LAKIREDDY BALIREDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
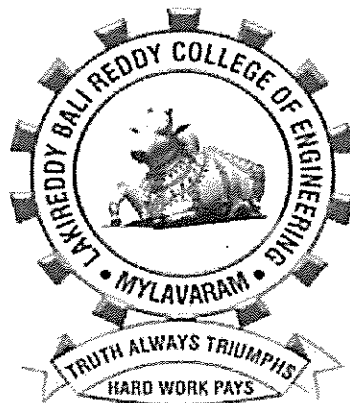
**(Approved by AICTE, Accredited by NBA,
Affiliated to JNTUK, Kakinada and ISO 9001: 2008 Certified)**

ACADEMIC REGULATIONS, COURSE STRUCTURE AND DETAILED SYLLABUS

2010 - 2011

M.TECH – COMPUTER SCIENCE AND ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**L.B.Reddy Nagar, MYLAVARAM – 521 230
Krishna District, Andhra Pradesh State**

M.TECH(CSE) - COURSE STRUCTURE
(Applicable for the batches admitted from 2010-11)

I-SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination				Credits
		Periods per Week			Maximum Marks		Total		
		Lecture	Tutorial	Lab.	Internal	External			
MCS101	Data Structures & Algorithm Analysis	4	--	--	40	60	100		4
MCS102	Database Management Systems	4	--	--	40	60	100		4
MCS103	Computer Organization	4	--	---	40	60	100		4
MCS104	Computer Networks	4	--	--	40	60	100		4
	ELECTIVE- I								
MCS1051	Simulation & Modeling	4	--	--	40	60	100		4
MCS1052	Software Engineering								
MCS1053	Programming Languages								
MCS1054	Software Project Management								
	ELECTIVE- II								
MCS1061	Automata and Compiler Design	4	--	--	40	60	100		4
MCS1062	Digital Image Processing								
MCS1063	Artificial Intelligence								
MCS1064	Computer Graphics								
MCS151	Data Structures & Algorithm Analysis Lab.	--	--	3	40	60	100		2
MCS152	Database Management Systems Lab	--	--	3	40	60	100		2
MCS153	Seminar	--	--	3	50	--	50		2
TOTAL		**24**	**--**	**9**	**370**	**480**	**850**		**30**

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

II-SEMESTER

Code No.	Name of the Course	Scheme of Instruction Periods per Week			Scheme of Examination Maximum Marks			Credits
		Lecture	Tutorial	Lab	Internal	External	Total	
MCS201	Web Technologies	4	--	--	40	60	100	4
MCS202	Object Oriented Software Engineering	4	--	---	40	60	100	4
MCS203	Discrete Mathematical Structures	4	---	---	40	60	100	4
MCS204	Operating Systems	4	--	--	40	60	100	4
	ELECTIVE - III							
MCS2051	Business Intelligence	4	--	--	40	60	100	4
MCS2052	Network Security							
MCS2053	Distributed Computing							
MCS2054	Advanced Computer Architecture							
	ELECTIVE - IV							
MCS2061	Cloud Computing	4	--	--	40	60	100	4
MCS2062	Wireless Sensor Networks							
MCS2063	E-Commerce							
MCS2064	Mobile Computing							
MCS251	Web Technologies Lab	--	--	3	40	60	100	2
MCS252	Object Oriented Software Engineering Lab	--	--	3	40	60	100	2
MCS253	Term Paper			3	50	--	50	2
TOTAL		**24**	--	**9**	**370**	**480**	**850**	**30**

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

M.TECH (COMPUTER SCIENCE AND ENGINEERING), A.Y.2010-2011

III SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Periods per Week			Maximum Marks		Total	credits
		Lecture	Tutorial	Lab	Internal	External		
MCS351	Technical Seminar	--	--	--	100	--	100	8

IV SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Periods per Week			Maximum Marks		Total	credits
		Lecture	Tutorial	Lab	Internal	External		
MCS451	DISSERTATION	--	--	--	50	150	200	20

TOTAL CREDITS : 88

I Semester	: 30	III Semester	: 08
II Semester	: 30	IV Semester	: 20

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

I SEMESTER

MCS101: DATA STRUCTURES AND ALGORITHMS ANALYSIS

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Algorithm Analysis: Mathematical Background, Model, Analysis and Run Time Calculations, **The List ADT:** Singly Linked, Doubly Linked, Circular Linked List. **Stacks ADT:** The Stack ADT and applications; Infix to postfix expression conversion, Evaluation of Postfix expressions. **Queue ADT:** The Queue ADT and Applications.

UNIT – II

Internal Sorting: Insertion Sort, Shell Sort, Heap Sort, Merge Sort, Quick Sort, Bucket Sort. **External Sorting:** Multiway Merge, Polyphase Merge. **Hashing:** Hash Function, Separate Chaining, Open Addressing, Rehashing, and Extendible Hashing.

UNIT – III

Binary Trees: Implementation, Expression Tress. **Search Trees:** Binary Search Trees, Implementation. **AVL Trees:** Single Rotations, Double Rotations. **Splay Trees:** Splaying, **B-Trees**. **Graph Algorithms:** Topological Sort, Breadth First Search, Depth First search, Biconnected Components

UNIT – IV

Algorithms Design Techniques: **Divide and Conquer Technique:** General Method, Strassen's Matrix Multiplication. **Greedy Method**: General Method, Knapsack Problem, Job sequencing with deadlines, Minimum cost spanning trees-Kruskal's algorithm, Single source shortest paths- Dijkstras Algorithm.

UNIT – V

Dynamic Programming Method - General method, All pairs shortest path problem, Optimal Binary Search Trees, 0/1 Knapsack problem, Traveling salesman problem, **Back tracking Method** - General Method, 8-Queens Problem, Sum of subsets, Graph coloring, Hamiltonian cycle, **Branch and Bound Method** - General Method, 0/1 Knapsack problem, Traveling salesperson.

TEXT BOOKS

1. Mark Allen Weiss: "Data Structures and Algorithm Analysis in C", 2nd edition, Addison Wesley.
2. Ellis Horowitz, Sartaj Sahni, S. Rajasekaran "Fundamentals of Computer Algorithms", Second editon, University Press.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

REFERENCES

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001
2. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.
3. Langson, Augenstein & Tenenbaum, 'Data Structures using C and C++', 2nd edition, PHI.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS102: DATABASE MANAGEMENT SYSTEMS

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT – I

Databases and Database users: Characteristics, Actors, Advantages, implications. **Database systems concepts and Architecture**: Data Models, Schemas and Instances, DBMS Architecture and Data Independence, Languages and Interfaces, Environment, Classification. **Data modeling using the Entity-Relationship model**.

UNIT – II

Enhanced Entity-Relationship and Object Modeling: Subclasses, Superclasses and Inheritance, Specialization and Generalization, Constraints and characteristics, Modeling of UNION TYPE, Conceptual Object Modeling Using UML Class Diagrams, Relationships of Degree higher than Two, Data Abstraction and Knowledge Representation. **Record storage and Primary File Organization:** Secondary storage devices, RAID technology, Buffering of Blocks, Placing File Records on Disk, Operations on Files, Heap Files, Sorted Files, **Index Structures for Files:** Single Level, Multi Level, B and B$^+$- Trees, Indexes on Multiple Keys.

UNIT – III

The Relational Data Model, Relational constraints, and the Relational Algebra: Update Operations and Dealing with constraint violations, Basic and Additional Relational Algebra operations. **SQL-The Relational Database Standard**: Queries in SQL, Insert, delete and Update statements, Views, Specifying General Constraints as Assertion. Additional Features.

UNIT – IV

ER and EER – to – Relational Mapping and other Relational Languages: Relational Database Design Using ER-to-Relational Mapping, Mapping EER Model concepts to Relations, Domain and Tuple Relational Calculus. **Functional Dependencies and Normalizations for Relational Databases**: Design Guidelines, Functional Dependencies, normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce-codd Normal Form. **Relational Database Design Algorithms and Further Dependencies**.

UNIT – V

Transactions Processing Concepts: Introduction, Transaction and system concepts, Desirable properties of Transactions, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL. **Concurrency Control Techniques**: Locking Techniques, Time Stand Ordering, Multiversion Techniques, Validation Techniques, Granularity and Multiple Granularity Locking, Using Locks, Other Concurrency control Issues.
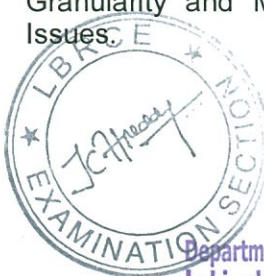
HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOK

Elmasri and Navathe, 'Fundamentals of Database Systems', 5th edition, Addison Wesley, Pearson Education,Inc.2000.

REFERENCES

1. Bipin C.Desai, 'An Introduction to Database Systems', West Publishing Company,2000.
2. CJ Date, 'An Introduction to Database Systems', 6th Edition, Addison Wesley Longman Inc-1999.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS103: COMPUTER ORGANIZATION

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

REGISTER TRANSFER & MICRO-OPERATIONS: Register Transfer Language, Register Transfer, Bus & memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

UNIT – II

BASIC COMPUTER ORGANIZATION AND DESIGN: Introduction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction cycle, Memory-Reference Instruct ion, Input-Output and Interrupt, Design of Basic Computer, Design of Accumulator Logic. **MICRO PROGRAMMED CONTROL:** Control Memory, Address Sequencing, Micro-Program example, Design of Control Unit.

UNIT – III

CENTRAL PROCESSING UNIT: General registers Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer (RISC). **COMPUTER ARITHMETIC:** Addition and Subtraction, Multiplication Algorithms, Division Algorithms Floating-point Arithmetic operations.

UNIT – IV

MEMORY ORGANIZATION: Memory Hierarchy, Main Memory, Auxiliary memory, Associative Men Cache Memory, Virtual Memory, Memory Management hardware.

UNIT – V

INPUT-OUTPUT ORGANISATION: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), Input-Output Processor, Serial Communication.

TEXT BOOK

Morris M. Mano, 'Computer Systems Architecture', 3rd Edition

REFERENCES

1.   John P Hayes, 'Computer Architecture and Organisation' 2nd edition.
2.   V.Carl Hamacher et.al, 'Computer Organization' 2nd edition.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS104: COMPUTER NETWORKS

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Introduction: Use of Computer Networks- Network Hardware- Network software-Reference models- Example Networks- Network Standardization. **Physical Layer**: The theoretical basis for Data communication- Guided Transmission Media.

UNIT - II

Data link layer: DLL design issues- Elementary data link protocols- sliding window protocols. **Medium Access Control Sublayer**: Channel allocation problem- multiple access protocols- Ethernet- Data link layer switching.

UNIT - III

Network layer: Network layer design issues- Routing algorithms- congestion control algorithms-Quality of service- Internetworking- network layer in the Internet.

UNIT - IV
Transport layer: Transport service- Elements of transport protocols- Internet transport protocols: TCP & UDP.

UNIT – V

Application Layer: Domain Name System- Electronic Mail -the World Wide Web.

TEXT BOOK

Andrews S. Tanenbaum; "Computer Networks"; Fourth Edition, PHI.

REFERENCES

1. William Stallings; "Data and Computer Communications"; seventh Edition,Pearson Education.
2. Behrouz A .Fourouzan; "TCP/IP Protocol Suite"; Fourth Edition, Tata McGraw-Hill.
3. James F.Kurose, Keith W.ROSS; "Computer Networking A Top-Down Approach featuring the Internet"; Pearson Education.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1051 : SIMULATION AND MODELLING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction to Simulation: Areas of Application, Systems and system Environment, Components of a System, Discrete and continuous systems, Types of Models. **General Principles**: Concepts in Discrete-Event Simulation, List Processing.

UNIT - II

Statistical Models in Simulation: Review of Technology and concepts, Useful Statistical Models, Discrete Distributions, Continuous Distributions, Poisson Process, Empirical Distributions. **Queuing Models**: Characteristics and notation, Transient and study state behavior of Queues, Long Run Measures of Performance of Queuing Systems, Study state behavior of Infinite population Markovian Models.

UNIT - III

Random Number Generation: Properties of Random Numbers, Generation of Pseudo-Random Numbers, Techniques for generating random numbers, Tests for Random Numbers. **Random Variate Generation**: Inverse transform technique, Direct Transformation for the Normal Distribution, Convolution Method, Acceptance-Rejection Technique.

UNIT – IV

Input Modeling: Data Modeling, Identifying the Distribution with Data, Parameter Estimation, Goodness-of-Fit Tests, Selecting Input models without Data, Multivariate and Time series Input Models. **Verification and Validation of Simulation Models**: Model Building, verification and validation, verification of simulation models, calibration and validation of Models

UNIT - V

Output Analysis for a Single Model: Stochastic Nature of Output Data, Types of Simulations with Respect to output Analysis, Measure of Performance and their Estimation, Output Analysis for Terminating Simulations, Output Analysis for Steady-state Simulations. **Comparisons and Evaluation of Alternative System Design**: Comparison of Two system designs, comparison of several system designs, Statistical Models for Estimating the Effect if Design Alternatives, Meta Modeling.

TEXT BOOK

Jerry Banks, John S.Carson, II and Barry L. Nelson; "Discrete - Event System Simulation"; 2nd Edition, PHI.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1052: SOFTWARE ENGINEERING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT – I

Software Engineering: Role of Software, Changing Nature of Software, Legacy Software, Software Myths. **A Generic View of Process:** Software Engineering - A Layered Technology, A Process Framework, The CMMI, Process Patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process. **Process Models:** Prescriptive Models, The Waterfall Model, Incremental Process Models, Evolutionary Models, Specialized Process Models. **An Agile View of Process:** What Is Agility? , Agile Process , Agile Process Models.

UNIT – II

Software Engineering Practice: Software Engineering Practice, Communication, Planning, Modeling Practices, Construction Practice, Deployment. **Requirements Engineering:** A Bridge To Design and Construction, Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Negotiating Requirements, Validating Requirements.

UNIT – III

Building The Analysis Model: Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Flow-Oriented Modeling, Creating a Behavioral Model. **Design Engineering:** Design within the Context of Software Engineering, Design Process and Design Quality, Design Concepts, The Design Model, Pattern-Based Software Design.

UNIT – IV

Creating An Architectural & Component Level Design: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs, Mapping Data Flow into Software Architecture. Component, Designing Conventional Components. **Performing User Interface Design:** The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

UNIT - V

Testing Strategies: A Strategic Approach to Software Testing, Strategic Issues, Test Strategies include Conventional Software, Test Strategies for Object-Oriented Software, validation testing, system testing, Art of Debugging. **Testing Tactics:** Software Testing Fundamentals, Black-Box and White-Box Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black- Box Testing, Object-Oriented Testing Methods, Testing Methods Applicable at the Class Level, Interclass Test Case Design, Testing for Specialized Environments, Architectures, and Applications, Testing Patterns. **Product Metrics:** Software Quality, A Framework for Product Metrics, Metrics for the Analysis Model, Metrics for the Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOK

1. Roger S.Pressman, 'Software Engineering- A Practitioner's Approach', Sixth Edition, McGraw-Hill International.
2. Ian Sommerville, 'Software Engineering', Sixth Edition, Pearson Education

REFERENCES

1. Ian Sommerville, 'Software Engineering', Sixth Edition, Pearson Education.
2. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, 'Fundamentals of Software Engineering', Second Edition, PHI.
3. RajibMall, 'Fundamentals of Software Engineering', Second Edition, PHI.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1053: PROGRAMMING LANGUAGES

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments.

UNIT – II

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT – III

Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. **Abstract Data types:** Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95

UNIT - IV

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT – V

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines. **Concurrency:** Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOKS

1.   Concepts of Programming Languages Robert .W. Sebesta 6/e, Pearson Education.
2.   2.. Programming Languages –Louden, Second Edition, Thomson.

REFERENCES

1.   Programming languages –Ghezzi, 3/e, John Wiley
2.   Programming Languages Design and Implementation–Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education
3.   Programming languages –Watt, Wiley Dreamtech

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1054: SOFTWARE PROJECT MANAGEMENT

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT – I

Introduction to Software Project Management, **An Overview of Project Planning**: Select Project, Identifying Project scope and objectives, infrastructure, project products and characteristics. Estimate efforts, Identify activity risks, Allocate resources.

UNIT – II

Project Evaluation: Stratagic Assessment, Technical Assessment, cost-benefit analysis, cash flow forecasting, cost-benefit evaluation techniques, Risk Evaluation. **Selection of Appropriate Project approach**: Choosing technologies, choice of process models, structured methods.

UNIT – III

Software Effort Estimation: Problems with over and under estimations, Basis of software estimation, Software estimation techniques, expert Judgment, Estimating by analogy. **Activity Planning**: Project schedules, projects and activities, sequencing and scheduling activities, networks planning models, formulating a network model.

UNIT – IV

Risk Management: Nature of Risk, Managing Risk, Risk Identification and Analysis, Reducing the Risk. **Resource Allocation**: Scheduling resources, Critical Paths, Cost scheduling.

UNIT – V

Monitoring and Control: Crating Frame work, cost monitoring, prioritizing monitoring. **Software Quality**: defining software quality, ISO9126, External Standards.

TEXT BOOK

Bob Hughes & Mike Cotterell, 'Software Project Management', Tata McGraw-Hill Pubs, Fourth Edition.

REFERENCES

1. Richard H.Thater; "Software Engineering Project Management": IEEE Computer Society
2. S.A. Kelkar; "Software Project Management"; PHI.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1061: AUTOMATA AND COMPILER DESIGN

Lecture	: 4 Periods/week		**Internal Marks**	: 40
Tutorial			**External Marks**	: 60
Credits	: 4		**External Examination**	: 3 Hrs

UNIT – I

Formal Language and Regular Expressions: Languages, Definition Languages, regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA.
Overview of Compilation: Phases of Compilation – Lexical Analysis, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator

UNIT – II

Context Free grammars: Context free grammars, derivation, parse trees, ambiguity grammars
Top down Parsing : Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT – III

Bottom up parsing : Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC – automatic parser generator .

UNIT – IV

Semantic analysis: Syntax directed translation, S-attributed and L-attributed grammars, Type checker. Intermediate code – abstract syntax tree, polish notation and three address codes , translation of simple statements and control flow statements
Run time storage : Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

UNIT – V

Code optimization : Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.
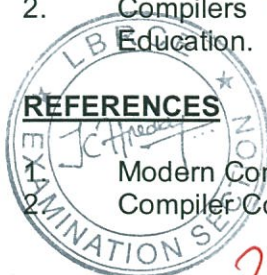Code generation : Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

TEXT BOOKS

1.   Introduction to Theory of computation.Sipser,2nd Edition,Thomson.
2.   Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

REFERENCES

1.   Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2.   Compiler Construction, LOUDEN, Thomson.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1062: DIGITAL IMAGE PROCESSING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT – I

Introduction: Digital Image Processing, Fundamental steps in Digital Image Processing, Components of an Image Processing System. **Digital Image Fundamentals:** Visual Perception, Image sensing & Acquisition, Image Sampling & Quantization, Some Basic Relationships between Pixels.

UNIT – II

Image Enhancement in the Spatial Domain: Some basic Gray level Transformations, Histogram Processing, Enhancement using Arithmetic/Logic Operations, Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters, Combining Spatial Enhancement methods.

UNIT – III

Image Enhancement in the Frequency Domain: Fourier Transform and the Frequency Domain, Smoothing Frequency-Domain Filters, Sharpening Frequency Domain Filters, Homomorphism Filtering, Implementation.

UNIT – IV

Image Restoration: Image Degradation/Restoration Process, Linear, Position-Invariant Degradations, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filtering. **Wavelets and MultiResolution Processing** : MultiResolution Expansions, Wavelet Transforms in One dimension, The Fast Wavelet Transform, Wavelet Transforms in Two Dimensions.

UNIT – V

Image Compression: Image Compression Models, Error-Free Compression, Lossy Compression, Image Compression Standards. **Image Segmentation:** Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation.

TEXT BOOK

Rafael C.Gonzalez, Richard E. Woods; "Digital Image Processing ' Addison Wesley Pubs(Second Edition).

REFERENCES

1. Milan Sonka, Vaclav Hlavac, Roger Boyle Image Processing. Analysis, and Machine Vision(Second Edition).
2. A.K.Jain, 'Fundamentals of Digital Image Processing' PHI.
3. Philips, 'Image Processing in C',BPB Publications.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1063: ARTIFICIAL INTELLIGENCE

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT – I

INTRODUCTION: Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.

UNIT – II

SEARCHING TECHNIQUES: Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT – III

KNOWLEDGE REPRESENTATION: First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

UNIT – IV

LEARNING: Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

UNIT - V

APPLICATIONS : Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

TEXT BOOK

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.
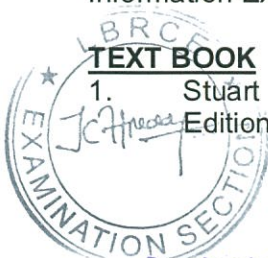
HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna Dist. - 521 230

REFERENCES

1.   Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2.   Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3.   George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS1064: COMPUTER GRAPHICS

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT – I

Introduction: Usage of Graphics and their applications, Presentation Graphics-Computer Aided Design- Computer Art- Entertainment- Education and Training-Visualization- Image Processing- Graphical User Interfaces. **Over view of Graphics systems**: Video Display Devices- Raster Scan systems-random scan systems-Graphics monitors and workstations-Input devices-hard copy devices-Graphics software. **Output primitives**: Points and Lines-Line Drawing Algorithms- Loading the Frame buffer- Line function- Circle- Generating Algorithms- Ellipse Generating Algorithms-Other Curves- Parallel Curve Algorithms-Curve Functions-Pixel Addressing- Filled Area Primitives-Filled Area Functions- Cell Array-Character Generation. **Attributes of Output Primitives**: Line and Curve Attributes-Color and Gray scale levels- Area Fill Attributes- Character Attributes-Bundled Attributes- Inquiry Functions-Antialiasing.

UNIT – II

Two Dimensional Geometric Transformations: Basic Transformations- Matrix Representations-Homogeneous Coordinates-Composite Transformations-Other Transformations-Transformations between Coordinate Systems- Affine Transformations-Transformation Functions- Raster methods for Transformations.

UNIT – III

Two Dimensional Viewing: The viewing Pipeline-Viewing Coordinate Reference Frame-Window-to-Viewport Coordinate Transformation-Two Dimensional Viewing Functions-Clipping Operations-Point Clipping-Line Clipping-Polygon Clipping-Curve Clipping- Text and Exterior Clipping. **Structure and Hierarchical Modeling:** Concepts of Structures and Basic models-Editing - Hierarchical Modeling with Structures-GUI and Interactive Input Methods-Windows and Icons- Virtual Reality Environments.

UNIT – IV

Three Dimensional Concepts and Object representations: 3D display methods-3DGraphics-Polygon Surfaces- Curved Lines and Surfaces- Quadratic Surfaces-Super Quadrics-Blobby Objects-Spline Representations- Cubic Spline methods-Bézier Curves and Surfaces- B Spline Curves and Surfaces.

UNIT – V

Three Dimensional Geometric and Modeling Transformations: Translation-Rotation-scaling-Other Transformations-Composite Transformations-3D Transformation Functions-Modeling and Coordinate Transformations. **Three Dimensional Viewing:** Viewing Pipeline-Viewing Coordinates- Projections-View Volumes- General Projection Transformations-Clipping-Hardware Implementations- Three Dimensional Viewing.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOK

1. Donald Hearn & M. Pauline Baker, "Computer Graphics C Version", Pearson Education, New Delhi, 2004 (Chapters 1 to 12 except 10-9 to 10-22 of the <u>TEXT BOOK</u>)

REFERENCES

1. David F. Rogers; "Procedural Elements for Computer Graphics"; TMH
2. J. D. Foley, S. K Feiner, A Van Dam F. H John; "Computer Graphics: Principles & Practice in C"; Pearson
3. Franscis S Hill Jr; "Computer Graphics using Open GL"; Pearson Education, 2004.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS151 : DATA STRUCTURES AND ALGORITHMS LAB

Lecture	: 3 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 2	**External Examination**	: 3 Hrs

1. Write an interactive C program to create a linear linked list of customer names and their telephone numbers. The program should be menu-driven and include features for adding a new customer, deleting an existing customer and for displaying the list of all customers.

2. Write a C program to merge two circular linked lists.

3. Write a C program to create a circular linked list so that the input order of data items is maintained. Add the following functions to carry out the following operations on circular linked lists. a. Count the number of nodes. Write a C program to implement Polynomial ADT.

4. Write a C program that will remove a specified node from a given doubly linked list and insert it at the end of the list. Also write a function to display the contents of the list.

5. Write a C program to implement a queue in which insertions, deletions and display can be performed.

6. Write a program for evaluating post fixed expressions using array and linked list implementation of list ADT

7. Write a C program to construct a binary tree and do inorder, preorder and postorder traversals, printing the sequence of vertices visited in each case.

8. Sort a sequence of n integers using Quick sort technique and then search for a key in the sorted array using Binary search technique.

9. Write a C Program for Checking balanced parenthesis using array implementation of stack ADT

10. Write a program for Checking balanced paranthesis using linked list implementation of Stack ADT

11. Write a C program to Search tree ADT-Binary search ADT

12. Write a C program to Heap sort

13. Write a C program to Quick sort

14. Write a C Program to implement Merge Sort

15. Write a C Program to implement Shell Sort

16. Write a C Program to implement Multiway Merge Sort

17. Write a C Program to implement Poly Phase Merge Merge Sort

18. Write a C Program to implement hashing methods
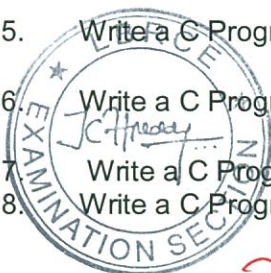
HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS152 : DATA BASE MANAGEMENT SYSTEMS LAB

Lecture	: 3 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 2	**External Examination**	: 3 Hrs

----

1. Draw an ER diagram to capture the requirements as stated below: A database is needed to capture information pertaining to the running of various clubs by the recreation cell of an institution. Details such as name, date of birth, gender are needed for each member. Club details are needed such as the activity type (oratorical, music, dance, instrumental music etc) and contact phone number.
Team details required to include team name and the days on which the team practices. Tutor details such as tutor name, address and telephone number are also needed, along with details of the skill each tutor is qualified in. Rules governing the involvement of members and tutors in the teams and clubs are as follows:
Members may head only one team and every team has to have a head. Tutors teach at least one team and every team has at least one tutor.
Every member must belong to at least one team and each team has a number of members. Every team must belong to a club and clubs must have at least one team. Every club has a member who is the president but a member may only be president of one club.
Draw the ER Diagram for the above requirement. Map the ER diagram to the Relational Model. Create tables identified and insert five tuples in each of the tables created. The students are required to carefully take care of the constraints on each of the table.

2. Consider the following three tables – SAILORS, RESERVES and BOATS having the following attributes SAILORS (Salid, Salname, Rating, Age) RESERVES (Salid, Boatid, Day) BOATS (Boatid, Boat-name, Color) Use the above schema and solve the queries using SQL
   i) Find the name of sailors who reserved green boat.
   ii) Find the colors of boats reserved by "Ramesh"
   iii) Find the names of sailors who have reserved a red or green boat.
   iv) Find the Sailid's of sailors with age over 20 who have not registered a red boat.

3. Consider the following relational database schema:
STUDENT (Student_id, Sname, Major, GPA) FACULTY (Faculty_id, fname, dept, designation, salary) COURSE (Course_id, Cname, Faculty_id) ENROL (Course_id, Student_id, grade) Use the above schema and solve the queries using SQL
   i) List the names of all students enrolled for the courses "CS-53"
   ii) List the names of students enrolled for the courses "CS-53" and have received "A" grade.
   iii) List all the departments having an average salary of above Rs20,000.
   iv) Give a 15% raise to salary of all faculty.
   v) List the names of all faculty members beginning with "R" and ending with letter "U".
Regulations and Syllabi for DipIETE (CS) Examination 61

4. Write the SQL commands to create a database schema for the following relational schema:

    CUSTOMER (CUST_ID, CUST_NAME, ANNUAL_REVENUE, CUST_TYPE) CUST_ID must be between 100 and 10,000 ANNUAL_REVENUE defaults to $20,000 CUST_TYPE must be manufacturer, wholesaler, or retailer SHIPMENT (SHIPMENT_#, CUST_ID, WEIGHT, TRUCK_#, DESTINATION, SHIP_DATE) Foreign Key: CUST_ID REFERENCES CUSTOMER, on deletion cascade Foreign Key: TRUCK_# REFERENCES TRUCK, on deletion set to null Foreign Key: DESTINATION REFERENCES CITY, on deletion set to null WEIGHT must be under 1000 and defaults to 10 TRUCK (TRUCK_#, DRIVER_NAME) CITY (CITY_NAME, POPULATION) Perform the following queries:
    a) What are the names of customers who have sent packages (shipments) to Sioux City?
    b) What are the names and populations of cities that have received shipments weighing over 100 pounds?
    c) List the cities that have received shipments from customers having over $15 million in annual revenue.

5. Consider the following schema for the COMPANY relational database Schema.

    Perform the following queries:
    a) For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.
    b) For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
    c) Make a list of all project numbers for projects that involve an employee whose last name is 'Smith' as a worker or as a manager of the department that controls the project.

    Regulations and Syllabi for DiplETE (CS) Examination 62
    d) Retrieve all employees in department '3' whose salary is between 10,000 and 20,000

6. Consider the Insurance database given below. The primary keys are underlined and the datatypes are specified.

    PERSON (driver – id #: String, name: string, address: strong) CAR (Regno: string, model: string, year: int) ACCIDENT (report-number: int, date: date, location: string) OWNS (driver-id #:string, Regno:string) PARTICIPATED (driver-id: string, Regno:string, report-number:int, damage amount:int)
    a) Create the above tables by properly specifying the primary keys and the foreign keys.
    b) Enter atleast five tuples for each relation.
    c) Demonstrate how you I. Update the damage amount for the car with a specific Regno in the accident with report number 12 to 25000.
    II. Add a new accident to the database.

    d) Generation of suitable reports.

7. Consider the following relations for an order processing database application in a company.

    CUSTOMER (cust #: int, cname: string, city: string) ORDER (order #: int, odate: date, cust #: int, ord-Amt: int) ORDER – ITEM (order #: int, Item #: int, qty: int) ITEM (item #: int, unit price: int) SHIPMENT (order #: int, warehouse#: int, ship-date: date)

WAREHOUSE (warehouse #: int, city: string)
a) Create the above tables by properly specifying the primary keys and the foreign keys.
b) Enter atleast five tuples for each relation.
c) Produce a listing: CUSTNAME, #oforders, AVG_ORDER_AMT, where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.
d) List the order# for orders that were shipped from all the warehouses that the company has in specific city.
e) Generation of suitable reports.

8. Consider the following database of student enrollment in courses and books adopted for each course:
STUDENT (regno: string, name: string, major: string, bdate:date) COURSE (course #:int, cname:string, dept:string) ENROLL (regno:string, course#:int, sem:int, marks:int) BOOK_ADOPTION (course# :int, sem:int, book-ISBN:int) TEXT (book-ISBN:int, book-title:string, publisher:string, author:string)
a) Create the above tables by properly specifying the primary keys and the foreign keys.
b) Enter atleast five tuples for each relation.
c) Produce a list of TEXT BOOKS (include Course #, Book-ISBN, Book-title) in the alphabetical order for course offered by the 'CS' department that use more than two books.
d) List any department that has all its adopted books published by a specific publisher.
e) Generation of suitable reports.

Regulations and Syllabi for DipIETE (CS) Examination 63

9. The following tables are maintained by a book dealer:
AUTHOR (author-id:int, name:string, city:string, country:string) PUBLISHER (publisher-id:int, name:string, city:string, country:string) CATALOG(book-id:int, title:string, author-id:int, publisher-id:int, category-id:int, year:int, price:int) ORDER-DETAILS (order-no:int, book-id:int, quantity:int)
a) Create the above tables by properly specifying the primary keys and the foreign keys.
b) Enter atleast five tuples for each relation.
c) Demonstrate how you increase the price of books published by a specific publisher by 10%.
d) Generation of suitable reports.

10. Consider the following database for a banking enterprise:
BRANCH(branch-name:string, branch-city:string, assets:real) ACCOUNT(accno:int, branch-name:string, balance:real) DEPOSITOR(customer-name:string, accno:int) COUSTOMER(customer-name:string, customer-street:string, customer-city:string) LOAN(loan-number:int, branch-name:string, amount:real) BORROWER(customer-name:string, loan-number:int)
a) Create the above tables by properly specifying the primary keys and the foreign keys.
b) Enter atleast five tuples for each relation
c) Find all the customers who have atleast two accounts at the Main branch.
d) Find all the customers who have an account at all the branches located in a specific city.
e) Generation of suitable reports.
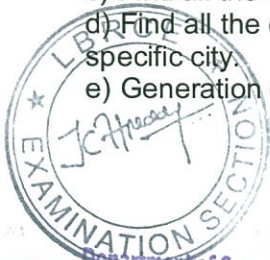
II SEMESTER

MCS201: WEB TECHNOLOGIES

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction to Java, Classes: Declaring Objects, methods, Constructors, This keyword. **Inheritance:** Types of Inheritance, using Super, Multi level Hierarchy, Method Overriding, Dynamic Method Dispatch. **Packages & Interfaces:** Access Protection, importing Packages

UNIT - II

Exception handling: Types of Exception, Uncaught Exception, Try and catch, Throw, Finally. **Multithreaded Programming:** creating Thread, Thread Priorities, Synchronizing threads, Inter Thread Communication. **Event handling Applets**: The Applet class, Applet Architecture, Skeleton, Display Methods, Parameter Passing to Applets,

UNIT - III

Event Handling: Two Event Handling Mechanisms, The Delegation Event Model, Event Classes, Sources of Events, Event Listener Interfaces, Suing the Delegation Event Model. **AWT:** AWT Classes, Window, working with Frame Windows, Working with Graphics, Color, Using AWT Controls, Layout Managers and menus.

UNIT – IV

Swing: JApplet, Icons and Labels, Text Fields, Buttons, Combo Boxes, Tabbed Panes, Scroll Panes, Trees, Tables, Exploring swing. **Java Beans**: Advantages, Bean Development Kit, JAR Files, Introspection, Bound Properties, Constrained Properties, persistence, Customizers, Java Beans API.

UNIT - V

J2EE Databases: J2EE Database Concepts, JDBC Objects, JDBC and Embedded SQL. **Java RMI:** Remote Method Invocation Concept, Server Side, Client Side. **Java Servlets**: Java Servlets and Common Gateway Interface programming, Anatomy of Java Servlet, Reading Data and HTTP Request headers, Sending Data and HTTP Response Header, Working With Cookies. **Java Server Pages**: JSP Installation, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects.

TEXT BOOKS

1.   Herbert Schildt, 'The Complete Reference Java2',5th Edition TMH
      (for Units-I and II)
2.   Jim Keogh, 'The Complete Reference J2EE'; TMH (for Units-III,IV and V)

REFERENCES

1.   Deitel & Deitel 'JAVA – How to program' 6th Edition - PHI

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS202: OBJECT ORIENTED SOFTWARE ENGINEERING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction to Classical software Engineering: Historical, Economic and Maintenance aspects. **Introduction to OO Paradigm:** Different phases in structured paradigm and OO Paradigm. Software Process and different life cycle models and corresponding strengths and weaknesses.

UNIT - II

Planning and Estimation: Estimation of Duration and Cost , COCOMO components of software. Project Management plan, one case Study. **Tools for step wised refinement** : Cost - Benefit analysis, Introduction to software metrics and CASE tools. Taxonomy and scope of CASE tools. Introduction to testing with focus on Utility, Reliability, Robustness, Performance, Correctness.

UNIT - III

Modules to objects: Cohesion and Coupling, Data Encapsulation and Information hiding aspects of Objects. Inheritance, polymorphism and Dynamic Binding aspects. Cohesion and coupling of objects. Reusability, Portability and Interoperability aspects.

UNIT – IV

Requirement phase: Rapid Prototyping method, Specification phase , Specification Document, Formal methods of developing specification document, Examples of other semi - formal methods of using Finite-State- Machines, Petri nets **Analysis phase**: Use case Modeling, Class Modeling , Dynamic Modeling, Testing during OO Analysis **Design phase:** Data oriented design, Object Oriented design, Formal techniques for detailed design. One case study. Challenges in design phase.

UNIT - V

IIM Phases: Implementation, Integration and maintenance phases, OOSE aspects in these phases

TEXT BOOKS

1. Object oriented and Classical Software Engineering, 7/e, Stephen R. Schach, TMH
2. Object oriented and classical software Engineering, Timothy Lethbridge, Robert Laganiere, TMH

REFERENCES

1. Component-based software engineering: 7th international symposium, CBSE 2004, Ivica Crnkovic,Springer

HEAD
Department of Computer Science and Engineering

MCS203: DISCRETE MATHEMATICAL STRUCTURES

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Foundations: Proof & Problem Solving, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First Order Logic & Other methods of proof, Rules of Inference and quantified propositions.

UNIT - II

Mathematical Induction, Elementary Combinations, Basics of counting, Combinations and permutations with & without repetitions.

UNIT - III

Recurrence relations, Generations Functions, Recurrence relations, Solving recurrence relations, the methods of characteristics roots.

UNIT – IV

Graphs, Relations & Digraphs, Relations & Directed graphs, Equivalence relations, Ordering relations, Lattices & enumerations, Operations on Relations, Paths & Closures, Directed graphs & Adjacency matrices.

UNIT – V

Graphs: Basic Concepts, Isomorphism's and sub Graphs, Trees and their properties, Spanning Tress, Planar Graphs, Euler's Formula, Multi Graphs and Euler Circuits, Hamiltonian Graphs.

TEXT BOOK

Joe L.Mott, Abrabam Kandel & Theodore P.Bakev, 'Discrete Mathematics for Computer Scientists & Mathematicians' PHI.

REFERENCES

1.   C.L.Liu, 'Elements of Discrete Mathematics'
2.   Rosen, 'Discrete Mathematics'

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS204: OPERATING SYSTEMS

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, **Operating-System Structures-** Operating-System Services, User Operating-System Interface, System Calls , Types of System Calls, System Programs , Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation, System Boot.

UNIT - II

Process-Concept-Process Scheduling, Operations on Processes, Inter Process Communication, Examples of IPC Systems, Communication in Client-Server Systems **Multithreaded Programming-** Multithreading Models, Thread Libraries. **Process Scheduling-**Scheduling Criteria, Scheduling Algorithms.

UNIT - III

Synchronization-The Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Atomic Transactions. **Deadlocks-** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention. Deadlock Avoidance, Deadlock Detection. Recovery from Deadlock.

UNIT - IV

Memory Management Strategies- Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation. **Virtual Memory Management-** Demand Paging, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory, **File-System -** The Concept of a File, Access Methods, Directory Structure, File-System Mounting, File Sharing, Protection. **File System Implementation-**File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management

UNIT - V

I/O Management: I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, and Performance. **Disk Management:** Disk Structure, Disk Scheduling, Disk Reliability, Disk Formatting, Boot Block, Bad blocks. **Protection & Security:** Goals of Protection, Domain of Protection, Access Matrix, Security problem, Authentication, One time password, Program Threats, System Threats, Threat Monitoring, Encryption.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOK

1.   Silberschatz & Galvin, 'Operating System Concepts', 7th edition, Wiley.

REFERENCES

1.   William Stallings-"Operating Systems"- 5th Edition - PHI
2.   Charles Crowley, 'Operating Systems : A Design-Oriented Approach', Tata McGraw Hill Co.,1998 edition.
3.   Andrew S.Tanenbaum, 'Modern Operating Systems', 2nd edition,1995, PHI.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2051: BUSINESS INTELLIGENCE

Lecture	: 4 Periods/week		**Internal Marks**	: 40
Tutorial			**External Marks**	: 60
Credits	: 4		**External Examination**	: 3 Hrs

UNIT – I

Introduction to Business Intelligence:
Introduction to OLTP and OLAP, BI Definitions & Concepts, Business Applications of BI, BI Framework, Role of Data Warehousing in BI, BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities

UNIT – II

Basics of Data Integration (Extraction Transformation Loading), Concepts of data integration need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL using SSIS, Introduction to data quality, data profiling concepts and applications.

UNIT – III

Introduction to Multi-Dimensional Data Modeling:
Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using SSAS

UNIT – IV

Basics of Enterprise Reporting
Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to SSRS Architecture, enterprise reporting using SSRS

UNIT – V

BI application areas, specification of these areas, BI in the company management, effects of BI applications.

TEXT BOOKS

1.   D. Loshin, *Business Intelligence*: Morgan Kaufmann Publishers, 2003.

REFERENCES

1.   M. Biere, *Business intelligence for the enterprise*, 2 ed.: IBM Press, 2003
2.   L. Langit, *Foundations of SQL Server 2005*, 1 ed., 2007
3.   C. Howson, *Successful Business Intelligence: Secrets to making Killer BI Applications*, 1 ed.: McGraw-Hill 2007.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering

MCS2052: NETWORK SECURITY

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT – I

Overview: Services, Mechanisms & Attacks, The OSI security Architecture, A Model for Network Security. **Classical Encryption Techniques:** Symmetric Cipher model, Substitution Techniques, Transposition Techniques, Rotor machines, Steganography. **Block Ciphers & The Data Encryption Standard**: DES, Differential and Linear Cyptanalysis, Block Cipher Modes of Operations. **Advanced Encryption Standard:** Evaluation Criteria, AES Cipher.

UNIT - II

Contemporary Symmetric Ciphers: Triples DES, Blowfish, RC5, Characteristics of Advanced Symmetric Block Ciphers. **Introduction to Number Theory:** Fermat's and Euler's Theorems. **Public-key Cryptography & RSA:** principles of Public Key Cryptosystems. RSA Algorithm.

UNIT - III

Key Management: Deffie-Hellman Key Exchange, Elliptic Curve Arithmetic and Cryptography. Message Authentication & Hash functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, hash Functions. **Hash Algorithms**: MD5 Message Digest Algorithm, Secure hash Algorithm.

UNIT – IV

Digital Signatures & Authentication: Digital Signatures, Authentication Protocols, Digital Signature standards. **Authentication Applications:** Kerberos, X.509 Authentication Service. **Electronic Mail Security:** Pretty Good Privacy, S/MIME.

UNIT - V

IP Security, Web Security: Overview, Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations, Key Management. **Firewalls:** Firewall Design Principles, Trusted Systems.

TEXT BOOK

1.   William Stallings; "Cryptography and Network Security", Third Edition, LPE.

REFERENCES

1.   Kahate; "Cryptography and Network Security"; PHI
2.   Charlie Kaufman, Radia Perlman, Mike Speciner; "Network Security "; 2nd Edition, LPE

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2053 : DISTRIBUTED COMPUTING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT- I

Introduction to Distributed System: Goals, Hardware concepts, Software concepts, and Client-Server model. Examples of distributed systems, Communication: Layered protocols, Remote procedures call, Remote object invocation, Message-oriented communication, Stream-oriented communication.

UNIT- II

Processes:Threads, Clients, Servers, Code Migration, Software agent, Naming:Naming entities, Locating mobile entities, Removing un-referenced entities, Synchronization:Clock synchronization, Logical clocks, Global state, Election algorithms, Mutual exclusion, Distributed transactions, Consistency and Replication:Introduction, Data centric consistency models, Client centric consistency models, Distribution protocols, Consistency protocols.

UNIT- III

Fault Tolerance: Introduction, Process resilience, Reliable client server communication, Reliable group communication. Distributed commit, Recovery, Security: Introduction, Secure channels, Access control, Security management, Distributed File System: Sun network file system, CODA files system, Case Study: CORBA, Distributed COM, Globe, Comparison of CORBA, DCOM, and Globe.

UNIT- IV

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management , Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution ,Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects.

UNIT- V

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues. Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOKS

1. A. Taunenbaum, Distributed Systems: Principles and Paradigms
2. G. Coulouris, J. Dollimore, and T. Kindberg, Distributed Systems: Concepts and Design, Pearson Education.
3. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez – Pearson Education.

REFERENCES

1. M. Singhal, N. Shivaratri, Advanced Concepts in Operating Systems, TMH
2. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2054 : ADVANCED COMPUTER ARCHITECTURE

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT- I

Fundamentals of computer design.-technology trends-cost-measuring and reporting performance. Quantitative principles of computer design.

UNIT – II

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of Operands- addressing modes for signal processing-operations in the instruction set- instructions for control Flow- encoding an instruction set.-the role of compiler

UNIT- III

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP

UNIT- IV

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

UNIT- V

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

TEXT BOOK

Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

REFERENCES

1.   Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
2.   Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier
3.   H. Stone. *Advanced Computer Architecture*, Addison Wesley, 1989.
4.   H. J. Siegel. *Interconnection Network for Large Scale Parallel Processing*, McGraw Hill, 1990.
5.   K. Hwang and F. A. Briggs. *Computer Architecture and Parallel Processing*, McGraw Hill, 1985.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2061 : CLOUD COMPUTING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Foundations: Introduction to Cloud Computing, Migrating into a Cloud Enriching the 'Integration as a Service' Paradigm for the Cloud Era, Cloud Computing for Enterprise Applications

UNIT – II

Infrastructure as a Service (IaaS): Virtual Machines Provisioning and Migration Services, On the Management of Virtual Machines for Cloud Infrastructures, Enhancing Cloud Computing Environments using a Cluster as a Service, Secure Distributed Data Storage in Cloud Computing

UNIT - III

Platform and Software as a Service (PaaS/IaaS): Aneka – Integration of Private and Public Clouds, CometCloud: An Autonomic Cloud Engine, T-Systems' Cloud-Based Solutions for Business Applications, Workflow Engine for Clouds, Understanding Scientific Applications for Cloud Environments, The MapReduce Programming Model and Implementations

UNIT – IV

Monitoring and Management: An Architecture for Federated Cloud Computing, SLA Management in Cloud Computing: A Service Provider's Perspective, Performance Prediction for HPC on Clouds

UNIT - V

Applications: Architecting Applications for the Amazon Cloud, Massively Multiplayer Online Game Hosting on Cloud Resources, Building Content Delivery Networks Using Clouds, Resource Cloud Mashups

TEXT BOOK

"Cloud Computing: Principles and Paradigms", Rajkumar Buyya, James Broberg, Andrzej Goscinski, Wiley, New York, USA

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2062 : WIRELESS SENSOR NETWORKS

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction and overview: Introduction and overview of wireless sensor networks, Applications of wireless sensor networks, Basic Wireless Sensor Technology, Wireless Transmission Technology and Systems.

UNIT - II

Operating System for Sensor Networks: Operating System Design Issues, Examples of Operating Systems: TinyOS, Mate, MagnetOS, MANTIS, OPSM, EYES OS, SenOS, EMERALDS, PicOS. **Medium Access Control:** Introduction, background, Fundamentals of MAC Protocols, MAC Protocol for WSN, Sensor MAC Case Study, IEEE 802.15.4 LR-WPAN standard case study.

UNIT - III

Routing Protocols for WSN: Introduction, Background, Data dissemination and gathering, Routing Challenges and Design Issues, Routing Strategies in WSN. **Performance and Traffic Management:** Introduction, background, WSN Design Issues, Performance modeling of WSN, Case Study: Simple Comparison of system lifespan.

UNIT - IV

Transport Control protocols for WSN: Traditional transport control protocols, Transport Protocol Design Issues, Examples of Existing transport control protocols, Performance of Transport control protocols

UNIT - V

Middleware for WSN: Introduction, WSN Middleware principles, Existing middleware. **Network Management for WSN:** Network management design Requirements, Traditional network management models, Networks management design issues, MANNA

TEXT BOOK

"Wireless Sensor networks, Technology protocols and Applications", Kazem Sohraby, Daniel Minoli, Taieb Znati, john Wiley & Sons, 2007.

REFERENCES

1. *Protocols and Architectures for Wireless Sensor Networks.* H. Karl and A. Willig. John Wiley & Sons, June 2005.
2. *Wireless Sensor Networks.* C. S. Raghavendra, K. M. Sivalingam, and T. Znati, Editors. Springer Verlag, Sep. 2006.
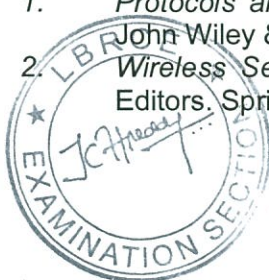
HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2063 : E-COMMERCE

Lecture	: 4 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT- I

Overview of Electronic Commerce (EC),Electronic Commerce-Frame work, anatomy of E-Commerce applications, features and functions of e-commerce, e-commerce practices v/s traditional practices, scope and limitations of e-commerce

UNIT- II

Business Model for E- Commerce: B2B, B2C, C2C, C2B. Inter Organizational Commerce - EDI, EDI Implementation, Value added networks. Intra Organizational Commerce - work Flow, Automation, Customization and internal Commerce, Supply chain Management.

UNIT- III

Modes of Electronic Commerce: Electronic Data Interchange, Electronic Commerce with www/Internet, Commerce Net Advocacy, web Commerce Going Forward. Approaches to Safe Electronic Commerce: Secure Transport Protocols, Secure Transactions, Secure Electronic Payment Protocol (SEPP), Secure Electronic Transaction (SET), Certificates for authentication Security on web Servers and Enterprise Networks.

UNIT – IV

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Security of e-commerce: Setting up Internet security, maintaining secure information, encryption, digital signature and other security measures.

UNIT- V

Internet Resources for Commerce: Introduction, Technologies for web Servers, Internet Tools Relevant to Commerce, Internet Applications for Commerce, Internet Charges, Internet Access and Architecture, Searching the Internet. Advertising on Internet: Issues and Technologies. Introduction, Advertising on the Web, Marketing creating web site, Electronic Publishing Issues, Approaches and Technologies: EP and web based EP.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

TEXT BOOK

1. Web Commerce Technology Handbook, by Daniel Minoli, Emma Minoli, McGraw-Hill
2. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.

REFERENCES

1. Electronic Commerce -Framework, technologies and Applications - Bharat Bhasker TMH Publications
2. Joseph PT: e-Commerce –A Managerial Perspective (PHI) &
    Tata McGraw Hill.
3. Daniel Amor, E Business R(Evolution), Pearson Edude.
4. Krishnamurthy, E-Commerce Management, Vikas Publishing House.
    David Whiteley, E-Commerce: Strategy, Technologies and Applications, Tata McGraw Hill

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS2064 : MOBILE COMPUTING

Lecture	: 4 Periods/week	Internal Marks	: 40
Tutorial		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Mobile Computing Introduction: Applications, Research Topics. Wireless Transmission: Frequencies, Signals, Antennas, signal propagation, Multiplexing, Modulation, Spread Spectrum, Fading.

UNIT – II

Medium access Control Techniques- SDMA, TDMA, FDMA, CDMA, Comparison. **Mobile network Layer:** Mobile IP, DHCP

UNIT - III

Mobile Transport Layer: Traditional TCP, Classical TCP Improvements, TCP over 2.5/3G Wireless networks, Performance Enhancing Proxies. **Support For Mobility:** File Systems,

UNIT – IV

Tele communication system: GSM, DECT, **Satellite Systems:** Basics, Routing, Localization, Handover.

UNIT - V

Wireless LANS: IEEE 802.11, Bluetooth, **Mobile Ad Hoc Networks,** The Architecture of Future Networks.

TEXT BOOK

J.Schiller, "Mobile Communications", Second Edition, Addition Wesley, 2008.

REFERENCES

1. Williams Stallings, "Wireless Communication and Networks", Second Edition, Pearson Education, 2009.
2. Uwe Hansmann, Lother Merk, Martin Nicklous, Thomas Stober, " Principles of Mobile Computing" , Springer International Edition, 2nd edition , 2003
3. C. Siva Ram Murthy, B.S. Manoj, "Ad hoc Wireless Networks – Architectures and Protocols", Pearson Education, 2004

_AD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS251 : WEB TECHNOLOGIES LAB.

Lecture	: 3 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 2	**External Examination**	: 3 Hrs

---

1.   Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box

2.   Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout

3.   Write programs in Java to create applets incorporating the following features:
     (a)   Create a color palette with matrix of buttons
     (b)   Set background and foreground of the control text area by selecting a color from color palette.
     (c)   In order to select Foreground or background use check box control as radio buttons
     (d)   To set background images

4.   Write programs in Java to do the following.
     (i)   Set the URL of another server.
     (ii)   Download the homepage of the server.
     (iii) Display the contents of home page with date, content type, and
     (iv) Expiration date. Last modified and length of the home page.

5.   Write programs in Java using sockets to implement the following:
     (i) HTTP request, (ii) FTP, (iii) SMTP, (iv) POP3

6.   Write a program in Java for creating simple chat application with datagram sockets and datagram packets.

7.   Write programs in Java using Servlets:
     (i) To invoke servlets from HTML forms, (ii) To invoke servlets from Applets

8.   Write programs in Java to create three-tier applications using servlets for conducting on-line examination for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

9.   Create a web page with the following using HTML
     (i) To embed a map in a web page, (ii) To fix the hot spots in that map
     (iii) Show all the related information when the hot spots are clicked.

10. Create a web page with the following.
     (i)   Cascading style sheets., (ii) Embedded style sheets.
     (iii) Inline style sheets, (iv) Use our college information for the web pages.

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.

MCS252 : OBJECT ORIENTED SOFTWARE ENGINEERING LAB.

Lecture	: 3 Periods/week	**Internal Marks**	: 40
Tutorial		**External Marks**	: 60
Credits	: 2	**External Examination**	: 3 Hrs

Prepare the following documents for Five of the Applications listed below using software engineering methodology.

1. Program Analysis and Project Planning. Thorough study of the problem – Identify project scope, Objectives, Infrastructure.

2. Software requirement Analysis Describe the individual Phases / Modules of the project, Identify deliverables.

3. Software Design
    Use work products – Data dictionary, Use case diagrams and activity diagrams, build and test class diagrams,
    Sequence diagrams and add interface to class diagrams, DFD, ER diagrams

4. Software Development and Debugging using any Front end and Back end tool

5. Software Verification and Validation procedures

SUGGESTED LIST OF APPLICATIONS:

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.