AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Gudur, Nellore Dist - 524101, A.P (India)

ACADEMIC REGULATIONS FOR THE AWARD OF FULL TIME
M.Tech DEGREE PROGRAMME
(WITH EFFECT FROM THE ACADEMIC YEAR 2013-14)

The **Audisankara College of Engineering and Technology**, Gudur, Nellore District, Andhra Pradesh shall confer M.Tech Post Graduate degree to candidates who are admitted to the Master of Technology Programs and fulfill all the requirements for the award of the degree.

1. ELIGIBILITY FOR ADMISSIONS:

Admission to the Master of Technology programme shall be made subject to the eligibility, qualifications and specialization criteria prescribed by the JNTUA, Anantapur for each programme, from time to time.

As per the norms of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made to the first year of two years M.Tech P.G. Degree Programme as follows:-

- As per the norms of Government of Andhra Pradesh, Category-A (based on the rank obtained in GATE / PGECET score) seats will be filled by the Convener, PGECET.
- As per the norms of Government of Andhra Pradesh, Category-B seats will be filled by the management.

2. COURSE WORK:

- A Candidate after securing admission must pursue the M.Tech course of study for Four Semesters duration.
- Each semester shall be of 20 weeks duration including all examinations.
- A candidate admitted to a programme should complete it within a period equal to twice the prescribed duration of the programme from the date of admission.

3.0 ATTENDANCE REGULATIONS AND CONDONATION:-

(i) A student shall be eligible to appear for end semester examinations, if he acquires a minimum of 75% attendance in aggregate of all the subjects.

(ii) Condonation of shortage of attendance in aggregate up to 10% on medical grounds (65% above and below 75%) in each semester may be granted on the recommendation of the College Academic Committee. However, granting condonation is purely at the discretion of Principal of the college.

(iii) A Student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester as applicable. They may seek re-admission for that semester as and when offered next.

(iv) Shortage of Attendance below 65% in aggregate shall in no case be condoned.

(v) Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that particular semester and their registration for examination shall stand cancelled.

(vi) A stipulated fee shall be payable towards condonation of shortage of attendance if granted.

(vii) Attendance may also be condoned for those students who participate in prestigious sports and co and extracurricular activities provided their attendance is in the minimum prescribed range for the purpose and recommended by the concerned authority.

4.0. EVALUATION:-

The performance of the candidate in each semester shall be evaluated subject-wise for a maximum of 100 marks for Theory and 100 marks for practical subjects, on the basis of Internal Evaluation and End Semester Examination. For the theory & practical subjects 60% of the marks will be for the External End Examination, while 40% of the marks for Internal Evaluation.

4.1 INTERNAL EVALUATION FOR THEORY SUBJECTS:

Each course is evaluated for **40** marks **(a+b)**

a) Two Midterm Examinations each for **30 marks** with a duration of two hours each will be conducted for every theory course in a semester. First Midterm Examination is conducted in the middle of the Semester (I & II units) and second Midterm Examination immediately after the completion of instruction (III & IV units) as per academic schedule. The Midterm Examination marks shall be awarded giving a weightage of 80% in the Midterm Examination in which the student scores more marks and 20% in the remaining Midterm Examination.

Midterm Examination Pattern for 30 Marks:

- Each Midterm Examination Question Paper comprises of four questions covering the two units.
- Answering any three questions.
- Questions 1 & 2 from one unit and Questions 3 & 4 from another unit. Each question is allotted 10 marks.

b) 10 marks are allocated for **Assignment Tests.**

- There will be four Assignment Tests per subject.
- One Assignment Test is conducted from each unit.
- Five Assignment questions are given in advance from each unit out of which two questions given by the concerned teacher has to be answered during Assignment Test.
- Average of Assignment Tests marks is considered.

NOTE: A student who is absent for any Midterm Examination / Assignment Test, for any reason whatsoever, shall be deemed to have scored zero marks in that Midterm Examination/ Assignment Test and no make-up test shall be conducted.

4.2 INTERNAL EVALUATION FOR PRACTICAL SUBJECTS:

For Laboratory courses there shall be continuous evaluation during the semester for 40 internal marks. The break-up of internal marks to be awarded is as given below:

Table 1: Break-up of Internal Marks

S.No.	Criterion	Marks
1	Conduct of experiments, Observation & Results in regular class work(Day-to-Day Performance)	25
2	Viva – voce and Internal Examination	15

In any semester a minimum of 90% of the prescribed number of experiments/exercises specified in the syllabus for laboratory course shall be conducted. They shall complete these experiments/exercises in all respects and submit report and get it certified by the concerned internal lab teacher and the Head of the Department to become eligible to appear for the final end examination in the Laboratory Course.

4.3 INTERNAL EVALUATION FOR SEMINAR-I & SEMINAR-II:

There shall be two Seminars conducted in each discipline, Seminar-I in the M.Tech I Semester and the Seminar-II in M.Tech IV semester. The distribution of internal marks for seminar is given below:

Table 2: Distribution of Marks

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

For the seminar, the student shall collect the information on a specialized relevant topic and prepare a report, showing his understanding over the topic, and submit the same to the department, which shall be evaluated by the Department Committee consisting of Head of the department, Seminar Supervisor and a Senior Faculty Member. Each Seminar shall be evaluated for 50 marks (10 marks for report, 10 marks for subject content, 20 marks for presentation and 10 marks for queries).

4.4 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.Techstudents. It helps to identify their Reserch area/topic and complete the groundwork andpreliminary 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

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

4.6 In case the candidate does not secure the minimum academic requirement in any subject(as specified in 4.4) he has to reappear for the Semester Examination either supplementary or regular in that subject, or repeat the course when next offered or do any other specified subject as may be required.

5.0 SEMESTER END EXAMINATIONS:-

5.1 Theory Courses: 60 marks each

The Semester end examination in each theory subject shall be conducted for 3 hours duration at the end of the semester for 60 marks. The question paper for Semester pattern shall be designed as per the following:

Question paper contains

- A total of Eight questions.
- Answer one Question from each Unit
- The Eight questions are to be designed taking one question from each unit (Unit Wise Either or Type) of the four units.
- In each question, one, two or more bits can be set, totaling 15 Marks with appropriate distribution of marks.

A student has to secure not less than a minimum of 40% of marks (24 marks) exclusively at the end semester examinations in each of the theory subjects in which the candidate had appeared. However, the candidate shall have to secure a minimum of 50% of marks (50 marks) in both external and internal components put together to become eligible for passing in the subject.

5.2 Lab Courses (Practical / Workshop): 60 marks

Out of 60 marks **40** marks are allocated for experiment (procedure for conducting the experiment carries 10 marks & readings, calculation and result-30 marks) and **15** marks for viva-voce examination with **5** marks for the record.

Each Semester External Lab Examination shall be evaluated by an Internal Examiner along with an External Examiner. External Examiner is appointed by the Principal.
A candidate shall be declared to have passed in individual lab course if he secures a minimum of 50% aggregate marks (50 marks) (Internal & Semester External Examination marks put together), subject to a minimum of 40% marks (24 marks) in the semester external examination.

5.3 EVALUATION OF PROJECT WORK:-

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the college/ concerned department.

- **Registration of Project work**: A candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory and practical courses of I & II Semesters)
- An Internal Departmental Committee (I.D.C) consisting of HOD, Supervisor/ Guide and one Internal senior expert shall monitor the progress of the project work.
- The work on the project shall be initiated in the penultimate semester and continued in the final semester. The duration of the project is for two semesters. The candidate can submit Project thesis with the approval of I.D.C. after 36 weeks from the date of registration at the earliest and one calendar year from the date of registration for the project work. Extension of time within the total permissible limit for completing the programme is to be obtained from the Head of the Institution.

- The student must submit status report at least in three different phases during the project work period. These reports must be approved by the I.D.C before submission of the Project Report.
- A candidate shall be allowed to submit the thesis / dissertation only after passing in all the prescribed subjects (both theory and practical) and then take viva-voce examination of the project. The viva-voce examination may be conducted once in two months for all the candidates submitted during that period.
- Three copies of the Thesis / Dissertation certified in the prescribed form by the supervisor and HOD shall be submitted to the HOD.
- The semester end examination for project work done during III & IV Semesters, shall be conducted by a Project Review Committee (PRC). The evaluation of project work shall be conducted at the end of the IV Semester.
- The PRC comprises of an External examiner appointed by the Principal, Head of the Department and Project Guide/Supervisor to adjudicate the thesis / dissertation. The PRC shall jointly evaluate candidates work and award grades as given below

S.No	Description	Grade
1	Very Good	Grade A
2	Good	Grade B
3	Satisfactory	Grade C
4	Not satisfactory	Grade D

If the report of the viva-voce is not satisfactory (Grade D) the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination he will not be eligible for the award of the degree unless the candidate is permitted to revise and resubmit the thesis.

6.0 RE-REGISTRATION FOR IMPROVEMENT OF INTERNAL EVALUATION MARKS:

Following are the conditions to avail the benefit of improvement of internal evaluation marks.

- The candidate should have completed the course work and obtained examinations results for I & II semesters.
- He should have passed all the subjects for which the internal evaluation marks secured are more than 50%.
- Out of the subjects the candidate has failed in the examination due to Internal evaluation marks secured being less than 50%, the candidate shall be given one more chance for each Theory subject and for a maximum of **three** Theory subjects for Improvement of Internal evaluation marks.
- The candidate has to re-register for the subjects so chosen and fulfill all the academic requirements.
- For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of **'The Principal, Audisankara College of Engineering & Technology' payable at Gudur** along with the requisition through the Controller of the Examinations of the college.
- In the event of availing the Improvement of Internal evaluation marks, the internal evaluation marks as well as the End Examinations marks secured in the previous attempt(s) for the reregistered subjects stand cancelled.

7.0 SEMESTER – WISE DISTRIBUTION OF CREDITS:

Table 3: Semester –wise Credits distribution

SEMESTER	No. of Credits per semester Theory + Lab	Total credits
I Semester	24+06	30
II Semester	24+06	30
III & IV Semesters	0+18	18
TOTAL CREDITS	48+30	78

8.0 AWARD OF DEGREE AND CLASS:-

A candidate shall be eligible for the award of degree if he satisfies the minimum academic requirements in every subject, Seminar and secures 'satisfactory' or higher grade report on his thesis/dissertation and viva-voce. Based on overall percentage of marks obtained, the following class is awarded.

Table 4: Award of Division

Class Awarded	% of marks to be secured
First Class with Distinction	70% and above
First Class	Below 70% but not less than 60%
Second Class	Below 60% but not less than 50%

9.0 READMISSION CRITERIA:

A Candidate, who is detained in a semester due to lack of attendance, 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.

10. SUPPLEMENTARY EXAMINATIONS:

Apart from the regular End Examinations the institute may also schedule and conduct supplementary examinations for all subjects for the benefit of students with backlogs. Such students writing supplementary examinations as supplementary candidates may have to write more than one examination per day.

11.CONDUCT AND DISCIPLINE:-

(a) Students shall conduct themselves within and outside the premises of the Institute in a descent and dignified manner befitting the students of ACET.

(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.

12.0 WITH – HOLDING OF RESULTS:

If the candidate has not paid dues to the university/college or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted to the next higher semester. The issuing of degree is liable to be withheld in such cases.

13.0 TRANSITORY REGULATIONS:

Candidates who have discontinued or have been detained for want of attendance or who have failed after having undergone the course in earlier regulations and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when such subjects are offered, subject to the conditions of 4.5 and 2.3 sections.

14.0MINIMUM INSTRUCTION DAYS:

The minimum instruction days for each semester shall be 90 clear instruction days excluding the days allotted for tests/examinations and preparation holidays declared if any.

15.0AMENDMENTS OF REGULATIONS-

The college may, from time to time, revise, amend or change the regulations, scheme of examinations and syllabi. However the academic regulations of any student will be same throughout the course of study in which the student has been admitted.

16.0 GENERAL:

- The academic regulations should be read as a whole for the purpose of any interpretation.
- Disciplinary action for Malpractice/improper conduct in examinations is appended.
- Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.
- In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Head of the Institute is final.

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RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	**Punishment**
	If the candidate	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Is found copying in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate will be cancelled.
3.	Comes in alcohol drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
4.	Smuggles the Answer book or a part there of additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of

		seat.
5.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
6.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate will also be debarred and forfeit the seat.
7.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate will also be debarred and forfeit the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate will also be debarred for two consecutive semesters from class work and all end examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the impostor is an outsider, he will be handed over to the police and a case registered against him.
8.	Refuses to obey the orders of the Chief Superintendent/Asst.Superintendent/ any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall causing any injury to him or to any of his relations	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are

	whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case registered against them.
9.	Is a student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clauses 6 to 8.	In case of students of the college expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
11.	Is detected copying on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	Indulging in any malpractice which is not covered in the above clauses 1 to 11 if detected shall be reported to the College Authorities for further action to award suitable punishment.	Appropriate action will be taken as recommended by the College Authorities.

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY
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Course Structure for M.Tech (CSE) Regular Programme
Applicable for students admitted from Academic Year 2013-14

M.Tech I Year (I Semester) – Computer Science and Engineering

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Theory	Lab	IM	EM	Total Marks	
1	13CO101	Advanced Data Structures and Algorithms	4	-	40	60	100	4
2	13CO102	Discrete Structures	4	-	40	60	100	4
3	13CO103	Computer System Design	4	-	40	60	100	4
4	13CO104	Advanced Computer Networks	4	-	40	60	100	4
5	13CO105	Software Engineering	4	-	40	60	100	4
6	13CO106 13CO107 13CO108	**Elective-I** 1.Big Data 2.Distributed Databases 3.Artificial Intelligence	4	-	40	60	100	4
7	13CO109	Advanced Data Structures and Algorithms Lab	-	3	40	60	100	2
8	13CO110	Computer System Design Lab	-	3	40	60	100	2
9	13CO111	Seminar-I	-	-	50	-	50	2
Contact Periods / Week			**24**	**6**	**370**	**480**	**850**	
			Total Periods/ Week		**30**	**Total Credits**		**30**

M.Tech I Year (II Semester) - Computer Science and Engineering

Sl.No	Course Code	Subject	Scheme of instruction (Periods / week)		Scheme of Examination			No. of Credits
			Theory	Lab	IM	EM	Total Marks	
1	13CO201	Software Quality Assurance and Testing	4	-	40	60	100	4
2	13CO202	Network Security and Cryptography	4	-	40	60	100	4
3	13CO203	Distributed Systems	4	-	40	60	100	4
4	13CO204	Cloud Computing	4	-	40	60	100	4
5	13CO205	Data Warehousing and Data Mining	4	-	40	60	100	4
6	13CO206 13CO207 13CO208	**Elective-II** 1.Software Architecture 2.Software Design 3.Design Patterns	4	-	40	60	100	4
7	13CO209	Data Warehousing and Data Mining Lab	-	3	40	60	100	2
8	13CO210	Network Security and Cryptography Lab	-	3	40	60	100	2
9	13CO211	Term Paper	-	-	50	-	-	2
Contact Periods / Week			**24**	**3**	**370**	**480**	**850**	
			Total / Week		**27**	**Total Credits**		**30**

M.Tech II Year (III & IV Semesters) - Computer Science and Engineering

Sl.No	Course Code	Subject	Scheme of Examination			No. of Credits
			IM	EM	Total Marks	
1	13CO401	Seminar-II	50	-	50	2
2	13CO402	Project Work	-	A/B/C/D		16
Contact Periods / Week						
					Total Credits	**18**

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR (AUTONOMOUS)

Detailed Syllabus

M.Tech I Semester (CSE)	L	T	P	[C]
	4	0	0	[4]

(13CO101) ADVANCED DATA STRUCTURES AND ALGORITHMS

UNIT- I:

Overview of Data Structures: Review of Arrays, Stacks, Queues, linked lists, Linked stacks and Linked queues, Applications

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

UNIT- II:

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

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, Strassen'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, 0 / 1 Knapsack problem, Reliability Design, Traveling Sales Person's Problem

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

Text Books:

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

Reference Books:

1. D. Samanta ,Classic Data Structures, PHI, 2005.
2. Aho, Hopcraft and 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 I Semester (CSE)	L	T	P	[C]
	4	0	0	[4]

(13CO102) DISCRETE STRUCTURES

UNIT –I:

Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Theory of inference for the statement calculus Rules of inference, Consistency of premises and indirect method of proof, Automatic Theorem Proving

Predicate Calculus: Predicates, statement functions, variables and quantifiers, predicate formulas, free & bound variables, universe of discourse, inference theory of predicate calculus

UNIT- II:

Set theory & Relations: Introduction, Relations and ordering, Properties of binary Relations, Equivalence, Compatibility Relations, Partial ordering, Hasse diagram.

Functions: composition of functions, Inverse Function, Recursive Functions, Lattice and its Properties, Pigeon hole Principles and its application.

Algebraic Structures: Algebraic systems, Examples and general properties, Semi groups and monoids, groups, sub groups, Definitions, Examples, homomorphism, Isomorphism and related problems.

UNIT – III:

Elementary Combinatorics: Basis of counting, Enumeration of Combinations & Permutations, Enumerating of Combinations & Permutations with repetitions and constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, principles of Inclusion – Exclusion.

Recurrence Relations: Generating Function of Sequences, Calculating Coefficient of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, The method of Characteristic roots, Solution of Inhomogeneous Recurrence Relation.

UNIT- IV:

Graph Theory: Representation of Graph, Spanning Trees, BFS, DFS, Kruskals Algorithm, Binary trees, Planar Graphs, Graph Theory and Applications, Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

Text Books:

1. J.P Tremblery, R.Manohar ,Discrete Mathematical Structures with Applications to computer science, TMH
2. J.L. Molt,A.Kandel and T.P.Baker,Discrete Mathematical for computer Scientists & Mathematicians ,PHI

Reference Books:

1. C L Liu, D P Mohanpatra ,Elements of Discrete Mathematics,TMH
2. Schaum's Outlines,Lipschutz,Lipson ,Discrete Mathematics, TMH.
3. Kolman, Busby, Ross, Discrete Mathematical Structures 6th ed., PHI, 2009
4. Johnsonbaugh,Discrete Mathematics 6th ed., Pearson, 2005
5. Malik, Sen, Discrete Mathematics, 6th ed., Cengage Learning, 2004
6. Bogart, Stein and Drysdale, Discrete Mathematics for computer science, Springer, 2005

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(13CO103) COMPUTER SYSTEM DESIGN

UNIT-I:

Computer Structure – hardware, software, system software, Von-neumann architecture – case study. IA -32 Pentium: registers and addressing, instructions, assembly language, program flow control, logic and shift/rotate instructions, multiply, divide MMX, SIMD instructions, I/O operations, subroutines.

Input/ Output Organization - interrupts, DMA, Buses, Interface circuits, I/O interfaces, device drivers in windows, interrupt handlers

UNIT- II:

Processing Unit - Execution of a complete instruction, multiple bus organization, hardwired control, micro programmed control.

Pipelining: data hazards, instruction hazards, influence on instruction sets, data path & control consideration, RISC architecture introduction.

UNIT- III:

Memory: types and hierarchy, model level organization, cache memory, performance considerations, mapping, virtual memory, swapping, paging, segmentation, replacement policies.

Processes and Threads: processes, threads, inter process communication, classical IPC problems, Deadlocks.

UNIT- IV:

File system: Files, directories, Implementation, UNIX file system

Security: Threats, intruders, accident data loss, basics of cryptography, user authentication.

Text Books:

1. Car Hamacher, Zvonks Vranesic, SafeaZaky, Computer Organization –Vth Edition, McGraw Hill.
2. Andrew S Tanenbaum, Modern Operating Systems, 2nd edition Pearson/PHI

Reference Books:

1. William Stallings ,Computer Organization and Architecture –Sixth Edition, pearson/PHI
2. Morris Mano -Computer System Architecture –3rd Edition-Pearson Education .
3. Abraham Silberchatz, Peter B. Galvin, Greg Gagne ,Operating System Principles- 7th Edition, John Wiley
4. Operating Systems – Internals and Design Principles Stallings, Fifth Edition–,Pearson Education/PHI, 2005.

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(13CO104) ADVANCED COMPUTER NETWORKS

UNIT- I:

Review of Computer Networks and the Internet: History of Computer Networking and the Internet, **Foundation of Networking Protocols:** 5-layer TCP/IP Model, 7-Layer OSI Model, Equal-Sized Packets Model: ATM.

Routing and Internetworking: Network–Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intradomain Routing Protocols, Interdomain Routing Protocols, Congestion Control at Network Layer. **Logical Addressing:** IPv4 Addresses, IPv6 Addresses - **Internet Protocol:** Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6.

UNIT –II:

Multicasting Techniques and Protocols: Basic Definitions and Techniques, Intradomain Multicast Protocols, Interdomain Multicast Protocols, Node-Level Multicast algorithms.

Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP),TCP Congestion Control **Application Layer:** Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Introduction to Socket.

UNIT- III:

Wireless Networks and Mobile IP: Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs),

Optical Networks and WDM Systems: Overview of Optical Networks, Basic Optical Networking Devices, Large-Scale Optical Switches, Optical Routers, Wavelength Allocation in Networks, Case Study: An All-Optical Switch.

UNIT- IV:

VPNs, Tunneling and Overlay Networks: Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), Overlay Networks – **VoIP and Multimedia Networking:** Overview of IP Telephony, VoIP Signaling Protocols, Real-Time Media Transport Protocols, Distributed Multimedia Networking, Stream Control Transmission Protocol.

Mobile Ad-Hoc Networks: Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing Protocols for Ad-Hoc Networks – **Wireless Sensor Networks:** Sensor Networks and Protocol Structures, Communication Energy Model, Clustering Protocols, Routing Protocols.

Text Books:

1. Nader F. Mir, Computer and Communication Networks, Pearson Education, 2007

Reference Books:

1. Behrouz A. Forouzan, Data Communications and Networking, Fourth Edition, Tata McGraw Hill, 2007
2. Greg Tomsho,Ed Tittel, David Johnson,Guide to Networking Essentials, Fifth Edition, Thomson.
3. S.Keshav, An Engineering Approach to Computer Networking , Pearson Education.
4. Diane Teare, Catherine Paquet, Campus Network Design Fundamentals, Pearson Education (CISCO Press)

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(13CO105) SOFTWARE ENGINEERING

UNIT-I:

Software, Software Engineering, and Process: The nature of Software, The unique nature of WebApps, Software engineering- A layered technology, The essence and principles of software engineering practice, Generic process model (framework), Process patterns, Process assessment and improvement, CMMI, Software myths.

Process Models: Prescriptive process models: The waterfall model, Incremental process models, Evolutionary process models.

The Unified process, Aspect oriented software development, Agile development: Agile process, Extreme programming.

UNIT-II:

Software Requirements: Introduction to functional and non-functional requirements, Requirements engineering activities, Eliciting requirements, Requirements modeling, Requirements validation, Software requirements specification (SRS), Requirements management.

Requirements modeling: Structured view: Data modeling (ERD), Functional modeling (DFD), and Behavioral modeling. Object oriented view: Use cases, CRC Modeling, Analysis classes, Collaborations, Responsibilities, Object relationship model, Object behavior model.

Software Project Estimation: Empirical estimation models.

UNIT-III:

Design Concepts: Software design quality guidelines and attributes, Design concepts.

Software Architecture: Architecture and its importance, Architectural Styles, Data design, Architectural design.

Design: Structured view (Traditional view): Architectural mapping using data flow (Call and return architecture), Interface design and Function based component design.

Object oriented view: OO Architecture, Class hierarchies, Message design, Class based component design.

Performing User Interface Design: Golden rules, User interface analysis and design,

Interface analysis, interface design steps.

Pattern Based Design: Design patterns, Pattern based software design, Architectural patterns, Component level design patterns, User interface design patterns.

UNIT-IV:

Testing: Software testing strategies: A strategic approach to software testing, Test strategies (Unit testing and integration testing) for conventional and object oriented software, Validation testing, System testing, the art of debugging.

Testing Conventional Applications: Software testing fundamentals, White-Box testing: basis path testing, condition (predicate) testing, data flow testing, loop testing, Black box testing: Equivalence partitioning, Boundary value analysis, Graph based testing methods.

Testing Object Oriented Applications: OO testing methods, Testing methods applicable at class level, Interclass test case design.

Umbrella Activities: Risk management, Software quality assurance, Software configuration management, Measurement and metrics: Size oriented metrics, Function oriented metrics, Metrics for software quality, Product metrics: Metrics for the requirements model, Metrics for the design model, Metrics for source code, Metrics for testing, Metrics for maintenance.
Software Reengineering: A software reengineering process model, Software reengineering activities.

Text Books:

1. Roger S. Pressman, Software Engineering, A practitioner's Approach- 7th edition. McGrawHill International Edition.
2. Sommerville, Software Engineering- 7th edition, Pearson education.

Reference Books:

1. K.K. Agarwal & Yogesh Singh, Software Engineering- New Age International Publishers
2. James F. Peters, Witold Pedrycz, John Wiely, Software Engineering, an Engineering approach
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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(13CO106) BIG DATA
(ELECTIVE-I)

UNIT- I:

What is cloud computing, Cloud computing for end users / system administrators / software developers / corporate customers, Infrastructure as service (IAAS), virtualization, Platform as service (PAAS),Type-1, Type-2 PAAS, Software as Service SAAS. A brief history of Hadoop, Apachehadoop and the Hadoop Eco System, Linux refresher; VmWare Installation of Hadoop.

UNIT- II:

The design of HDFS, HDFS concepts, Command line interface to HDFS, Hadoop File systems, Interfaces,Java Interface to Hadoop. Anatomy of a file read, Anatomy of a file write, Replica placement and Coherency Model, Parallel copying with distcp, Keeping an HDFS cluster balanced.

UNIT-III:

Introduction, Analyzing data with unix tools, Analyzing data with hadoop, Java Map Reduce classes (new API), Data flow, combiner functions, Running a distributed Map Reduce Job, Configuration API, Setting up the development environment, Managing configuration, Writing a unit test with MRUnit,Running a job in local job runner,Running on a cluster, Launching a job, The Map Reduce WebUI.

UNIT- IV:

Classic Mapreduce,Job submission, Job Initialization, Task Assignment, Task execution, Progress and status updates, Job Completion, Shuffle and sort on Map and reducer side, Configuration tuning,
MapReduce Types, Input formats, Output formats ,Sorting, Map side and Reduce side joins, The Hive Shell: Hive services, Hive clients. The meta store. Comparison with traditional databases, HiveQl.
Hbasics,Concepts,Implementation,Java and Mapreduce clients,Loading data, web queries,

Text Books:

1. Tom White, Hadoop: The Definitive Guide, 3rd Edition, O'Reilly Publications, 2012
2. Landis &Blacharski , Cloud Computing made easy , 1st edition,Virtual Global, Inc,

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(13CO107) DISTRIBUTED DATABASES
(ELECTIVE-I)

UNIT-I:

Introduction: Features of Distributed databases, Features of Centralized databases, Level of Distributed Transparency, Reference Architecture, Types of Data Fragmentation, Distribution Transparency, access primitives, integrity constraints.

Distributed Database Design: A framework for Distributed Database Design, Design of Database Fragmentation, Allocation of fragments

UNIT-II:

Global and Fragment Queries: Global Queries, fragment Queries, Equivalence Transformations for Queries, transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parameter Queries.

Optimization of Access Strategies: Frame Work for Query Optimization, Join Queries, General Queries

UNIT-III:

Management of Distributed Transactions: Framework for Transaction Management, Atomicity of Distributed Transactions, Concurrence Control for Centralized Database.

Concurrency: Concurrency Control for Distributed databases, Foundations, Locking Protocols, Deadlocks, Timestamps.

UNIT-IV:

Reliability: Basic concepts, Commitment Protocols, reliability and Concurrency Control, Consistent View of Network, detection and Resolution of Inconsistency, Check points and cold restart.

Distributed Database Systems Commercial Systems: Commercial Systems, Tanden's ENCOMPASS Distributed Database systems, IBM's inter system Communication, features of Distributed, INGRESS Heterogeneous Database: General problems, brief study of MULTIBASE.

Text Books:

1. Ceri. S. Pelagatti G, "Distributed Databases : Principles and Systems", MCG,1985.
2. Ozsu, " Principles of Distributed Database Systems" , 1e, PEA, 2002.

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(13CO108) ARTIFICIAL INTELLIGENCE
(ELECTIVE-I)

UNIT- I:

Problem Solving: Introduction – Agents – Problem formulation – uninformed search strategies – heuristics – informed search strategies – constraint satisfaction

UNIT- II:

Logical Reasoning: Logical agents – propositional logic – inferences – first-order logic – inferences in first order logic – forward chaining – backward chaining – unification – resolution

Planning: Planning with state-space search – partial-order planning – planning graphs – planning and acting in the real world

UNIT- III:

Uncertain Knowledge and Reasoning: Uncertainty – review of probability - probabilistic Reasoning– Bayesian networks –inferences in Bayesian networks – Temporal models – Hidden Markov models

UNIT- IV:

Learning: Learning from observation - Inductive learning – Decision trees – Explanation based learning – Statistical Learning methods - Reinforcement Learning

Text Books:

1. S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education, 2003.

Reference Books:

1. David Poole, Alan Mackworth, Randy Goebel, ”Computational Intelligence : a logical approach”, Oxford University Press, 2004.
2. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem solving”, Fourth Edition, Pearson Education, 2002.
3. J. Nilsson, “Artificial Intelligence: A new Synthesis”, Elsevier Publishers, 1998.

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(13CO109) ADVANCED DATA STRUCTURES AND ALGORITHMS LAB

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.

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

3) Implement Queues Using Array.

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

5) Implement applications of linked lists.
   a) Stack Using Linked List.
   b) Queue Using Linked List.
   c) Circular Queue Using Linked List.
   d) Single Linked List.
   e) Double Linked List.

6) Arrange words in dictionary order using Binary Search Tree In order Traversal.

7) Implement search traversals for graphs.
   a) DFS
   b) BFS

8) Find minimum cost spanning tree using Kruskal's and Prism's Algorithms.

9) Using Floyd's Algorithm find out"All Pair Shortest Path".

10) Implement N-Queens Problem

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(13CO110) COMPUTER SYSTEM DESIGN LAB

1) Write a program using Arithmetic and Logical instruction of IA-32 processor for ASCII to BCD conversion.
2) Exploring Instruction Set Architecture (ISA) of x86 Machines.
3) Bread Board implementation of counters & shift registers.
4) Write programs using the following system calls of UNIX operating system:
   Fork, exec, getpid, exit, wait, close, stat, opendir, readdir
5) Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
6) Write C programs to simulate UNIX commands like ls, grep, etc.
7) Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
8) Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions)
9) Do mount and unmount operation in a file system.
10) Implement the Producer – Consumer problem using semaphores (using UNIX system calls).

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(13CO111) SEMINAR-I

Objectives: To get involved with the latest advancements and developments to enhance communication and presentation skills, exchange of ideas, greater connectivity to develop a research bent of mind.

For the seminar, the student shall collect the information on a specialized relevant topic and prepare a report, showing his understanding over the topic, and submit the same to the department, which shall be evaluated by the Department Committee consisting of Head of the department, Seminar Supervisor and a Senior Faculty Member. Each Seminar shall be evaluated for 50 marks (10 marks for report, 10 marks for subject content, 20 marks for presentation and 10 marks for queries).

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(13CO201) SOFTWARE QUALITY ASSURANCE AND TESTING

UNIT- I:

Software Quality Assurance Framework and Standards SQA Framework: What is Quality? Software Quality Assurance, Components of Software Quality Assurance

Software Quality Assurance Plan: Steps to develop and implement a Software Quality Assurance Plan

Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Baldrige, 3 Sigma, 6 Sigma

UNIT- II:

Software Quality Assurance Metrics and Measurement Software Quality Metrics: Product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metric Programs

Software Quality metrics methodology: Establish quality requirements, Identify Software quality metrics, Implement the software quality metrics, analyze software metrics results, validate the software quality metrics – **Software quality indicators** – **Fundamentals in Measurement theory**

UNIT- III:

Software Testing Strategy and Environment: Establishing testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing.

Software Testing Methodology: Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist

Software Testing Techniques : Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing

UNIT- IV:

Software Testing Tools : Taxonomy of Testing tools, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus.

Testing Process: Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes, Evaluate Test Effectiveness.

Testing Specialized Systems and Applications: Testing Client/Server – Web applications, Testing off the Shelf Components, Testing Security, Testing a Data Warehouse

Text Books:

1. William E. Perry , Effective Methods for Software Testing, 2nd Edition, Second Edition, Wiley India, 2006.
2. Menachem/Garry S. Marliss, Software Quality, Mordechai Ben- Thomson Learning publication, 1997.

Reference Books:

1. Gao, Tsao and Wu, Testing and Quality Assurance for Component-based Software, Artech House Publishers
2. Bories Beizer, Software Testing Techniques, Second Edition, Dreamtech Press
3. Rex Black, Managing the Testing Process, Wiley
4. G. Gordon Schulmeyer, James I.McManus, Handbook of Software Quality Assurance, Second Edition, International Thomson Computer Press
5. William E.Lewis, Gunasekaran Veerapillai, Software Testing and continuous Quality Improvement, Second Edition, Auerbach Publications
6. Stephen H. Kan, Metrics and Models for Software Quality Engineering, Pearson Education Publication

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(13CO202) NETWORK SECURITY AND CRYPTOGRAPHY

UNIT- I:

Introduction: Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork security.

Classical Techniques: Conventional Encryption model, Steganography, Classical Encryption Techniques.

Modern Techniques: Simplified DES, Block Cipher Principles, Data Encryption standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of operations.

UNIT- II:

Algorithms: Triple DES, International Data Encryption algorithm, Blowfish, RC5, CAST-128, RC2, Characteristics of Advanced Symmetric block ciphers.

Conventional Encryption: Placement of Encryption function, Traffic confidentiality, Key distribution, Random Number Generation.

Public Key Cryptography: Principles, RSA Algorithm, Key Management, Diffie-Hellman Key exchange, Elliptic Curve Cryptography.

UNIT- III:

Number Theory: Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms.

Message Authentication and Hash Functions: Authentication requirements and functions, Message Authentication, Hash functions, Security of Hash functions and MACs.

Hash and MAC Algorithms: MD File, Message Digest Algorithm, Secure Hash Algorithm, RIPEMD-160, HMAC.

Digital Signatures And Authentication Protocols: Digital signatures, Authentication Protocols, Digital signature standards.

UNIT- IV:

Authentication Applications: Kerberos, X.509 directory Authentication service.

Electronic Mail Security: Pretty Good Privacy, S/MIME.

IP Security: Overview, Architecture, Authentication, Encapsulating Security Payload, Combining security Associations, Key Management.

Web Security: Web Security requirements, Secure sockets layer and Transport layer security, Secure Electronic Transaction.

Intruders, Viruses And Worms: Intruders, Viruses and Related threats.

Fire walls: Fire wall Design Principles, Trusted systems.

Text Books:

1. William Stallings, Cryptography and Network Security: Principles and Practice -Pearson Education., 2000.

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(13CO203) DISTRIBUTED SYSTEMS

UNIT-I:

Introduction of Distributed System: Goals, Hardware Concepts, Software Concepts, the Client-Server Model. **Communication:** Remote Procedure Call, Remote Object Invocation, Message Oriented Communication, Stream-Oriented Communication.

UNIT-II:

Processes: Threads, Clients, Servers, Code Migration, Software Agents.
NAMING: Naming Entities, Locating Mobile Entities.
Synchronization: Clock Synchronization, Logical Clocks, Global State, Election Algorithms, Mutual Exclusion, Distributed Transactions.

UNIT-III:

Consistency and Replication: Introduction, Data-Centric Consistency Models, Client Centric Consistency Models, Distribution Protocols, Consistency Protocols, Examples.
Fault Tolerance: Introduction to Fault Tolerance, Process Resilience, Reliable Client-Server Communication, Reliable Group Communication, Distributed Commit, Recovery.

UNIT-IV:

Distributed Object-Based Systems: CORBA, Distributed COM.
Distributed File Systems: SUN Network File System, The CODA File System, Other Distributed File Systems, Comparison of Distributed File Systems.

Text Books:

1. Andrew S. Tanenbaum, Maarten Van Steen. Distributed Systems – Principles and Paradigms 2/e, PHI, 2004.

Reference Books

1. Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design", PHI 2002.
2. Randy Chow Theodore Johnson, "Distributed Operating Systems and Algorithm Analysis", PEA, 2009.
3. George Couloris, Jean Dollimore, Tim Kind berg, "Distributed Systems Concepts and Design", 3/e, PEA, 2002.

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(13CO204) CLOUD COMPUTING

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. IvankaMenken, Gerard Blokdijk,Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book, 2009.
2. George Reese,CloudApplicationArchitecturesBuilding 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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(13CO205) DATA WAREHOUSING AND DATA MINING

UNIT-I:

Introduction : Data Mining, Kinds of Data, Data Mining Functionalities, Classification of Data Mining Systems, Primitives, Major Issues in Data Mining.

Data Preprocessing: Descriptive Data Summarization, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Discretization and Concept Hierarchy Generation.

UNIT-II:

Data Warehouse and OLAP Technology: What is Data Warehouse, A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation. From Data Warehouse to Data Mining.

Mining Frequent Patterns and Associations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining Various Kinds of Association Rules.

UNIT-III:

Classification and Prediction: Issues regarding classification and prediction, classification by decision tree induction, Bayesian classification, Rule based classification, Prediction, Accuracy and Error Measures.

Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density based Methods, Grid based methods, model based clustering methods, Clustering high dimensional data, Outlier analysis.

UNIT-IV:

Mining Stream, Time-Series, and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Biological Data.

Applications and Trends in Data Mining: Data Mining Applications, : Data Mining for Financial Data Analysis, Data Mining for the Retail Industry, Data Mining for the Telecommunication Industry, Data Mining for Biological Data Analysis, Data Mining in Other Scientific Applications, Data Mining for Intrusion Detection, Social Impacts of Data Mining.

Text Books:

1. Jiawei Han and Micheline Kamber, Data Mining, Concepts and Techniques, Elsevier, II Edition, 2008.

Reference Books:

1. Margaret H Dunham, Data Mining Introductory and Advanced Topics, Pearson Education, 2e, 2006.
2. Amitesh Sinha, Data Warehousing, Thomson Learning, 2007.

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(13CO206) SOFTWARE ARCHITECTURE
(ELECTIVE-II)

UNIT-I:

Introduction To Software Architecture: An Engineering Discipline for Software, Status of S/W Arch. Architecture Business Cycle, Where do Architectures come from. Software Processes and the Architecture Business Cycle, Features of Good Architecture.

Architecture Styles: Pipes and Filters, Data Abstraction and Object Oriented organization, Even-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

UNIT-II:

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

Architectural Design Guidance: Guidance for User Interface Architectures, Case Study in Inter Operability: World Wide Web.

UNIT-III:

Pattern Types: Architectural Patterns, Structural Patterns, Patterns for Distribution, Patterns for Interactive Systems.

Formal Models And Specifications: Finalizing the Architectural of a Specific System. Architectural Style. Architectural Design Space. Case Study of an Industry Standard Computing. Infrastructure: CORBA

UNIT-IV:

Architectural Description Languages: ADL's today, capturing Architectural Information in an ADL, Application of ADL's in system Development, Choosing an ADL, Example of ADL.

Reusing Architectural Assets within an Organization: Creating Products and Evaluating a Product Line, Organizational Implications of a Product Line, Component Based Systems. Software Architectures in Figure: Legacy Systems. Achieving an Architecture, from Architecture to System.

Text Books:

1. Mary Show, David Garlan, "S/W Arch. Perspective: on an Emerging Discipline", PHI, 1996.
2. Len Bass, Paul Elements, Rick Kazman, "Software Architecture in Practice", PEA, 1998.

Reference Books:

1. Garmus, Herros, " Measuring the Software Process: A Practical Guide to Functional Measure", PHI, 1996.
2. Florac, Carleton, "Meas. Software Process: Stat. Proce. Cont. for Software process Improvemnts", PEA, 1999.
3. W.Humphery, " Introduction to Team Software Process", PEA, 2002.
4. Peters, "Software Design: Methods and Techniques", Yourdon, 1981.
5. Buschmann, " Pattern Oriented Software Architecture", Wiley, 1996.
6. Gamma et al, "Design Patterns", PEA,1995.

AUDISANKARA COLLEGE OF ENGINEERING & TECHNOLOGY: GUDUR
(AUTONOMOUS)

M.Tech II Semester (CSE)

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(13CO207) SOFTWARE DESIGN
(ELECTIVE-II)

UNIT-I:

The Nature of Design Process: What is design?, The role of the design activity, Design as a problem-solving process, Design as a 'wicked' problem.

The Software Design Process: What is software?, Building models, Transferring design knowledge, Constraints upon the design process and product, Recording design decisions, Designing with others

Design In The Software Development Process: A context for design, Linear development processes, Incremental development processes, Economic factors, The longer term.

Design Qualities: The quality concept, Assessing design quality, Quality attributes of the design product, Assessing the design process.

UNIT-II:

Describing A Design Solution: Representing abstract ideas, Design viewpoints for software, Forms of notation. **Transferring Design Knowledge:** The need to share knowledge, The architecture concept, Design methods, Design Patterns, A unified interpretation.

Some Design Representations: A problem of selection, Black box notations, White box notations, Development a diagram. **The Rotionale For Method:** What is a software design method? The support that design methods provide, Why methods don't work miracles, Problem domains and their influence.

UNIT-III:

Design Process And Design Strategies: The role of strategy in methods, Describing the design process-the D- Matrix, Design by top-down decomposition, Design by composition, Organizational influences upon design. **Design Patterns:** Design by template and design reuse, The design patterns, Designing with Patterns, Patterns in the wider design context.

Stepwise Refinement: The historical role of stepwise refinement, Architecture consequences, Strengths and weaknesses of the stepwise strategy.

Incremental Design: Black box to white box in stages, Prototyping, An example-DSDM.

Structured Systems Analysis and Structured Design: Origins, development and philosophy, Representation forms for SSA/SD, The SSA/SD process, the role of heuristics in SSA/SD, External forms of SSA/SD, SSA/SD: an outline Example

UNIT-IV:

Jackson Structured Programming (JSP): Some background to JSP, JSP representation forms, The JSP process, Some JSP heuristics. **Jackson System Development (JSD):** The JSD model, JSD representation forms, The JSD Process, JSD heuristics. **Design with Objects:** The 'object concept', Design Practices for the object-oriented paradigm, Object-Oriented frameworks, Object-based design, Object-Oriented design. **Component-Based Design:** The component concept, designing with components, Designing components, at the extremity-COTS. **A Formal Approach to Design:** The case for rigour, Model-based strategies, Property-based strategies

Text Books:

1. David Budgen ,Software Design-2/e, Pearson Education.
2. Software Design Methods for Concurrent and Real-Time Systems, 1/e Pearson Education.

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M.Tech II Semester (CSE)

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(13CO208) DESIGN PATTERNS
(ELECTIVE-II)

UNIT-I:

Review Of Formal Notations & Foundation Classes In C++: Class diagram, Object diagram, Interaction diagram Examples. List, Iterator, ListIterator, Point, Rect, coding in C++.

Introduction To Design Patterns: Design Pattern Definition, Design Patterns in Small Talk MVC, Describing Design Patterns, Catalog of Design Patterns, Organizing the Catalog, Solving of Design Problems using Design Patterns, Selection of a Design Pattern, use of Design Patterns.

UNIT-II:

Designing A Document Editor: A Case Study: Design problems, Document structure, Formatting, Embellishing the User Interface, Supporting Multiple Look and Feel standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

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

UNIT-III:

Structural Patterns-1: Adapter, Bridge, Composite, Decorator.

Structural Patterns-2 & Behavioral Patterns-1: Structural patterns: Façade. Flyweight, Proxy. Discuss of Structural Patterns.

Behavioral Patterns: Chain of Responsibility Command, Interpreter.

UNIT-IV:

Behavioral Patterns-2: Iterator. Mediator. Observer. State. Strategy. Template Method. Visitor. Discussion of Behavioral Patterns.

Behavioral Patterns-3: State. Strategy. Template Method. Visitor. Discussion of Behavioral Patterns. Expectations from Design Patterns.

Text Books:

1. Gamma, Belm, Johnson, “Design Patterns: Elements of Reusable Object Oriented Software”, PEA, 1995.

Reference Books:

1. Cooper, “Java Design Paterns”, Pearson.
2. Horstmann, “Object Oriented Design and Pattetrns”, Wiley.
3. Ali Bahrami, “Object Oriented Systems Development”, MCG, 1999.
4. Larman, “Applying UML Patterns”, PEA.

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M.Tech II Semester (CSE)	**L**	**T**	**P**	**[C]**
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(13CO209) DATA WAREHOUSING AND DATA MINING LAB

1) By using Filter transformation filter the given data.
2) Join two Heterogeneous table using Joiner Transformation.
3) Perform the Aggregation operation by using Aggregator transformation on any database.
4) Perform sorting by using Sorter Transformation.
5) By using Rank Transformation, generate ranks to the Student data.
6) Perform Expression Transformation and hike the Employee Salary.
7) Create student Relation explore in explorer application by using data mining functionalities preprocessing and classification of the data.
8) Implement decision tree based algorithm for classification
9) Implement K-means algorithm for clustering
10) Implement Apriori algorithm for association rule
11) Bayesian Classification
12) Introduction to the Weka machine learning toolkit
13) Classification using the Weka toolkit – Part 1
14) Classification using the Weka toolkit – Part 2
15) Performing data preprocessing tasks for data mining in Weka

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M.Tech II Semester (CSE)

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(13CO210) NETWORK SECURITY AND CRYPTOGRAPHY LAB

1) Write a program for transformation using a String.
2) a) Write a program to implement the CAESER CIPHER b) Write a program to implement the HILL CIPHER c) Write a program to implement the PLAYFAIR CIPHER.
3) Write a program to implement DES Algorithm
4) Write a Program to implement RSA Algorithm
5) Write a Program that demonstrates the Diffie -Hellman key exchange key Algorithm
6) Implement elliptic curve point addition for polynomial basis form.
7) Perform an experiment to grab a banner with telnet and perform the task using netcat utility.
8) Implement NMAP for ports monitoring.
9) Performa an experiment to demonstrate how to sniff for router traffic by using the tool WIRESHARK.
10) Perform an wireless audit of an access point / router and decrypt WEP and WPA.

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M.Tech II Semester (CSE)

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(13CO211) 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 III & IV Semesters (CSE)

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(13CO401) SEMINAR-II

Objectives: To get involved with the latest advancements and developments to enhance communication and presentation skills, exchange of ideas, greater connectivity to develop a research bent of mind.

For the seminar, the student shall collect the information on a specialized relevant topic and prepare a report, showing his understanding over the topic, and submit the same to the department, which shall be evaluated by the Department Committee consisting of Head of the department, Seminar Supervisor and a Senior Faculty Member. Each Seminar shall be evaluated for 50 marks (10 marks for report, 10 marks for subject content, 20 marks for presentation and 10 marks for queries).

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M.Tech III & IV Semesters (CSE)	L	T	P	[C]
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(13CO402) PROJECT WORK

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.