ACADEMIC REGULATIONS

M.Tech Programmes

Regulation: R16

Applicable for the students admitted from the Academic year 2016-17 onwards

ASCET
AUDISANKARA Originating the Bright Careers

AUDISANKARA
COLLEGE OF ENGINEERING & TECHNOLOGY
An Autonomous Institute Affiliated to JNTUA, Ananthapuram & Accredited by NAAC with 'A' Grade

NH5 Bypass Road, Gudur, SPSR Nellore (Dt.)

www.audisankara.ac.in

REGULATIONS FOR M. TECH TWO YEAR REGULAR COURSES

R 1.0 Eligibility for Admission:

The admissions for category A and B seats shall be as per the guidelines of APSCHE in consonance with government reservation policy.

a) Under Category A: 70% of the seats are filled based on GATE/PGCET ranks.

b) Under Category B: 30% seats are filled on merit basis as per guidelines of APSCHE.

R 2.0 Semester wise Course Beak-up:

Sem	Theory	Lab	Total Credits
1st	6	2+ Technical Seminar	24
2nd	6	2+ Term Paper + Comprehensive Vive	26
3rd	7	Internship + Project Work	4 + 0
4th	4	Project Work	20
Total	23	5+Internship+ Project Work	74

R 2.1 Course wise break-up for the total credits:

Total Theory Courses : 23 @ 3 credits each = 69
Total Laboratory Courses : 5 @ 2 credits each = 15
Technical Seminar : 1 @ 2 credits = 2
Term Paper : 1 @ 2 credits = 2
Internship : 1 @ 2 credits = 2
Compre. Vive-Voce : 1 @ 2 credits = 2
Project work : 1 @ 20 credits =20

R 3.0 Division of marks for Internal and External assessment:

Course	Marks of Continuous Assessment	Marks of External Assessment	Maximum Marks
Theory	40	60	100
Labs	25	50	75
Term Paper	25	50	75
Comprehensive Viva-Voce	--	75	75
Internship	25	50	75
Project work	Grade	Grade	

R 4.0 Evaluation Methodology:

R 4.1 Theory Course:

Each theory course will be evaluated for a total of 100 marks, consisting of 40 marks for Continuous assessment and 60 marks for semester end examination. Following is the scheme for continuous assessment:

Scheme for Continuous Assessment:

Assessment Component	Marks	Schedule	Final Marks
Assignment Test#1 (AT#1)	5	After and on Unit#1	80% of first best SE + 20% of second best SE (30M) + AT#1 (5M) + AT#2 (5M)
Sessional Exam#1 (SE#1)	30	At the end of Unit#1 & 2	
Assignment Test#2 (AT#2)	5	After and on Unit#3	
Sessional Exam#2 (SE#2)	30	At the end of Unit#3 & 4	

4..1 (a) Scheme for SE Marks:

Two Sessional examinations (SE) each for 30 marks with the duration of 90 minutes each will be conducted for every theory course in a semester. The SE marks shall be awarded giving a weightage of 80% in the SE in which the student scores more marks and 20% in the remaining SE.

4.1 (b) Scheme for Assignment Test Marks:

Assignment test#1 shall be conducted for 5M at the end of Unit#1 covering the syllabus of unit#1. Assignment test#2 shall be conducted for 5M at the end of Unit#3 covering the syllabus of unit#3. Questions for Assignment test shall address the topics covered/ extension of the covered topics/Case Studies.

R 4.2 Laboratory Course:

a) Each lab will be evaluated for a total of 75 marks consisting of 25 marks for continuous assessment and 50 marks for semester end lab examination. Out of 25 marks of internal assessment, continuous lab assessment will be done for 15 marks for the day to day performance and 10 marks for the final internal lab assessment. The semester end lab examination for 50 marks shall be conducted by two Examiners, one of them being laboratory class Teacher as internal examiner and an external examiner nominated by the Principal from the panel of experts recommended by HOD.

R 4.3 Technical Seminar

Technical Seminar shall be conducted in 1st semester. The distribution of internal marks for component of Technical seminar is given below:

Table 5: Distribution of Marks for component of Technical seminar

S. No.	Criterion	Marks
1	Seminar Report & Subject content	20
2	Seminar presentation & Viva – Voce Exam	30

A Technical Seminar shall have two components, one chosen by the student from the course work as an extension and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before a committee consisting of Head of the department, seminar supervisor and a senior faculty member. Each Technical Seminar shall be evaluated for 100 marks. Technical Seminar component-I for 50 marks and component-II for 50 marks making total 100 marks. (**Distribution of marks for 50:** 10 marks for report, 10 marks for subject content, 20 marks for presentation and 10 marks for queries).

R 5.3 Term Paper

The Term Paper is a self study report and shall be carried during 2nd semester along with other lab courses. Every student will take up this term paper individually and submit a report. The scope of the term paper could be an exhaustive literature review choosing any engineering concept with reference to a standard research papers or an extension of the concept of earlier course work in consultation with the term paper supervisor. The term paper reports submitted by the individual students during the second semester will be evaluated for a total of 75 marks consisting of 25 marks for internal assessment and 50 marks for semester end examination. Internal assessment shall be done by the term paper supervisor. Semester end examination for 50 marks shall be conducted by two examiners, one of them being term paper supervisor as internal examiner and an external Examiner nominated by the Principal from the panel of experts recommended by HOD.

R 5.4 Comprehensive Viva-Voce

All the students shall face a Comprehensive viva-voce covering the total courses of first and second semesters. The comprehensive viva-voce will be conducted along with 2nd semester lab examination for 75 marks by a committee consisting of Head of the Department, two senior faculty members nominated by the Head of the Department.

R 4.3 Internship

All the students shall undergo the summer internship during summer break after 2nd semester. The minimum internship period is eight weeks and the students have an option of choosing their own industry/area of interest, which may be related to their respective branch or any other service oriented task. A self study report for the internship shall be submitted and evaluated during the 3rd semester and will be evaluated for a total of 75 marks consisting of 25 marks for internal assessment and 50 marks for semester end examination. Internal assessment shall be done by the internship supervisor. Semester end examination for 50 marks shall be conducted by two examiners, one of them being internship supervisor as internal examiner and an external examiner nominated by the Principal from the panel of experts recommended by HOD.

R 4.6 Project Work

All the students shall take up a project work during 3rd and 4th semesters which carries a total of 20 credits. Every candidate shall be required to submit thesis or dissertation after completion of satisfactory work on a topic approved by the Project Review Committee.

a) A Project Review Committee (PRC) shall be constituted with the Dean (R&D), Head of the Department and one senior faculty member of the department apart from the Project Supervisor.
b) Registration of Project Work: A student is permitted to register for the project work in the beginning of the third semester after satisfying all the academic requirements.
c) A student has to submit the title, objective and plan of action of his project work in consultation with his project supervisor to the Project Review Committee (PRC) for its approval. After obtaining the approval of the Committee the student can initiate the Project work from the beginning of the third semester.
d) The project work initiated during the third semester shall be completed in duration of 10 months and its progress will be reviewed from time to time by the PRC.

e) Progress of the project work shall be reviewed in the 3rd semester tor two times for satisfactory performance of the student for zero credits. 20 credits shall be awarded based on the successful submission and approval of thesis at the end of the 4th semester.

f) On the completion of the project work the candidate shall submit the draft copy of thesis to the Head of the Department for the approval of PRC and shall make an oral presentation.

g) After the final approval by PRC, four copies of the Project Thesis certified by the supervisor shall be submitted to the Department.

h) Students are allowed to submit the project work/ thesis if s/he clears all the first and second semester courses.

i) The thesis shall be evaluated by one examiner selected by the Principal/Chief Controller of examinations from a panel of 5 examiners, who are eminent in the field and nominated by the concerned guide and Head of the department.

j) The following weightage are given for the continuous assessment as well as for the final evaluation of the project work:

i) Weightage for Supervisor evaluation	-	40 %
ii) Weightage for PRC evaluation	-	10%
iii) Weightage for External evaluation	-	50%

R5.0 Attendance Requirements:

a) It is desirable for a candidate to put on 100% attendance in all the subjects. However, a candidate shall be permitted to appear for the semester end examination provided s/he maintains a minimum of 75% overall attendance in the semester.

b) The shortage of attendance on medical grounds can be condoned to an extent of 10% provided a medical certificate is submitted to the Head of the Department when the candidate reports back to the classes immediately after the leave. Certificates submitted afterwards shall not be entertained. Condonation fee as fixed by the college for those who put on attendance between ≥ 65% and <75% shall be charged before the end examinations. Attendance may also be condoned as per the State Government rules for those who participate in sports, co-curricular and extra-curricular activities provided their attendance is in the minimum prescribed limits for the purpose and recommended by the concerned authority.

c) In case of the students having over all attendance less than 65% after condonation shall be declared detained and has to repeat semester again.

R 6.0 Promotion Policies:

a) A student shall be promoted to subsequent semester only if s/he fulfills the attendance requirement. In case a student fails to fulfill the attendance requirement, s/he has to repeat the semester in the next academic year.

b) A Student will be promoted from 2nd semester to 3rd semester if s/he fulfills the academic requirements and earning of minimum of 50% credits up to 2nd semester.

R 6.1 Scheme for the award of Grade

a) A student shall be deemed to have satisfied the minimum academic requirements and earn the credits for each theory course, if s/he secures

   i. Not less than 40% marks for each theory course in the semester end exam, and

   ii. A minimum of 40% marks for each theory course considering both internal and semester end examination.

   i. A student shall be deemed to have satisfied the minimum academic requirements and earn the credits for each Lab/ Technical Seminar/Term Paper/Comprehensive Viva/Internship/Project, if s/he secures not less than 50% marks for each Lab/ Term Paper/Mini Project/ Project course in the semester end exam,
   and

   ii. A minimum of 50% marks for each Lab/ Technical Seminar/Term Paper/Comprehensive Viva/Internship/Project course considering both internal and semester end examination.

R 6.2 Graduation requirements:

The following academic requirements shall be met for the award of the MCA. Degree.

a) Student shall register and acquire minimum attendance in all courses and secure 74 credits. However, the CGPA obtained for the best 71 credits shall be considered for the award of Grade/Class/Division.

b) A student of a regular program who fails to earn 91 credits within four consecutive academic years from the year of his/her admission with a minimum CGPA of 4.0 shall forfeit his/her degree and his/her admission stands cancelled.

R 6.3 Award of Degree:

a) Classification of degree will be as follows:

1. CGPA ≥ 7.5 : First Class with Distinction
2. CGPA ≥6.5 and < 7.5 : Degree with First Class
3. CGPA ≥5.5 and < 6.5 : Degree with Second Class
4. CGPA ≥4.0 and < 5.5 : Degree with Pass Class

b) Degree with Distinction will be awarded to those students who clear all the subjects in single attempt and secure a CGPA ≥ 8.0 during his/her regular course of study.

c) In case a student takes more than one attempt in clearing a course, the final marks secured shall be indicated by * mark in the marks memo.

All the candidates who register for the semester end examination will be issued memorandum of grades by the Institute. Apart from the semester wise marks memos, the institute will issue the provisional certificate subject to the fulfillment of all the academic requirements.

R7.0 Re-Admission Criteria:

A Candidate, who is detained in a year/semester due to lack of attendance/credits, has to obtain written permission from the Principal for readmission into the same semester after duly fulfilling all the required norms stipulated by the college in addition to paying the required fee.

R8.0 Conduct & Discipline:-

(a) Students shall conduct themselves within and outside the premises of the Institute in a descent and dignified manner befitting the students of Audisankara College of Engineering & Technology.

(b) As per the order of the Honorable Supreme Court of India, ragging in any form is considered a criminal offence and is totally banned. Any form of ragging will be severely dealt with.

(c) The following acts of omission and / or commission shall constitute gross violation of the code of conduct and are liable to invoke disciplinary measures with regard to ragging.

(i) Lack of courtesy and decorum; indecent behavior anywhere within or outside the college campus.

(ii) Damage of college property or distribution of alcoholic drinks or any kind of narcotics to fellow students / citizens.

(d) Possession, consumption or distribution of alcoholic drinks or any kind of narcotics or hallucinogenic drugs.

(e) Mutilation or unauthorized possession of library books.

(f) Noisy and unruly behavior, disturbing studies of fellow students.

(g) Hacking in computer systems (such as entering into other person's areas without prior permission, manipulation and / or damage of computer hardware and software or any other cyber crime etc.

(h) Usage of camera /cell phones in the campus.

(i) Plagiarism of any nature.

(j) Any other act of gross indiscipline as decided by the college academic council from time to time.

(k) Commensurate with the gravity of offense, the punishment may be reprimand, fine, expulsion from the institute/ hostel, debarring from examination, disallowing the use of certain facilities of the Institute, rustication for a specified period or even outright expulsion from the Institute, or even handing over the case to appropriate law enforcement authorities or the judiciary, as required by the circumstances.

(l) For an offence committed in (i) a hostel (ii) a department or in a class room and (iii) elsewhere, the chief Warden, the concern Head of the Department and the Principal respectively, shall have the authority to reprimand or impose fine.

(m) Cases of adoption of unfair means and/ or any malpractice in an examination shall be reported to the principal for taking appropriate corrective action.

(n) All cases of serious offence, possibly requiring punishment other than reprimand, shall be reported to the Academic council of the college.

(o) The Institute Level Standing Disciplinary Action Committee constituted by the academic council shall be the authority to investigate the details of the offence, and recommend disciplinary action based on the nature and extent of the offence committed.

(p) The Principal shall deal with any problem, which is not covered under these rules and regulations.

(q) **"Grievance and Redressal Committee" (General)** constituted by the Principal shall deal with all grievances pertaining to the academic / administrative / disciplinary matters.

(r) All the students must abide by the code and conduct rules prescribed by the college from time to time.

R9.0 Transitory Regulations:

A student, who is detained or discontinued in the year/semester, on readmission shall be required to do all the courses in the curriculum prescribed for such batch of students in which the student joins subsequently.

R9.1 A student who is following the JNTUA, Anantapur curriculum/R13 regulations, detained due to lack of credits/ attendance at the end of the any semester of any year, shall join the forthcoming autonomous/ R13 batch (es) (which ever applicable) after fulfilling the requirements. Such students will study all the courses prescribed for that batch, in which the student joins. The student has to clear all backlog subjects if any by appearing in the supplementary examinations of JNTUA/R13 for the award of degree. The class will be awarded based on the academic performance of a student. Such candidates will be considered on par with R13 stream and will be governed by the regulations applicable.

R9.2 A student who is following the JNTUA, Anantapur curriculum/R13, detained due to lack of credits/ attendance at the end of any semester, shall join the autonomous batch at the appropriate semester. Such candidates shall be required to pass in all the courses in the Programme prescribed by concerned BoS for such batch of students, to be eligible for the award of degree. However, exemption will be given in all those courses of the semester(s) of the batch, which the candidate joins now, which he had passed earlier. The student has to clear all his backlog subjects by appearing in the supplementary examinations, conducted by JNTUA, Anantapur and College (Autonomous Stream) for the Award of Degree. The class will be awarded based on the academic performance of a student in the JNTUA Pattern and academic regulations of JNTUA will be followed.

General:

a) s/he represents "she" and "he" both
b) Where the words 'he', 'him', 'his', occur, they imply 'she', 'her', 'hers' also.
c) The academic regulations should be read as a whole for the purpose of any interpretation.
d) In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, Academic Council will be final.

The college may change or amend the academic regulations or syllabi from time to time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the institute.

Course Structure for M.Tech (Computer Science & Engineering) Regular Programme

Applicable for students admitted from 2016-17 Academic Year

M.Tech 1st Semester – Computer Science & Engineering

S.No	Code	Course	L	P	C
1	16CO1101	Advanced Data Structures and Algorithms	3	0	3
2	16CO1102	Distributing Computing	3	0	3
3	16CO1103	Business Intelligence	3	0	3
4	16CO1104	Advanced Computer Networks	3	0	3
5	16CO1105	Object Oriented Software Engineering	3	0	3
6	**ELECTIVE-I**				
	16CO1106	Pattern Recognition	3	0	3
	16CO1107	Advanced Compiler Design			
	16CO1108	Image Processing			
7	16CO2109	Advanced Data Structures and Algorithms Lab	0	3	2
8	16CO2110	Business Intelligence Lab	0	3	2
9	16CO2111	Technical Seminar	2	0	2
		TOTAL	**20**	**6**	**24**

M.Tech 2nd Semester – Computer Science & Engineering

S.No	Code	Course	L	P	C
1	16CO1201	Big-Data Analytics	3	0	3
2	16CO1202	Cyber Security	3	0	3
3	16CO1203	Mobile Application Development	3	0	3
4	16CO1204	Soft Computing	3	0	3
5	16CO1205	Advanced Computer Architecture	3	0	3
6	**ELECTIVE-II**				
	16CO1206	Software Project Management	3	0	3
	16CO1207	Software Quality Assurance			
	16CO1208	Design Patterns			
7	16CO2209	Big-Data Analytics Lab	0	3	2
8	16CO2210	Cyber Security Lab	0	3	2
9	16CO2211	Term Paper	2	0	2
10	16CO2212	Comprehensive Viva-Voce	0	0	2
		TOTAL	**20**	**6**	**26**

M.Tech 3rd Semester – Computer Science & Engineering

S.No	Code	Course	L	P	C
1	16CO2301	Internship + Project Work	0	0	4
		TOTAL	**0**	**0**	**4**

M.Tech 4th Semester – Computer Science & Engineering

S.No	Code	Course	L	P	C
1	16CO2401	Project Work	0	0	20
		TOTAL	**0**	**0**	**20**

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –CSE

L	T	P	C
3	0	0	3

16CO1101 ADVANCED DATA STRUCTURES AND ALGORITHMS

COURSE OUTCOMES:

At the end of the course students able to

1. Describe and implement a variety of advanced data structures (hash tables, priority queues, balanced search trees, graphs).
2. Analyze the space and time complexity of the algorithms studied in the course.
3. Identify different solutions for a given problem; analyze advantages and disadvantages to different solutions.
4. Demonstrate an understanding of external memory and external search and sorting algorithms.
5. Demonstrate an understanding of Dynamic Programming.

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 BigO 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.

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-III

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.

Divide – and – Conquer & Greedy Method: General Method, Binary Search, Finding Maximum and Minimum, Quick Sort, Merge sort, Stassen's Matrix Multiplication, Greedy Method- General Method, Minimum Cost Spanning Trees, Single Source Shortest Path

UNIT-IV

Dynamic Programming: General Method, All Pairs Shortest Path, Single Source Shortest Path, 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 G.A.V. Pai ,Data Structures and Algorithms, TMH, 2009.
2 Fundamentals of Computer Algorithms by Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, 2nd Edition, University Press.

REFERENCE BOOKS:

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

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –CSE

L	T	P	C
3	0	0	3

16CO1102 DISTRUBUTING COMPUTING

COURSE OUTCOMES:

At the end of the course students able to

1 Ability to design algorithmic solution to problems
2 Understand the role of constants, variables, identifiers, operators, and type conversions of C Language.
3 design programs Decision making and utilizing repetition
4 design modular programs using functions
5 Concept of Array and pointers dealing with memory management
6 Structures and unions through which derived data types can be formed.

UNIT-I

BASIC CONCEPTS: Characterization of Distributed Systems – Examples – Resource Sharing and the Web Challenges – System Models – Architectural and Fundamental Models – Networking and Internetworking – Types of Networks – Network Principles – Internet Protocols – Case Studies

UNIT-II

PROCESSES AND DISTRIBUTED OBJECTS: Inter–process Communication – The API for the Internet Protocols – External Data Representation and Marshalling – Client –Server Communication – Group Communication – Case Study – Distributed Objects and Remote Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events and Notifications – Java RMI – Case Study

UNIT-III

OPERATING SYSTEM ISSUES: The OS Layer – Protection – Processes and Threads – Communication and Invocation – OS Architecture – Security – Overview – Cryptographic Algorithms – Digital Signatures – Cryptography Pragmatics – Case Studies – Distributed File Systems – File Service Architecture – Sun Network File System – The Andrew File System

UNIT-IV

DISTRIBUTED TRANSACTION PROCESSING: Transactions – Nested Transactions – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions – Atomic Commit Protocols – Concurrency Control in Distributed Transactions – Distributed Deadlocks Transaction Recovery – Overview of Replication And Distributed Multimedia Systems

TEXT BOOKS:

1 George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", 3rd Edition, Pearson Education, 2002.
2 Andrew S. Tanenbaum, Maartenvan Steen, Distributed Systems, "Principles and Pardigms", Pearson Education, 2002.

REFERENCE BOOKS:

1 Sape Mullender, "Distributed Systems", 2nd Edition, Addison Wesley, 1993.
2 Albert Fleishman, Distributes Systems, "Software Design and Implementation", Springer, Verlag, 1994.
3 M. L. Liu, "Distributed Computing Principles and Applications", Pearson Education, 2004.
4 Mugesh Singhal, Niranjan G Shivaratri, "Advanced Concepts in Operating Systems", Tata McGraw Hill Edition, 2001.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –CSE

L	T	P	C
3	0	0	3

16CO1103 BUSINESS INTELLIGENCE

COURSE OUTCOMES:

At the end of the course students able to

1 Organizational and individual decision-making
2 key concepts and current practices of business intelligence
3 the individual, organizational and societal impacts of BI systems
4 analytical techniques used in business intelligence systems
5 data visualization techniques

UNIT-I

Introduction to Business intelligence

Definition and History of BI, Transaction processing versus analytical processing, BI implementation, Major tools and techniques of BI

UNIT-II

Data warehousing

Definition and concepts, Data warehouse architecture, ETL process, data warehouse development, Top down vs. Bottom up, Data Mart vs. EDW, Implementation issues, Real-time data warehousing

UNIT-III

Business performance management

Key performance indicators and operational metrics, Balanced scorecard, Six Sigma, Dashboards and scorecards

UNIT-IV

Data Mining for Business Intelligence

Data mining process, Data mining methods, ANN for Data Mining

Text and Web mining for Business intelligence

Text mining Applications, Process and Tools, Web content, structure and usage mining

BI implementation, Integration and emerging trends

Implementing BI, BI Application Life Cycle, Connecting BI to Enterprise systems, On-demand BI, Issues of legality, privacy and Ethics, Emerging topics in BI, Social Networking and BI, RFID and BI

TEXT BOOKS:

1 Business Intelligence: A Managerial Approach, By EfraimTurban, Ramesh Sharda, Dursun Delen, and David King 2nd Edition, PEARSON 2012
2 Business Intellegent data mining and optimization for decision making by carlo Vercillis, Wiley India Publication

REFERENCE BOOKS:

1 Oracle Business Intelligence Applications, McGraw Hill Education 2013
2 Data for Business Intelligence concepts techniques and applications by P.C Bruce , N.R.Patel.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –CSE

L	T	P	C
3	0	0	3

16CO1104 ADVANCED COMPUTER NETWORKS

COURSE OUTCOMES:

At the end of the course students able to

1 Independently understand basic computer network technology.
2 Understand and explain Data Communications System and its components.
3 Identify the different types of network topologies and protocols.
4 Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5 Identify the different types of network devices and their functions within a network

UNIT-I

Computer Networks and the Internet: History of Computer Networking and the Internet, Networking Devices, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones.

Networking Models: 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM.

UNIT-II

Routing and its concepts: Structure of a Router, Basic Router Configuration, Building a Routing Table, Static Routing, Dynamic Routing – Distance Vector Routing Protocol (RIPv1, RIPv2,EIGRP), Link State Routing Protocols (OSPF).

UNIT-III

Switching and its concepts: Structure of a Switch, Basic Switch Configuration, Virtual LANs (VLANs),
VLAN Trunking Protocol (VTP), Spanning Tree Protocol (STP), Inter-VLAN Routing

UNIT-IV

Wide Area Networks (WANs): Introduction to WANs, Point-to-Point Protocol (PPP) concepts, Frame Relay concepts, Dynamic Host Configuration Protocol (DHCP), Network Address Translation (NAT), IPv6.

Network Programming using Java:

TCP sockets, UDP sockets (datagram sockets), Server programs that can handle one connection at a time and multiple connections (using multithreaded server), Remote Method Invocation (Java RMI) - Basic RMI Process, Implementation details - Client-Server Application

TEXT BOOKS:

1 Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, Keith W.Ross, Fifth Edition, Pearson Education, 2012.
2 Network Fundamentals, Mark Dye, Pearson Education.
3 Routing Protocols & Concepts, Rick Graziani, Pearson Education.

REFERENCE BOOKS:

1 Computer Networks: A Systems approach, *Larry L. Peterson & Bruce S. Davie,* Fifth edition, Elsevier, rp2012.
2 Computer Networks: A Top-Down Approach, *Behrouz A. Forouzan, Firoz Mosharaf*, Tata McGraw Hill, 2012.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –CSE

L	T	P	C
3	0	0	3

16CO1105 OBJECT ORIENTED SOFTWARE ENGINEERING

COURSE OUTCOMES:

At the end of the course students able to

1 Ability to gather and specify requirements of the software projects.
2 Able to differentiate different testing methodologies
3 Ability to analyze software requirements with existing tools
4 design and understand and apply the basic project management practices in real life projects
5 Ability to work in a team as well as independently on software projects

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. **Planning and Estimation:** Estimation of Duration and Cost – COCOMO components of software.

UNIT-II

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. Cost - Benefit analysis, Introduction to software metrics and CASE tools. Taxonomy and scope of CASE tools

UNIT-III

Analysis and Design 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. Challenges in design phase.
Modules to objects: Cohesion and Coupling, Data Encapsulation and Information hiding aspects of Objects. Inheritance, polymorphism and Dynamic Binding aspects

UNIT-IV

Testing: Testing, Implementation, Integration and maintenance phases, OOSE aspects in these phases, one case study

TEXT BOOKS:

1 Object oriented and Classical Software Engineering, 7th edition, Stephen R. Schaech, TMH
2 Object oriented and classical software Engineering, Timothy Lethbridge, Robert Laganiere, TMH

REFERENCE BOOKS:

1 Roger S. Pressman, Software Engineering, A practitioner's Approach- 7th edition, McGraw Hill International Edition.
2 Summerville, Software Engineering- 7th edition, Pearson education.
3 Shely Cashman Rosenblatt, Systems Analysis and Design- Thomson Publications.
4 Waman S Jawadekar, Software Engineering principles and practice- The McGraw-Hill Companies.

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M.Tech 1st Semester –CSE

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16CO1106 PATTERN RECOGNITION

COURSE OUTCOMES:

At the end of the course students able to

1. Explain and compare a variety of pattern classification, structural pattern recognition, and pattern classifier combination techniques.
2. Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.
3. Apply performance evaluation methods for pattern recognition, and critique comparisons of techniques made in the research literature.
4. Apply pattern recognition techniques to real-world problems such as document analysis and recognition.
5. Implement simple pattern classifiers, classifier combinations, and structural pattern recognizers.
6. Explain and compare a variety of pattern classification, structural pattern recognition, and pattern classifier combination techniques.

UNIT-I

Pattern Classifier

Overview of pattern recognition - Discriminate functions - Supervised learning - Parametric estimation –Maximum likelihood estimation - Bayesian parameter estimation - Perceptron algorithm - LMSE algorithm - Problems with Bayes approach - Pattern classification by distance functions - Minimum distance pattern classifier.

UNIT-II

Unsupervised Classification

Clustering for unsupervised learning and classification - Clustering concept - C-means algorithm – Hierarchical clustering procedures - Graph theoretic approach to pattern clustering - Validity of clustering solutions.

UNIT-III

Structural Pattern Recognition

Structural Pattern Recognition, Elements of formal grammars - String generation as pattern description - Recognition of syntactic description - Parsing - Stochastic grammars and applications - Graph based structural representation.

UNIT-IV

Feature Extraction and Selection

Feature Extraction and Selection- Entropy minimization - Karhunen - Loeve transformation Feature selection through functions approximation - Binary feature selection.

TEXT BOOKS:

1 Robert J.Schalkoff, Pattern Recognition: Statistical, Structural and Neural Approaches, John Wiley & Sons Inc., New York, 2007.

REFERENCE BOOKS:

1 Tou and Gonzales, Pattern Recognition Principles, Wesley Publication Company, London, 1974.
2 Duda R.O., and Hart.P.E. Pattern Classification and Scene Analysis, Wiley, New York, 1973.
3 Morton Nadier and Eric Smith P., Pattern Recognition Engineering, John Wiley & Sons, New York, 1993.

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16CO1107 ADVANCED COMPILER DESIGN

COURSE OUTCOMES:

At the end of the course students able to

1 Ability using lexical analyzer and parser generator tools
2 Master building symbol tables and generating intermediate code.
3 Be familiar with compiler architecture
4 Be exposed to compiler optimization
5 Master generating assembly code for a RISC machine

UNIT-I

Compiler Phase:

Compiler phases - Compiler techniques review - lexical & syntax analysis, intermediate representation (AST), etc. Introduction to compiler analysis & optimization – basic blocks DAG – control flow analysis - Data flow analysis – Dependency analysis – dependency graphs– alias analysis

UNIT-II

Optimization Techniques:

Optimization Techniques – Early optimization – redundancy elimination – loop optimization– Procedure optimization – Procedural analysis

UNIT-III

Register Allocation:

Register allocation strategies – issues – local register allocation and assignment – moving beyond single blocks – global register allocation – instruction selection – simple tree walk scheme – Pattern matching – peephole optimization – instruction scheduling – list scheduling

UNIT-IV

Instruction Level Parallelism Processor Architectures:

Instruction level parallelism Processor Architectures – code scheduling constraints – basic block scheduling – global code scheduling – software pipelining – optimization for parallelism – Basic concepts and examples – Iteration spaces – Affine array indexes – Data reuse – Array data dependence - Finding synchronization free parallelism – Synchronization between parallel loops,- Pipelining - Locality optimizations.

TEXT BOOKS:

1 Aho, Lam, Sethi, & Ullman, Compilers: Principles, Techniques, & Tools (Second Edition), Addison-Wesley, 2007. – Unit 1, 4, 5
2 Steven Muchnick, Advanced Compiler Design and Implementation, Morgan Kaufman Publishers, 1997 – Unit 2

REFERENCE BOOKS:

1 Andrew W. Appel and Jens Palsberg, Compiler Implementation in Java (2nd Ed.), Cambridge University Press, 2002
2 Keith D. Cooper, Linda Torczon, Engineering a Compiler, Morgan Kaufman Publishers, 2003
3 Randy Allen and Ken Kennedy, "Optimizing Compilers for Modern Architectures: A Dependence based Approach", Morgan Kaufman, 2001.

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16CO1108 IMAGE PROCESSING

COURSE OUTCOMES:

At the end of the course students able to

1. Appreciate image manipulations and different digital image processing techniques in various fields.
2. Perform basic operations like – Enhancement, Image transform and restoration techniques on image.
3. Make use of image segmentation, compression for various applications.
4. Analyze pseudo and full color image processing techniques.
5. Apply the various image transforms used in image processing.

UNIT-I

Fundamental steps of image processing

Fundamental steps of image processing, components of an image processing of system, the image model and image acquisition, sampling and quantization, station ship between pixels, distance functions, scanner.

UNIT-II

Statistical and spatial

Statistical and spatial operations, Grey level transformations, histogram equalization, smoothing & Sharpening-spatial filters, frequency domain filters, homomorphic filtering, image filtering & restoration. Inverse and weiner filtering. FIR weiner filter. Filtering using image transforms, smoothing splines and interpolation.

UNIT-III

Morphological and other area operations

Morphological and other area operations, basic morphological operations, opening and closing operations, dilation erosion, Hit or Miss transform, morphological algorithms, extension to grey scale images. Segmentation and Edge detection region operations, basic edge detection, second order detection, crack edge detection, gradient operators, compass and laplace operators, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersheds.

UNIT-IV

Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression, image data compression-predictive technique, pixel coding, transfer coding theory, lossy and lossless predictive type coding. Basics of color image

processing, pseudo color image processing, color transformation, color smoothing and sharpening, color segmentation, color image compression, compression standards.

TEXT BOOKS:

1 Digital Image Processing – by Rafael.C.Gonzalez & Richard E.Woods, 3rd edition, Pearson Education, 2008.
2 Digital Image Processing, M.Anji Reddy, Y.Hari Shankar, BS Publications.
3 Fundamentals of Digital Image Processing – by A.K. Jain, PHI.

REFERENCE BOOKS:

1 Digital Image Processing – William K, Part I - John Wiley edition.
2 Digital Image Processing using MATLAB – by Rafael.C.Gonzalez, Richard E.Woods, & Steven L.Eddins, Pearson Education, 2006
3 Digital Image Processing, Kenneth R. Castleman, Pearson Education, 2007

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16CO2109 ADVANCED DATA STRUCTURES AND ALGORITHMS LAB

COURSE OUTCOMES:

At the end of the course students able to

1. Describe and implement a variety of advanced data structures (hash tables, priority queues, balanced search trees, graphs).
2. Analyze the space and time complexity of the algorithms studied in the course.
3. Identify different solutions for a given problem; analyze advantages and disadvantages to different solutions.
4. Demonstrate an understanding of external memory and external search and sorting Algorithms.
5. Demonstrate an understanding of Dynamic Programming

List of Experiments:

Exercise-1: Sort a given set of elements using the Quick sort method and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator

Exercise-2: Implement a parallelized Merge Sort algorithm to sort a given set of elements and determine the time required to sort the elements. Repeat the experiment for different values of n, the number of elements in the list to be sorted and plot a graph of the time taken versus n. The elements can be read from a file or can be generated using the random number generator.

Exercise-3: a) Obtain the Topological ordering of vertices in a given digraph.
b) Compute the transitive closure of a given directed graph using Warshall's algorithm.

Exercise-4: Implement 0/1 Knapsack problem using Dynamic Programming.

Exercise-5: From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijikstras algorithm.

Exercise-6: Find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm.

Exercise-7: a) Print all the nodes reachable from a given starting node in a digraph using BFS method.

b) Check whether a given graph is connected or not using DFS method.

Exercise-8: Find a subset of a given set S = {sl,s2,.....,sn} of n positive integers whose sum is equal to a given positive integer d. For example, if S= {1, 2, 5, 6, 8} and d = 9 there are two solutions{1,2,6}and{1,8}.A suitable message is to be displayed if the given problem instance doesn't have a solution.

Exercise-9: Implement any scheme to find the optimal solution for the Traveling Salesperson problem and then solve the same problem instance using any approximation algorithm and

determine the error in the approximation.

Exercise-10: Find Minimum Cost Spanning Tree of a given undirected graph using Prim's algorithm. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

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16CO2110 BUSINESS INTELLIGENCE LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Organizational and individual decision-making
2 key concepts and current practices of business intelligence
3 the individual, organizational and societal impacts of BI systems
4 analytical techniques used in business intelligence systems
5 data visualization techniques

List of Experiments:

Exercise-1: Develop an application for Business Intelligence Transaction Processing.
Exercise-2: Develop an application for Business Intelligence Analytical Processing.
Exercise-3: Data warehouse development
Exercise-4: Data Mining for Business Intelligence
Exercise-5: Text mining for Business intelligence
Exercise-6: Web mining for Business intelligence
Exercise-7: Connecting BI to Enterprise systems

Case Studies

Exercise-8: Study the Text mining Application
Exercise-9: Study the uses of Social Networking and BI
Exercise-10: Implementation issues Data Mart vs. EDW,

TEXT BOOKS:

1 Business Intelligence: A Managerial Approach, 2nd Edition, PEARSON 2012 Authors: EfraimTurban, Ramesh Sharda, Dursun Delen, and David King ISBN-10: 0-13-610066-X ISBN-13: 978-0-13-610066-9

REFERENCE BOOKS:

1 Oracle Business Intelligence Applications, McGraw Hill Education 2013

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M.Tech 1st Semester –CSE **L T P C**

16CO2111 TECHNICAL SEMINAR

COURSE OUTCOMES:

At the end of the course students able to

1 Analyze and develop a thought process for presentation
2 Improve his language and communication skills
3 Be conversant with the latest developments in power systems

A Technical Seminar shall have two components, one chosen by the student from the course work as an extension and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before a committee consisting of Head of the department, seminar supervisor and a senior faculty member. Each Technical Seminar shall be evaluated for 100 marks. Technical Seminar component-I for 50 marks and component-II for 50 marks making total 100 marks. (**Distribution of marks for 50:** 10 marks for report, 10 marks for subject content, 20 marks for presentation and 10 marks for queries).

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16CO1201 BIG-DATA ANALYTICS

COURSE OUTCOMES:

At the end of the course students able to

1 Identify the need for big data analytics for a domain.
2 Apply big data analytics for a given problem.
3 Suggest areas to apply big data to increase business outcome.
4 Use Hadoop, Map Reduce Framework handle massive data.

UNIT-I

Introduction to Big Data: Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis –Nature of Data - Analytic Processes and Tools – Analysis vs Reporting - Modern Data Analytic Tools Statistical Concepts: Sampling Distributions – Re Sampling - Statistical Inference - Prediction Error.

UNIT-II

Mining Data Streams: Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

UNIT-III

Hadoop: History of Hadoop – The Hadoop Distributed File System – Components of Hadoop-Analyzing the Data with Hadoop – Scaling Out – Hadoop Streaming – Design of HDFS-Java interfaces to HDFS Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort Task execution-Map Reduce Types and Formats- Map Reduce Features

UNIT-IV

Hadoop Environment: Setting up a Hadoop Cluster – Cluster specification – Cluster Setup and Installation – Hadoop Configuration – Security in Hadoop – Administering Hadoop HDFS – Monitoring-Maintenance – Hadoop benchmarks – Hadoop in the cloud

TEXT BOOKS:

1 Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
2 Tom White “Hadoop: The Definitive Guide” Third Edition, O’Reilly Media, 2012.

REFERENCE BOOKS:

1 Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHil Publishing, 2012.
2 Anand Rajarman and Jeffrey David Ullman."Mining of Massive Datasets", Cambridge university 2012
3 Bill Franks, " Taming The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics", John Wiley & Sons, 2012

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16CO1202 CYBER SECURITY

COURSE OUTCOMES:

At the end of the course students able to

1 Students will communicate effectively both orally and in writing in a variety of audiences.
2 Students will demonstrate critical thinking by analyzing situations and by constructing and selecting solutions to problems.
3 Students will understand and appreciate the importance of the impact of effective leadership in IT organizations.
4 Students will understand and appreciate the legal and ethical environment impacting individuals as well as business organizations and have an understanding of the ethical implications of IT legal decisions.
5 Students will have a fundamental knowledge of Information Technologies which affect organizational processes and decision-making.
6 Students will communicate effectively both orally and in writing in a variety of audiences.

UNIT-I

Introduction : Cyber Security – Cyber Security policy – Domain of Cyber Security Policy – Laws and Regulations – Enterprise Policy – Technology Operations – Technology Configuration Strategy Versus Policy – Cyber Security Evolution – Productivity – Internet – E commerce Counter Measures Challenges.

UNIT-II

Cyber Security Objectives and Guidance: Cyber Security Metrics – Security Management Goals – Counting Vulnerabilities – Security Frameworks – E Commerce Systems – Industrial Control Systems – Personal Mobile Devices – Security Policy Objectives – Guidance for Decision Makers – Tone at the Top – Policy as a Project – Cyber Security Management Arriving at Goals – Cyber Security Documentation – The Catalog Approach – Catalog Format Cyber Security Policy Taxonomy.

UNIT-III

Cyber Security Policy Catalog: Cyber Governance Issues – Net Neutrality – Internet Names and Numbers – Copyright and Trademarks – Email and Messaging - Cyber User Issues Malvertising - Impersonation – Appropriate Use – Cyber Crime – Geo location – Privacy Cyber Conflict Issues – Intellectual property Theft – Cyber Espionage – Cyber Sabotage- Cyber Welfare.

UNIT-IV

Cyber Management Issues: Fiduciary Responsibility – Risk Management – Professional Certification – Supply Chain – Security Principles – Research and Development – Cyber Infrastructure Issue – Banking and finance – Health care – Industrial Control systems.

Case Study: A Government's Approach to Cyber Security Policy.

TEXT BOOKS:

1 Jennifer L. Bayuk, J. Healey, P. Rohmeyer, Marcus Sachs , Jeffrey Schmidt, Joseph Weiss "Cyber Security Policy Guidebook" John Wiley & Sons 2012.
2 Rick Howard "Cyber Security Essentials" Auerbach Publications 2011.

REFERENCE BOOKS:

1 Richard A. Clarke, Robert Knake "Cyberwar: The Next Threat to National Security & What to Do About It" Ecco 2010
2 Dan Shoemaker Cyber security The Essential Body Of Knowledge, 1st ed. Cengage Learning 2011

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16CO1203 MOBILE APPLICATION DEVELOPMENT

COURSE OUTCOMES:

At the end of the course students able to

1. Understand and apply the key technological principles and methods for delivering and maintaining mobile applications.
2. Evaluate and contrast requirements for mobile platforms to establish appropriate strategies for development and deployment.
3. Develop and apply current standard-compliant scripting/programming techniques for the successful deployment of mobile applications targeting a variety of platforms.
4. Carry out appropriate formative and summative evaluation and testing utilizing a range of mobile platforms.
5. Interpret a scenario, plan, and design and develop a prototype hybrid and native mobile application.
6. Understand and apply the key technological principles and methods for delivering and maintaining mobile applications.

UNIT-I

Introduction: Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications Requirements gathering and validation for mobile applications

UNIT-II

Basic Design: Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures Achieving quality constraints – performance, usability, security, availability and modifiability.

UNIT-III

Advanced Design: Designing applications with multimedia and web access capabilities Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT-IV

Technology I - Android Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI –Persisting data using SQLite - Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.

TEXT BOOKS:

1 Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox, 2012
2 Charlie Collins, Michael Galpin and Matthias Kappler, “Android in Practice”, DreamTech, 2012

REFERENCE BOOKS:

1 James Dovey and Ash Furrow, “Beginning Objective C”, Apress, 2012
2 David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.

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16CO1204 SOFT COMPUTING

COURSE OUTCOMES:

At the end of the course students able to

1 Learn about Soft Computing concepts
2 Understand the Genetic Algorithms
3 Study the Machine Learning Using Neural Networks, Adaptive Networks and Advances in Neural Networks
4 Analyze the Rules, Operations, Relations and functions of Fuzzy Logic
5 Define the fuzzy systems

UNIT-I

Introduction to Soft Computing and Neural Networks: Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT-II

Genetic Algorithms: Introduction to Genetic Algorithms (GA) – Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

UNIT-III

Neural Networks: Machine Learning Using Neural Network, Adaptive Networks – Feed forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks - Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance architectures – Advances in Neural networks.

UNIT-IV

Fuzzy Logic: Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions- Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making.

TEXT BOOKS:

1 Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2003.
2 George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.
3 James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.

REFERENCE BOOKS:

1 Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
2 David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 1997.
3 S. N. Sivanandam, S. Sumathi and S. N. Deepa, "Introduction to Fuzzy Logic using MATLAB", Springer, 2007.
4 S.N.Sivanandam · S.N.Deepa, " Introduction to Genetic Algorithms", Springer, 2007.

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16CO1205 ADVANCED COMPUTER ARCHITECTURE

COURSE OUTCOMES:

At the end of the course students able to

1. Ability to describe the operation of modern and high performance computers.
2. Ability to undertake performance comparisons of modern and high performance computers.
3. Development of software to solve computationally intensive problems.
4. Lifelong learning skills, in particular the ability to undertake self-directed study.
5. Describe the operation of performance enhancements such as pipelines, dynamic scheduling, branch prediction, caches, and vector processors.

UNIT-I

Instruction Level Parallelism: ILP – Concepts and challenges – Hardware and software approaches – Dynamic Scheduling – Speculation - Compiler techniques for exposing ILP Branch prediction.

UNIT-II

Instruction Level Parallelism: ILP – Concepts and challenges – Hardware and software approaches – Dynamic Scheduling – Speculation - Compiler techniques for exposing ILP Branch prediction.

UNIT-III

Multiprocessors and Thread Level Parallelism: Symmetric and distributed shared memory architectures – Performance issues – Synchronization – Models of memory consistency – Introduction to Multithreading.

UNIT-IV

Memory and I/O: Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time – Main memory and performance – Memory technology. Types of storage devices – Buses – RAID- Reliability, availability and dependability – I/O performance measures – Designing an I/O system.

TEXT BOOKS:

1. John L. Hennessey and David A. Patterson, "Computer architecture – A quantitative Approach", Morgan Kaufmann / Elsevier Publishers, 4th. Edition, 2007.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.

REFERENCE BOOKS:

1 David E. Culler, Jaswinder Pal Singh, "Parallel computing architecture: A hardware/software approach", Morgan Kaufmann /Elsevier Publishers, 1999.
2 Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw Hill, New Delhi, 2003.

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16CO1206 SOFTWARE PROJECT MANAGEMENT

COURSE OUTCOMES:

At the end of the course students able to

1. Understand and practice the process of project management and its application in delivering successful IT projects
2. Evaluate a project to develop the scope of work, provide accurate cost estimates and to plan the various activities.
3. Understand and use risk management analysis techniques that identifies the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
4. Identify the resources required for a project and to produce a work plan and resource schedule.
5. Monitor the progress of a project and to assess the risk of slippage, revising targets or counteract drift.

UNIT-I

Conventional Software Management: Waterfall model, Conventional Software Management performance, Evolution of software economics-Software economics, Pragmatic software cost estimation.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, achieving required quality, peer inspections

UNIT-II

The Old Way and the New: The principles of conventional software Engineering, Principles of modern software management, transition to an iterative process.

Life Cycle Phases: Engineering and Production stages, Inception, Elaboration, Construction, transition phases. Artifacts of the process-The Artifact sets, Management artifacts, Engineering artifacts, Program aticartifacts.

UNIT-III

Model Based Software Architectures: A Management perspective and technical perspective, Software process work lows, Iteration workflows. Checkpoints of the process-Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process planning: Work break down structures, Planning guidelines, Cost and Schedule estimating, Iteration planning process, Pragmatic planning

UNIT-IV

Project Organization and Responsibilities: Line-of-Business Organizations, Project Organizations, and evolution of Organizations. Process automation-Automation Building blocks, The Project Environment.

Project Control and Process Instrumentation: The seven core Metrics, Management indicators, Quality indicators, Life cycle exceptions, Pragmatic Software Metrics, Metrics automation Tailoring the process- **Process** discriminates. Modern process transitions. **CCPDS-R CASE STUDY:** life cycle overview.

TEXT BOOKS:

1 Software Project Management, Walker Royce: Pearson Education, 2005.
2 Software Project Management, Joel Henry, Pearson Education.

REFERENCE BOOKS:

1 Software project management walker Royce, Bob Hughes and Mike Cotterell, Tata McGraw-Hill Edition
2 SoftwareProjectManagementinpractice,PankajJalote,PearsonEducation2005
3 Software Engineering, K.K.Aggarwal&Yogeshsingh, New Age International publishers

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16CO1207 SOFTWARE QUALITY ASSURANCE

COURSE OUTCOMES:

At the end of the course students able to

1 Understand quality management processes
2 Distinguish between the various activities of quality assurance, quality planning and quality control
3 Understand the importance of standards in the quality management process and their impact on the final product
4 Objectively evaluate software processes and provide project staff with feedback about non compliance issues
5 Understand concepts and methods required for effective and efficient SQA

UNIT-I

Introduction: Introduction – Views on quality – Cost of quality - Quality models – Quality frameworks –Verification and Validation – Defect taxonomy – Defect management Statistics and measurements – IEEE standards – Quality assurance and control processes

UNIT-II

Verification, Test Generation: Introduction – Verification techniques – Inspections, reviews, walk-troughs – Case studies Software testing- Validation – Test plan – Test cases - Test Generation – Equivalence partitioning – Boundary value analysis – Category partition method – Combinatorial generation – Decision tables – Examples and Case studies

UNIT-III

Structural Testing: Introduction – Test adequacy criteria – Control flow graph
Coverages: block, conditions, multiple conditions, MC/DC, path – Data flow graph Definition and use coverages – C-use, P-use, Defclear, Def-use – Finite state machines – Transition coverage – Fault based testing – Mutation analysis – Case studies

UNIT-IV

Functional Testing: Introduction – Test adequacy criteria - Test cases from use cases – Exploratory testing - Integration, system, acceptance, regression testing – Testing for specific attributes: Performance, load and stress testing – Usability testing – Security testing - Test automation – Test oracles

TEXT BOOKS:

1 Boriz Beizer, "Software Testing Techniques", 2nd Edition, DreamTech, 2009.
2 Aditya P. Mathur, "Foundations of Software Testing", Pearson, 2008
3 Mauro Pezze and Michal Young, "Software Testing and Analysis. Process, Principles, and Techniques", John Wiley 2008

REFERENCE BOOKS:

1 Stephen H. Kan, "Metrics and Models in Software Quality Engineering", 2nd Edition, Pearson, 2003
2 Kshirasagar Naik and Priyadarshi Tripathy (Eds), "Software Testing and Quality Assurance: Theory and Practice", John Wiley, 2008

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16CO1208 DESIGN PATTERNS

COURSE OUTCOMES:

At the end of the course students able to

1 Classify and document design patterns.
2 Understand patterns to manage algorithms and assign responsibilities to objects.
3 Apply patterns to solve design problems.
4 Create new design patterns.
5 Understand patterns algorithms and assign responsibilities to objects

UNIT-I

Introduction: What is Software Architecture? An Engineering Discipline for Software, the Status of Software Architecture.

Architectural Styles: Architectural Styles, Pipes and Filters, Data Abstraction and Object-Oriented Organization, Event-Based, Implicit Invocation, Layered Systems, Repositories, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

Shared Information Systems: Shared Information Systems, Database Integration, Integration in Software Development Environments, Architectural Structures for Shared Information Systems.

UNIT-II

Introduction: What Is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT-III

Structural Pattern Part-I: Adapter, Bridge, Composite.

Structural Pattern Part-II: Decorator, Facade, Flyweight, Proxy.

UNIT-IV

Behavioral Patterns Part-I: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer.

TEXT BOOKS:

1 Design Patterns By Erich Gamma, Pearson Education
2 Software Architecture: Perspective on an Emerging Discipline By Mary Shaw, David Garlan, PHI.

REFERENCE BOOKS:

1 Software Architecture in Practice by Len Bass, Paul Clements, Rick Kazman, Third Edition, Pearson Education.
2 Head First Design Patterns By Eric Freeman-Oreilly-spd.
3 Design Patterns Explained By Alan Shalloway, Pearson Education.
4 Pattern Oriented Software Architecture, F.Buschmann&others, John Wiley & Sons

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester – CSE

L	T	P	C
0	0	3	2

16CO2209 BIG-DATA ANALYTICS LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Identify the need for big data analytics for a domain.
2 Apply big data analytics for a given problem.
3 Suggest areas to apply big data to increase business outcome.
4 Use Hadoop, Map Reduce Framework handle massive data.

LIST OF EXPERIMENTS

Exercise-1: Set up a pseudo-distributed, single-node Hadoop cluster backed by the Hadoop Distributed File System, running on Ubuntu Linux. After successful installation on one node, configuration of a multi-node Hadoop cluster (one master and multiple slaves).

Exercise-2: Map Reduce application for word counting on Hadoop cluster

Exercise-3: Unstructured data into NoSQL data and do all operations such as NoSQL query with API.

Exercise-4: K-means clustering using map reduce

Exercise-5: Page Rank Computation

Exercise-6: Mahout machine learning library to facilitate the knowledge build up in big data analysis.

Exercise-7: Application of Recommendation Systems using Hadoop/mahout libraries.

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M.Tech 2nd Semester – CSE

L	T	P	C
0	0	3	2

16CO2210 CYBER SECURITY LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Students will communicate effectively both orally and in writing in a variety of audiences.
2 Students will demonstrate critical thinking by analyzing situations and by constructing and selecting solutions to problems.
3 Students will understand and appreciate the importance of the impact of effective leadership in IT organizations.
4 Students will understand and appreciate the legal and ethical environment impacting individuals as well as business organizations and have an understanding of the ethical implications of IT legal decisions.
5 Students will have a fundamental knowledge of Information Technologies which affect organizational processes and decision-making.
6 Students will communicate effectively both orally and in writing in a variety of audiences.

LIST OF EXPERIMENTS

Exercise-1: Implementation of Substitution and Transposition ciphers

Exercise-2: Implementation of Data Encryption Standard

Exercise-3: Implementation of International Data Encryption Algorithm

Exercise-4: Implementation of Advanced Encryption Standard

Exercise-5: Implementation of RSA Algorithm

Exercise-6: Implementation of Diffie-Hellman Key Exchange

Exercise-7: Implementation of Message Authentication Codes

Exercise-8: Implementation of Hash functions

Exercise-9: Implementation of Digital Signature Standard

Exercise-10: Hiding of confidential information within Image

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M.Tech 2nd Semester – CSE

L	T	P	C
2	0	0	2

16CO2211 **TERM PAPER**

The Term Paper is a precursor to the project work done in the 2nd year M.Tech Programme. The paper may be of 8-10 (A4 size) in length and follows the standard IEEE/Technical Journal Format.

The Term Paper helps to supplement the second year Project Work of the M.Tech students. It helps to identify their Research area/topic and complete the groundwork and preliminary research required for it comfortably. It trains the students to make use of Research Tools and Material available both in print and digital formats.

Based on the topic, a hypothesis is to be made by the student, under the supervision of the guide. The student is then required to collect literature and support information for his / her term paper from Standard Reference Books, Journals, and Magazines - both printed and online. Each student should refer to a minimum of 6 reference sources related to the topic. The student also presents his/her paper with the help of Power Point slides / OHP.

The Term Paper contains: The Aim and Objective of the study, The need for Rationale behind the study, Identify the work already done in the field, Hypothesis and Discussion, Conclusion Appendix with support data (Illustrations, Tables, Graphs, etc.).

Page Limit: minimum of eight pages.

Date of evaluation: During the Lab Internal Exam.

Method of Evaluation: Total 50 marks

1. Day to day work - 10 marks
2. Term Paper Report - 20 marks
3. Seminar - 20 marks

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M.Tech 2nd Semester – CSE

L	T	P	C
0	0	0	2

16CO2212 COMPREHENSIVE VIVA-VOCE

COURSE OUTCOMES:

At the end of the course students able to

1 Test the learning and understanding during the course of under graduate program.
2 Face interview both at the academic and the industrial sector.

All the students shall face a Comprehensive viva-voce covering the total courses of first and second semesters. The comprehensive viva-voce will be conducted along with 2nd semester lab examination for 75 marks by a committee consisting of Head of the Department, two senior faculty members nominated by the Head of the Department

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 3rd Semester – CSE

L	T	P	C
0	0	0	4

16CO2301 INTERNSHIP + PROJECT WORK

COURSE OUTCOMES:

At the end of the course students able to

1 develop awareness, understanding and capacity in the specific roles and responsibilities in an industry
2 develop and refinement of technical and professional skills

All the students shall undergo the summer internship during summer break after 2nd semester. The minimum internship period is eight weeks and the students have an option of choosing their own industry/area of interest, which may be related to their respective branch or any other service oriented task. A self study report for the internship shall be submitted and evaluated during the 3rd semester and will be evaluated for a total of 75 marks consisting of 25 marks for internal assessment and 50 marks for semester end examination. Internal assessment shall be done by the internship supervisor. Semester end examination for 50 marks shall be conducted by two examiners, one of them being internship supervisor as internal examiner and an external examiner nominated by the Principal from the panel of experts recommended by HOD

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(AUTONOMOUS)

M.Tech 4th Semester – CSE

L	T	P	C
0	0	0	20

16CO2401 **PROJECT WORK**

COURSE OUTCOMES:

At the end of the course students able to

1 Identify a problem of current relevance to society
2 Formulate the problem and identify suitable modeling paradigm.
3 Analyze the problem and identify the solution methodology

Students are required to take up a project work, in which the student can choose any specific problem of Industry or Industry based project work. Alternatively it can be secondary source based or Field based project work. Before the commencement of the project work each student is required to submit a synopsis indicating the objectives, Methodology, Framework for analysis, Action plan with milestones in order to have clarity for the subsequent work. The project should have an internal faculty as guide. The student can initiate the project work in the penultimate semester of the course.