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 (Software Engineering) Regular Programme

Applicable for students admitted from 2016-17 Academic Year

M.Tech 1st Semester – Software Engineering

S.No	Code	Course	L	P	C
1	16SE1101	Advanced Data Structures and Algorithms	3	0	3
2	16SE1102	Object Oriented Software Engineering	3	0	3
3	16SE1103	Software Project Management	3	0	3
4	16SE1104	Web Technologies	3	0	3
5	16SE1105	Cloud Computing	3	0	3
6	**ELECTIVE-I**				
	16SE1106	Middleware Technologies	3	0	3
	16SE1107	Software Reliability			
	16SE1108	Introduction to Analytics			
7	16SE2109	Advanced Data Structures and Algorithms Lab	0	3	2
8	16SE2110	Web Technologies Lab	0	3	2
9	16SE2111	Technical Seminar	2	0	2
		TOTAL	**20**	**6**	**24**

M.Tech 2nd Semester – Software Engineering

S.No	Code	Course	L	P	C
1	16SE1201	Software Architecture and Design Patterns	3	0	3
2	16SE1202	Software Quality Assurance	3	0	3
3	16SE1203	Service Oriented Architecture	3	0	3
4	16SE1204	Software Testing	3	0	3
5	16SE1205	Secure Software Engineering	3	0	3
6	**ELECTIVE-II**				
	16SE1206	Internet of Things	3	0	3
	16SE1207	Distributing Computing			
	16SE1208	Knowledge Engineering			
7	16SE1209	Design Patterns Lab	0	3	2
8	16SE2210	Software Testing Lab	0	3	2
9	16SE2211	Term Paper	2	0	2
10	16SE2212	Comprehensive Viva-Voce	0	0	2
		TOTAL	**20**	**6**	**26**

M.Tech 3rd Semester – Software Engineering

S.No	Code	Course	L	P	C
1	16SE2301	Internship + Project Work	0	0	4
		TOTAL	**0**	**0**	**4**

M.Tech 4th Semester – Software Engineering

S.No	Code	Course	L	P	C
1	16SE2401	Project Work	0	0	20
		TOTAL	**0**	**0**	**20**

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –SE

L	T	P	C
3	0	0	3

16SE1101 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 –SE

L	T	P	C
3	0	0	3

16SE1102 OBJECT ORIENTED SOFTWARE ENGINEERING

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, and 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, 7/e, Stephen R. Schach, 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, McGrawHill International Edition.
2 Sommerville, 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.
5 Component-based software engineering: 7th international symposium, CBSE 2004, Ivica Crnkovic,

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –SE

L	T	P	C
3	0	0	3

16SE1103 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.

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

THEOLDWAYANDTHENEW: 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 PROCESSPLANNING: 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, ProjectOrganizations,evolutionofOrganizations.processautomationAutomationBuildingblocks ,TheProjectEnvironment.

PROJECTCONTROLAND PROCESSINSTRUMENTATION: 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, WalkerRoyce: PearsonEducation,2005.
2 Software Project Management ,Joe lHenry, Pearson Education.

REFERENCE BOOKS:

1 SoftwareProjectManagement,WalkerRoyce,BobHughesandMikeCotterell,TataMcGraw-HillEdition
2 SoftwareProjectManagementinpractice,PankajJalote,PearsonEducation
3 Software Engineering, K.K.Aggarwa l& Yogeshsingh, New Age International publishers

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –SE

L	T	P	C
3	0	0	3

16SE1104 WEB TECHNOLOGIES

COURSE OUTCOMES:

At the end of the course students able to

1 Understand the need for and be able to write validated XHTML 1.0.
2 Understand and be able to apply sound, non-browser specific web design principles.
3 Understand and be able to use Javascript to access the DOM to reference web document object CSS properties.
4 Understand the application of XHTML for document structure and content.
5 Understand and apply Javascript, CSS & XHTML to create dynamic XHTML.

UNIT-I

HTML5 Introduction, Forms, Graphics, Media, APIs.

UNIT-II

Web Servers and Servlets: The life cycle of a Servlet, Using Tomcat for Servlet Development, A Simple Servlet, Servlet API, The javax. Servlet Package, Reading Servlet Parameters, The javax. servlet.http Package, handling Http request and response, using Cookies, Session Tracking, Security Issues.

UNIT-III

JSP Application Basics: Introducing Java Server Pages, Http and Servelet Basics, JSP Overview, Setting up the JSP Environment.

JSP Application Development: Generating Dynamic Content, Using JavaBeans Components in JSP Pages, Using Custom Tag Libraries and the JSP Standard Tag Library, Processing Input and Output, Error Handling and Debugging, Sharing Data between JSP Pages, Requests and users, Developing Custom Tag Libraries as Tag Files.

UNIT-IV

Accessing a Database: Accessing a database from a JSP page, validating Complex input without a bean, using Transactions, Application –Specific Database Actions.

Database Access Strategies: JDBC Basics, Using Connections and Connection pools, making Connection Pool Available to Application Components, Using a Generic Database Bean, Developing Application-Specific Database Components.

TEXT BOOKS:

1 Java Server Pages –Hans Bergsten, SPD O'Reilly, 2003.
2 The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH, 2002.

REFERENCE BOOKS:

1 Java Server Pages, Pekowsky, Pearson.
2 Core Servlets and JavaServer Pages Volume 1: Core Technologies by Marty Hall and Larry Brown Pearson
3 Internet and world wide web – How to program by Dietel and Nieto PHI/Pearson Education Asia .
4 Murach's beginning Java JDK 5, Murach, SPD.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester –SE

L	T	P	C
3	0	0	3

16SE1105 CLOUD COMPUTING

COURSE OUTCOMES:

At the end of the course students able to

1 Compare the strengths and limitations of cloud computing.
2 Identify the architecture, infrastructure and delivery models of cloud computing.
3 Address the core issues of cloud computing such as security, privacy and interoperability.
4 Apply suitable virtualization concept.
5 Design Cloud Services and Set a private cloud.

UNIT-I

Introduction to Virtualization: Objectives of virtualization, history of virtualization, benefits of virtualized technology, the virtual service desk, what can be virtualized, related forms of computing, cloud computing, software as a service – SaaS, grid computing, utility computing, virtualization processes.

UNIT-II

Virtualization Technologies-I:ubuntu (server edition),altiris, windows, server, software virtualization, vmware, intel virtualization, red hat virtualization, softgrid application, Linux virtualization ,desktop, virtualization, hardware virtualization, resource virtualization, processor virtualization, application virtualization.

Virtualization Technologies-II: Storage virtualization, virtualization density ,para-virtualization, OS virtualization, virtualization software, data storage virtualization, Intel virtualization technology ,thinstall virtualization suite, net framework virtualization, windows virtualization on fedora, storage virtualization technologies, virtualization level, security monitoring and virtualization, oracle virtualization.

UNIT-III

Virtualization and Storage Management: The heart of cloud computing -virtualization, defining virtualization, why virtualize, what can be virtualized, where does virtualization happen, how does virtualization happen, on the road to storage virtualization, improving availability using virtualization, improving performance through virtualization, improving capacity through virtualization, business value for virtualization.

Introduction to Cloud Computing: Cloud Introduction and overview- Components, Infrastructure and Services, Why Use Cloud Computing, Benefits and Limitations, Cloud Application Architectures, Cloud Infrastructure Models, Cloud Computing Technology-Hardware & Software Infrastructure

UNIT-IV

Cloud Computing Architecture: Requirements, Introduction to Cloud Computing Architecture, various kinds of Cloud Computing Architecture, Grid Computing, Transactional Computing, On Demand Computing, and Distributed Computing. Security: Security issues in Cloud Computing - Data Security, Network Security, and Host Security. Disaster Recovery: Disaster Recovery Planning, Disasters in the

Cloud, Disaster Management. Scaling a Cloud Infrastructure- Capacity Planning, Cloud Scale. Case Studies: Amazon S3, Google APP Engine, IBM Clouds, Oracle OBIEE.

TEXT BOOKS:

1 Cloud Computing Virtualization Specialist Complete Certification Kit Ivanka MenkenGerard Blokdijk, - Study Guide Book, 2009.
2 George Reese, Cloud Application Architectures Building Applications and Infrastructure in the Cloud, O'Reilly Media Press, 2009.

REFERENCE BOOKS:

1 Anthony T.Velte, TobeJ.Velte, Robert Elsenpeter, Cloud Computing: A Practical Aprroach, Publication Person Education, 2009
2 Tom Clark,Addison ,Storage Virtualization: Technologies for Simplifying Data Storage and Management, -Wesley, 2005
3 Curtis Franklin Jr.Brian J.S. Chee**,**Cloud Computing Technologies and Strategies of the Ubiquitous DataCenter, 2010
4 Timothy Chou,Introduction to Cloud Computing: Business & Technology, 2009

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M.Tech 1st Semester –SE

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16SE1106 MIDDLEWARE TECHNOLOGIES

COURSE OUTCOMES:

At the end of the course students able to

1 Choose appropriate client server computing model for given problem.
2 Design a dynamic remote application with RMI and JDBC Connectivity.
3 Develop client server applications using C#.net.
4 Select appropriate language for homogeneous and heterogeneous objects.
5 Develop real time projects by combining CORBA and database interfacing.

UNIT-I

Client/Server Computing

Building blocks-types of servers-types of Clients-types of middleware-aspects of client/server systems-sizing-scalability-tiered architecture-client/server models-requirements of client/server systems-**Distributed objects**-benefits-drawbacks-from distributed objects to components

UNIT-II

Component Technology

Components- definitions-properties-benefits-components and interfaces- direct and indirect interfaces- versions-interfaces as contracts- callbacks- forms of design levels reuse- connection oriented programming – connectable objects.

Component Architecture

Component architecture- component frameworks- composition- data driven, contextual, aspect oriented programming, subject oriented programming, XML components-component development- assembly.

UNIT-III

Common Language Infrastructure

Common language infrastructure- common language Runtime.NET framework class library-ADO.NET, ASP.NET- enterprise services. CORBA Component model

UNIT-IV

THE MICROSOFT WAY

Component object model- from COM, COM+, DCOM to .NET framework-evolution- web services technologies- XML, WSDL, UDDI, SOAP.

TEXT BOOKS:

1 Clemens szyperski, Dominik Gruntz and Stephan Murer, "Component Software Beyond object oriented Programming" Second edition, Pearson education, 2004.
2 Robert Orfali, Dan Harkey, Jeri Edwards, "Client/Server Survival Guide" third edition, John Wiley Inc, 2003.

REFERENCE BOOKS:

1 David Chappell, "Understanding .NET", Pearson education Inc, 2002.
2 Bill Burke, Richard Monson-Haefel, "Enterprise JavaBeans", Fifth Edition, O"Reily, 2001.
3 Dan harkey, Roberrt Orfali, " Client/Server programming with JAVA and CORBA", second edition, wiley& sons Inc, 1999.

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M.Tech 1st Semester –SE

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16SE1107 SOFTWARE RELIABILITY

COURSE OUTCOMES:

At the end of the course students able to

1 To understand the software reliability and its various model
2 An Ability to understand the metrics used for software reliability and maintainability
3 To understand the fault detection and correction approaches used in developing a quality software
4 To understand the design principles for achieving higher reliable software system.
5 An Ability to understand the fault detection and correction approaches

UNIT-I

INTRODUCTION

Need and Concepts of Software Reliability, Failure and Faults – Prevention, Removal, Tolerance, Forecast**, Dependability Concept** – Failure Behavior, Characteristics, Maintenance Policy, Reliability and Availability Modeling, Reliability Evaluation

UNIT-II

SOFTWARE RELIABILITY MODELS Introduction - Historical Perspective and Implementation, classification, limitations and issues, Exponential Failure Models – Jelinski-moranda model, Poisson, Musa, Exponential models, Weibull Model, Musa-okumoto Model, Bayseian Model – Littlewood verral Model, Phase Based Model

UNIT-III

PREDICTION ANALYSIS Model Disagreement and Inaccuracy – Short & Long Term Prediction, Model Accuracy, Analyzing Predictive Accuracy – Outcomes, PLR, U & Y Plot, Errors and Inaccuracy, Recalibration – testing Bias, Techniques, Power of Recalibration, Limitations in Present Techniques, improvements.

UNIT-IV

THE OPERATIONAL PROFILE Concepts and Development Procedures – Customer Type, User Type, System Mode, Functional and Operational Profile, Test Selection - Selecting Operations, Regression Test, Special Issues – Indirect Input Variables, Updating, Distributed system, CASE STUDY - Application of DEFINITY & FASTAR, Power Quality Resource System. **Testing For Reliability Measurement-** Testing Methods, Limits, Starvation , Coverage, Filtering, Microscopic Model of Software Risk.

TEXT BOOKS:

1 Patric D. T.O connor, "*Practical Reliability Engineering*", 4th Edition, John Wesley & sons, 2003.
2 John D. Musa, "*Software Reliability Engineering",* Tata McGraw Hill, 1999.
3 Michael Lyu, "*Handbook of Software Reliability Engineering"*, IEEE Computer Society Press, ISBN: 0-07-039400-8, 1996.

REFERENCE BOOKS:

1 Software Reliability Engineered Testing (The McGraw-Hill series on software development) by John Musa (Author)

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M.Tech 1st Semester –SE

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16SE1108 INTRODUCTION TO ANALYSIS

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 Analytics and R programming: Introduction to R, RStudio (GUI): R Windows Environment, introduction to various data types, Numeric, Character, date, data frame, array, matrix etc., Reading Datasets, Working with different file types .txt,.csv etc. Outliers, Combining Datasets, R Functions and loops.

Manage your work to meet requirements: Understanding Learning objectives, Introduction to work & meeting requirements, Time Management, Work management & prioritization, Quality & Standards Adherence,

UNIT-II

Summarizing Data & Revisiting Probability (NOS 2101): Summary Statistics - Summarizing data with R, Probability, Expected, Random, Bivariate Random variables, Probability distribution. Central Limit Theorem etc.

Work effectively with Colleagues (NOS 9002): Introduction to work effectively, Team Work, Professionalism, Effective Communication skills, etc.

UNIT-III

SQL using R: Introduction to NoSQL, Connecting R to NoSQL databases. Excel and R integration with R connector. **Correlation and Regression Analysis:** Regression Analysis, Assumptions of OLS Regression, Regression Modeling. Correlation, ANOVA, Forecasting, Heteroscedasticity, Autocorrelation, Introduction to Multiple Regression etc.

UNIT-IV

Understand the Verticals - Engineering, Financial and others: Understanding systems viz. Engineering Design, Manufacturing, Smart Utilities, Production lines, Automotive, Technology etc. Understanding Business problems related to various businesses

TEXT BOOKS:

1 **Student's Handbook for Associate Analytics.**

REFERENCE BOOKS:

1 Introduction to Probability and Statistics Using R, ISBN: 978-0-557-24979-4, is a textbook written for an undergraduate course in probability and statistics.

2 An Introduction to R, by Venables and Smith and the R Development Core Team. This may be downloaded for free from the R Project website (http://www.r-project.org/, see Manuals). There are plenty of other free references available from the R Project website.

3 Montgomery, Douglas C., and George C. Runger, Applied statistics and probability for engineers. John Wiley & Sons, 2010

4 The Basic Concepts of Time Series Analysis.http://anson.ucdavis.edu/~azari/sta137/AuNotes.pdf

5 Time Series Analysis and Mining with R,Yanchang Zhao.

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M.Tech 1st Semester –SE

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16SE2109 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 basic principles of software design and development and be able to apply these principles in course programming projects.

List of Experiments:

Exercise-1: Implement the applications of Arrays:

a) Ordered List.(Different operations)
b) Sparse Matrix to Efficient Matrix.
c) Checking an expression whether it is completely fully parenthesis or not.

Exercise-2: Implement the applications of Stacks: a) Infix To Postfix ression. b) Infix To Prefix Expression. c) Prefix To Postfix Expression. d) Evaluation Postfix Expression.

Exercise-3: Implement Queues Using Array.

Exercise-4: Implement Circular Queue Using Array: a) Ascending Priority Queue. b) Descending Priority Queue. c) Input & Output De-queue.

Exercise-5: Implement applications of

a) Stack Using Linked List.
b) Queue Using Linked List.
c) Circular Queue Using Linked
d) Single Linked List.
e) Double Linked List.

Exercise-6: Arrange words in dictionary order using Binary Search Tree In order Traversal.

Exercise-7: Implement search traversalsfor

Graphs. a) DFS b) BFS

Exercise-8: Find minimum cost spanning tree using Kruskal's and Prism's Algorithms.

Exercise-9: Using Floyd's Algorithm find out" All Pair Shortest Path".

Exercise-10: Implement N-Queens Problem.

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M.Tech 1st Semester –SE

L	T	P	C
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16SE2110 WEB TECHNOLOGIES LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Design a web page using basic html tags like list, frame, table
2 Use client-side technologies (XHTML, CSS, forms, JavaScript, and Use server-side technologies (Servlets and JSP) to implementwebsites.
3 Program to connect to the database and extract the data from the table
4 Create tables in the database which contain the details of items of each category
5 Create an XML application.

List of Experiments:

Week-1

Design a web page using basic html tags like list, frame, table, images etc.

Week-2

Prepare a "*registration form* "with the following fields
Name (Text field)
Password (password field)
E-mail id (text field)
Phone number (text field)
Sex (radio button) Date of birth (3 select boxes.
Languages known (check boxes – English, Telugu, Hindi)
Address (text area)

Week-3

Write *JavaScript* to validate the following fields of the above registration page.
Name (Name should contain alphabets and length should not be less than 6 characters).
Password (Password should not be less than 6 characters length).
E-mail id (Must follow the standard pattern name@domain.com)
Phone number (Phone number should contain 10 digits only).

Week-4

Design a web page using CSS (Cascading Style Sheets) which includes the following:
1) Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.
2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:
3) Control the repetition of the image with the background-repeat property. As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.
4) Define styles for links as A: link A: visited A: active A: hover
5) Work with layers
6) Add a customized cursor: Selector {cursor: value}

Week-5

1) Install and run Hello world Application in APACHE Tomcat Server.

Week-6

Write a Servelet Program to connect to the database and extract the data from the table and display in html tabular model.

Week-7

User Authentication: Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a Servelet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form and authenticate with the values available in the cookies. If he is a valid user you should welcome him by name else you should display "You are not an authenticated user ".

Week-8

Install a database (Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number (these should hold the data from the registration form).

Week-9

Write a JSP program to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

Week-10

Write a JSP which does the following job: Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.

Week-11

Create tables in the database which contain the details of items of each category. Modify your catalogue page in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC

Week-12

HTTP is a stateless protocol. Session is required to maintain the state. The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time. This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated. Modify your JSP pages to achieve the above mentioned functionality using sessions.

REFERENCE BOOKS:	
1	Java Server Pages, Pekowsky, Pearson.
2	Core Servlets and JavaServer Pages Volume 1: Core Technologies by Marty Hall and Larry Brown Pearson
3	Internet and world wide web – How to program by Dietel and Nieto PHI/Pearson Education Asia .
4	Murach's beginning Java JDK 5, Murach, SPD.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 1st Semester – SE

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16SE2111 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).

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester –SE

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16SE1201 SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

COURSE OUTCOMES:

At the end of the course students able to

1. Understand the architecture, creating it and moving from one to any, different structural patterns.
2. Analyze the architecture and build the system from the components.
3. Design creational and structural patterns.
4. Learn about behavioral patterns.
5. Do a case study in utilizing architectural structures

UNIT-I

Envisioning An Architecture : The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views.

Creating An Architecture: Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT-II

Analyzing Architectures : Architecture Evaluation, Architecture design decision making, ATAM, CBAM.

Moving from one system to many : Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT-III

Patterns : Pattern Description, Organizing catalogs, role in solving design problems Selection and usage.

Creational and Structural patterns : Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight, Proxy.

UNIT-IV

Behavioral Patterns: Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

Case Studies : A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

TEXT BOOKS:

1. Len Bass,Paul Clements & Rick Kazman, Software Architecture in Practice, second edition, Pearson Education,2003.
2. Erich Gamma, Design Patterns, Pearson Education,1995.

REFERENCE BOOKS:

1 Luke Hohmann, Beyond Software architecture, Addison wesley, 2003.
2 David M. Dikel, David Kane and James R. Wilson, Software architecture, Prentice Hall PTR,2001
3 F.Buschmann, Pattern Oriented Software Architecture, John Wiley & Sons.
4 Eric Freeman & Elisabeth Freeman, Head First Design patterns, O'REILLY, 2007.
5 Steven John Metsker & William C. Wake, Design Patterns in Java, Pearson education, 2006
6 Deepak Alur, John Crupi & Dan Malks, J2EE Patterns, Pearson education, 200

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester –SE

L	T	P	C
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16SE1202 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-throughs – 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

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester –SE

L	T	P	C
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16SE1203 SERVICE ORIENTED ARCHITECTURE

COURSE OUTCOMES:

At the end of the course students able to

1 Learn standards related to Web services: Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description, Discovery and Integration (UDDI).
2 Learn basic principles of Service-Oriented Architecture and apply these concepts to develop a sample application
3 Conceptually model Web services and formulate specifications of them in the Resource Description Framework (RDF) and the Web Ontology Language (OWL).
4 Evaluate emerging and proposed standards for the main components of Web services architectures
5 Design, develop and test Web services.

UNIT-I

SOA and Web Services Fundamentals: Introducing SOA- Fundamental SOA, Common Characteristics of Contemporary SOA, Common tangible benefits of SOA, Common pitfalls of adopting SOA. The Evolution of SOA – An SOA timeline, The continuing evolution of SOA, The roots of SOA. Web Services and primitive SOA-The Web Services frame work, Services, Service descriptions, Messaging. **Web Services and Contemporary SOA** (Part I-Activity management and Composition) Message exchange patterns, Service Activity Coordination, Atomic transactions, Business Activities, Orchestration, Choreography

UNIT-II

Web Services and Contemporary SOA: (Part-II-Advanced Messaging, Metadata , and Security) Addressing , Reliable messaging, Correlation, Policies, Metadata exchange, Security, Notification and eventing. **Principles of Service-Orientation:** Service – Orientation and the enterprise, Anatomy of SOA, Common Principles of Service – Orientation, interrelation between Principles of Service-Orientation, Service Orientation and Object Orientation, Native Web Services support for Principles of Service- Orientation.

UNIT-III

Service Layers: Service-Orientation and Contemporary SOA, Service Layer abstraction, Application Service Layer , Business Service Layer, Orchestration Service Layer, Agnostic Services, Service Layer Configuration Scenarios.

Building SOA (Planning and Analysis): SOA Delivery Strategies-SOA delivery lifecycle phases, the top-down strategy, the bottom-up strategy, the agile strategy. Service Oriented Analysis (Part I- Introduction)-Introduction to Service Oriented Analysis, Benefits of a Business Centric SOA, Deriving Business Services. Service Oriented Analysis (Part-II-Service Modeling)-Service Modeling, Service Modeling guidelines, Classifying Service model logic, Contrasting Service modeling approaches.

UNIT-IV

Building SOA (Technology and Design): Service Oriented Design (Part I-Introduction)-Introduction to Service-Oriented design, WSDL related XML Schema language basics, WSDL language basics, Service interface design tools. Service Oriented Design (Part II-SOA Composition Guidelines)-SOA Composing steps, Considerations for choosing service layers, Considerations for positioning core SOA standards, Considerations for choosing SOA extensions.

Service Oriented Design (Part III- Service Design): Service Design overview, Entity-centric business Service Design, Application Service Design, Task-centric business Service Design, Service Design guidelines.

TEXT BOOKS:

1 Thomas Erl, Service-Oriented Architecture-Concepts, Technology, and Design, Pearson Education.
2 Eric Newcomer, Greg Lomow, Understanding SOA with Web Services, Pearson Education.

REFERENCE BOOKS:

1 Jeff Davies & others, The Definitive guide to SOA, Apress, Dreamtech. E.Hewitt, Java SOA Cook book, SPD.
2 M.Rosen and others, Applied SOA, Wiley India pvt. Ltd.
3 J.Mc Govern, and others, Java Web Services Architecture, Morgan Kaufmann Publishers, Elsevier.
4 Shankar.K, SOA for Enterprise Applications, Wiley India Edition.
5 W.Roshen, SOA-Based Enterprise Integration, TMH.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester –SE

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16SE1204 SOFTWARE TESTING

COURSE OUTCOMES:

At the end of the course students able to

1 Study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
2 Understand various software testing issues and solutions in software unit test, integration, regression, and system testing.
3 Learn how to plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, and generate a testing report.
4 Study the advanced software testing topics, such as object-oriented software testing methods, and component-based software testing issues, challenges, and solutions.
5 Learn software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects.
6 Study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.

UNIT-I

INTRODUCTION: Software Engineering-Software Process- Generic process model-Prescriptive process model-specialized, unified process-Agile development-Agile Process-Extreme Programming- Other agile Process models-Software engineering Knowledge-core Principles-Principles that guide each framework Activity.

UNIT-II

SOFTWARE REQUIREMENTS AND ANALYSIS: Requirements Engineering-Establishing the Groundwork-Eliciting Requirements-Developing use cases-Building the requirements model-Negotiating, validating Requirements-Requirements Analysis-Requirements Modeling Strategies.

UNIT-III

SOFTWARE DESIGN: Design Diagrams: Use Case Diagrams - Class Diagrams - Interaction Diagrams -State chart Diagrams - Activity Diagrams - Package Diagrams - Component Diagrams – Deployment Diagrams - Diagram Organization- Diagram Extensions. Design Process- Design concepts : Abstraction, Architecture, patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component, Deployment Level Design Elements .

UNIT-IV

SOFTWARE IMPLEMENTATION: Structured coding Techniques- Coding Styles-Standards and Guidelines- Documentation Guidelines-Modern Programming Language Features: Type checking-User defined data types-Data Abstraction-Exception Handling-Concurrency Mechanism. Software Testing and Web Apps-Validating Testing- System Testing- Art of Debugging. MAINTENANCE - Software Maintenance-Software

Supportability- Reengineering-Business Process Reengineering- Software Reengineering-Reverse Engineering-

TEXT BOOKS:

1 Roger S. Pressman, "*Software Engineering – A Practitioner's Approach",*Tata McGraw-Hill seventh edition, 2009.
2 Richard Fairley, *"Software Engineering Concepts"* –, Tata Mcgraw Hill, 2008.

REFERENCE BOOKS:

1 Ian Sommerville, *"Software Engineering"*, Seventh Edition, Pearson Education Asia, 2007.
2 Gopalaswamy Ramesh, Ramesh Bhattiprolu, *"Software Maintenance"* Tata Mcgraw Hill, 2003.
3 Shari Lwarence Pfleeger, Joanne M.Atlee *"Software Engineering Theory andPractice"*, Third Edition, Pearson Education, 2006.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester –SE	**L**	**T**	**P**	**C**
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16SE1205 SECURE SOFTWARE ENGINEERING

COURSE OUTCOMES:

At the end of the course students able to

1 Apply knowledge of computing and mathematics appropriate to the discipline; specifically to include the application of mathematics, science and engineering to solve and reason about computational problems
2 Analyze a problem, and identify and define the computing requirements appropriate to its solution
3 Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs and budget, by applying best practices in software development processes, methods, and tools
4 Be able to: function effectively on teams to accomplish a common goal
5 Be able to: demonstrate an understanding of professional, ethical, legal, security, and social issues and responsibilities

UNIT-I

OSI: ISO Layer Protocols: Application Layer Protocols-TCP/IP, HTTP, SHTTP, LDAP, MIME,-POP& POP3-RMON-SNTP-SNMP. Presentation Layer Protocols-Light Weight Presentation Protocol Session layer protocols –RPC protocols.

Transport layer protocols ITOT, RDP, RUDP, TALI, TCP/UDP, compressed TCP. Network layer Protocols – routing protocols-border gateway protocol-exterior gateway protocol-internet protocol IPv4- IPv6- Internet Message Control Protocol- IRDP- Transport Layer Security-TSL-SSL-DTLS

UNIT-II

Data Link layer Protocol: ARP – InARP – IPCP – IPv6CP – RARP – SLIP.

WideArea and Network Protocols- ATM protocols – Broadband Protocols – Point to Point Protocols – Other WAN Protocols- security issues.

UNIT-III

Local Area Network and LAN Protocols: ETHERNET Protocols – VLAN protocols – Wireless LAN Protocols – Metropolitan Area Network Protocol – Storage Area Network and SAN Protocols -FDMA, WIFI and WIMAX Protocols- security issues.

Mobile IP – Mobile Support Protocol for IPv4 and IPv6 – Resource Reservation Protocol. Multi-casting Protocol – VGMP –IGMP – MSDP.

UNIT-IV

Network Security and Technologies and Protocols: AAA Protocols – Tunneling Protocols –Secured Routing Protocols – GRE- Generic Routing Encapsulation – IPSEC – Security architecture for IP – IPSECAH – Authentication Header – ESP – IKE – ISAKMP and Key management Protocol. IEEE 802.11 - Structure of 802.11 MAC – WEP- Problems with WEP – Attacks and Risk- Station security – Access point Security – Gate way Security – Authentication and Encryption.

TEXT BOOKS:

1 Jawin, "Networks Protocols Handbook", Jawin Technologies Inc., 2005.
2 Bruce Potter and Bob Fleck, "802.11 Security", O'Reilly Publications, 2002.
3 Lawrence Harte, "Introduction to WCDMA", Althos Publishing, 2004.

REFERENCE BOOKS:

1 Ralph Oppliger "SSL and TSL: Theory and Practice", Arttech House, 2009.
2 Lawrence Harte, "Introduction to CDMA- Network services Technologies and Operations", Althos Publishing, 2004.
3 Lawrence Harte, "Introduction to WIMAX", Althos Publishing, 2005.

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M.Tech 2nd Semester –SE	**L**	**T**	**P**	**C**
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16SE1206 **INTERNET OF THINGS**

COURSE OUTCOMES:

COURSE OUTCOMES:

At the end of the course students able to

1 Understand the vision of IoT from a global context
2 Determine the Market perspective of IoT
3 Use of Devices, Gateways and Data Management in IoT
4 Building state of the art architecture in IoT.
5 Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

The IoT Networking Core : Technologies involved in IoT Development:
Internet/Web and Networking Basics: OSI Model, Data transfer referred with OSI Model, IP Addressing, Point to Point Data transfer, Point to Multi Point Data transfer & Network Topologies, Sub-netting, Network Topologies referred with Web, Introduction to Web Servers, Introduction to Cloud Computing

UNIT-II

IoT Architecture:
History of IoT, M2M – Machine to Machine, Web of Things, IoT protocols **Applications:** Remote Monitoring & Sensing, Remote Controlling, and Performance Analysis
The Architecture The Layering concepts, IoT Communication Pattern, IoT protocol Architecture, **Security aspects in IoT**

UNIT-III

IoT Application Development:
Application Protocols MQTT, REST/HTTP, CoAP, MySQL
Back-end Application Designing Apache for handling HTTP Requests, PHP & MySQL for data processing, MongoDB Object type Database, HTML, CSS & jQuery for UI Designing, JSON lib for data processing, Security & Privacy during development, Application Development for mobile Platforms: Overview of Android / IOS App Development tools

UNIT-IV

Case Study & advanced IoT Applications:
IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipments. Use of Big Data and Visualization in IoT, Industry concepts. Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi / Intel Galileo/ARM Cortex/ Arduino)

The IoT Networking Core : Technologies involved in IoT Development:
Internet/Web and Networking Basics: OSI Model, Data transfer referred with OSI Model, IP Addressing, Point to Point Data transfer, Point to Multi Point Data transfer & Network Topologies, Sub-netting, Network Topologies referred with Web, Introduction to Web Servers, Introduction to Cloud Computing

TEXT BOOKS:

1 Zach Shelby, Carsten Bormann, The Wireless Embedded Internet Wiley
2 Dr. Ovidiu Vermesan, Dr. Peter Friess, River Publishers, Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems
3 Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam Dunkels, Morgan Kuffmann

REFERENCE BOOKS:

1 The Internet of Things: From RFID to the Next-Generation Pervasive Networked Lu Yan, Yan Zhang, Laurence T. Yang, Huansheng Ning
2 Internet of Things (A Hands-on-Approach) , Vijay Madisetti , Arshdeep Bahga
3 Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally

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M.Tech 2nd Semester –SE

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16SE1207 DISTRIBUTING COMPUTING

COURSE OUTCOMES:

At the end of the course students able to

1 The differences among: concurrent, networked, distributed, and mobile.
2 Resource allocation and deadlock detection and avoidance techniques
3 Understand Remote procedure calls.
4 Apply IPC mechanisms in distributed systems.
5 Design and build application programs on distributed systems.

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

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

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, Distibuted 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 2nd Semester –SE	**L**	**T**	**P**	**C**
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16SE1208 KNOWLEDGE ENGINEERING

COURSE OUTCOMES:

At the end of the course students able to

1 Apply KM concepts to devise KM practices, actions, and programmes for effective business support;

2 Apply methods and tools for knowledge engineering and management

3 Use working knowledge and sound skills to plan, assess, develop, and implement KM projects and to address industrial problems;

4 Design and implement a KM system and justify the success of the implementation

5 An understanding of the methods and tools of knowledge engineering and management

UNIT-I

INTRODUCTION

Key concepts – Why knowledge Representation and Reasoning – Language of first order Logic – Syntax, Semantics Pragmatics – Expressing Knowledge – Levels of Representation – Knowledge Acquisition and Sharing – Sharing Ontologies – Language Ontologies –Language Patterns – Tools for Knowledge Acquisition

UNIT-II

RESOLUTION AND REASONING

Proportional Case – Handling Variables and Qualifies – Dealing with Intractability – Reasoning with Horn Clauses - Procedural Control of Reasoning – Rules in Production – Description Logic - Vivid Knowledge – Beyond Vivid. Representation: Object Oriented Representations – Frame Formalism – Structured Descriptions – Meaning and Entailment - Taxonomies and Classification – Inheritance – Networks – Strategies for Defeasible Inheritance – Formal Account of Inheritance Networks.

UNIT-III

DEFAULTS, UNCERTAINTY AND EXPRESSIVENESS

Defaults – Introduction – Closed World Reasoning – Circumscription – Default Logic Limitations of Logic – Fuzzy Logic – Non monotonic Logic – Theories and World – Semiotics – Auto epistemic Logic - Vagueness – Uncertainty and Degrees of Belief – Non categorical Reasoning – Objective and Subjective Probability.

UNIT-IV

ACTIONS AND PLANNING

Explanation and Diagnosis – Purpose – Syntax, Semantics of Context – First Order Reasoning – Modal Reasoning in Context – Encapsulating Objects in Context – Agents – Actions – Situational Calculus – Frame Problem – Complex Actions – Planning –Strips – Planning as Reasoning – Hierarchical and Conditional Planning.

TEXT BOOKS:

1 John F. Sowa, "Knowledge Representation: Logical, Philosophical, and Computational Foundations", 2000.
2 Ronald Brachman, Hector Levesque "Knowledge Representation and Reasoning ", The Morgan Kaufmann Series in Artificial Intelligence 2004

REFERENCE BOOKS:

1 Arthur B. Markman, "Knowledge Representation", Lawrence Erlbaum Associates,1999

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M.Tech 2nd Semester –SE

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16SE1209 DESIGN PATTERNS LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Develop, test and debug RPC based client-server programs in Unix.
2 Design and build application programs on distributed systems
3 Improve the performance and reliability of distributed programs
4 Design and build newer distributed file systems for any OS.

List of Experiments:

Exercise-1: Define an abstract Shape class that declares an interface for creating each basic kind of shape by implementing Abstract Factory design pattern.

Exercise-2: Implement an appropriate design pattern that converts the interface of a class into another interface clients expect.

Exercise-3: Write a program that implements Command Design pattern encapsulating a request as an object, thereby letting to parameterize clients with different requests, queue or log requests, and support undoable operations.

Exercise-4: Compose objects into tree structures to represent part-whole hierarchies Implementing Composite Design Pattern.

Exercise-5: Write a program that demonstrates Mediator Design pattern where mediator objects are used to encapsulate and centralize the interactions between classes.

Exercise-6: Write a program that executes methods of proxy class which are transferred to Real Subject's methods.

Exercise-7: Ensure a class has only one instance and provide a global point of access to it by Singleton design pattern.

Exercise-8: Write a program that demonstrates state pattern that allows an object to completely change its behavior depending upon its current internal state.

Exercise-9: Implement Visitor Design Pattern that lets you define a new operation to be performed without changing the classes of the elements on which it operates.

Exercise-10: Implement Facade design pattern

REFERENCE BOOKS:

1 Len Bass, Paul Clements & Rick Kazman, Software Architecture in Practice, second edition, Pearson Education, 2003.
2 Erich Gamma, Design Patterns, Pearson Education, 1995.

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M.Tech 2nd Semester –SE

L	T	P	C
3	0	0	3

16SE2210 SOFTWARE TESTING LAB

COURSE OUTCOMES:

At the end of the course students able to

1 Develop the software testing, including software testing methods.
2 Apply software testing issues and solutions in software unit test, integration, regression, and system testing.
3 Develop to plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, and generate a testing report.
4 Develop the advanced software testing topics, such as object-oriented software testing methods.
5 Applying software testing knowledge and methods to practice-oriented software testing projects.

List of Experiments:

Using Rational Rose do the following for a given source code.

Exercise-1: Understand SRS concept and its documentation.
Exercise-2: Design a Use Case Diagram for the application.
Exercise-3: Design an Activity Diagram.
Exercise-4: Design a Sequence, Collaboration, and Class Diagram.
Exercise-5: Source Code analysis.
Exercise-6: Testing the application by Rational Functional Tester.
Exercise-7: Understand Maintenance activity (change, configuration management) and document it.

REFERENCE BOOKS:

1 Boris Beizer, “Software Testing Techniques”, Second Edition,Dreamtech, 2003
2 Elfriede Dustin, “Effective Software Testing”, First Edition, Pearson Education, 2003.

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M.Tech 2nd Semester –SE

L	T	P	C
3	0	0	3

16SE2211 **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

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

M.Tech 2nd Semester –SE	**L**	**T**	**P**	**C**
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16SE2212 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 2nd Semester –SE	**L**	**T**	**P**	**C**
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16SE2301 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

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

M.Tech 2nd Semester –SE

L	T	P	C
3	0	0	3

16SE2401 **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.