SRI KRISHNADEVARAYA UNIVERSITY

COLLEGE OF ENGINEERING AND TECHNOLOGY: ANANTAPURAM

ACADEMIC REGULATIONS 2013 FOR M.Tech (Regular) DEGREE COURSE

(Effective for the students admitted into first year from the academic year 2013-2014)

The M.Tech Degree of Sri Krishnadevaraya University College of Engineering and Technology Anantapuram shall be conferred on candidates who are admitted to the program and fulfill all the requirements for the award of the Degree.

1.0Courses of Study

1.1 The following specializations are offered at present for the M.Tech course of study.

S.No.	Department	Specialization
1	Computer Science and Engineering	Computer Science and Engineering
2	Electronics and Communications Engineering	Embedded Systems and VLSI Design
3	Electrical and Electronics Engineering	Electrical Power Systems

2.0Eligibility for Admissions

2.1 Admission to the above program shall be made subject to the eligibility, qualifications and specialization prescribed by the University from time to time.

2.2 Admissions shall be made on the basis of merit rank obtained by the qualifying candidate in GATE or PGECET or on the basis of any other order of merit approved by the University, subject to reservations prescribed by the university from time to time.

3.0Award of Degree

3.1 A student shall be declared eligible for the award of the M.Tech degree, if he/she pursues a course of study and completes it successfully for not less than two academic years (Four Semesters) and not more than four academic years.

3.2 A student, who fails to fulfill all the academic requirements for the award of the degree within four academic years from the year of his/her admission, shall forfeit his/her seat in M.Tech course.

4.0Attendance

4.1 The minimum instruction for each semester is 90 days.

4.2 A candidate shall be deemed to have eligible to write End Semester University examinations if he/she has put in a minimum of 75% of attendance in aggregate of all the subjects.

4.3 Condonation of shortage of attendance up to 10% i.e. 65% and above, and below 75% may be given by the College academic committee.

4.4 Condonation of shortage of attendance shall be granted only on genuine and valid reasons on representations by the candidate with supporting evidence to the college principal.

4.5 A candidate shall not be promoted to the next semester unless he/she fulfills the attendance requirements of the previous semester.

4.6 A stipulated fee shall be payable towards condonation of shortage of attendance.

5.0Evaluation

5.1 The performance of the candidate in each semester shall be evaluated subject-wise, with a maximum of 100 marks for theory subject and 100 marks for Laboratory, on the basis of Internal Evaluation and End Semester University Examination.

5.2 For theory subjects 60 marks shall be awarded based on the performance in the End Semester University Examination and 40 marks shall be awarded based on the Internal Evaluation. The internal evaluation shall be based on two midterm examinations. First midterm examination shall be conducted for the first half of the syllabus in the middle of the semester and second midterm examination shall be conducted for the second half of the syllabus towards the end of the semester. A weightage of 0.75 for better score and 0.25 for the other score will be considered for awarding the sessional marks in both the midterm examinations. Each midterm examination shall be conducted for duration of 120 minutes with 4 questions to be answered out of 4 questions.

5.3 For practical subjects 50 marks shall be awarded based on the performance in the End Semester Examinations, 50 marks shall be awarded based on the performance in Laboratory as Internal assessment.

5.4 Laboratory examination for M.Tech courses must be conducted with two Examiners, one of them being Laboratory Class Teacher and second examiner shall be appointed by the Principal from the panel of examiners submitted by the Head of the Department.

5.5 A candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Semester University Examination and a minimum aggregate of 50% of the total marks in the End Semester University Examination and Internal Evaluation taken together.

5.6 In case the candidate does not secure the minimum academic requirement in any subject he has to reappear for the End Semester University Examination in that subject.

5.7 There shall be a seminar presentation at the end of 3rd semester. For seminar, a student under the supervision of a faculty member, shall collect the literature on a relevant topic and critically review the literature and submit it to the Department in a report form and shall make an oral presentation before the Departmental Committee. The Departmental Committee consists of Head of the Department, supervisor and two other senior faculty members of the department. For Seminar there will be only internal evaluation of 100 marks. A candidate has to secure a minimum of 50% to be declared successful.

6.0Evaluation of Project Work/Dissertation

6.1 The work on the project shall be initiated in the beginning of 3rd semester and the duration of the project is for 3rd and 4th semesters.

6.2 A candidate is permitted to register for the Project Work after satisfying the attendance requirement of all the subjects (theory and practical) of 1st and 2nd semesters.

6.3 A Project Review Committee (PRC) shall be constituted with Principal/his nominee as chair person, Head of the Department and one other senior faculty member of the concerned department apart from the guide. The concerned Head of the Department will be the convener for all the PRC meetings.

6.4 A candidate has to submit, in consultation with his project supervisor, the title, objective and plan of action of his project work (Based on a publication in a peer Reviewed Journal) to the Project Review Committee for its approval before the second semester end examinations. After obtaining the approval of the PRC the student can initiate the Project work after the second semester end examinations.

6.5 Every candidate shall work on projects approved by the PRC of the college.

6.6 If a candidate wishes to change his supervisor or topic of the project he can do so with approval of the PRC. However, the PRC shall examine whether the change of topic/supervisor leads to a major

change of his initial plans of project proposal. If so, his date of registration for the project work starts from the date of change of Supervisor or topic as the case may be.

6.7 A candidate shall submit status report in two stages at least with a gap of 3 months between them.

6.8 A candidate shall be allowed to submit the project report only after fulfilling the attendance requirements of all the semesters with the approval of PRC and not earlier than 40 weeks from the date of registration of the project work. For the approval of PRC the candidate shall submit the draft copy of thesis to the Head of the Department and shall make an oral presentation before the PRC.

6.9 The Candidate is desired to publish the work/accepted to be published in a journal or presented in a national/international conference/seminar of repute and relevance in order to submit the Project Report /dissertation.

6.10 Three copies of the dissertation/Project Report certified by the supervisor and the concerned Head of the Department in the prescribed form shall be submitted to the College. Once a student fails to submit the dissertation within the stipulated period of four semesters, extension of time up to one more year may be permitted by the Principal with recommendation of the College Academic Council. Beyond this period, extension may be given with the permission of the university by collecting the prescribed fee.

6.11 The dissertation shall be adjudicated by an external examiner nominated by the Vice Chancellor from among the panel of examiners submitted by the Principal in consultation with the concerned Head of the Department.

6.12 The Viva voce examination shall be conducted at the end of 3rd semester (Project work Part-A) and at the end of 4th semester or later depending on the completion of the project

6.13 The viva-voce examination shall be conducted by a board consisting of the supervisor, Head of the Department and the examiner who adjudicated the Dissertation.

The Board shall jointly report candidates work as:

A. Excellent

B. Good

C. Satisfactory

D. Unsatisfactory

Head of the Department shall coordinate and make arrangements for the conduct of viva-voce examination. If the report of the viva-voce is unsatisfactory, the candidate will retake the viva-voce examination within six months. If he fails to get a satisfactory report at the second viva-voce examination, the candidate may be asked to submit a new project proposal to PRC.

7.0Award of Class

7.1 After a student has satisfied the requirements prescribed for the completion of the course and is eligible for the award of M. Tech. Degree he shall be placed in one of the following three classes:

Class Awarded	**% of marks to be secured**
First Class with Distinction	75% and above(Without any Supplementary Appearance) and 'A' grade in project
First Class	Below 75% but not less than 60% and A or B or C grade in Project
	75% and above (With Supplementary Appearance) and A or B or C grade in Project
Second Class	Below 60% but not less than 50% and A or B or C grade in Project

(The marks in internal evaluation and end semester University examination shall be shown separately in the marks memorandum and also the project grade)

8.0General

8.1 The academic regulations should be read as a whole for purpose of any interpretation.

8.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the University is final.

8.3 The University may change or amend the academic regulations and syllabus at any time and the changes and amendments made shall be applicable to all the students with effect from the date notified by the University.

Sri Krishnadevaraya University College of Engineering and Technology : Anantapur
Department of Computer Science and Engineering

M.Tech (CSE) I Year I Semester Course Structure

S.No.	Abbreviation	Subject	Periods / Week		C	Marks		
			L	T/P		Internal	External	Total
1.	ADA	Advanced Data Structures and Algorithms	4	-	4	40	60	100
2.	ACA	Advanced Computer Architecture	4	-	4	40	60	100
3.	DIP	Digital Image Processing	4	-	4	40	60	100
4.	AD	Advances in Databases	4	-	4	40	60	100
5.	ASE	Advances in Software Engineering	4	-	4	40	60	100
6.	DDL	Data Structures and DBMS Lab	-	4	2	40	60	100
7.	DIPL	DIP Lab	-	4	2	40	60	100
		TOTAL	20	8	24	280	420	700

M.Tech (CSE) I Year II Semester Course Structure

S.No.	Abbreviation	Subject	Periods / Week		C	Marks		
			L	T/P		Internal	External	Total
1.	MAN	Mobile and Adhoc Networks	4	-	4	40	60	100
2.	ADM	Advances in Data Mining	4	-	4	40	60	100
3.	IS	Information Security	4	-	4	40	60	100
4.	E-I	Elective-I 1. Cloud Computing 2. Software Quality Assurance and testing 3. Natural Language Processing	4	-	4	40	60	100
5.	E-II	Elective-II 1. Information Retrieval Systems 2. High Speed Computer Networks 3. Soft Computing	4	-	4	40	60	100
6.	NSL	Network Simulation Lab	-	4	2	40	60	100
7.	DML	Data Mining Lab	-	4	2	40	60	100
		TOTAL	20	8	24	280	420	700

L – Lecture, T – Tutorial, P - Practical

M.Tech II Year I Semester Course Structure

SUBJECTS	CREDITS	MAX.MARKS		TOTAL	Min.Marks/grades to pass
	C	Int.	Ext.		
Seminar	6	100	-	100	50
Project Part - A	8	-	-	-	-

M.Tech II Year II Semester Course Structure

SUBJECTS	CREDITS	MAX.MARKS		TOTAL	Min.Marks/grades to pass
	C	Int.	Ext.		
Project Part - B Grades:A,B,C,D A- Excellent B- Good C- Satisfactory D- Unsatisfactory	18	-	-	-	A/B/C

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – I Sem	T	C
	4	4

SR45101 – ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT I : Overview of Data Structures

Review of Arrays, Stacks, Queues, linked lists , Linked stacks and Linked queues, Applications

Algorithm Analysis

Efficiency of algorithms, Apriori Analysis, Asymptotic Notations, Time complexity of an algorithm using O notation, Polynomial Vs Exponential Algorithms, Average, Best, and Worst Case Complexities, Analyzing Recursive Programs.

UNIT II: Trees and Graphs

Introduction, Definition and Basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graphs-basic concepts, representation and traversals.

UNIT III: Binary Search Trees, AVL Trees and B Trees

Introduction, Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications. B Trees: Definition, Operations and applications.

UNIT IV: Red – Black Trees, Splay Trees and Hash Tables

Red – Black Trees, Splay Trees and its applications. Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

UNIT V: Divide – and – Conquer & Greedy Method

General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Strassen's Matrix Multiplication, Greedy Method- General Method, Minimum Cost Spanning Trees, Single Source Shortest Path.

UNIT VI: Dynamic Programming

General Method, All Pairs Shortest Path, Single Source Shortest Path, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem.

Back Tracking and Branch – and – Bound

General Method, 8 – Queen's Problem, Graph Coloring. Branch – and – Bound: The Method, LC Search, Control Abstraction, Bounding, 0 / 1 Knapsack Problem.

TEXT BOOKS:

1. Data Structures and Algorithms by G.A.V. Pai, 2009, TMH.
2. Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd edition, University Press.

REFERENCE BOOKS:

1. Classic Data Structures by D. Samanta, 2005, PHI
2. Design and Analysis of Computer Algorithms by Aho, Hopcraft, Ullman 1998, PEA.
3. Introduction to the Design and Analysis of Algorithms by Goodman, Hedetniemi, TMG.
4. Design and Analysis of Algorithms by E. Horowitz, S. Sahani, 3rd Edition, Galgotia.
5. Data Structures and Algorithms in C++ by Drozdek 2nd Edition, Thomson.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – I Sem

	T	C
	4	4

SR45105 – ADVANCES IN SOFTWARE ENGINEERING

Unit - I : Software and Software Engineering: The Nature of Software, The Unique Nature of WebApps, Software Engineering, Software Process, Software Engineering Practice, Software Myths.

Process Models: A Generic Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Models, The Unified Process, Personal and Team Process Models, Process Terminology, Product and Process.

Unit – II: Understanding Requirements: Requirements Engineering, Establishing the Groundwork, Eliciting Requirements, Developing Use Cases, Building the Requirements Model, Negotiating Requirements, Validating Requirements.

Requirements Modeling: Requirements Analysis, Scenario-Based Modeling, UML Models That Supplement the Use Case, Data Modeling Concepts, Class-Based Modeling.

Unit – III : Design Concepts: Design within the Context of Software Engineering, Design Process, Design Concepts, The Design Model.

Architectural Design: Software Architecture, Architectural Genres, Architectural Styles, Architectural Design, Assessing Alternative Architectural Designs, Architectural Mapping Using Data Flow.

Unit – IV : Component-Level Design: What is a Component, Designing Class-Based Components, Conducting Component-Level Design, Component-Level Design for WebApps, Designing Traditional Components, Component-Based Development.

User Interface Design: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

Unit – V : Coding and Testing: Coding, Code Review, Software Documentation, Testing, Testing in the Large versus Testing in the Small, Unit Testing, Black-Box Testing, White-Box Testing, Debugging, Program Analysis Tools, Integration Testing, Testing Object-Oriented Programs, System Testing, Some General Issues Associated with Testing.

Unit – VI : Verification and Validation: Planning Verification and Validation, Software Inspections, Automated Static Analysis, Verification and Formal Methods.

Software Maintenance: Characteristics of Software Maintenance, Software Reverse Engineering, Software Maintenance Process Models, Estimation of Maintenance cost.

Text Books :

1.Software Engineering A Practitioner's Approach, Roger S. Pressman, 7th Edition MCH International Edition.

2.Fundamentals of Software Engineering, Rajib Mall, Third Edition, PHI.

Reference Books :

1.Software Engineering, Ian Sommerville, Eighth Edition, Pearson education.
2.Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3.Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India,2010.
4.Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5.Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
6.Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition , 2006.
7.Software Engineering Foundations, Yingxu Wang, Auerbach Publications,2008.
8.Software Engineering Principles and Practice, Hans Van Vliet,3rd edition, John Wiley &Sons Ltd.
9.Software Engineering 3:Domains,Requirements,and Software Design, D.Bjorner, Springer International Edition.
10.Introduction to Software Engineering, R.J.Leach, CRC Press.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – I Sem	T	C
	4	4

SR45103 – DIGITAL IMAGE PROCESSING

UNIT - I

Introduction : Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between.

UNIT - II

Image enhancement in the spatial domain : Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods.

UNIT - III

Image restoration : A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function.

UNIT - IV

Color Image Processing : Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation.

Image Compression : Fundamentals, image compression models, error-free compression, lossypredictive coding, image compression standards.

UNIT - V

Morphological Image Processing : Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms.

UNIT - VI

Image Segmentation : Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation.

Object Recognition : Patterns and patterns classes, recognition based on decision–theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching.

TEXT BOOK :

1. Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI.

REFERENCES :

1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
4. Digital Image Processing using Matlab, Rafeal C.Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.
5. Digital Image Processing, William K. Prat, Wily Third Edition
6. Digital Image Processing and Analysis, B. Chanda, D. Datta Majumder, Prentice Hall of India, 2003.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – I Sem	T	C
	4	4

SR45104 – ADVANCED DATABASES

UNIT I: DATABASE SYSTEM ARCHITECTURE AND PARALLEL DATABASES

Database System Architectures: Centralized and Client-Server Architectures – Server System Architectures – Parallel Systems- Distributed Systems – Parallel Databases: I/O Parallelism – Inter and Intra Query Parallelism – Inter and Intra operation Parallelism

UNIT II: DISTRIBUTED DATABASES

Distributed Database Concepts - Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency Control – Distributed Query Processing – Three Tier Client Server Architecture- Case Studies.

UNIT III: OBJECT AND OBJECT RELATIONAL DATABASES

Concepts for Object Databases: Object Identity – Object structure – Type Constructors – Encapsulation of Operations – Methods – Persistence – Type and Class Hierarchies – Inheritance – Complex Objects – Object Database Standards, Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems: Object Relational features in SQL/Oracle – Case Studies.

UNIT IV: XML DATABASES

XML Databases: XML Data Model – DTD - XML Schema - XML Querying – Web Databases – JDBC – Information Retrieval – Data Warehousing – Data Mining

UNIT V: MOBILE DATABASES

Mobile Databases: Location and Handoff Management - Effect of Mobility on Data Management - Location Dependent Data Distribution - Mobile Transaction Models - Concurrency Control - Transaction Commit Protocols- Mobile Database Recovery Schemes

UNIT VI: MULTIMEDIA DATABASES

Multidimensional Data Structures – Image Databases – Text/Document Databases- Video Databases – Audio Databases – Multimedia Database Design.

Text Books

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Fifth Edition, Pearson Education/Addison Wesley, 2007.
2.Henry F Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, Fifth Edition, McGraw Hill, 2006
3. V.S.Subramanian, “Principles of Multimedia Database Systems”, Harcourt India Pvt Ltd., 2001.
4. Vijay Kumar, “ Mobile Database Systems”, John Wiley & Sons, 2006

References:

1. Thomas Cannolly and Carolyn Begg, “ Database Systems, A Practical Approach to Design, Implementation and Management”, Third Edition, Pearson Education, 2007.
2. C.J.Date, A.Kannan and S.Swamynathan,”An Introduction to Database Systems”, Eighth Edition, Pearson Education, 2006.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – I Sem	T	C
	4	4

SR45102 – ADVANCED COMPUTER ARCHITECTURE

UNIT-I

Introduction to parallel processing: Trends towards parallel processing, parallelism in uni processor systems, parallel computer structures, architecture classification schemes, parallel processing Applications, memory hierarchy in parallel processing systems, addressing schemes.

UNIT-II

Principles of pipelining: pipeline concept, linear pipelining and space time diagram, classification of pipeline processor, nonlinear pipeline and reservation table, instruction and arithmetic pipelines, principles of designing pipeline processors-instruction prefetch and branch handling, data buffering and busing structures, internal forwarding and register tagging, hazard detection and resolution, job sequencing and collision prevention. Vector Processing Requirementscharacteristics, pipelined vector processing methods.

UNIT-III

Structures and algorithms for array processors: SIMD array processors, organization, masking and routing mechanisms, inter processor communication, SIMD interconnection network, single stage and multistage network, cube network, barrel shifter, shuffle exchange and omega networks, parallel algorithms for array processors (matrix multiplication and parallel sorting)

UNIT-IV

Multiprocessor architecture: Loosely coupled and tightly coupled multiprocessor systems, processor characteristics, interconnection network, timeshared or common busses, crossbar switch and multi port memories, multistage network, banyan and delta networks, parallel memory organization, multiprocessor operating systems, classification and requirements, software requirements for MPS, language features to exploit parallelism, massively parallel processor system(MPS)-architecture, processor array, memory, control.

UNIT-V

Data flow computers: control flow Vs data flow, data flow computer architectures, static and dynamic data flow computers, data flow graphs and languages, data flow and design alternatives-dependency driven approach and multi level driven approaches-VLSI computing structures-systolic array architecture, reconfigurable processor array.

UNIT-VI

Stack computers: stacks, arithmetic evaluation stacks, control stacks, storage for simple and structured variables, the parameter preparation stack combining stacks, evaluation criteria.

Text books:1. Kai Hwang, Faye Briggs, “Computer architecture and parallel processing”, MC GRAW HILL.

2. Stone Harods, “Introduction to computer architecture”,Galgotia.

Reference books:

1. Kai Hwang, “Advanced computer architecture”, MC GRAW HILL.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

MOBILE AND ADHOC NETWORKS

UNIT-I: INTRODUCTION Applications, History of wireless Communication, Simplified Reference Model. Wireless Transmission: Introduction, Frequencies for Radio Transmission, Signals, Modulation, Cellular spectrums. Wireless LAN: Introduction, Infrared Vs Radio Transmission, Infrastructure and Adhoc Networks, IEEE802.11, Hyper LAN, Bluetooth. **MEDIUM ACCESS CONTROL** Introduction, Motivation for a Specialized MAC, SDMA, FDMA, TDMA, CDMA.

UNIT-II: MOBILE NETWORK LAYER Introduction, Mobile IP, Dynamic Host Configuration Protocol, Adhoc Network. **MOBILE TRANSPORT LAYER** Introduction, Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit/Fast Recovery, Transmission/Time Out Freezing, Selective Retransmission, Transmission oriented TCP.

UNIT-III: ADHOC NETWORKS Fundamentals: Fundamentals of Wireless Communication Technology- The Electromagnetic Spectrum – Radio Propagation Mechanisms – Characteristics of the Wireless Channel. Adhoc Routing Protocols: Introduction- Issues in designing a Routing Protocol for Ad Hoc Wireless Networks – Classifications of Routing Protocols – Destination Sequenced Distance Vector (DSDV) – Wireless Routing Protocol (WRP) – Ad hoc On-Demand Distance Vector Routing (AODV) – Dynamic Source Routing (DSR) – Temporally Ordered Routing Algorithm (TORA) – Signal Stability Routing (SSR) – Location-Aided Routing (LAR) – Power-Aware Routing (PAR) – Zone Routing Protocol (ZRP).

UNIT-IV: MULTICAST ROUTING IN ADHOC NETWORKS Introduction – Issues in Designing a Multicast Routing Protocol – operation of Multicast Routing Protocols – An Architecture Reference Model for multicast routing protocols – Classifications of Multicast Routing Protocols – Tree–Based Multicast Routing Protocols- Bandwidth efficient Multicast routing Protocol – Zone based – Core extraction routing Protocol – Ad Hoc On-demand vector routing Protocol - Mesh-based Multicast Routing Protocols – On-demand Multicast Dynamic Core based Multicast routing Protocol - Energy-Efficient Reliable Broadcast and Multicasting protocols – Wireless Ad Hoc Real-time Multicasting – Application – Dependent Multicast Routing

UNIT-V: TRANSPORT LAYER- SECURITY PROTOCOLS Introduction- Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks – Design Goals of a Transport Layer Protocol for Ad hoc Wireless Networks – Classification of Transport Layer Solutions – TCP over Ad hoc wireless Networks – Ad Hoc Transport Protocol - Security in Ad Hoc Wireless Networks – Network Security Requirements – Issues and Challenges in Security Provisioning – Network Security Attacks – Secure Routing in Ad hoc Wireless Networks – Requirements – Security Aware Ad Hoc Routing Protocol.

UNIT-VI: QoS AND ENERGY MANAGEMENT Introduction – Issues and Challenges in Providing QoS in Ad hoc Wireless Networks – Classification of QoS Solutions – MAC Layer Solutions – Cluster TDMA – IEEE802.11e - Network Layer Solutions – QoS Routing Protocols – On-demand QoS routing Protocol - QoS Frameworks for Ad hoc Wireless Networks – QoS models – QoS resource reservation Signalling - INSIGNIA. Energy Management in Ad hoc Wireless Networks: Introduction – Need for Energy Management in Ad hoc Wireless Networks – Classification of Energy Management Schemes – Battery Management Schemes.

TEXTBOOKS:

1. Jochen Schiller PE, "Mobile Communications", 2e, 2004, PEA.
2. C.Siva Ram Murthy and B.S. Manoj, "Ad Hoc Wireless Networks Architectures and Protocols", Prentice Hall, 2004.

REFERENCES:

1. Lee, "Cellular Mobile Communication", TMH.
2. Pandya "Mobile and Personal Communication Systems and Services", 2003, PHI.
3. C. K. Toh, "Ad Hoc Mobile Wireless Networks Protocols and Systems", Prentice Hall, PTR, 2001.
4. Charles E.Perkins," Ad Hoc Networking", Addison Wesley, 2000.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

ADVANCES IN DATA MINING

UNIT-I

Introduction about data mining, Need of data mining, Business data mining, data mining tools, Data Mining Process: CRISP Data Mining, Business Understanding, data understanding and data preparation, modeling, evaluation and deployment, SEMMAS Process, Data mining applications, comparison of CRISP & SEMMA.

UNIT-II

Memory-Based Reasoning Methods, Matching ,Weighted Matching, Distance Minimization Data Mining Methods As Tools X Contents, Association Rules in Knowledge Discovery, Market-Basket Analysis, Market Basket Analysis Benefits Demonstration on Small Set of Data, Real Market Basket Data The Counting Method Without Software.

UNIT-III

Fuzzy Sets in Data Mining, Fuzzy Sets and Decision Trees, Fuzzy Sets and Ordinal Classification, Fuzzy Association Rules, Demonstration Model, Computational Results, Testing Inferences.

Rough Sets :Theory of Rough Sets , Information System, Decision Table, Applications of Rough Sets, Rough Sets Software Tools, The Process of Conducting Rough Sets Analysis, Data Pre-Processing, Data Partitioning, Discretization, Reduct Generation, Rule Generation and Rule Filtering, Apply the Discretization Cuts to Test Dataset, Score the Test Dataset on Generated Rule set , Deploying the Rules in a Production System.

UNIT-IV

Support Vector Machines, Formal Explanation of SVM, Primal Form, Dual Form, Soft Margin, Non-linear Classification, Regression, implementation, Kernel Trick.

Use of SVM–A Process-Based Approach, Support Vector Machines versus Artificial Neural Networks, Disadvantages of Support Vector Machines, Genetic Algorithm Support to Data Mining, Demonstration of Genetic Algorithm, Application of Genetic Algorithms in Data Mining

UNIT-V

Performance Evaluation for Predictive Modeling, Performance Metrics for Predictive Modeling
Estimation Methodology for Classification Models, Simple Split, The *k*-Fold Cross Validation
Bootstrapping and Jackknifing, Area Under the ROC Curve.

UNIT VI

Applications: Applications of Methods Memory-Based Application, Association Rule Application Fuzzy Data Mining, Rough Set Models, Support Vector Machine Application, Genetic Algorithm Applications-Product Quality Testing Design, Customer Targeting .

Text Book:

1. Advanced Data Mining Techniques Authors: David L. Olson (Author), Dursun Delen.

References :

1. Advances in data mining and modeling by Wai-Ki ChingMichael Kwok-Po Ng
2. Advanced Techniques in Knowledge Discovery and Data Mining edited by Nikhil R. Pal, Lakhmi C Jain.
3. Dynamic and Advanced Data Mining for Progressing Technological Development: Innovations and Systemic ApproachesA B M Shawkat Ali (Central Queensland University, Australia) and Yang Xiang (Central Queensland University, Australia)

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

INFORMATION SECURITY

UNIT-I

Introduction: Cyber attacks, Defence Strategies and Techniques

Mathematical background for Cryptography: Modulo arithmetic, The greatest common divisor, Useful Algebraic Structures, Chinese Remainder Theorem

Basics of Cryptography: Secret versus Public key Cryptography, Types of attacks, Elementary substitution Ciphers, Elementary Transposition Ciphers, Other Cipher Properties

Secrete Key Cryptography: Product Ciphers, DES Construction, Modes of Operation, MAC and other Applications, Attacks, Linear Crypt analysis.

UNIT-II

Public Key Cryptography: RSA Operations, Performance, Applications, Practical Issues **Cryptographic Hash**: Properties, Construction, Applications and Performance

Discrete Logarithm and its applications: Diffie-Hellman Parameters, Other applications

Elliptic Curve Cryptography and Advanced Encryption Standard: Elliptic Curve Cryptography, Applications, Practical Considerations, Advanced Encryption Standard (AES).

UNIT-III

Key Management: Digital Certificates, Public key Infrastructure, Identity based Encryption, **Authentication-I**: One-way Authentication, Mutual Authentication, Dictionary attacks, **Authentication-II**: Centralized Authentication, The Needham-Schroeder Protocol, Kerberos, Biometrics

Security at the Network Layer: Security at Different Layers: Pros and Cons, IP Sec, Internet Key Exchange(IKE) protocol, Security policy and IPSec, Virtual Private Networks

Security at the Transport Layer: Introduction, SSL Handshake Protocol, SSL Record Layer Protocol, Open SSL.

UNIT-IV

Software Vulnerabilities: Phishing, Buffer Overflow, Format string attacks, Cross-site Scripting(XSS), SQL Injection, Virus and Worm Features, Internet scanning Worms, Topological Worms, Botnets,

Access Control in the Operating System: Preliminaries, Mandatory Access Control, Role-based Access control

Firewalls: Basics, Practical issues

UNIT-V

Intrusion Prevention and Detection: Prevention Versus Detection, Types of Intrusion detection systems, DDoS attack prevention/detection, Malware Defense.

WLAN Security: IEEE 802.11 Wireless LAN Security: Background, Authentication, Confidentiality and Integrity

Cell phone Security: Preliminaries, GSM (2G) Security, Security in UMTS (3G)

UNIT-VI

RFIDs and E-Passports: RFID basics, Applications, Security issues, Addressing RFID Privacy Concerns, Electronic Passports

Electronic Payment: Introduction, Enabling Technologies, Cardholder Present E-Transactions, Payment over the Internet, Mobile Payments, Electronic cash

TEXT BOOKS:

1. Network security and Cryptography by Bernard Menezes CENGAGE Learning Publications, 2010.

REFERENCES:

1. Wenbo Mao, “Modern Cryptography – Theory and Practice”, Pearson Education, New Delhi, 2006.
2. Jonathan Katz, Yehuda Lindell, “Introduction to Modern Cryptography”, Chapman & Hall/CRC, New York, 2007.
3. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons, New York, 2004.
4. Charlie Kafuman, Radia Perlman, Mike Spenciner, Network Security Private Communication in Private world, Second Edition, Prentice Hall India 2002,ISBN:81-203-2213-4

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

CLOUD COMPUTING
(Elective-I)

UNIT I:
Cloud Computing Basics: Cloud computing overview, Applications, Intranets and the Cloud. Cloud Computing Benefits, Limitations, Security Concerns, Regulatory Issues

UNIT II:
Cloud Computing with the titans: Google, Microsoft, Amazon, IBM. Cloud computing services, benefits, deleting datacenter.

UNIT III:
Hardware and Infrastructure: Clients, Security, Network, Services. Accessing the clouds: Platforms, Web Applications, Web APIs, Web Browsers.

UNIT IV:
Cloud Storage: basics and overview, Storage Providers. Standards: Application, Client, Infrastructure, Service.

UNIT V:
Software as a Service: advantages and limitations, Driving Forces, Company Offerings, Industries. Software plus services: Pros and cons, mobile device integration, providers, Microsoft online.

UNIT VI:
Developing applications: Google, Microsoft, Development of GAE, Salesforce.com, Microsoft Windows Azure. Local Clouds: Virtualization, Server Solutions. Migrating to the cloud.

Text Book:
1. Cloud Computing: A Practical Approach by Anthony T. Velte, Toby J. Velte, Robert Elsenpeter, MCH

Reference:
1. Cloud Computing: Implementation, Management and Security by John W. Rittinghouse, James F. Ransome, CRC Press

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

Software Quality and Assurance Testing

(Elective-I)

UNIT I

Introduction to software quality, Challenges, Objectives, Quality Factors, Components of SQA, Contract review, Development and quality Plans, SQA Components in Project Life Cycle, SQA Defect Removal Policies, Reviews.

UNIT II

Software Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy.

UNIT III

Building Software Testing Process: Software Testing Guidelines, Workbench Concept, Customizing the Software Testing Process, Process Preparation Checklist.

Software Testing Techniques: Dynamic Testing – Black Box Testing Techniques, White Box Testing Techniques, Static Testing, Validation Activities, Regression Testing.

UNIT IV

Software Testing Tools: Selecting and Installing Software Testing tools

Automation and Testing Tools: Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus.

UNIT V

Seven Step Testing Process–I: Overview of the Software Testing Process, Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing.

UNIT VI

Seven Step Testing Process-II: Analyzing and Reporting Test results, Acceptance and Operational Testing, Post-Implementation Analysis

Specialized Testing Responsibilities: Software Development Methodologies, Testing Client/Server Systems.

TEXT BOOKS:

1. Effective Methods for Software Testing, Third edition, William E. Perry, Wiley India, 2009
2. Software Testing – Principles and Practices, Naresh Chauhan, Oxford University Press, 2010.
3. Software Quality Assurance – From Theory to Implementation, Daniel Galin, Pearson Education, 2009.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

NATURAL LANGUAGE PROCESSING
(Elective-I)

UNIT I: Introduction to Natural language

The Study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different Levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English Syntax.

Unit II: Grammars and Parsing

Grammars and Parsing- Top- Down and Bottom-Up Parsers, Transition Network Grammars, Feature Systems and Augmented Grammars, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.

UNIT III: Grammars for Natural Language

Grammars for Natural Language, Movement Phenomenon in Language, Handling questions in Context Free Grammars, Hold Mechanisms in ATNs, Gap Threading, Human Preferences in Parsing, Shift Reduce Parsers, Deterministic Parsers.

UNIT IV: Semantic Interpretation

Semantic & Logical form, Word senses & ambiguity, The basic logical form language, Encoding ambiguity in the logical Form, Verbs & States in logical form, Thematic roles, Speech acts & embedded sentences, Defining semantics structure model theory.

Language Modeling Introduction, n-Gram Models, Language model Evaluation, Parameter Estimation, Language Model Adaption, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Crosslingual Language Modeling.

UNIT V: Machine Translation Survey: Introduction, Problems of Machine Translation, Is Machine Translation Possible, Brief History, Possible Approaches, Current Status.

Anusaraka or Language Accessor: Background, Cutting the Gordian Knot, The Problem, Structure of Anusaraka System, User Interface, Linguistic Area, Giving up Agreement in Anusarsaka Output, Language Bridges.

UNIT VI: Multilingual Information Retrieval

Introduction, Document Preprocessing, Monolingual Information Retrieval, CLIR, MLIR, Evaluation in Information Retrieval, Tools, Software and Resources.

Multilingual Automatic Summarization

Introduction, Approaches to Summarization, Evaluation, How to Build a Summarizer, Competitions and Datasets.

TEXT BOOKS:

1. James Allen, Natural Language Understanding, 2nd Edition, 2003, Pearson Education.

2.Multilingual Natural Language Processing Applications : From Theory To Practice-Daniel M.Bikel and Imed Zitouni , Pearson Publications.

3.Natural Language Processing, A paninian perspective, Akshar Bharathi,Vineet chaitanya,Prentice –Hall of India.

REFERENCES BOOKS:

1. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.

2. Jurafsky, Dan and Martin, James, Speech and Language Processing, 2nd Edition, Prentice Hall, 2008.

3. Manning, Christopher and Henrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press, 1999.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

INFORMATION RETRIVAL SYSTEMS

(Elective-II)

UNIT I

Boolean retrieval. The term vocabulary and postings lists. Dictionaries and tolerant retrieval. Index construction. Index compression.

UNIT II

Scoring, term weighting and the vector space model. Computing scores in a complete search system. Evaluation in information retrieval. Relevance feedback and query expansion.

UNIT III

XML retrieval. Probabilistic information retrieval. Language models for information retrieval. Text classification & Navie Bayes..

UNIT IV

Vector space classification, Support vector machines and machine learning on documents

UNIT V

Flat clustering, Hierarchical clustering, Matrix decompositions and latent semantic indexing.

UNIT VI

Web search basics. Web crawling and indexes, Link analysis.

TEXT BOOK:

1. Introduction to Information Retrieval , Christopher D. Manning and Prabhakar Raghavan and Hinrich Schütze, Cambridge University Press, 2008.

REFERENCE BOOKS:

1. Information Storage and Retrieval Systems: Theory and Implementation, Kowalski, Gerald, Mark T Maybury, Springer.
2. Modern Information Retrieval, Ricardo Baeza-Yates, Pearson Education, 2007.
3. Information Retrieval: Algorithms and Heuristics, David A Grossman and Ophir Frieder, 2nd Edition, Springer, 2004.
4. Information Retrieval Data Structures and Algorithms, William B Frakes, Ricardo Baeza-Yates, Pearson Education, 1992.
5. Information Storage & Retieval, Robert Korfhage, John Wiley & Sons.

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

HIGH SPEED COMPUTER NETWORKS

(Elective-II)

UNIT I HIGH SPEED NETWORKS

Frame Relay Networks – Asynchronous transfer mode – ATM Protocol Architecture, ATM logical Connection, ATM Cell – ATM Service Categories – AAL. High Speed LAN's: Fast Ethernet, Gigabit Ethernet, Fibre Channel – Wireless LAN's: applications, requirements – Architecture of 802.11

UNIT II CONGESTION AND TRAFFIC MANAGEMENT

Queuing Analysis- Queuing Models – Single Server Queues – Effects of Congestion – Congestion Control – Traffic Management – Congestion Control in Packet Switching Networks – Frame Relay Congestion Control.

UNIT III TCP AND ATM CONGESTION CONTROL

TCP Flow control – TCP Congestion Control – Retransmission – Timer Management – Exponential RTO backoff – KARN's Algorithm – Window management – Performance of TCP over ATM. Traffic and Congestion control in ATM – Requirements – Attributes – Traffic Management Frame work, Traffic Control – ABR traffic Management – ABR rate control, RM cell formats, ABR Capacity allocations – GFR traffic management.

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES

Integrated Services Architecture – Approach, Components, Services- Queuing Discipline, FQ, PS, BRFQ, GPS, WFQ – Random Early Detection, Differentiated Services

UNIT V PROTOCOLS FOR QOS SUPPORT

RSVP – Goals & Characteristics, Data Flow, RSVP operations, Protocol Mechanisms – Multiprotocol Label Switching – Operations, Label Stacking, Protocol details – RTP – Protocol Architecture, Data Transfer Protocol, RTCP.

UNIT VI COMPRESSION

Overview of Information Theory, Lossless Compression, Lossy Compression.

TEXTBOOK

1. William Stallings, "HIGH SPEED NETWORKS AND INTERNET", Pearson Education, Second Edition, 2002.

REFERENCES

1. Warland & Pravin Varaiya, "HIGH PERFORMANCE COMMUNICATION NETWORKS", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.
2. Irvan Pepelnjk, Jim Guichard and Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and 2, 2003

SRI KRISHNADEVARAYA UNIVERSITY
COLLEGE OF ENGINEERING AND TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

I Year M.Tech (CSE) – II Sem	T	C
	4	4

SOFT COMPUTING
(Elective-II)

UNIT I:
AI Problems and Search: AI problems, Techniques, Problem Spaces and Search, Heuristic Search Techniques- Generate and Test, Hill Climbing, Best First Search Problem reduction, Constraint Satisfaction and Means End Analysis. Approaches to Knowledge Representation- Using Predicate Logic and Rules.

UNIT II:
Artificial Neural Networks: Introduction, Basic models of ANN, impotant terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Backpropogation Network. Asscociative Memory Networks. Traing Algorithms for pattern association, BAM and Hopfield Networks.

UNIT III:
Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propogation Networks, Adaptive Resonance Theory Networks. Special Networks-Introduction to various networks.

UNIT IV:
Introduction to Classical Sets (crisp Sets)and Fuzzy Sets- operations and Fuzzy sets. Classical Relations - and Fuzzy Relations- Cardinality, Operations, Properties and composition. Tolerance and equivalence relations.
Membership functions- Features, Fuzzification, membership value assignments, Defuzzification.

UNIT V:
Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making

UNIT VI:
Fuzzy Logic Control Systems. Genetic Algorithm- Introduction and basic operators and terminology.Applications: Optimization of TSP, Internet Search Technique

TEXT BOOKS:

1 Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India, 2007.
2 Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva, Pearson Edition, 2004.

REFERECE BOOKS:

1. Artificial Intelligence and SoftComputing- Behavioural and Cognitive Modelling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
2. Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991, rp2008.
3. Artificial Intelligence – Patric Henry Winston – Third Edition, Pearson Education.
4. A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.
5. Artificial Intelligence and Intelligent Systems, N.P.Padhy, Oxford Univ. Press.