networks, Internet working, An ATM network of workstation.

Text Book :

1. Advanced Computer Architecture & Parallel Programming, Hwang K, 3rd Edition, McGraw Hill,1998.

Reference Books:

1. Computer Architecture: A Quantitative Approach, Hennessy J.L. & Patterson D, 4th Edition, Harcourt Asia, 2007.
2. Computer Organization & Architecture, Seventh Edition , Stallings Prentice Hall, 2002.

CSU703 ELECTIVE - I
(B) EMBEDDED SYSTEM

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction to embedded systems, Processor in the system, Hardware units required in the exemplary cases, Software embedded into a system, Final Machine implementable software for a product, Software in Processor specific assembly language and high level language, Device drivers, device management using an operating systems, Software design for scheduling multiple tasks and devices using RTOS, Embedded SoC in VLSI circuits.

Structural units of the processor, Allocation of memory to program segment and blocks, memory map of the system, Memory blocks for different data sets and structures, Virtual Devices, Device drivers for parallel port, serial and timing devices, Context and periods for context switching, deadline and interrupt latency.

Embedded programming in assembly language and C: Function pointers, Function queues and ISR queues, Queues for implementing protocol for a network, Queuing of functions on interrupts, Use of FIFO queues, Stacks, Lists and Ordered Lists.

Modeling process: Use of dataflow & control data flow graphs, Programming model for event controlled or response time constraint, Real time programs, Inter process Communication and Synchronization, Multiple processes in an application, Sharing data by multiple tasks, use of finite states machine model & Petri net Model, Use of Semaphores for a task or for Critical section of code, Mutex & P & V, Priority inversion problems & deadlock situations IPC issues, Use of Semaphore flags or Mutex as resource key, use of message queues, mailboxes, pipes, virtual sockets, RPCs.

Introduction to RTOS: RTOS Services, Schedule management for multiple tasks in Real Time, Handling of interrupt source call, RTOS task scheduling models, Cooperative Round Robin Scheduling using a Circular Queue of ready tasks and using ordered list as per precedence constraints, cycling scheduling in Time Sharing, fixed Real Time scheduling, Precedence assignment in Scheduling algorithms, fifteen-point strategy for Synchronization, Embedded Linux Kernel. Advances in Embedded System.

Text Book:

1. Embedded Systems, Architecture, Programming & Design, Rajkamal, 2nd edition, Tata McGraw Hill, 2007

Reference Books:

1. Real Time Systems, Jane W. S. Liu, 1st Edition, Pearson Education, 2004.
2. Embedded System Design: A Unified Hardware/Software Introduction by Frank Vahid, Tony Givargis, 1st Edition, John Wiley & Sons publication, 2002.

CSU703 ELECTIVE - I
(C) MULTIMEDIA TECHNOLOGY

Teaching Scheme: 03 L + 00 T **Total-03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction : Multimedia basic concepts, Multimedia building blocks, multimedia applications design considerations, goals and objectives, architectural support for multimedia processing. Multimedia Authoring Fundamentals: authoring fundamentals, card/page based, time based, icon based, theatrical-frame based and object based authoring, interactive multimedia software authoring basics.

Multimedia audio : Basic sound concepts, audio capture, sound processor, VOC, WAV file format for sound, MIDI standard, Basic audio compression technique: ADPCM in speech coding, MPEG audio compression Technique MP3 encoder and decoder.

Image and Video technology: Representation of image in digital format, BMP, TIFF file formats, Video technology, Video capture, Video processing, AVI file formats, NTSC, PAL, SECAM, television standards, HDTV, Video streaming.

Image compression techniques: Huffman coding, LZW, DCT, Run Length Coding,JPEG, JPEG 2000, Basic Video Compression Technique.
Video Compensation based on motion compensation: H.261, H.263, MPEG videocoding, MPEG1, MPEG4 and MPEG7.

Multimedia operating system and networking: OS support for continuous media applications, file systems and process management, multimedia database management system, characteristics of multimedia database management system, system support, Distributed multimedia database management, Multimedia networking and multimedia communication systems, networking requirements, key technologies used for multimedia communication, traffic attributes, QoS.

Windows support to multimedia: Function Calls API, Support for WINDOWS.

Case study of audio driver.

Text Book:

1. Multimedia Technologies, Ashok Banerji, Second Edition, Tata McGraw Hill, 2010.

Reference Books:

1. Multimedia technology and applications, Vincent W. S. Chow, Springer, 1997.
2. Multimedia Communication Technology: Representation, Transmission, and Identification of Multimedia Signals, J.R. Ohm, Springer, 2004.

CSU703 ELECTIVE - I
(D) INTERNET TECHNOLOGY

Teaching Scheme: 03 L + 00 T Total-03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

Servlets in Java: Introduction, Servlet structure & lifecycle, Servlet API basics, various classes & interfaces, Servlet requirements & writing, Running and debugging of Servlets, Servlet Debug Class.

HTTP Redirects & Servlet API: Concepts of cookies, Servlets & cookies, State and session management with Servlet API, Server side includes and request forwarding, Servlet chaining, Jdbc Servlet.

Introduction to XML: Writing XML, creating a DTD, elements & attitudes definitions, XML schema, Defining simple & complex types, Namespaces, schemas and validation.

Cascading Style Sheets (CSS) L & XML:Anatomy of a style, creating and calling stylesheets for an XML/HTML document, Layout with CSS, setting up various properties of elements using CSS, Formatting Text with CSS.

Introduction to JSP: Simple JSP & concepts, Request-time expressions, Concept of Beans, Bean instances & serialization. Advanced JSPs: JSP tag library, Scripts, conditionals, loops, Try/Catch.

Beans & Scriplets: Bean Scopes, Writing Beans, Jdbc & Beans, E-commerce concepts, Using Scopes from Servlets, Using Beans from servlets,JSP classes, JSPs and XML.

Text Books:

1. Professional JAVA Server Programming, Allamaraju & LongShaw, 2nd Edition, Wrox Publication, 2008.
2. Core Servlets & Java Server Pages, Hall & Brown, 2nd Edition, Prentice Hall, 2008.

Reference Books:

1. Web Technologies, Godbole & Kahate, 2nd Edition, Tata Mc-Graw Hill, 2008.
2. Internet & world wide web, Deitel & Nieto, 1st Edition, Pearson Education Publication**,** 2000.

CSU703 ELECTIVE - I
(E) ARTIFICIAL INTELLIGENCE

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction to Artificial Intelligence: Introduction, Intelligent Agents.

Problem-Solving: Solving Problems by Searching, Informed Search Methods, Game Playing.

Knowledge and Reasoning: Agents that reason logically, first order logic, building a knowledge base, inference in first order logic, logical reasoning systems.

Planning: Practical Planning, Planning and Acting.

Uncertain Knowledge and Reasoning: Uncertainty, Probabilistic Reasoning Systems,Making Simple Decisions, Making Complex Decisions.

Text Book:

1. Artificial Intelligence: A Modern Approach, S. Russel and P. Norvig, 2nd edition Pearson Education, Asia, 1995.
2. Introduction to Artificial Intelligence & Expert Systems, Dan W. Patterson, 4th Edition, Prentice Hall of India,1999.
3. Artificial Intelligence, E.Rich, K.K. Knight, 2nd edition, Tata McGraw Hill, New Delhi,1991

Reference Books :

1. Artificial Intelligence, P.H. Winston, 2nd Edition, Addison-Wesley Publication Company, 1984.
2. Artificial Intelligence: A New Synthesis: Nils J. Nilsson, 1st edition, Morgan Kaufmann Publishers,1998.

CSU704 INTERDISCIPLINARY ELECTIVE
(A) NANOTECHNOLOGY

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction : Background and definition of Nanotechnology, Top-down & Bottom -up approaches to nanotechnology, Major fields of nanotechnology.

Properties of Nanoscale structure : Brief idea about Crystal structure and defects, Solid disorder Nanostructure (Failure mechanism of conventional grain sized materials, Its different properties, Metal Nanocluster composite, poros Silicon), Effect of size dependence on electrical properties, Magnetic properties, Mechanical properties (Hall-Petch relation), Chemical properties.

Quantum Well, Wires, Dots : Preparation of Quantum nanostructure, quantum size effect, Conduction Electrons And Dimensionality, Femi gas and Density of states, Potential well, Partial confinement, Properties Dependent on Density of states, Exitrons Single electron tunneling, Applications (Infra red detectors, Quantum dot laser), Spintronics.

Carbon Nanotubes : Introduction, fabrications Structure, Electrical properties, Mechanical properties, Vibrational properties, Applications of CNT.

Technique of Nanomaterials Fabrication & Methods of measuring properties : Mechanical & Chemical approaches, (Inort gas Condensation, high energy ball miling, , Sol-gel, Pulse Laser deposition, Chemical vapour deposition), Brief discussion of Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), X-ray Diffraction (XRD).

Nanomachines : Microelectromechanical System (MEMSs) : Intoduction to Micro/Nano sensor and actuator, Materials and Fabrication (Oxidation on Si, Lithography, Photoresist, Etching) surface micro/nanomachining.

Introduction to Nanomedicine : Medical Applications of Nanomaterials: drug delivery, Cancer, Surgery, Nano robots, Cell repair etc

Text Books :

1. Introduction to Nanotechnology, C.P. Poole (Jr) & F.J. Owens, John Villy & Sons, Publication, 2006.

2. Nanotechnology: Principles and Practices, S. K. Kulkarni, Capital Publishing Co., 2007.

Reference Books :

1. Principle of Nanotechnology, Edited by Bharat Bhusan, Spinger Verlag, 2003.

2. Introduction to Nanoscience & Nanotechnology, G. L. Hornyak, H. F. Tibbals, J. Dutta, J. J.Moore, CRC Press, New York, 2009.

CSU704 INTERDISCIPLINARY ELECTIVE
(B) SOFTWARE ENGINEERING

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction: Introduction to Software Engineering.

Software Development Life-cycle : Requirements analysis, software design, coding, testing, maintenance, etc.

Software Requirement Specification: Problem analysis, requirement specification, validation, metrics, monitoring and control.

Software Requirements Specification: Waterfall model, prototyping, interactive enhancement, spiral model. Role of Management in software development, Role of metrics and measurement

System Design : Problem partitioning, abstraction, top-down and bottom-up design, structured approach. Functional versus object-oriented approach, design specification and verification metrics, monitoring and control.

Coding : Top-down and bottom-up, structured programming, information hiding, programming style, and internal documentation. Verification, Metrics, monitoring and control.

Testing : Levels of testing functional testing, structural testing, test plane, test cases specification, and reliability assessment. Implementation & Maintenance.

Software Project Management : Cost estimation, Project scheduling, Staffing, Software configuration management, Quality assurance, Project Monitoring, Risk management, etc.

Text Books:

1. Pressman R.S, Software Engineering: A Practitioner's Approach, 6th Edition, McGraw Hill, 2005.

2. The Unified modeling Language User Guide, Grady Booch, James Rumbaugh, Jacobson, 2nd Edition, Addison-Wesley, 2005.

Reference Books:

1. Software Engineering, Ian Sommerville, 7th Edition, Pearson Education Asia, 2004.

2. A concise introduction to software engineering, P. Jalote, Springer Verlag, 2008.

3. An integrated approach to software engineering, third edition By P. Jalote Springer Verlag, 2005.

CSU704 INTERDISCIPLINARY ELECTIVE
(C) NETWORK SECURITY

Teaching Scheme: 03L + 00 T Total 03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

Introduction to Network Security: passive and active attacks, authentication, integrity, access control, The model of internet work security, internet standards: internet society and RFC publications.
Cryptography: Encryption principles and various algorithms, standardization process, key distribution, public key cryptography and message authentication, digital signature.
Network security applications: Kerberos, X.509 directory authentication services, e-mail security PGP (Pretty Good Privacy), operational description. MIME (Multipurpose Internet Mail Extensions), SMIME (Security/Multipurpose internet mail extensions) functionality.
IP Security: Overview, IP security architecture, Authentication header,
Web Security: Web security requirements, secure socket layer, Transport layer security, Secure electronic transactions.
Firewall: Characteristics, types of firewalls, Firewall configuration, Trusted systems, data access control, the concept of the trusted systems.
Network Management Security: Basic concepts of SNMP, Network management architecture and protocol architectures, proxies, services, SNMPv1 authentication service, access policy and proxy service, SNMPv2 architecture, message processing and user security model, view based access control.
System Security: Intruders, Intrusion technologies, password protection, password selection strategies, Intrusion detection.
Viruses and related threats: Nature of viruses, types, micro viruses and various antivirus approaches.

Text Book :

1. Network Security Essentials, William Stallings, 3rd edition, Prentice Hall India, 2006.

Reference Books:

1. Security for Telecommunication and Network management, Moshe Rozenblit, 1st Edition, Prentice Hall India, 2000.

2. Internet Security Protocols - Protecting IP Traffic, Uyless Black, 1st Edition, Pearson.

CSU705 SYSTEM SOFTWARE LAB

Teaching Scheme: 02 P **Total-02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

The course will have project where students will have to develop compiler for a subset of C language using tools like Lex and Yacc.

Note:-
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU706 MICROPROCESSOR AND INTERFACING LAB

Teaching Scheme: 02 P **Total-02** **Credit: 01**

Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**

Duration of ESE: 3hrs.

Minimum Eight Experiments to be performed on following topics
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same.

Aim of the list is to inform about minimum expected outcomes.

1. 8086 minimum mode and maximum mode.
2. Methods of I/O interfacing.
3. 8255 interfacing with 8086.
4. 8251 interfacing with 8086.
5. 8237 interfacing with 8086.
6. 8254 interfacing with 8086.
7. ADC 0800/0809.
8. DAC 0800/0808.

Note:-
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU707 ELECTIVE - I
(A) ADVANCED COMPUTER ARCHITECTURE LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Eight Experiments to be performed on following topics
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same.

Aim of the list is to inform about minimum expected outcomes.

1. Given a set of numbers, count number of zeros, number of positive numbers and number of negative numbers.
2. Transferring contents of an array from one location to another location.
3. To Study Advanced pipeline and instruction - level parallelism
4. Implement Booth's multiplication algorithm.
5. Implement BCD arithmetic using ordinary ADD instruction.
6. A pair of 32-bit numbers is stored in group of four consecutive memory locations, the memory locations with the lowest memory address in each group contains the least significant byte. Write a program to add the numbers. If a carry is generated store it in a specific location.
7. Sort a given set of numbers in ascending order.
8. To Study Interconnection Networks.

Note:-
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU707 ELECTIVE - I
(B) EMBEDDED SYSTEM LAB

Teaching Scheme: 02 P **Total 02** **Credits: 01**

Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**

Duration of ESE: 3hrs.

Minimum Eight Experiments to be performed on following topics

The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. NIOS II System and SDRAM Interface
2. Expanded NIOS II System
3. Study of Development Education Board
4. A Simple Computer Embedded System
5. Program Controlled Input Output
6. Subroutines and Stacks
7. Polling and Interrupts
8. Bus Communication

Note:-

ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.

ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU707 ELECTIVE - I
(C) MULTIMEDIA TECHNOLOGY LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Eight Experiments to be performed on following multimedia tools
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same.

Aim of the list is to inform about minimum expected outcomes.

1. To create a Banner using Adobe Photoshop CS5.
2. Link two different pages from the same image using image map in Adobe Dream weaver CS5
3. Apply several transformation at same time on star tool using transform each command in adobe illustrator.
4. Create Animation with Twin Shape using Adobe Flash CS3 Professional.
5. To Move object along a Path using Adobe Flash CS5 Professional.
6. To create Frame by Frame animation in Adobe Flash CS5 Professional.
7. Create Powerful Motion with Simple Expressions in AE using Adobe after Effect.
8. Change one object into another using Adobe Flash CS3 Professional.
9. Perform isolated adjustments to an image using Graduated Filters in Adobe Photoshop Extended CS3.

Note:-
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU707 ELECTIVE - I
(D) INTERNET TECHNOLOGY LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum eight experiments shall be performed to cover entire curriculum of CSU703 (D) Internet Technology

The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same.

Aim of the list is to inform about minimum expected outcomes.

1. Write a simple servlet that will display “Hello World”
2. Write a servlet that uses doGet() and doPost() methods in a single servlet.
3. Write a servlet that receives first name, last name and city name from an html page and puts this data in to cookies provide a hyperlink that can retrieve cookies from the client machine & display.
4. Write a servlet to maintain of state and session with HTTP using rewritten URL’s and hidden variables.
5. Introduction to JDBC (Java Database Connectivity).
6. Write a simple servlet to display the information related to students, like student id, student name and his/her age, using JDBC. (Assume student information stored in Microsoft Access database.)
7. Write a servlet that accept banking information like account number, customer name, balance from an html page, and store it into the database, using JDBC (Assume Account table is already created in Microsoft Access database.)
8. Introduction to XML
9. Write an application in XML for representing ‘Student Information System’.
10. Write a simple JSP that uses JDBC for accessing information like student name and gender from Microsoft access.
11. Write a bean that receives two numbers and returns result of four basic calculations i.e. addition, subtraction, multiplication and division using JSP beans
12. Write a Servlet with JDBC connectivity for MySQL/Oracle database

Note:-

ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.

ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU707 ELECTIVE - I
(E) ARTIFICIAL INTELLIGENCE LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Eight Experiments to be performed on following topics
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same.

Aim of the list is to inform about minimum expected outcomes.

1. Write a simple prolog program to study fact, verification, domain, predicate and clauses section.

2. Write a Prolog program containing facts related to following predicates

1. Location (city, state) 2. Stays (person, city)

Display: (i) list of person, state and city (ii) Give n person staying in which state

3. Create a family tree program(of EXP2) to include following rules

1. M is the mother of P if she is a parent of P and is female

2. F is the father of P ifhe is a parent of P and is male

3. X is a sibling of Y if they both have the same parent.

4. Then add rules for grandparents, uncle-aunt, sister and brother.

Based on the facts, define goals to answer questions related to family tree.

4. (1) WAP for using Input, Output and fail predicates in Prolog.

Display:

(i) list of married & unmarried employees (ii) List of male & female employees

(iii)List of employees for given job location

(2)Create a small set of facts and rules on who is the ancestor of whom.

Display:

(i) who is ancestor of given person. (ii)Complete list i.e who is ancestor of whom

5. Write programs for studying Usage of arithmetic operators in Prolog.

(1) Accept name of the student, rollno, his /her subject name, maximum marks and obtained marks in the subject. (Take marks of atleast 6 subjects). Compute the percentage of a student. Display his result with other information.

(2) Accept department, designation, name, age, basic salary, house rent allowance(HRA) of an employee. Compute dearness allowance (DA) which is 15% of basic salary. Determine the gross salary(basic salary+HRA+DA) of the employee. Display all information of the employee(Generate Payslip)

6. WAP to study usage of cut, not, fail predicates in Prolog. Write a Prolog program having facts in clauses section for predicate student (studentname,branchname).

Display: (i) list of all students

(ii) list of students for given specific branch.

(iii) list of students excluding specific branch

7. A WAP to study usage of Recursion in Prolog.

(1) Write program which finds and display factorial of a given number.

(2) Write program which display Fibonacci series.

8. WAP to study usage of logical, arithmetic, string operators in Prolog

(1) Write a program which finds and displays maximum numberand minimum number from three given numbers.

(2) Write a program which accepts integer number as an input and displays its square .It should also find its positive square root value, if its square root is integer, otherwise display 'NA'.

(3) Write a program to find substring from a given string. The substring should start from 1st location of source string and should contain the entered number of characters from the source string.

Note:-
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU708 PROJECT PHASE - I

Teaching Scheme : 04 P Total: 04 Credit: 02
Evaluation Scheme: 50 ICA Total Marks: 50

1. In general, a group of 3-6 students should be allowed to complete the project on Approved topic.
2. Preferably more than 25 % projects shall be Industry / Research based / oriented.
3. Exhaustive survey of literature based on a clear definition of the scope and focus of the topic should be carried out by the students.
4. Students should finalize the topic for the project after literature survey in consultation with the Guide.
5. The **Synopsis/Abstract** on the selected topic should be submitted to the H.O.D. for approval.
6. On approval of the topic, students should initiate the topic based work.
7. Approximately more than 30% work(of the total quantum) should be completed by the end of VII semester.
8. At the end of semester, each batch should submit the progress report in following format:
   Title
   Introduction
   Concept
   Work completed
   Work to be completed
   References
9. For uniform and continuous evaluation, the Evaluation Committee comprising of the Guide, Project Course Coordinator and Expert appointed by the Program Head will award the marks based on the work completed by the end of semester and the presentation based on the project work.

Note:

ICA: The Internal Continuous Assessment shall be based on the active participation of the students in the Project work and knowledge / skill acquired. Oral examination shall be conducted by the panel of examiners.

CSU709 SEMINAR

Teaching Scheme : 02 P Total: 02 Credit: 02
Evaluation Scheme: 50 ICA Total Marks: 50

1. Student shall select a topic for seminar which is **not covered in curriculum**.
2. Topics shall be registered within a month after beginning of VII Semester and shall be approved by the concerned guide and Program Head.
3. Students should know the functional and technical details of selected topic after carrying out the conceptual study.
4. Before the end of semester, student shall deliver a seminar and submit the seminar report in following format:
   Introduction
   Literature Survey
   Concept
   Functional and Technical Details
   Future scope
   Applications
   Comparison with similar topics / methods
   References
5. Student shall deliver a seminar based on submitted report. The presentation and oral examination on selected seminar topic shall be assessed by pannel of examiners

Note:

ICA: The Internal Continuous Assessment shall be based on the active participation of the students in the Seminar Topic and the knowledge acquired. The seminar shall be assessed by the examiner panel consisting of Project Guide, Course Coordinator Seminar and Expert appointed by Program Head.

CSU710 INDUSTRIAL TRAINING / VISIT

Teaching Scheme: 00 Total: 00 Credits: 01
Evaluation Scheme: 50 ICA Total Marks: 50

Industrial Training shall have an option of Industrial Visit.

Industrial Training: List of renowned industries shall be prepared by the Departmental Coordinator of T & P Cell for the course. After approval from the Principal and with the consultation of Industry personnel, 02 weeks trainings shall be arranged during the vacations (after the VI semester). The students may be permitted to undergo the trainings of 02 weeks as per their choices for which all the official formalities will be completed by the students under the guidance of course coordinator. The students shall submit the report based on the Industrial training to the course coordinator which will be evaluated during the VII semester

Industrial Visit: An Industry Visits to minimum three industries shall be arranged for the students unable to complete the Industrial Training. The visit shall be arranged preferably during the vacation period. However in non-availability of permission for the visit during vacation period, same may be arranged during the regular VII semester. The students will be required to submit the report based on the Industrial Visit which will be evaluated by the course coordinator

Note:

ICA: The Internal Continuous Assessment shall be based on the active participation of the students in the training/visits and knowledge / skill acquired. The technical report submitted by the students shall be assessed, by the panel of examiners consisting of Project Guide, Course Coordinator and Expert appointed by the Program Head.

CSU711 INDUSTRIAL LECTURE-II

Teaching Scheme: 01 L Total: 01 Credits: 01
Evaluation Scheme: 25 ICA Total Marks: 25

List of renowned persons from industry shall be prepared by the Departmental Coordinator of T & P Cell for the course. After approval from the Principal, Minimum twelve Industrial lectures shall be arranged, preferably once a week, which shall be delivered by the experts/Officials from Industries/Govt. organizations/ Private Sectors/Public Sectors covering the various aspects.

The assignments based on the Industry Lecture-I and Industry Lecture-II will be evaluated during VII semester

Topics of Industrial Lectures shall be Technical in nature and should not be the specific contents from the curriculum.

Students shall submit the report based on lectures.

Note:

ICA: The Internal Continuous Assessment shall be based on the active participation of the students in the lectures and knowledge acquired. The technical report submitted by the students shall be assessed, by the panel of examiners consisting of Project Guide, Course Coordinator and Expert appointed by the Program Head.

CSU712 SELF STUDY-III

Teaching Scheme: 00 P **Total: 00** **Credit: 02**
Evaluation Scheme: 25 TA **Total Marks: 25**

1] Self study III is based on one class test each on the basis of 20% curriculum of the courses CSU701, CSU702, CSU703 declared by respective course coordinator at the beginning of semester.
2] One faculty member shall be appointed as course coordinator for Self Study - III and his/her work load shall be considered as 1 hr/week.

CSU 801 OPERATION RESEARCH AND MANAGEMENT

Teaching Scheme : 03 L + 00 T Total -03 Credits : 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

Operation Research (OR) modeling approach: Problem identification, modeling, finding solution, testing etc., scope and limitations of OR.

Linear Programming (LP): Assumption and formulation of LP model, solution by graphical method, simplex and two phase simplex method, use of Excel to solve LP model, dual simplex method and sensitivity analysis, transportation and assignment models.

Project Management: CPM and PERT, finding critical path, time-cost trade off, Resource smoothing and resource leveling.

Dynamic Programming: Introduction and characteristics, recursion in dynamic programming, investment problem, production scheduling problem, stage coach problem, equipment replacement, budget allocation problem, shortest route models and cargo loading.

Non-Linear Programming: Introduction, types, constrained and unconstrained optimization method, one variable and multivariable, steepest descent method, quadratic programming.

Decision Theory and Game Theory: Introduction, minmax decision procedure, Bays decision procedure with and without data,regret function versus loss function, minmax and maxmin strategies, expected payoffs, solution of m × n games, Brown algorithm.

Machine Sequencing Problems: n jobs through two machines,n jobs through three machines,n jobs through m machines, two jobs through m machines sequencing problem.

Text Books

1. Introduction to Operation Research, B. E. Gillet, 1st Edition, McGraw-Hill, 1996.
2. Introduction to Operation Research, Concepts and Cases, Hillier and Liberman, 8th Edition, McGraw-Hill,2004.

Reference Books

1. Operation Research, Tiwari and Shandilya, 1st Edition, Prentice Hall of India, 2006.
2. Introduction to Optimization,S. S. Rao, 3rd Edition, Prentice Hall of India,2005.
3. Computer Aided Project Management, P. B. Mahapatra, 2nd Edition, Prentice Hall of India,2004.
4. Operation Research, Natrajan, 8thEdition, Balsubramani, Pearson Education, 2008.

CSU802 DIGITAL SIGNAL PROCESSING

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks :100**

Duration of ESE: 2hrs.30min.

Discrete Time Signals: Introduction to DSP, Advantages, basic elements of DSP system, Elementary discrete-time sequences.

Discrete Time Systems: Description, representation, classification (linear versus non linear, time-invariant versus time variant, static versus dynamic, casual versus non causal , stable versus unstable)

LTI systems: The convolution sum, properties of convolution, Analysis of causal LTI systems, stability of LTI systems, step response of LTI systems, difference equation, solution of difference equations, Impulse response of LTI recursive system, Correlation of discrete time signals and types.

Fourier Transforms: Definition & properties of Fourier transform, Finite duration sequences and the discrete Fourier transform (DFT), properties, circular convolution, Fast algorithms for the computation of DFT: radix-2 algorithms, Bit Reversal Algorithm.

Z- Transform: Definition of z- Transform, properties, rational z-Transforms, evaluation of the inverse z- Transforms analysis of linear time invariant systems in z-domain, transient and steady-state responses, causality, stability, pole-zero cancellation, relation with Fourier transform.

Digital Filters: Classification (LP, HP, BP, FIR and IIR filters), filter specifications, Impulse invariant transformation and bilinear transformation, Commonly used Analog filters and IIR Filter design example**,** Structures for realization of Discrete-Time systems.

Realization of FIR and IIR Systems: Direct Form, Cascade Form, Signal flow graph and Transposed structures, Cascade form, Lattice and Lattice-ladder.

Text Book:

1. Digital Signal Processing: Principles Algorithms and Applications, J G Prokis and D G Manolokis, 4th Edition, Pearson Education Pvt .Ltd, 2006.

Reference Books:

1. Digital Signal Processing: A Computer-Based Approach, S K Mitra, 4th Edition Tata McGraw Hill Publish Co. Ltd., 2007.
2. Digital Signal Processing a Practical Approach, E C Ifeacthor and B W Jervis, 1st Edition, Pearson Education, 2002.
3. Discrete Time Signal Processing, A V Oppenheim, R W Schafer with J RBuck, 2nd Edition PHI, 2005.

CSU 803 ELECTIVE - II
(A) MODELING AND SIMULATION

Teaching Scheme: 03 L + 00 T **Total-03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

System Models and System studies: Basic concepts of systems and system modeling, static and dynamic, physical and mathematical models, principles used in modeling. Corporate models: analysis, design and postulation of system.

Basic Concepts and continuous system: Techniques used, distributed log models and cobweb models, continuous system Model, Analytical equations and methods of obtaining solutions, analog, hybrid computers and simulations, CSSLS examples of different continuous system, System dynamics, probability concepts and basic principles of discrete simulation, Growth and decay models, and system dynamics diagrams, stochastic Process, probability functions and their evaluation, random number generation, rejection method, comparison of Monte-Carlo method and stochastic simulation examples.

Simulation of Queuing System and PERT Network: Simulation of Queuing system, Rudiments of queuing theory, simulation of a single server queue, simulation of a two server queue, simulation of more general queues. Simulation of a PERT Network: Network model of a project, Analysis of an activity network, critical path, Simulation of Inventory Control & Forecasting.

Simulation Experiments Inventory Control and Forecasting: Elements of inventory theory, more Complex inventory models, simulation example-1, Generation of Poison and Erlanger variates, Simulation example-2, Forecasting and regression Analysis. Design and Evaluation of simulation Experiments: Length of Simulation runs, variance reduction techniques, Experimental layout, Validation, summary and conclusion.

Simulation of Languages and Introduction to GPSS: Different special purpose languages used for continuous and discrete systems and comparison, factors affecting the selection of discrete system, simulation languages-comparison of GPSS and SIMSCRIPT, detailed study of GPSS with examples.

Text Books:

1. System Simulation, Groffrey Gordon, 2nd Edition, PHI Pvt. Ltd., New Delhi-1987.
2. System Simulation with Digital Computers, Narsingh Deo,1st edition PHI Pvt.Ltd., NewDelhi,2005.

Reference Books:

1. System Simulation: The Art of Science, Shannon R.E., 1st edition, Prentice Hall, Englewood Cliffs, NY, 1975.
2. Computer Simulation, Hugh j. Wston, John H. Blackstone, Jr., 2nd Edition, John Wiley & Sons, 2000.

CSU 803 ELECTIVE - II
(B) PARALLEL COMPUTING

Teaching Scheme: 03 L + 00 T **Total 03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Scalability and Clustering: Evolution of Computer Architecture, Dimensions of Scalability, Parallel Computer Models, Basic Concepts Of Clustering, Scalable Design Principles, Parallel Programming Overview, Processes, Tasks and Threads, Parallelism Issues, Interaction / Communication Issues, Semantic Issues in Parallel Programs.

Enabling Technologies: System Development Trends, Principles of Processor Design, Microprocessor Architecture Families, Hierarchical Memory Technology, Cache Coherence Protocols, Shared Memory Consistency, Distributed Cache Memory Architecture, Latency Tolerance Techniques, Multithreaded Latency Hiding.

System Interconnects: Basics of Interconnection Networks, Network Topologies and Properties, Buses, Crossbar and Multistage Switches, Software Multithreading, Synchronization mechanisms.

Parallel Programming: Paradigms and Programmability, Parallel Programming Models, Shared Memory Programming.

Message Passing Programming: Message Passing Paradigm, Message Passing Interface , Parallel Virtual Machine.

Text Book:

1. Introduction to Parallel Computing, Ananth Grama, Anshul Gupta, George Karypis, Vipin Kumar, 2nd Edition, Addison Wesley,2003.

Reference Books:

1. The Sourcebook of Parallel Computing, Jack Dongarra, Geoffrey Fox, Ken Kennedy, Linda Torczon, William Gropp, 1st Edition , Berkeley Publication,2003.

2. Introduction to Parallel Algorithms and Architectures: Arrays, Trees, Hypercubes**,** F. T. Leighton, 1st Edition, Morgan Kaufmann Publishers, CA 1992.

3. Analysis and Design of Parallel Algorithms, Laxmivarahn and Dahl**,** 1st Edition, McGraw Hill. 1990

CSU 803 ELECTIVE - II
(C) ADVANCED DATABASE MANAGEMENT SYSTEM

Teaching Scheme: 03 L + 00 T Total-03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

SQL: Use Of SQL, DDL Statements, DML Statements, View Definitions, Constraints, Triggers Keys and Foreign Keys, Constraints on Attributes and Tuples, Modification of Constraints Cursors, Dynamic SQL.

Query Execution: Introduction to Physical-Query-Plan Operators, One-Pass and Twopass algorithms, Nested-Loop Joins, Index-Based Algorithms, Buffer Management, Parallel Algorithms for Relational Operations, Using Heuristics in Query Optimization, Basic Algorithms for Executing Query Operations.

Query Complier: Parsing, Algebraic Laws for Improving Query Plans, From Parse Trees to Logical Query Plans, Estimating the Cost of Operations, Cost-Based Plan Selection, Completing the Physical-Query-Plan, Coping With System Failures, Issues and Models for Resilient Operation, Redo Logging, Undo/Redo Logging, Protecting Against Media Failures.

Concurrency Control: Serializability, Enforcing Serializability by Locks, Locking Systems With Several Lock Modes, Architecture for a Locking Scheduler Managing Hierarchies of Database Elements, Concurrency Control.

Transaction Management: Introduction of Transaction management, Serializability and Recoverability, View Serializability, Resolving Deadlocks, Distributed Databases, Distributed Commit, Distributed Locking.

Database System Architecture: Centralized and Client-Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems, Network Types.

Distributed Database: Homogeneous And Heterogeneous Database, Distributed Data Storage, Distributed Transaction, Commit Protocols, Concurrency Control in Distributed Databases, Availability, Heterogeneous.

Text Books:

1. Database Management Systems, Raghu Ramakrishnan/Johannes Gehrke,3rd edition, Tata Mc Graw Hill, 2007.

Reference Books:

1. Database System Concepts, Silber Schatz. Korth, 5th edition, Tata Mc Graw Hill, 2005.

2. Fundamental of DataBase System, ShamKanth B. Navathe, 5th Edition, Pearson Education, 2006.

CSU 803 ELECTIVE - II
(D) ARTIFICIAL NEURAL NETWORK

Teaching Scheme: 03 L + 00 T **Total-03** **Credits: 03**
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**
Duration of ESE: 2hrs.30min.

Introduction to Neural Network : History of Neural Networks, Biological Neural Networks, Artificial Neuron, Analysis of Neural networks, Characteristics of Neural Networks ,Limitations of Neural Networks, Neural Network Applications.

Perceptron:-Overview of Perceptron ,Pattern Recognition, Mathematical modeling of Simple Perceptron ,Perceptron Learning Algorithms ,Limitations of Perceptron.

Multi-Layer Perceptron Networks: Delta Learning Rule for the Output Layer, Generalized Delta Learning Rule, Backpropagation learning algorithm, Mathematical modeling of MLP Networks ,Application to Function Approximation.

Radial Basis Function (RBF) Networks: Least Square Estimator, Linear Neuron, Recursive Least Squares Algorithm, Basis Function Networks, Radial Basis Function Networks ,RBF as Interpolation Networks ,Generalized RBF as Approximation Networks, MLP vs. RBF Networks as Function Approximators .

Hopfield Networks: Hopfield Network, Energy Minimizing Networks, Analysis and Mathematical modeling of Hopfield Model, Designing Stable States (Energy Wells), Application to Optimization Problems .

Associative Memory Networks: Linear Feed forward Associative Memory Network, Recurrent Associative Memory Network,Bidirectional Associative Memory Network (BAM) ,Brain-State-in-a-Box (BSB) Network ,Cross-Talk versus Perfect Recall.

Kohonen Networks: Self-Organization in Human Brain,Self-Organizing Neural Networks, Kohonen's Neural Network, Kohonen Learning Rule ,Self-Organizing Feature Maps, Vector Quantization ,Application to Data Compression.

Text Books :

1. Introduction to Artificial Neural Systems, Zurada, Jacek M, 1st Edition West Publishing Company, 1992.

2. Neural Networks, Simon Haykin, 1st Edition, MacMillan College Publishing Company, 1999.

Reference Books:

1. Artificial Neural Networks, Robert J. Schalkoff, 2nd Edition, McGraw-Hill, 1997

2. Neural Networks for Pattern Recognition, Christopher M. Bishop, 1st Edition Oxford University Press, Oxford UK , 1995.

CSU 803 ELECTIVE - II
(E) BIOINFORMATICS

Teaching Scheme: 03 T + 00 T **Total-03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Basics: Basics of biology

Sequences : Problem statement, Edit distance and substitution matrices, HMMs and pair wise HMMs, Global and local alignments, Spliced alignment, Space-efficient sequence alignment, Multiple alignment, Database searching tools, Sequence by hybridization, Profile HMMs

Structures : Protein structure alignment, Protein structure prediction

Phylogenetic trees : Large parsimony and small parsimony problems, Probabilistic approaches, Grammar-based approaches

Miscellaneous topics : Pathways and networks, Microarrays, Biomedical images

Text Books

1. An Introduction to Bioinformatics Algorithms, Jones and Pevzner, 1st Edition, MIT Press,2004
2. Biological Sequence Analysis, Durbin, Eddy, Krogh, Mitchison, 3rd Edition, Cambridge University Press, 2008.

Reference Books

1. Algorithms on Strings, Trees and Sequences, Gusfield, 2nd Edition, Cambridge University Press, 2010.
2. Bioinformatics: A Practical Guide to the analysis of Genes and Proteins , Baxevanis, A.D. & Ouellettee, B., F. F., 3rd Edition, New York, John Wiley & Sons, Inc.Publications,2002.
3. Bioinformatics: Sequence and Genome Analysis , David Mount, 2nd Edition ,New York, Cold Spring Harbor Laboratory Press, 2004

CSU 804 ELECTIVE - III
(A) DISTRIBUTED OPERATING SYSTEMS

Teaching Scheme: 03L + 00 T Total-03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

Introduction: Characteristics of Distributed Systems, Applications. Challenges, Architecture of Distributed System: Introduction, System Architecture types, Distributed operating systems, Issues in distributed Operating systems.

Programming in Distributed Systems: Sockets and socket programming, LPC, RPC, Distributed Objects, Event Notification.

Distributed File Systems: Design Issues and Case Studies of NFS, AFS, RFS.

Timing Issues: Clock Synchronization, Lamport's Logical Clocks, Vector Clocks, Casual Ordering of messages, Global State Collection, and Termination Detection.

Coordination and Agreement: Leader Election, Distributed Mutual Exclusion, Byzantine Agreement Problem.

Distributed Deadlock Detection: Edge Chasing, Diffusion Computation and Hierarchical Algorithms.

Recovery: Synchronous and Asynchronous Check pointing and Recovery.

Fault Tolerance: Commit protocols, Voting techniques, static and dynamic voting protocols.

Text Book:

1. Advanced Concepts in Operating Systems – M. Singhal and N. Shivaratri, 1st Edition,Tata McGraw Hill Publications,1994.

Reference Books:

1. Distributed Systems – Concepts and Design, Coulouoris, Dollimore and Kindberg, 4th Edition, Pearson Education Asia, 2004.

2. Distributed Systems – A.S. Tanenbaum, 2nd Edition. Pearson Education Asia, 2002.

CSU 804 ELECTIVE - III
(B) NATURAL LANGUAGE PROCESSING

Teaching Scheme: 03 L + 00 T **Total-03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Introduction: Brief history of NLP research, current applications, generic NLP system architecture, knowledge-based versus probabilistic approaches.

Finite-state techniques: Inflectional and derivational morphology, finite-state automata in NLP, finite-state transducers.

Prediction and Part-of-Speech Tagging: Corpora, simple N-grams, word prediction, stochastic tagging, evaluating system performance.

Parsing and generation: Generative grammar, context-free grammars, parsing and generation with context-free grammars, weights and probabilities.

Parsing with constraint-based grammars: Constraint-based grammar, unification.
Compositional and lexical semantics: Simple compositional semantics in constraint based grammar, Semantic relations, Word Net, word senses, word sense disambiguation.

Discourse and dialogue: Anaphora resolution, discourse relations.

Applications: Machine translation, email response, spoken dialogue systems.

Text Book:

1. Speech and language processing**,** Jurafsky, D. & Martin, J., 2nd Edition, Prentice Hall, 2000.

Reference Book:

1. Foundations of Statistical Natural Language Processing, Christopher D. Manning and Hinrich Schutze,2nd edition, IT Press, 1999

CSU 804 ELECTIVE - III
(C) ROBOTICS

Teaching Scheme: 03 L + 00 T **Total-03** **Credits: 03**

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE **Total Marks: 100**

Duration of ESE: 2hrs.30min.

Robot Fundamentals: Definitions, History of robots, present and future trends in robotics, Robot classifications, Robot configurations, Point to Point robots, Continuous Path robots, Work volume, Issues in design and controlling robots Repeatability, Control resolution, spatial resolution, Precision, Accuracy, Robot configurations, Point to Point robots, Continuous Path robots, Work volume, Applications of robots. Drives used in robots: Hydraulic, Pneumatic and Electric drives, Comparison of drive systems and their relative merits and demerits.

Manipulator Kinematics: Matrix Algebra, Inverse of matrices, rotational groups, matrix epresentations of coordinate transformation, transformation about reference frame and moving frame Forward & Inverse Kinematics examples of 2R, 3R & 3P manipulators, Specifying position and orientation of rigid bodies, Euler's angle and fixed rotation for specifying position and orientation, Homogeneous coordinate transformation and examples, D-H representation of kinematics linkages, Forward kinematics of 6R manipulators using D-H representations, Inverse kinematics of 6R manipulators using DH representations, Inverse Kinematics geometric and algebraic methods.

Robotics Dynamics : Velocity Kinematics, Acceleration of rigid body, mass distribution Newton's equation, Euler's equation, Iterative Newton –Euler's dynamic formulation, closed dynamic, Lagrangian formulation of manipulator dynamics, dynamic simulation, Computational consideration.

Trajectory planning: Introduction, general considerations in path description and generation, joint space schemes, Cartesian space schemes, path generation in runtime, planning path using dynamic model point to point and continuous trajectory , 4-3-4 & trapezioidal velocity strategy for robots.

Robot Sensors: Internal and external sensors, position- potentiometric, optical sensors ,encoders -absolute, incremental ,touch and slip sensors velocity and acceleration sensors, proximity sensors, force & torque sensors, laser range finder, camera, Microcontrollers, DSP, centralized controllers, real time operating systems.

Robot Controllers: Essential components-Drive for Hydraulic and Pneumatic actuators, H-bridge drives for DC motor Overload over current and stall detection methods, example of a micro-controller/ microprocessor based robot Controller.

Robot Programming languages:

Introduction the three level of robot programming, requirements of a robot programming language, problems peculiar to robot programming languages.

TextBook:

1. Robotics Technology and Flexible Automation, S.R.Deb,1st edition, Tata Mc GrawHill,1994.
2. Industrial Robotics (Technology, Programming and application s) , M.P.Groover, M. Weiss R.N. Nagel, N.G. Odrey,1st edition, McGraw, Hill 1996

Reference Book:

1. Robotics : Control , sensors , vision and intelligence ,K.S.Fu, R.C.Gonzalez and C.S.G. Lee, 1st edition, McGraw-Hill.1987.

CSU 804 ELECTIVE - III
(D) ADVANCED WEB TECHNOLOGY

Teaching Scheme: 03 L + 00 T Total-03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

Introduction : Introduction to .Net, Introduction to Microsoft .Net Framework. Building blocks in .Net**,** Drawback of previous languages. Understand what is .Net VB.Net overview, VB Vs VB.Net, .Net framework: components of .Net framework**,** Advantages, requirement of .Net.

Introduction and implementation : VB.Net: Features, VB.Net IDE, Data Types, Loops, Control structures, Cases, Operators, Creating forms, Procedures and functions, Form controls, Implementation of OOP: Creation of class and objects, Inheritance, Constructors, Exception handling. Component based programming: Working with Private assembly, shared assembly, Using COM components developed VB or other language.

Introduction to ADO.Net and data manipulation: Introduction to ADO.Net**,** What is database? Writing XML file.ADO.Net architecture, Creating connection, Dataset and Data reader, Types of Data adapter and ADO controls, reading data into dataset and data adapter, Binding data to controls, Data table and Data row. Migrating from VB 6.0 to VB.Net.

Introduction to ASP.Net : Difference between ASP and ASP.Net, Introduction to IIS, ASP.Net IDE. Creation of web forms & form controls, ASP.Net objects and components**:** Response, Server, Application, Session, ASP.Net scope, state, view state, post back and configuration, Object creation, Scripting, Drive, folder, file,Server components, Ad rotator, Content linker, Browser capabilities, Use and creation of global .asax file, Using Application object, Events methods and collection, Using session object, enabling and disabling of session, Event, properties, methods, collection.

ADO.Net in ASP.Net: Connection, Dataset and data reader, Data table and Data row, Web. config introduction, Binding data with data grid, Accessing and manipulating data, Server control templates and Data binding techniques, Understand data access in .Net using ADO.Net, Understand various Server Control Templates available for Data Binding like Repeater, Data List and Data Grid Controls. ASP transactions and e-mail: Transactions, Transaction db design, CDONTS object. Email sending web page creation.

Text Books:

1. Programming in VB.Net, Anita & Bradely, 2nd edition, TATA Mc Grow Hill, 2003.
2. ASP.net, Dave Mercer,2nd Edition, TATA McGraw-Hill, 2002

Reference Books:

1. Net Framework, Anthony Jones, 1st Edition, TATA Mc Grow Hill,2003.
2. .Net Frame Work Essential, Thwan ThAI , Hoang Lan,, 3rd Edition, O'Reilly Media,2003.

CSU 804 ELECTIVE – III
(E) COMPUTER GRAPHICS

Teaching Scheme: 03L + 00 T Total-03 Credits: 03
Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE Total Marks: 100
Duration of ESE: 2hrs.30min.

An Overview of Computer Graphics and Graphics System: Video display devices, Raster-Scan systems, Random-Scan systems, Graphics monitors and workstations, input devices, hard copy devices, Graphics software.

Output Primitives : Point and Lines, Line drawing algorithms, loading the frame buffer, line function, circle and ellipse generating algorithms, curves, parallel curves algorithms, Pixel addressing, filled-area primitives , functions, Cell array, character generation. Attributes of output primitives: Line and curve attributes, color and grayscale levels, area fill attributes, Character attributes, and bundled attributes, anti aliasing.

2-D Geometric Transformations: Basic and composite transformations, matrix representations, transformations between coordinate systems, affine transformations, transformation functions, Raster methods for transformations. Two-Dimensional viewing: viewing coordinates, Window-to-view port coordinate transformation, viewing functions. Clipping: point, line, polygon, curve, and text, exterior.

Structures And Hierarchical Modeling: Concepts, editing structures, basic modeling concepts, hierarchical modeling.GUI and interactive input methods: the user dialogue, input of graphical data, functions, initial values for input device parameters, interactive picture - construction techniques, virtual reality environments.

Three Dimensional Concepts: Display methods, graphics, Bezier curves and surfaces, B-spline curves and surfaces, Beta-splines. Three dimensional geometric and modeling transformations: translation, rotation, scaling. Three dimensional viewing: viewing pipeline, viewing coordinates, projections, Animation, Illumination and Shading Models.

Text book :

1. Computer Graphics, D. Hearn, M.P. Baker, 2nd edition, Pearson Education,1997.

References Books:

1.Computer Graphics Using Open GL, F.S.Hill: 2nd edition ,Pearson Education, 2001.

2.Principles of Interactive Computer Graphics, W.M.Newman & R.F.Sproul, 2nd Edition, McGraw Hill, 1979.

3.Computer Graphics, Hamington, 2nd edition, (McGraw Hill).2001.

4.http://nptel.iitm.ac.in/syllabus/syllabus.php?subjectId=106102063

CSU805 OPERATION RESEARCH AND MANAGEMENT LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Eight Experiments to be performed on following topics
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. Write a program for implementing Simplex (two phase and dual phase)
2. Write a program to implement Transportation problem
3. Write a program to implement Assignment problem
4. Write a program for Critical path method/ Programme evaluation review technique
5. Write a program to implement Travelling salesman problem
6. Write a program for Investment problem
7. Write a program to study Decision Theory
8. Write a program to implement Three machine sequencing
9. Write a program for Inventory model (deterministic/probabilistic)
10. Write a program to implement Brown's Algorithm

Note: Practical may be performed with any computer programming language, following languages/ packages are suggested MATLAB/C/C++/JAVA.

ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU806 DIGITAL SIGNAL PROCESSING LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Ten Experiments to be performed on following topics.
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. Operation on Sinusoidal Sequence.
2. Operation on DTS.
3. Scaling Operation on DTS.
4. Shifting Operation on DTS.
5. Folding Operation on DTS.
6. Linear Convolution.
7. DFT Computation.
8. Magnitude and Phase Spectrum.
9. Poles and Zero's of Z
10. FFT Computation.

Note:
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU 807 ELECTIVE - II
(A) MODELING AND SIMULATION LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**

Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**

Duration of ESE: 3hrs.

Minimum Ten Experiments to be performed on following topics.
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1) Simulation of dynamics of continuous systems.
2) Simulation of discrete systems.
3) Evaluation of random number generation-rejection method.
4) Monte Carlo simulation.
5) Implementation of stochastic simulation algorithm.
6) Simulation of Queuing System and PERT Network.
7) Simulation of a two server queue.
8) Simulation of Inventory Control & Forecasting.
9) Simulation of Languages and Introduction to GPSS.
10) Evaluation and improvement of variance reduction in Monte-Carlo production simulation

Note:
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU 807 ELECTIVE - II
(B) PARALLEL COMPUTING LAB

Teaching Scheme: 02 P **Total: 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum 8 experiments should be performed
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes. The following programs should be developed in 'C' language preferably on 'UNIX' platform. Programs (3-7) require usage of Parallel Computing APIs.

1. Implement three POSIX Threads (PThreads) simultaneously for updating a text file.
2. Implement synchronizing POSIX Threads (PThreads) using (a) Semaphore (b)Mutex.
3. Implement the PRAM Algorithm for (a) Parallel Reduction (b) Prefix Sums (c) Preorder Tree Traversal.
4. Implement Parallel Matrix Multiplication using (a) Row-Column oriented Algorithm (b) Block-Oriented Algorithm.
5. Implement Solution of Linear Systems using (a) Gaussian Elimination (b) Jacobi Algorithm.
6. Implement (a) Parallel Quick Sort (b) Hyper Quicksort.
7. Implement Parallel Fast Fourier Transform Algorithm.
8. Implementation of Parallel programming paradigm.
9. Implementation of Message Passing.

Note:
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU 807 ELECTIVE - II
(C) ADVANCED DATABASE MANAGEMENT SYSTEM LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Twelve Experiments to be performed from following List of Experiment.
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. Login in to your own accounts2. Execute: select table_name from user_tables; (to list the tables which are in your account).
2. Execute*:* select table_ name from all tables*;* (to list the tables to which you have access to).
3. Display the system date. Note the format in which it is displayed.
4. Display the date in Month/Day/YYYY format.
5. Load the above script (downloaded in 5th task) into your account and execute it.
6. Execute: *select* table_name from user_tables;
7. Enter one complete record into the LOCATION table.
8. Enter another record into the LOCATION table, but the value for one of the fields should be null.
9. Enter a record for three columns into FACULTY table, but this entry should be of the primary key, first and last name.
10. Enter one complete record into the COURSE table.
11. List all the entries of the COURSE table.
12. Commit your entries for the COURSE table.
13. Enter another complete record into the COURSE table.
14. List all the entries of the COURSE table.
15. Roll back your entries for the COURSE table.
16. List all the entries of the COURSE table. Check for the difference in this listing than that of the listing done in 11th task.
17. Load the above script (downloaded in 16th task) into your account and execute it.
18. Execute: select table_name from user_tables*;*

19. List all the information of the student called Tammy Jones.

20. List only those students which are not in senior class (SR) but students from every other class.

21. List student id, student's full name (concatenate first and last name and display heading as STUDENT'S NAME) along with the similar details of advisor. Advisor's first and last name should be concatenated and displayed as ADVISOR'S NAME.

22. List those students whose first name begins with 'J'.

23. List those students whose last name ends with 'N' or the second last letter is 'T' in their last name.

24. List those faculty members who have 'L' as the third last letter in their last name.

25. List the students in order of their zip codes.

26. List only those students who are staying beyond zip code 32500.

27. Count the total number of students who are staying within zip code 32500.

28. List only those students whose birthday falls in the months August or November.

Note:
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU 807 ELECTIVE - II
(D)ARTIFICIAL NEURAL NETWORK LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Twelve Experiments to be performed from following List of Experiment.
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. Regression Analysis
2. The Back Propagation Algorithm
3. Multilayer Perceptions
4. Radial Basis Function Networks
5. Over-learning and Generalization
6. Probabilistic Neural Networks
7. Generalized Regression Neural Networks

Note:

ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.

ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU 807 ELECTIVE - II
(E) BIOINFORMATICS LAB

Teaching Scheme: 02 P **Total 02** **Credit: 01**
Evaluation Scheme: 25 ICA + 25 ESE **Total Marks: 50**
Duration of ESE: 3hrs.

Minimum Twelve Experiments to be performed from following List of Experiment.
The sample list of programs is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. To view and use the various biological databases available on the World Wide Web.
2. Queries based on Biological databases-To retrieve the gene sequence in FASTA format corresponding to Protein IDP00519
3. To retrieve the sequence of the Human keratin protein from UniProt database and to interpret the results.
4. To retrieve the sequence of the Human keratin protein from GenBank database and to interpret the results.
5. To find the similarity between sequences using BLAST(Basic Local Alignment Search Tool)
6. To perform Sequence analysis by using EMBOSS(European Molecular Biology Open Software Suite)
7. To search for a motif in a DNA sequence
8. To predict secondary structure of the give protein sequences

Note:
ICA - Internal Continuous Assessment shall be based on the practical record and knowledge or skills acquired. The performance shall assess experiment wise by using continuous assessment formats, A and B.
ESE - The End Semester Exam for practical shall be based on performance in one of Experiments and may be followed by sample questions.

CSU808 PROJECT PHASE - II

Teaching Scheme : 06 P Total: 06 **Credit: 06**
Evaluation Scheme: 75 ICA + 100 ESE **Total Marks: 175**
Duration of ESE: 3 Hrs.

1. Project work decided in VII semester shall be continued.
2. Students should complete implementation of ideas given in synopsis, so that project work should be completed before end of semester.
3. Students shall submit the final project report in proper format as per guidelines given on the college website which shall include the work of both semesters.
4. For uniform and continuous evaluation, evaluation committee for each group shall be formed by Program Head in which guide must be a member. Internal marks should be awarded by committee at the end of semester based on continuous evaluation.
5. Final examination of project shall include demonstration, presentation of complete work and oral examination based on the project work.

Note:

ICA: The Internal Continuous Assessment shall be based on the active participation of the students in the Project work and knowledge / skill acquired. Oral examination shall be conducted on the Project report, by the panel of examiners consisting of Project Guide, Course Coordinator and Expert appointed by Program Head.

ESE: The End Semester Examination for Project shall consists of Demonstration if any, presentation and oral examinations based on the project report.

CSU809 SELF STUDY-IV

Teaching Scheme: 00 P Total: 00 **Credit: 02**
Evaluation Scheme: 25 TA **Total Marks: 25**

1] Note6: Self study IV is based on one class test each on the basis of 20% curriculum of the courses CSU801,CSU802 ,CSU803,CSU804 declared by respective course coordinator at the beginning of semester.
2] One faculty member shall be appointed as course coordinator for self study IV and his/her teaching work load shall be considered as one hour per week.