
**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**
**(Autonomous Institution – UGC, Govt. of India)**
**Sponsored by CMR Educational Society**
(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)
Maisammaguda, Dhulapally (Post Via. Kompally), Secunderabad – 500100, Telangana State, India.
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# BACHELOR OF TECHNOLOGY
# COMPUTER SCIENCE AND ENGINEERING

# ACADEMIC REGULATIONS
## (Batches admitted from the academic year 2017 - 2018)

*Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.*

**PRELIMINARY DEFINITIONS AND NOMENCLATURES**

- ”Autonomous Institution /College” means an institution/college designated as autonomous institute / college by University Grants Commission (UGC), as per the UGC Autonomous College Statutes.

- “Academic Autonomy” means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.

- “Commission” means University Grants Commission.

- “AICTE” means All India Council for Technical Education.

- “University” the Jawaharlal Nehru Technological University, Hyderabad.

- “College” means Malla Reddy College of Engineering & Technology, Secunderabad unless indicated otherwise by the context.

- “Program” means:
    - Bachelor of Technology (B.Tech) degree program
    - UG Degree Program: B.Tech

- “Branch” means specialization in a program like B.Tech degree program in Electronics & Communication Engineering, B.Tech degree program in Computer Science and Engineering etc.

- “Course” or “Subject” means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester.

- T–Tutorial, P–Practical, D–Drawing, L-Theory, C-Credits

**FOREWORD**

The autonomy is conferred on Malla Reddy College of Engineering & Technology (MRCET) by UGC based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the UGC in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Malla Reddy College of Engineering & Technology (MRCET) is proud to win the credence of all the above bodies monitoring the quality of education and has gladly accepted the responsibility of sustaining, and also improving upon the values and beliefs for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several experts drawn from academics, industry and research, in accordance with the vision and mission of the college which reflects the mindset of the institution in order to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications, if needed, are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the institution and brighter prospects of engineering graduates.

***"A thought beyond the horizons of success committed for educational excellence"***

**PRINCIPAL**

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

## (Autonomous Institution – UGC, Govt. of India)

## Sponsored by CMR Educational Society

(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)
Maisammaguda, Dhulapally (Post Via. Kompally), Secunderabad – 500100, Telangana State, India.
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**VISION**

- To establish a pedestal for the integral innovation, team spirit, originality and competence in the students, expose them to face the global challenges and become technology leaders of Indian vision of modern society.

**MISSION**

- To become a model institution in the fields of Engineering, Technology and Management.
- To impart holistic education to the students to render them as industry ready engineers.
- To ensure synchronization of MRCET ideologies with challenging demands of International Pioneering Organizations.

**QUALITY POLICY**

- To implement best practices in Teaching and Learning process for both UG and PG courses meticulously.
- To provide state of art infrastructure and expertise to impart quality education.
- To groom the students to become intellectually creative and professionally competitive.
- To channelize the activities and tune them in heights of commitment and sincerity, the requisites to claim the never ending ladder of SUCCESS year after year.

**For more information: www.mrcet.ac.in**

## ACADEMIC REGULATIONS FOR B. TECH. (REGULAR)

**Applicable for the students of B. Tech. (Regular) from the Academic Year 2017-18 and onwards**

**The college affiliating to JNTUH, Hyderabad offers a 4-year (8 semesters) Bachelor of Technology (B.Tech.) degree programme, under Choice Based Credit System (CBCS) for the following branches of Engineering.**

### 1.0 Award of B. Tech. Degree

A student will be declared eligible for the award of B. Tech. Degree if he fulfills the following academic regulations:

1.1 The candidate shall pursue a course of study for not less than four academic years and not more than eight academic years.

1.2 After eight academic years of course of study, the candidate is permitted to write the examinations for two more years.

**1.3 The candidate shall register for 192 credits and secure 192 credits with compulsory subjects as listed in Table-1. However, student will earn minimum of 184 credits for the award of the B.Tech Degree.**

**Table 1: Compulsory Subjects**

| S.No | Subject Particulars |
|---|---|
| 1 | All practical Subjects |
| 2 | Mini Project |
| 3 | Technical Seminar |
| 4 | Project Work |

1.4 In addition to 1.3, the candidate has to register for Mandatory courses (Non-credit course), in which 50% of scoring is required for the award of the degree.

2.0 The students, who fail to fulfill all the academic requirements for the award of the degree within ten academic years from the year of their admission, shall forfeit their seats in B. Tech. course.

### 3.0 Courses of study

The following courses of study are offered at present as specializations for the B. Tech. Course:

| S.No | Department |
|---|---|
| 01 | Aeronautical Engineering |
| 02 | Computer Science Engineering |
| 03 | Electronics & Communication Engineering |
| 04 | Information Technology |
| 05 | Mechanical Engineering |
| 06 | Electrical and Electronics Engineering |

**4.0 Credits**

| Particulars | Semester | |
|---|---|---|
| | * Periods per week | Credits |
| Theory | 04 | 04 |
| | 03 | 03 |
| Practical | 03 | 02 |
| Drawing | 03 | 02 |
| | 04 | 04 |
| Mini Project | -- | 04 |
| Technical Seminar | 04 | 02 |
| Major Project | 12 | 10 |

***Duration of each period is 60 minutes.**

**5.0 Distribution and Weightage of Marks**

5.1 The performance of a student in each semester shall be evaluated subject-wise for a maximum of 100 marks for a theory and 75 marks for a practical subject. In addition, Mini Project, Technical seminar and Major Project work shall be evaluated for 100, 50 and 300 marks, respectively.

5.2 For theory subjects the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination.

5.3 For theory subjects, during a semester there shall be 2 mid-term examinations. Each mid-term examination consists of a descriptive paper and assignment. The descriptive paper shall be for 24 marks with a total duration of 2 hours. The descriptive paper shall contain 6 full questions out of which, the student has to answer 4 questions, each carrying 6 marks. Six (6) marks are allocated for Assignments (as specified by the subject teacher concerned). The first Assignment should be submitted before the conduct of the first mid-examination, and the second Assignment should be submitted before the conduct of the second mid-examination. While the first mid-term examination shall be conducted from 1 to 2 units of the syllabus, the second mid-term examination shall be conducted from 3 to 5 units. The total marks secured by the student in each mid-term examination are evaluated for 30 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each candidate.

However, if any student is absent/scoring internal marks less than 40% in any subject of a mid-term examination he/she will be given a chance to write the internal exam once again after he/she re-registering for the internal exam in the concerned subject and paying stipulated fees as per the norms.

The end examination will be conducted for 70 marks with 5 questions consisting of two parts each (a) and (b), out of which the student has to answer either (a) or (b), not both and each question carrying 14 marks.

5.4 For practical subjects there shall be a continuous evaluation during a semester for 25 sessional marks and 50 end semester examination marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The end semester examination shall be conducted with an external examiner and the laboratory teacher. The external examiner shall be appointed from the clusters of colleges which are decided by the examination branch of the College.

5.5 For the subject having design and/or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and Estimation, the distribution shall be 30 marks for internal evaluation (15 marks for day-to-day work and 15 marks for internal tests) and 70 marks for end semester examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

5.6 There shall be a Mini Project to be taken up during the vacation after III year II Semester examination. However, the Mini-Project and its report shall be evaluated along with the Major Project work in IV year II Semester. The Mini Project shall be submitted in a report form and presented before the committee. It shall be evaluated for 100 marks. The committee consists of an External Examiner, Head of the Department, and the Supervisor of the Mini Project and a Senior Faculty member of the department. There shall be no internal marks for Mini Project.

5.7 There shall be a Technical Seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding of the topic, and submit it to the department. It shall be evaluated by the departmental committee consisting of head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for the seminar.

5.8 Out of a total of 300 marks for the Major Project work, 100 marks shall be allotted for Internal Evaluation and 200 marks for the End Semester Examination (Viva Voce). The End Semester Examination of the Major Project work shall be conducted by the same committee as appointed for the mini-project. In addition, the project supervisor shall also be included in the committee. The topics for mini project, seminar and project work shall be different from one another. The evaluation of project work shall be made at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.

5.9 The Laboratory marks and the sessional marks awarded by the College are subject to scrutiny and scaling by the college wherever necessary. In such cases, the sessional and laboratory marks awarded by the College will be referred to Academic Council. The Academic Council will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the Academic Council are final and binding. The laboratory records and internal test papers shall be preserved in the College as per the Affiliation University rules and produced before the Committees/Academic Council as and when asked for.

**6.0 Attendance Requirements**

6.1 A student is eligible to write the University examinations only if he acquires a minimum of 75% of attendance in aggregate of all the subjects.

6.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee

**6.3 Shortage of Attendance below 65% in aggregate shall not be condoned.**

6.4 A student who is short of attendance in semester may seek re-admission into that semester when offered within 4 weeks from the date of the commencement of class work.

**6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to write their end semester examination of that class and their registration stands cancelled.**

6.6 A stipulated fee as determined by the examination branch shall be payable towards condonation of shortage of attendance.

**6.7 A student will be promoted to the next semester if he/she satisfies the attendance requirement of the present semester, as applicable, including the days of attendance in sports, games, NCC and NSS activities.**

**6.8 The candidate fulfills the attendance requirement in the present semester, he/she shall not be permitted for readmission into the same class.**

**7. Course Registration:**

7.1 Every student has to register for a set of Courses in each Semester, with the total number of their Credits being limited by considering the permissible weekly Contact Hours (typically: 30/Week); For this, an average Course Registration of minimum 20 Credits/Semester (e.g., 6-7 Courses) and a maximum of 28 credits are generally acceptable on recommendation of concerned academic advisor by satisfying the pre-requisite conditions.

7.2 Approval of the Course Registration will be informed by the concerned Head of the Department on the beginning of the semester by taking the number of students registered (minimum **one-third** students per class) and availability of the faculty into consideration.

7.3 Dropping of the Course Registration can be permitted up to two weeks from the commencement of the semester. Thereafter no droppings are permitted.

7.4 Interchanging of Course Registrations are not permitted.

7.5 The Pre-requisite conditions for the additional course(s) registration by the students are based on the slots available in the Time Table, Class rooms and Faculty availability.

**8.0 Minimum Academic Requirements**

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6.

8.1 A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the mid examination (rounded to 10 marks out of 30 marks) and also not less than 35% in end semester examination and minimum 40% of marks in the sum total of the mid-term and end semester exams put-together.

8.2 A student shall be promoted from I year to II year upon fulfilling the minimum required attendance.

8.3 A student will be eligible to be promoted from II year to III year, upon fulfilling the academic requirements of 50 % credits up to II year I semester examinations and secures prescribed minimum attendance in II year.

8.4 A student will be eligible to be promoted from III year to IV year, upon fulfilling the academic requirements of 50 % credits up to III year I semester examinations and secures prescribed minimum attendance in III year.

8.5 A student shall register and put up minimum attendance in all 192 credits and shall earn a minimum of 184 credits for the award of B.Tech degree. Further, marks obtained in the 184 credits shall be considered for the calculation of percentage of marks as well as overall CGPA.

8.6 Students who fail to earn 184 credits as indicated in the course structure within ten academic years (8 years of study + 2 years additionally for appearing for exams only) from the year of their admission, shall forfeit their seat in B.Tech course and their admission stands cancelled.

**9.0 Course pattern**

9.1 The entire course of study is for four academic years. I,II,III and IV years shall be on semester pattern.

9.2 A student, eligible to appear for the end examination in a subject, but absent from it or has failed in the end semester examination, may write the exam in that subject during the period of supplementary exams.

9.3 When a student is detained for lack of credits/shortage of attendance, he/she will not be promoted to the next semester for that particular academic year. However, the academic regulations under which he was first admitted shall continue to be applicable to him.

**10.0 Grading Procedure**

10.1 Marks will be awarded to indicate the performance of student in each theory subject, laboratory/practicals, seminar, UG mini project and UG major project. Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken grade together) as specified in item 8 above, a corresponding letter shall be given.

10.2 As a measure of the performance of student, a 10-point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed.

**10.3 Letter Grades and Grade Points:**

The UGC recommends a 10-point grading system with the following letter grades as given below:

| Letter Grade | Points | % of Marks secured in a subject or course (Class Intervals) |
|---|---|---|
| O (Outstanding) | 10 | Greater than or equal to 90 |
| A+(Excellent) | 9 | 80 and less than 90 |

| | | |
|---|---|---|
| A(Very Good) | 8 | 70 and less than 80 |
| B+(Good) | 7 | 60 and less than 70 |
| B(Average) | 6 | 50 and less than 60 |
| C(Pass) | 5 | 40 and less than 50 |
| F(Fail) | 0 | Below 40 |
| Ab (Absent) | 0 | - |

A student obtaining Grade F shall be considered failed and will be required to reappear in the examination

**10.4 Computation of SGPA and CGPA**

The UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA):

**Credit points (CP) = grade point (GP) x credits …. For a course**

i. The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e

**SGPA (Si) = Σ(Ci x Gi) / ΣCi**

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme, i.e.

**CGPA = Σ(Ci x Si) / Σ Ci**

where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

iii. The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

10.5. A student obtaining 'F' grade in any subject shall be deemed to have 'failed' and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

10.6 A student who has not appeared for examination in any subject '**Ab'** grade will be allocated in that subject, and student shall be considered **'failed'**. Student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered.

10.7 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

10.8 A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

**Credit points (CP) = grade point (GP) x credits …. For a course**

10.9 The student passes the subject/ course only when **GP ≥ 5 ('C' grade or above)**

**Illustration of calculation of SGPA**

| Course/Subject | Credits | Letter Grade | Grade Points | Credit Points |
|---|---|---|---|---|
| Course 1 | 4 | A | 8 | 4 x 8 = 32 |
| Course 2 | 4 | O | 10 | 4 x 10 = 40 |
| Course 3 | 4 | C | 5 | 4 x 5 = 20 |
| Course 4 | 3 | B | 6 | 3 x 6 = 18 |
| Course 5 | 3 | A+ | 9 | 3 x 9 = 27 |
| Course 6 | 3 | C | 5 | 3 x 5 = 15 |
| | 21 | | | 152 |

**SGPA = 152/21 = 7.24**

**Illustration of calculation of CGPA:**

| Course/Subject | Credits | Letter Grade | Grade Points | Credit Points |
|---|---|---|---|---|
| **I Year I Semester** | | | | |
| Course 1 | 4 | A | 8 | 4 x 8 = 32 |
| Course 2 | 4 | A+ | 9 | 4 x 9 = 36 |
| Course 3 | 4 | B | 6 | 4 x 6 = 24 |
| Course 4 | 3 | O | 10 | 3 x 10 = 30 |
| Course 5 | 3 | B+ | 7 | 3 x 7 = 21 |
| Course 6 | 3 | A | 8 | 3 x 8 = 24 |

| I Year II Semester | | | | |
|---|---|---|---|---|
| Course 7 | 4 | B+ | 7 | 4 x 7 = 28 |
| Course 8 | 4 | O | 10 | 4 x 10 = 40 |
| Course 9 | 4 | A | 8 | 4 x 8 = 32 |
| Course 10 | 3 | B | 6 | 3 x 6 = 18 |
| Course 11 | 3 | C | 5 | 3 x 5 = 15 |
| Course 12 | 3 | A+ | 9 | 3 x 9 = 27 |
| | Total Credits = 42 | | | Total Credits Points = 327 |
| | | | | |

**CGPA = 327/42 = 7.79**

10.10 For merit ranking or comparison purposes or any other listing, **only** the **'rounded off'** values of the CGPAs will be used.

10.11 For calculations listed in regulations 10.4 to 10.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/courses will also be included in the multiplications and summations. After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA. However, mandatory courses will not be taken into consideration.

**11.0 Passing standards**

11.1 student shall be declared successful or 'passed' in a semester, if student secures a GP $\geq$ 5 ('C' grade or above) in every subject/course in that semester (i.e. when student gets an SGPA $\geq$ 5.00 at the end of that particular semester); and a student shall be declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA $\geq$ 5.00 for the award of the degree as required.

11.2 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

**12.0 Declaration of results**

12.1 Computation of SGPA and CGPA are done using the procedure listed in 10.4 to 10.9.

12.2 For final percentage of formula marks equivalent to the computed final CGPA, the following formula maybe used.

**% of Marks = (final CGPA – 0.5) x 10**

**13.0 Award of Degree**

In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (sessional, mid-term, end-

semester etc.,) in a semester. As per UGC Autonomous guidelines, the following system is implemented in awarding the grades and CGPA under the **Choice Based Credit System (CBCS).**

13.1 A student who registers for all the specified subjects/ courses as listed in the course structure and secures the required number of 192 credits (with CGPA $\geq$ 5.0), within 8 academic years from the date of commencement of the first academic year, shall be declared to have **'qualified'** for the award of the B.Tech. degree in the chosen branch of Engineering as selected at the time of admission.

13.2 A student who qualifies for the award of the degree as listed in 13.1 shall be placed in the following classes.

13.3 Students with final CGPA (at the end of the under graduate programme) $\geq$ 8.00, and fulfilling the following conditions shall be placed in **'first class with distinction'**.

i. Should have passed all the subjects/courses within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.
ii. Should have secured a CGPA $\geq$ 8.00, at the end of each of the 8 sequential semesters, starting from first year first semester onwards.

13.4 Students with final CGPA (at the end of the under graduate programme) $\geq$ 6.50 but < 8.00, shall be placed in **'first class'**.

13.5 Students with final CGPA (at the end of the under graduate programme) $\geq$ 5.50 but < 6.50, shall be placed in **'Second class'.**

13.6 All other students who qualify for the award of the degree (as per item 13.1), with final CGPA (at the end of the under graduate programme) $\geq$ 5.00 but < 5.50, shall be placed in **'pass class'.**

13.7 A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

13.8 Students fulfilling the conditions listed under item 13.3 alone will be eligible for award of **'university rank'** and **'gold medal'.**

**14.0 Withholding of results**

14.1 If the student has not paid the fees to the university/ college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

**15.0 Transitory regulations.**

15.1 A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects/ courses (or equivalent subjects/ courses, as the case may be), and same professional electives/ open electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).

15.2 After the revision of the regulations, the students of the previous batches will be given two chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent

subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.

15.3 In case of transferred students from other Universities, the credits shall be transferred to JNTUH as per the academic regulations and course structure of the MRCET.

**16 Minimum Instruction Days**

The minimum instruction days for each semester shall be 90days.

**17.0 General**

17.1 Wherever the words he, him, his, occur in the regulations, they include she, her, hers.

17.2 The academic regulation should be read as a whole for the purpose of any interpretation.

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

17.4 The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council.

17.5 The students seeking transfer to colleges affiliated to JNTUH from various other Universities/Institutions, have to pass the failed subjects which are equivalent to the subjects of prescribed curriculum of the institute, and also pass the subjects of prescribed curriculum of the institute which the candidates have not studied at the earlier Institution on their own without the right to sessional marks. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of prescribed curriculum of the institute, the candidates have to study those subjects in prescribed curriculum of the institute in spite of the fact that those subjects are repeated.

**18.0 Scope**

18.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

18.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic senate is final.

18.3 The college may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the date notified by the academic senate of the college.

## Academic Regulations for B.Tech. (Lateral Entry Scheme) w.e.f the AY 2017-18

1. **Eligibility for award of B. Tech. Degree (LES)**
   The LES students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years.

2. The student shall register for 144 credits and secure 144 credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) for the award of B.Tech. degree. **Out of the 144 credits secured, the student can avail exemption up to 6 credits**, that is, one open elective subject and one professional elective subject or two professional elective subjects resulting in 138 credits for B.Tech programme performance evaluation.

3. The students, who fail to fulfil the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech.

4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

**5. Promotion rule**

5.1 A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the mid examination (rounded to 10 marks out of 30 marks) and also not less than 35% in end semester examination and minimum 40% of marks in the sum total of the mid-term and end semester exams put together.

5.2 A student shall be promoted from II year to III year upon fulfilling the minimum required attendance.

5.3 A student will be eligible to be promoted from II year to III year, upon fulfilling the academic requirements of 50 % credits up to II year I semester examinations and secures prescribed minimum attendance in II year.

5.4 A student will be eligible to be promoted from III year to IV year, upon fulfilling the academic requirements of 50 % credits up to III year I semester examinations and secures prescribed minimum attendance in III year

**6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)**

## MALPRACTICES RULES

### DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

| S.No | 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. | Has copied 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 is to be cancelled and sent to the University. |
| 3. | Impersonates any other candidate in connection with the examination. | The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has |

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|---|---|---|
| | | 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 is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him. |
| 4. | Smuggles in the Answer book or 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 University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 5. | Using 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. |
| 6. | Refuses to obey the orders of the Chief | In case of students of the college, |

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| | Superintendent/Assistant 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 of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-incharge, 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. | 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 debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them. |
| 7. | 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 University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 8. | Possess 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 |

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| | | 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. |
| 9. | If 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 clause 6 to 8. | Student of the colleges 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. | Comes in a 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. |
| 11. | Copying detected 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. |
| | If any malpractice is detected which is not | |

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| 12. | covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment. | |

**Malpractices identified by squad or special invigilators**

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions: (if the squad reports that the college is also involved in encouraging malpractices)
    i. A show cause notice shall be issued to the college.
    ii. Impose a suitable fine on the college.
    iii. Shifting the examination centre from the college to another college for a specific period of not less than one year.

* * * * *

## PRE-REQUISITES FOR CORE ELECTIVES

| Core Elective Number | Subject Code | Title of the Subject | Pre-Requisite Subject Code | Pre-Requisite Subject Title |
|---|---|---|---|---|
| 1 | R17A0515 | Advanced Computer Architecture | R17A0510 | Computer Organization |
| | R17A0516 | Distributed Data Bases | R17A0509 | Database Management Systems |
| | R17A0517 | Computer Graphics | R17A0501 | Computer Programming With C |
| 2 | R17A0522 | Information Security Management (security analyst-1) | R17A0519 | Information Security |
| | R17A0523 | Introduction To Analytics (associate analytics-1) | R17A0509 | Database Management Systems |
| | R17A0524 | Distributed systems | R17A0514 | Computer Networks |
| | R17A0525 | Artificial Intelligence & Neural Networks | R17A0514 | Computer Networks |
| 3 | R17A0530 | Information Security Assessments & Audits(Security Analyst-2) | R17A0522 | Information Security Management (security analyst-1) |
| | R17A0531 | Big-Data Analytics (Associate Analytics-2) | R17A0523 | Introduction To Analytics (associate analytics-1) |
| | R17A0532 | Mobile Computing | R17A0514 | Computer Networks |
| | R17A0533 | Computer Forensics | R17A0519 | Information Security |
| 4 | R17A0534 | Parallel Processing | R17A0514 | Computer Networks |
| | R17A0535 | Semantic Web and Social Networks | R17A0514 | Computer Networks |
| | R17A0536 | Internet of Things | R17A0514 | Computer Networks |
| 5 | R17A0537 | Information Security Incident Response and Management (Security Analyst-3) | R17A0530 | Information Security Assessments & Audits(Security Analyst-2) |
| | R17A0538 | Predictive Analytics (Associate Analytics-3) | R17A0531 | Big-Data Analytics (Associate Analytics-2) |
| | R17A0539 | Web Services | R17A0520 | Web Technologies |
| | R17A0540 | Database Security | R17A0509 | Database Management Systems |
| 6 | R17A0541 | Scripting Languages | R17A0507 | Java Programming |
| | R17A0542 | Storage Area Networks | R17A0509 | Database Management Systems |
| | R17A0543 | Software Project Management | R17A0511 | Software Engineering |

# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## Vision

- To acknowledge quality education and instill high patterns of discipline making the students technologically superior and ethically strong which involves the improvement in the quality of life in human race.

## Mission

- To achieve and impart holistic technical education using the best of infrastructure, outstanding technical and teaching expertise to establish the students into competent and confident engineers.
- Evolving the center of excellence through creative and innovative teaching learning practices for promoting academic achievement to produce internationally accepted competitive and world class professionals.

# PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

**PEO1 – ANALYTICAL SKILLS**

1. To facilitate the graduates with the ability to visualize, gather information, articulate, analyze, solve complex problems, and make decisions. These are essential to address the challenges of complex and computation intensive problems increasing their productivity.

**PEO2 – TECHNICAL SKILLS**

2. To facilitate the graduates with the technical skills that prepare them for immediate employment and pursue certification providing a deeper understanding of the technology in advanced areas of computer science and related fields, thus encouraging to pursue higher education and research based on their interest.

**PEO3 – SOFT SKILLS**

3. To facilitate the graduates with the soft skills that include fulfilling the mission, setting goals, showing self-confidence by communicating effectively, having a positive attitude, get involved in team-work, being a leader, managing their career and their life.

**PEO4 – PROFESSIONAL ETHICS**

4. To facilitate the graduates with the knowledge of professional and ethical responsibilities by paying attention to grooming, being conservative with style, following dress codes, safety codes,and adapting themselves to technological advancements.

## PROGRAM SPECIFIC OUTCOMES (PSOs)

After the completion of the course, B. Tech Computer Science and Engineering, the graduates will have the following Program Specific Outcomes:

1. **Fundamentals and critical knowledge of the Computer System:-** Able to Understand the working principles of the computer System and its components , Apply the knowledge to build, asses, and analyze the software and hardware aspects of it .
2. **The comprehensive and Applicative knowledge of Software Development:** Comprehensive skills of Programming Languages, Software process models, methodologies, and able to plan, develop, test, analyze, and manage the software and hardware intensive systems in heterogeneous platforms individually or working in teams.
3. **Applications of Computing Domain & Research:** Able to use the professional, managerial, interdisciplinary skill set, and domain specific tools in development processes, identify the research gaps, and provide innovative solutions to them.

# PROGRAM OUTCOMES (POs)

**Engineering Graduates will be able to:**

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design / development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi disciplinary environments.
12. **Life- long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

## COURSE STRUCTURE

**I Year B. Tech (CSE) – I Semester**

| S.NO | SUBJECT CODE | SUBJECT | L | T/P/D | C | MAX.MARKS | |
|---|---|---|---|---|---|---|---|
| | | | | | | Int | Ext |
| 1 | R17A0001 | ENGLISH | 2 | | 2 | 30 | 70 |
| 2 | R17A0021 | MATHEMATICS-1 | 4 | 1 | 4 | 30 | 70 |
| 3 | R17A0011 | ENGINEERING PHYSICS-1 | 2 | 1 | 2 | 30 | 70 |
| 4 | R17A0013 | ENGINEERING CHEMISTRY | 3 | | 3 | 30 | 70 |
| 5 | R17A0501 | COMPUTER PROGRAMMING WITH C | 3 | | 3 | 30 | 70 |
| 6 | R17A0302 | ENGINEERING DRAWING | 4 | 3 | 4 | 30 | 70 |
| 7 | R17A0581 | COMPUTER PROGRAMMING LAB | - | 3 | 2 | 25 | 50 |
| 8 | R17A0083 | ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB | - | 3 | 2 | 25 | 50 |
| 9 | R17A0081 | ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-1 | - | 3 | 2 | 25 | 50 |
| | | **TOTAL** | **18** | **14** | **24** | **255** | **570** |

**I Year B. Tech (CSE) – II Semester**

| S.NO | SUBJECT CODE | SUBJECT | L | T/P/D | C | MAX.MARKS | |
|---|---|---|---|---|---|---|---|
| | | | | | | Int | Ext |
| 1 | R17A0002 | PROFESSIONAL ENGLISH | 2 | | 2 | 30 | 70 |
| 2 | R17A0022 | MATHEMATICS-II | 4 | 1 | 4 | 30 | 70 |
| 3 | R17A0012 | ENGINEERING PHYSICS-II | 2 | 1 | 2 | 30 | 70 |
| 4 | R17A0502 | OBJECT ORIENTED PROGRAMMING THROUGH C++ | 3 | 1 | 3 | 30 | 70 |
| 5 | R17A0201 | ELECTRICAL CIRCUITS | 4 | - | 4 | 30 | 70 |
| 6 | R17A0014 | ENVIRONMENTAL STUDIES | 3 | | 3 | 30 | 70 |
| 7 | R17A0582 | OBJECT ORIENTED PROGRAMMING THORUGH C++ LAB | - | 3 | 2 | 25 | 50 |
| 8 | R17A0084 | IT WORKSHOP/ENGINEERING WORKSHOP | - | 3 | 2 | 25 | 50 |
| 9 | R17A0082 | ENGLISH LANGUAGE COMMUNICATION SKILLS LAB - II | - | 3 | 2 | 25 | 50 |
| *10 | R17A0003 | HUMAN VALUES AND SOCIETAL PERSPECTIVES | 2 | - | - | 50 | - |
| | | **TOTAL** | **20** | **12** | **24** | **305** | **570** |

***Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree**

**II Year B. Tech (CSE) – I Semester**

| S.NO. | SUBJECT CODE | SUBJECT | L | T/P/D | C | MAX MARKS | |
|---|---|---|---|---|---|---|---|
| | | | | | | INT | EXT |
| 1 | R17A0503 | Mathematical Foundation of Computer Science | 3 | 1 | 3 | 30 | 70 |
| 2 | R17A0504 | Data Structures using C++ | 4 | - | 4 | 30 | 70 |
| 3 | R17A0510 | Computer Organization | 3 | - | 3 | 30 | 70 |
| 4 | R17A0024 | Probability and Statistics | 4 | - | 4 | 30 | 70 |
| 5 | R17A0401 | Electronic Devices and Circuits | 3 | 1 | 3 | 30 | 70 |
| 6 | R17A0061 | Managerial Economics and Financial Analysis | 3 | - | 3 | 30 | 70 |
| 7 | R17A0282 | Electrical & Electronics lab | - | 3 | 2 | 25 | 50 |
| 8 | R17A0583 | Data Structures using C++ Lab | - | 3 | 2 | 25 | 50 |
| *9 | R17A0004/ R170005 | Foreign Language : French/German | 2 | - | - | 50 | |
| **Total** | | | **22** | **8** | **24** | **280** | **520** |

***Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree**

**II Year B. Tech (CSE) – II Semester**

| S.NO. | SUBJECT CODE | SUBJECT | L | T/P/D | C | MAX MARKS | |
|---|---|---|---|---|---|---|---|
| | | | | | | INT | EXT |
| 1 | R17A0506 | Formal Language and Automata Theory | 4 | 1 | 4 | 30 | 70 |
| 2 | R17A0507 | Java Programming | 3 | 1 | 3 | 30 | 70 |
| 3 | R17A0508 | Design and Analysis of Algorithms | 4 | 1 | 4 | 30 | 70 |
| 4 | R17A0509 | Database Management Systems | 3 | 1 | 3 | 30 | 70 |
| 5 | R17A0461 | Digital Logic Design | 3 | - | 3 | 30 | 70 |
| 6 | ***** | Open Elective 1 | 3 | | 3 | 30 | 70 |
| 7 | R17A0584 | Database Management Systems Lab | - | 3 | 2 | 25 | 50 |
| 8 | R17A0585 | Java Programming Lab | - | 3 | 2 | 25 | 50 |
| 9 | R17A0006 | Gender Sensitization | - | 3 | 0 | 50 | - |
| **Total** | | | **20** | **13** | **24** | **280** | **520** |

**Open Elective: 1**

| S.NO. | SUBJECT CODE | SUBJECT |
|---|---|---|
| 1 | R17A0451 | Digital Electronics |
| 2 | R17A0251 | Elements Of Electrical Engineering |
| 3 | R17A0551 | Database Systems |
| 4 | R17A0351 | Elements of Mechanical Engineering |
| 5 | R17A0352 | Green Energy Systems |
| 6 | R17A0051 | Intellectual Property Rights |

**III Year B. Tech (CSE) – I Semester**

| S.NO. | SUBJECT CODE | SUBJECT | L | T/P/D | C | MAX MARKS | |
|---|---|---|---|---|---|---|---|
| | | | | | | INT | EXT |
| 1 | R17A0511 | Software Engineering | 3 | 1 | 3 | 30 | 70 |
| 2 | R17A0512 | Compiler Design | 4 | - | 4 | 30 | 70 |
| 3 | R17A0513 | Operating Systems | 4 | - | 4 | 30 | 70 |
| 4 | R17A0514 | Computer Networks | 3 | 1 | 3 | 30 | 70 |
| 5 | R17A0515<br>R17A0516<br>R17A0517 | Core Elective 1<br>1. Advanced Computer Architecture<br>2. Distributed Data Bases<br>3. Computer Graphics | 3 | - | 3 | 30 | 70 |
| 6 | **** | Open Elective 2 | 3 | - | 3 | 30 | 70 |
| 7 | R17A0586 | Compiler Design Lab | - | 3 | 2 | 25 | 50 |
| 8 | R17A0587 | Computer Networks & Operating Systems Lab | - | 3 | 2 | 25 | 50 |
| 9 | R17A0007 | Technical Communication and Soft Skills | - | 2 | - | 50 | - |
| **Total** | | | **20** | **10** | **24** | **280** | **520** |

***Mandatory course: Non-credit course, 50% of scoring is required for the award of the degree**

**Open Elective: 2**

| S.NO. | SUBJECT CODE | SUBJECT |
|---|---|---|
| 1 | R17A0452 | Industrial Electronics |
| 2 | R17A0453 | Communication Networks |
| 3 | R17A0552 | Introduction to Java Programming |
| 4 | R17A1251 | Introduction to Scripting Languages |
| 5 | R17A1252 | Software Project Management |
| 6 | R17A0353 | Enterprise Resource Planning |

**III Year B. Tech (CSE) – II Semester**

| S.NO. | SUBJECT CODE | SUBJECT | L | T/P/D | C | MAX MARKS | |
|---|---|---|---|---|---|---|---|
| | | | | | | INT | EXT |
| 1 | R17A0518 | Object Oriented Analysis and Design | 4 | - | 4 | 30 | 70 |
| 2 | R17A0519 | Information Security | 4 | - | 4 | 30 | 70 |
| 3 | R17A0520 | Web Technologies | 3 | 1 | 3 | 30 | 70 |
| 4 | R17A0521 | Software Testing Methodologies | 3 | 1 | 3 | 30 | 70 |
| 5 | R17A0522<br>R17A0523<br>R17A0524 | Core Elective 2<br>1. Natural Language Processing<br>2. Distributed systems<br>3. Artificial Intelligence & Neural Networks | 3 | - | 3 | 30 | 70 |
| 6 | ***** | Open Elective 3 | 3 | - | 3 | 30 | 70 |
| 7 | R17A0588 | Web Technologies Lab | | 3 | 2 | 25 | 50 |
| 8 | R17A0589 | Case Tools & Software Testing Methodologies Lab | - | 3 | 2 | 25 | 50 |
| **Total** | | | **20** | **8** | **24** | **230** | **520** |

**Open Elective: 3**

| S.NO. | SUBJECT CODE | SUBJECT |
|---|---|---|
| 1 | R17A0454 | Robotics Engineering |
| 2 | R17A0455 | Embeded Systems |
| 3 | R17A0520 | Web Technologies |
| 4 | R17A0554 | Data Structures |
| 5 | R17A0354 | Nano Technology |
| 6 | R17A0052 | Total Quality Management |

**IV Year B. Tech (CSE) – I Semester**

| S.No | Subject Code | SUBJECT | L | T/P/D | C | Max. Marks | |
|---|---|---|---|---|---|---|---|
| | | | | | | Int | Ext |
| 1 | R17A0525 | Data Warehousing and Data Mining | 4 | - | 4 | 30 | 70 |
| 2 | R17A0526 | LINUX Programming | 4 | - | 4 | 30 | 70 |
| 3 | R17A0527 | Design Patterns | 3 | 1 | 3 | 30 | 70 |
| 4 | R17A0528 | Cloud Computing | 3 | 1 | 3 | 30 | 70 |
| 5 | R17A0529<br>R17A0530<br>R17A0531 | Core Elective 3<br>1. Big-Data Analytics<br>2. Mobile Computing<br>3. Database Security | 3 | - | 3 | 30 | 70 |
| 6 | R17A0532<br>R17A0533<br>R17A0534 | Core Elective 4<br>1. Parallel Processing<br>2. Scripting Languages<br>3. Internet of Things | 3 | - | 3 | 30 | 70 |
| 7 | R17A0590 | Data Ware Housing and Data Mining Lab | - | 3 | 2 | 25 | 50 |
| 8 | R17A0591 | Linux Programming Lab | - | 3 | 2 | 25 | 50 |
| **Total** | | | **20** | **8** | **24** | **230** | **520** |

**IV Year B. Tech (CSE) – II Semester**

| S.No | Subject Code | SUBJECT | L | T/P/D | C | Max. Marks | |
|---|---|---|---|---|---|---|---|
| | | | | | | Int | Ext |
| 1 | R17A0535<br>R17A0536<br>R17A0537 | Core Elective 5<br>1. Machine Learning<br>2. Web Services<br>3. Computer Forensics | 4 | - | 4 | 30 | 70 |
| 2 | R17A0538<br>R17A0539<br>R17A0540 | Core Elective 6<br>1. Semantic web and Social Networks<br>2. Storage Area Networks<br>3. Software Project Management | 4 | - | 4 | 30 | 70 |
| 3 | R17A0596 | Mini Project | - | - | 4 | - | 100 |
| 4 | R17A0597 | Technical Seminar | - | 6 | 2 | 50 | - |
| 5 | R17A0598 | Major Project | 15 | - | 10 | 100 | 200 |
| **Total** | | | **23** | **6** | **24** | **210** | **440** |

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B. Tech CSE-I Sem**

| L | T/P/D | C |
|---|---|---|
| 2 | - / - / - | 2 |

## (R17A0001) ENGLISH

**INTRODUCTION:**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking, and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

**OBJECTIVES:**

- To provide amateur engineers with the critical faculties necessary in an academic environment, using the theoretical and practical components of English syllabus.
- To upgrade the capability of analyzing of texts from different periods and genres.
- To improve the language proficiency of the students in English with emphasis on LSRW skills to face complex engineering activities at work place.
- To understand the basics of grammar to speak correct English and communicate effectively both formally and informally.

**SYLLABUS:**

**Listening Skills:**

**Objectives**

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions. Students should be given practice in listening to the sounds of the language to be able to recognize them, to distinguish between them to mark stress and recognize and use the right intonation in sentences.
   - Listening for general content
   - Listening to fill up information
   - Intensive listening
   - Listening for specific information

**Speaking Skills:**

**Objectives**

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.
   - Oral practice
   - Describing objects/situations/people

- Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: Learning English: A Communicative Approach)
- Just A Minute (JAM) Sessions.

**Reading Skills:**

**Objectives**

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

Skimming the text

- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
    - Scanning the text
- Recognizing coherence/sequencing of sentences

**NOTE:**

The students will be trained in reading skills using the prescribed text for detailed study.
They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

**Writing Skills:**

**Objectives**

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

- Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

**TEXTBOOKS PRESCRIBED:**

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following text and course content, is prescribed for this semester.
Textbook titled "Epitome of Wisdom", published by Maruthi Publications, Hyderabad.

**Unit –I**

Chapter entitled 'Mokshagundam Visvesvaraya' from *Epitome of Wisdom*

**and**

Listening – Conversations – introducing each other, talking about a course
Speaking – Jam sessions
Reading – The Palm Islands
Writing – Writing Paragraphs
Grammar – Conjunctions and Adverbs
Vocabulary – Prefixes and Suffixes

**Unit – II**

Chapter entitled "Three Days to See" from *Epitome of Wisdom*

**and**

Listening –Conversations-planning for an outing
Speaking –Telephone Etiquettes
Reading – Physically challenged athletes
Writing – Memo writing
Grammar –Modal Auxiliaries
Vocabulary – Synonyms & antonyms

**Unit – III**

Chapter entitled "The Road Not Taken" from *A Selection of Robert Frost's Poems (Owl Book)*, by Holt Paperbacks: 2 Revised Edition. 2002.

**and**

Listening – News items
Speaking – Public speaking
Reading – 'If' poem
Writing – Letter writing-formal/informal
Grammar – Knowing with questions (Wh –questions,) Question tags
Vocabulary –Similes and Metaphors

**Unit – IV**

Chapter entitled "The Last Leaf" from *Epitome of Wisdom*

**and**

Listening – Speech on environmental conservation
Speaking – Group discussion
Reading – Choose how to start your day
Writing – Writing a narrative
Grammar –Prepositions
Vocabulary – Idioms and one-word substitutes

**Unit –V**

5. Chapter entitled "The Convocation Speech" from *Epitome of Wisdom*

**and**

Listening – Speech on 'How do you make a teacher great'?
Speaking –Role plays
Reading – What is meant by entrepreneurship?
Writing – Essay writing
Grammar – Active voice and Passive voice
Vocabulary – Phrasal verbs

* Exercises apart from the text book shall also be used for classroom tasks.

**REFERENCES:**

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press

9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.

**OUTCOMES:**

- Acquire and apply the critical thought process effectively on complex engineering activities.
- Utilize the analytical capability to comprehend and design any text effortlessly.
- Imbibe the English proficiency to receive clear instructions, make notes and draft letters vividly.
- Identify the basic grammatical structures and its application accurately to communicate with society at large.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B. Tech CSE-I Sem**

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## (R17A0021) MATHEMATICS – I

**Objectives:**

To learn

- Concept of rank of a matrix and applying the concept of rank to know the consistency of linear equations and to find all possible solutions if exist and concept of eigen values and eigen vectors of a matrix
- The mean value theorems and to understand the concepts geometrically , functions of several variables and optimization of these functions.
- Methods of solving the differential equations of first and higher order ,Newton's law of cooling, Natural growth and decay, bending of beams etc.
- In many engineering fields the physical quantities involved are vector valued functions. Hence the vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.

**UNIT - I: Matrix Theory**

Introduction to matrices- Rank of a matrix - Finding rank of a matrix by reducing to Echelon and Normal forms-Consistency of system of linear equations (homogeneous and non- homogeneous) using the rank of a matrix-Cayley - Hamilton Theorem (without proof) – Verification- finding inverse of a matrix and powers of a matrix by Cayley-Hamilton theorem- Linear dependence and Independence of Vectors- Eigen values and eigen vectors of a matrix-Properties of eigen values and eigen vectors of real and complex matrices-Diagonalization of a matrix.

**UNIT – II: Differential Calculus**

**Mean Value Theorms:** Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value theorems with geometrical interpretations (all theorems without proof)- verification of the Theorems and testing the applicability of these theorems to the given function- Taylor's series -Maclaurin's series.

**Functions of Several Variables:** Jacobian-Functional dependence- Maxima and Minima of functions of two variables without constraints and with constraints - Method of Lagrange multipliers.

**UNIT – III: Ordinary Differential Equations of First Order and Applications**

Introduction to ordinary differential equation - Variable Separable form- Homogeneous-Non homogeneous- Exact-Non Exact-Linear and Bernoulli's equations-Applications of first order differential equations – Newton's Law of cooling- Law of natural growth and decay- Orthogonal trajectories.

**UNIT - IV: Linear Differential Equations of Higher Order and Applications**

Linear differential equations of second and higher order with constant coefficients- Non-homogeneous term of the type f(x) = $e^{ax}$ , sinax, cosax, $x^n$ , $e^{ax}$ V and $x^n$ V- Method of variation of parameters-Applications to bending of beams, Electrical circuits and simple harmonic motion.

**UNIT – V : Vector Calculus**

Introduction- Scalar point function and vector point function, Gradient- Divergence- Curl and their related properties - Laplacian operator, Line integral – work done – Surface integrals -Volume integral. Green's Theorem,Stoke's theorem and Gauss's Divergence Theorems (Statement & their Verification).

**TEXT BOOKS:**

1. Mathematics – I , Special Edition-MRCET, Mc Graw Hill Publishers 2017.
2. Engineering Mathematics – I by T.K.V Iyenger ,B.Krishna Gandhi and Others ,S.Chand Publishers.

**REFERENCES:**

1. Engineering Mathematics by P. Sivaramakrishna Das, Pearson Publishers.
2. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.

**Outcomes:**

- After learning the contents the student is able to write the matrix representation of a set of linear equations and to analyze solutions of system of equations.
- The student will be able to understand the methods of differential calculus to optimize single and multivariable functions.
- The student is able to identify the type of differential equation and uses the right method to solve the differential equations. Also able to apply the theory of differential equations to the real world problems.
- The student will be able to evaluate multiple integrals(line, surface volume integrals) and convert line integrals to area integrals and surface integrals to volume integrals.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B. Tech CSE -I Sem**

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## (R17A0011) ENGINEERING PHYSICS – I

**OBJECTIVES:**

- The information in optics is required for engineering technology students to understand wave nature of light for applying accurate measurements by means of optical instruments.
- From the study of quantum and statistical aspects dual behavior of electron and solid state physics can be realized by the engineering students.
- The basic information regarding electrons and holes and their functioning in semiconductors is evident to the students. The semiconductor devices provide basic information for the present communication system

**UNIT-I**

**OPTICS:**

Interference-Coherence-Coherent sources, Constructive and destructive interference. Theory of interference fringes(Expression for band width). Interference in thin films by reflected light, Newton's rings Experiment. Diffraction-Types of diffraction, Difference between interference and diffraction, Fraunhofer's diffraction (Single Slit), Diffraction grating, Polarization, Types of polarization, Double Refraction, Nicol Prism.

**UNIT-II**

**LASERS:**

Characteristics of lasers, Spontaneous and Stimulated emissions, Einstein's Coefficients,Population inversion, Meta stable state, pumping, lasing action, Construction and working of Ruby Laser, Helium-Neon Laser, Semi conductor lasers, Applications of lasers.

**FIBER OPTICS:**

Construction and Working Principle of an optical fiber, Advantages of optical fibers, Numerical aperture and Acceptance angle, Types of Optical fibers - Mode and Propagation through step and graded index fibers, Optical Fiber Communication System, Attenuation, Applications of optical fibers.

**UNIT-III**

**PRINCIPLES OF QUANTUM MECHANICS**:

Wave nature and particle nature-de Broglie's Hypothesis, GP Thomson's Experiment, Davisson and Germer's experiment, Matter Waves, Heisenberg's uncertainty principle, physical significance of wave function, Schrodinger time-independent wave equation, Particle in One dimensional infinite potential box.

**UNIT-IV**

**ELEMENTS OF STATISTICAL MECHANICS & BAND THEORY OF SOLIDS:**

Micro and Macro states, Maxwell Boltzmann, Bose Einstein, Fermi Dirac Statistical distributions ( Qualitative), Density of States, Fermi Energy, Introduction to electron theory of metals, Bloch Theorem (Qualitative), Kronig Penny model(Qualitative), EK curve (Brillouin Zone)-Effective mass of electron, Origin of energy bands in solids, Classification of solids-conductors, semi conductors and insulators.

**UNIT-V**

**SEMICONDUCTOR PHYSICS:**

Types of semi conductors**,** Carrier concentration and Fermi level of intrinsic and Extrinsic Semiconductors, Hall Effect and applications, Direct and indirect band gap of semiconductors.

**SEMICONDUCTOR DEVICES:**

Formation of PN junction diode, Energy level diagram of PN junction diode. V-I characteristics of PN junction diode- PN junction diode as LED and Solar cell.

**TEXT BOOKS:**

1. Engineering Physics - S Mani Naidu- Pearson Publishers.
2. A Text Book of Engineering Phyiscs- P.G. Kshirsagar, Avadhanulu – S.Chand

**REFERENCES:**

1. Solid State Physics, Kittel- Wiley International.
2. Solid State Physics – AJ DekKer-Macmillan Publishers.
3. Engineering Physics, P.K. Palaniswamy, Scitech Publishers

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

| I Year B. Tech CSE-I Sem | L | T/P/D | C |
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## (R17A0013)ENGINEERING CHEMISTRY

**Objectives**

- To impart the basic concepts and ideas in chemistry, to develop scientific attitudes and enable the students to correlate the concepts of chemistry with the core programmes.
- Electrochemistry unit give conceptual knowledge about spontaneous processes and how can they be harnessed for producing electrical energy and efficiency of systems. Fuel cells which are the alternate energy sources for generating electrical energy on spot and portable applications.
- Understand various techniques involved in polymerization and application of polymer technology in the area of various engineering fields and manufacturing process of important metallurgical materials.

**UNIT I: Electrochemistry:** Conductance - Specific, Equivalent, Molar conductance and their unit, Applications of Conductance-Conductometric titrations (Acid base and Precipitation titrations); EMF-electrode and electrode potentials; Nernst equation and its applications; Electrochemical cells-Galvanic cell (Daniel cell) and Concentration cell (electrolytic concentration cell); Types of Electrodes–(construction and functioning of Calomel, Quinhydrone and Glass electrodes); determination of $P^H$ using glass electrode; Potentiometric titrations (Acid Base and Redox titrations); electrochemical series and its applications; Numerical problems on conductance.
**Batteries**: Primary (Lithium cells) and Secondary cells (Lead-Acid cell and Ni-Cd cell); **Fuel cells** - Hydrogen -Oxygen fuel cell and Methanol-Oxygen fuel cell - construction, functioning, advantages and applications.

**Unit II: Corrosion and its Control:** Causes and effects of corrosion; Theories of corrosion – Chemical corrosion (oxidation corrosion) & Electrochemical corrosion (mechanism of evolution of Hydrogen and Absorption of oxygen); Galvanic corrosion; Factors affecting rate of corrosion – Nature of metal (position of metal in galvanic series, overvoltage, relative areas of anodic and cathodic parts, purity of metal and passivity) and Nature of environment (temperature, humidity and pH effect)
**Corrosion control methods:** Cathodic protection (Sacrificial Anodic and Impressed Current Cathodic protection). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), cladding, electroplating (Cu plating) and Electroless plating (Ni plating) – advantages and applications of electroplating/electroless plating.

**UNIT- III: Engineering Materials**
**Polymers:** Classification of Polymers, Types of Polymerization (Chain growth, Step growth & Zeigler Natta) **Plastics:** Thermoplastic & Thermosetting resins, Preparation, properties, engineering applications of PVC, Teflon and Bakelite. **Fibers-** Characteristics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications. **Rubbers**–Natural rubber and its vulcanization; **Elastomers**–Buna-S and Butyl rubber; **Conducting polymers:** Polyacetylene-Mechanism of conduction, doping; applications of conducting polymers; **Bio-degradable Polymers:** preparation and applications of Poly vinylacetate and Poly lactic acid.
**Lubricants:** Characteristics of a good lubricant; Classification with examples; properties of lubricants: viscosity, cloud point, pour point, flash and fire point.
**Refractories:** Classification of refractories with examples, characteristics of a good refractory and applications of refractories.
**Nanomaterials:** Introduction and applications of nanomaterials.

**UNIT IV: Water and its Treatment:**

Hardness of Water: Causes of hardness, types of hardness, units of hardness; determination of hardness of water by EDTA method - numerical problems. Boiler troubles – Scales & Sludges, Priming, Foaming, and Caustic Embrittlement; Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal and Calgon conditioning); External treatment–Zeolite process and Ion exchange process; **Potable Water**-Its Specifications–Disinfectation of water by ozonisation, chlorination (break point chlorination and its significance); Reverse Osmosis.

**UNIT V: Fuels**

**Fuels** – Characteristics of a good fuel, Classification – Solid fuels: Coal – analysis of coal - proximate and ultimate analysis and their significance, Liquid fuels – petroleum and its refining; Cracking – Fixed bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol- Fischer-Tropsch's process: Gaseous fuels - constituents, characteristics and applications of Natural gas, LPG and CNG; Calorific value of fuel – HCV, LCV; Determination of calorific value by Junker's gas calorimeter.

**TEXT BOOKS:**

1. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company 14th Edition (2013)
2. Engineering Chemistry by B. Rama Devi, Ch. Venkataramana Reddy and R.P. Mani, CENGAGE learning (2016)

**REFERENCE BOOKS**

1. Engineering Chemistry by M. Thirumala Chary and E. Laxminarayana, Scitech publications (2016).
2. Engineering Chemistry by Bharathi Kumari and Jyotsna Cherukuri, VGS Techno Series (2016).

**Outcomes:**

- Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatment plants.
- Understand the operating principles of various types of electrochemical cells, including fuel cells and batteries.
- Analyze and develop a technically sound, economic and sustainable solution to corrosion problems related to engineering service.
- Be able to apply core concepts in Materials Science to solve engineering problems
- To learn about types of fuels and their characteristics, and combustion systems with emphasis on engineering applications.
- Recently modern materials synthesized find applications in industry and creating instruments for solving problems of electronics, telecommunications, health care, agriculture, and technology etc., In order to emphasize the above the topics like composite materials, polymers, conducting polymers and nanomaterials have been incorporated in the curriculum.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B. Tech CSE -I Sem**

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## (R17A0501) COMPUTER PROGRAMMING WITH C

**Objectives**

- To understand the various steps in Program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs
- To learn to write programs (using structured programming approach) in C to solve problems.
- To introduce the students to basic data structures such as lists, stacks and queues.
- To make the student understand simple sorting and searching methods

**UNIT - I**

Introduction to Computing – Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Software Development Life Cycle, Algorithm, Flowchart.

Introduction to C – History of C, Features Of C, Structure Of C Program, Character Set, C Tokens-keywords, Identifiers, Constants, Data types, Variables, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversion, Statements- Selection Statements( Decision Making) – if and switch statements, Repetition statements ( loops)-while, for, do-while statements, other statements related to looping –break, continue, goto.

**UNIT-II**

Functions-Designing Structured Programs, Types of Functions- user defined functions, Standard Functions, Inter function communication, Categories of functions ,Parameter Passing techniques, Scope, Storage classes-auto, register, static, extern, Type qualifiers, Recursion- recursive functions, Preprocessor commands.

**UNIT – III**

**Arrays** – Declaration and Initialization, Arrays with functions , Array Applications, Two dimensional arrays, Multi dimensional arrays.

**Strings** – Declaration and Initialization, String Input / Output functions, Arrays of strings,
String manipulation functions.

**UNIT-IV**

**Pointers**- Introduction, Definition and uses of pointers, address operator, Pointer variables, Pointer constants , void pointers, Pointer arithmetic, Pointers to Pointers, Pointers with Arrays, Pointers with Functions, Pointers to functions, Array of pointers, Pointers with Strings. Dynamic Memory Management functions: malloc(), calloc(), realloc() and free()

**UNIT-**V

Structures and Unions - **I**ntroduction, Declaration and Initialization, Structure within a structure, Operations on structures, Array of Structures, Pointer to Structures, Structures with Functions, Self referential structures, Typedef, enum, bitfields, Unions.

Files – Concept of a file, Streams, Text files and Binary files, Opening and Closing files, File input / output functions, File Status functions (Error handling), Positioning functions, Command line arguments.

**TEXT BOOKS:**

1. Computer Programming with C, Special Edition-MRCET, Mc Graw Hill Publishers 2017.
2. Computer Science: A Structured Programming Approach Using C, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

**REFERENCE BOOKS:**

1. The C Programming Language, B.W. Kernighan and Dennis M.Ritchie, PHI.
2. Computer Programming, E.Balagurusamy, First Edition, TMH.
3. C and Data structures – P. Padmanabham, Third Edition, B.S. Publications.
4. Programming in *C, Ashok Kamthane*. Pearson Education India.
5. Let us C ,Yashwanth Kanethkar, 13th Edition, BPB Publications.

**Outcomes:**

- Demonstrate the basic knowledge of computer hardware and Software.
- Ability to apply solving and logical skills to programming in C language and also in other languages.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B. Tech CSE -I Sem**

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## (R17A0302) ENGINEERING DRAWING

**UNIT – I**

**Introduction To Engineering Drawing**: Principles of Engineering Drawing/Graphics – Various Drawing Instruments – Conventions in Drawing- Dimensioning – Lettering practice – BIS Conventions.

a) Polygons – Construction of regular polygons (General Method only)
b) Conic Sections (General Method only- Eccentricity Method)
c) Cycloid, Epicycloid and Hypocycloid
d) Scales-Plain, Diagonal and Vernier

**UNIT – II**

**Orthographic Projection in First Angle only**: Principles of Orthographic Projections – Conventions – First and Third Angle projections (Introduction).

**Projections of Points**. Points in all four quadrants.

**Projections of Lines** – Parallel and inclined to both planes.

**UNIT – III**

**Projections of Planes**: Projection of regular planes, Plane inclined to both reference planes (No conditional problems).

**Projections of Solids**: Projections of regular solids prism and pyramid inclined to both planes (No conditional problems).

**UNIT – IV**

**Isometric Projections:** Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Plane Figures, Simple and Compound Solids.

**UNIT – V**

**Transformation of Projections:** Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects

Basic Principles of ACAD – Demo Only.

**TEXT BOOKS**

1. Engineering Drawing – Special Edition-MRCET, Tata Mc Graw Hill Publishers 2017
2. Engineering Drawing, N.D. Bhatt
3. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.

**REFERENCES**

1. Engineering drawing – P.J. Shah .S.Chand Publishers.
2. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B. Tech CSE -I Sem**

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## (R17A0581) COMPUTER PROGRAMMING LAB

**Objectives:**

- Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming
- Acquire knowledge about the basic concept of writing a program.
- Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
- Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Role of Functions involving the idea of modularity.
- Concept of Array and pointers dealing with memory management.
- Structures and unions through which derived data types can be formed
- File Handling for permanent storage of data or record.
- Programming using gcc compiler in Linux.

**Week 1:**

a) Write a C program to find sum and average of three numbers.
b) Write a C program to find the sum of individual digits of a given positive integer.
c) Write a C program to generate the first n terms of the Fibonacci sequence.

**Week 2:**

a) Write a C program to generate prime numbers between 1 to n.
b) Write a C program to Check whether given number is Armstrong Number or Not.
c) Write a C program to evaluate algebraic expression (ax+b)/(ax-b).

**Week 3:**

a) Write a C program to check whether given number is perfect number or Not.
b) Write a C program to check whether given number is strong number or not.

**Week 4:**

a) Write a C program to find the roots of a quadratic equation.
b) Write a C program perform arithmetic operations using switch statement.

**Week 5:**

a) Write a C program to find factorial of a given integer using non-recursive function.
b) Write a C program to find factorial of a given integer using recursive function.

**Week 6:**

a) Write C program to find GCD of two integers by using recursive function.
b) Write C program to find GCD of two integers using non-recursive function.

**Week 7:**

a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a C Program to Sort the Array in an Ascending Order
c) Write a C Program to find whether given matrix is symmetric or not.

**Week 8:**

Revision of programs

**Week 9:**

a) Write a C program to perform addition of two matrices.
b) Write a C program that uses functions to perform Multiplication of Two Matrices.

**Week 10:**

a)Write a C program to use function to insert a sub-string in to given main string from a given position.

b)Write a C program that uses functions to delete n Characters from a given position in a given string.

**Week 11:**

a) Write a C program using user defined functions to determine whether the given string is palindrome or not.

b) Write a C program that displays the position or index in the main string S where the sub string T begins, or - 1 if S doesn't contain T.

**Week 12:**

a) Write C program to count the number of lines, words and characters in a given text.

b) Write a C program to find the length of the string using Pointer.

**Week 13:**

a) Write a C program to Display array elements using calloc( ) function.

b) Write a C Program to Calculate Total and Percentage marks of a student using structure.

**Week 14:**

a) Write a C program that uses functions and structures to perform the following operations:

i) Reading a complex number ii) Writing a complex number

iii) Addition of two complex numbers iv) Multiplication of two complex numbers

b) Write a C program to display the contents of a file.

**Week 15:**

a) Write a C program to copy the contents of one file to another.

b) Write a C program to merge two files into a third file.

c) Write a C program to reverse the first n characters in a file.

**Week 16:**

Revision Of Programs

**TEXT BOOKS**

1. C Programming and Data Structures, P.Padmanabham, Third Edition, BS Publications
2. Computer programming in C.V.RAjaraman, PHI Publishers.
3. C Programming, E.Balagurusamy, 3rd edition, TMH Publishers.
4. C Programming, M.V.S.S.N Venkateswarlu and E.V.Prasad,S.Chand Publishers
5. Mastering C,K.R.Venugopal and S.R.Prasad, TMH Publishers.

**Outcomes:**

- Acquire knowledge about the basic concept of writing a program.
- Understand the Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.
- Learn how to use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.
- Understand the Role of Functions involving the idea of modularity.
- Understand the Concept of Array and pointers dealing with memory management.
- Learn Structures and unions through which derived data types can be formed
- Learn File Handling for permanent storage of data or record.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B. Tech CSE -I Sem**

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## (R17A0083) ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB

## ENGINEERING PHYSICS LAB

**(Any EIGHT experiments compulsory)**

**OBJECTIVES**

- The students are exposed to various experimental skills which is very essential for an Engineering student.
- The experiments are selected from various areas of physics like physical optics, Lasers, Fiber optics, Sound, Mechanics, Electricity & Magnetism and Basic Electronics.
- The students are exposed to various tools like Screw gauge, Vernier calipers, and physics.

**OUTCOMES**

- The student learns the concept of error and its analysis and try formulate new solutions to problems related to engineering physical balance, Spectrometer and Microscope.
- The student develops experimental skills to design new experiments in Engineering that accelerates development of society considering the public health and safety of society.
- Comprehension power of the engineering student increases with exposure to these experiments that helps them to compare the theory and correlate with experiment.
- This course on physics lab is designed with 12 experiments in an academic year. It is common to all branches of Engineering in B.Tech 1$^{st}$ year.

**LIST OF EXPERIMENTS: (Any Eight experiments compulsory)**

1. Dispersive power of the material of a prism - Spectrometer.
2. Wave length of light –Diffraction grating-using laser.
3. Newton's Rings –Radius of curvature of Plano convex lens.
4. Melde's experiment –Transverse and Longitudinal modes.
5. Time Constant of an R-C circuit.
6. L-C-R circuit.
7. Magnetic field along the axis of current carrying coil – Stewart and Gee's method.
8. Study the characteristics of LED.
9. Evaluation of numerical aperture of given fiber.
10. Energy gap of a material of p-n junction.
11. Rigidity modulus of given wire - Torsional pendulum.
12. Characteristics of a Solar cell.

# ENGINEERING CHEMISTRY LAB

**List of Experiments** (Any Eight experiments compulsory)

**OBJECTIVES**

This course on chemistry lab is designed with 12 experiments in an academic year. It is common to all branches of Engineering in 1st B.Tech.

The objective of the course is that the student will have exposure to various experimental skills which is very essential for an Engineering student. At the end of the course the student is expected to

- Provide the students with a solid foundation in chemistry laboratory required to solve engineering problems.
- Practical implementation of fundamental concepts.

**OUTCOMES**

- Students are able to estimate the total hardness and alkalinity present in a sample of water.
- Ability to select lubricants for various purposes.
- Ability to determine the surface tension of a given liquid.
- Ability to prepare advanced polymer materials.
- Ability to know the strength of an acid by conductometric and potentiometric method.
- Ability to find the $Fe^{+2,}$ and $Mn^{+2}$ present in unknown substances/ ores using titrimetric and instrumental methods.

**List of Experiments**

**Titrimetry:**

1. Estimation of hardness of water by EDTA method.
2. Estimation of alkalinity of water.

**Mineral analysis:**

3. Estimation of manganese dioxide in pyrolusite.

**Instrumental Methods:**

**Colorimetry:**

4. Determination of ferrous iron in cement by colorimetric method

**Conductometry:**

5. Conductometric titration of strong acid vs strong base.
6. Conductometric titration of mixture of acids vs strong base.

**Potentiometry:**

7. Titration of strong acid vs strong base by Potentiometry.
8. Titration of weak acid vs strong base by Potentiometry.

**Preparation:**

9. Preparation of Phenol Formaldehyde Resin(Bakelite)-Demonstration
10. Preparation of Aspirin.

**Physical properties:**

11. Determination of Viscosity of sample oil by Redwood Viscometer.
12. Determination of Surface Tension of a given liquid by Stalagmometer

**TEXT BOOKS:**

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

**REFERENCE BOOKS:**

1. Text Book of engineering chemistry by R. N. Goyal and HarrmendraGoel, Ane Books Private Ltd.,
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B. Tech CSE-I Sem** **L T/ P/ D C**

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## (R17A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB - I

The Language Lab focuses on the production and practice of sounds of the English language and familiarizes the students with its use in everyday situations and contexts.

**Objective:**

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation, ample speaking opportunities are provided.
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussions and public speaking

**Syllabus**: English Language Communication Skills Lab has two parts:
a. Computer Assisted Language Learning (CALL) Lab
b. Interactive Communication Skills (ICS) Lab
The following course content is prescribed for the English Language Communication Skills Lab

**UNIT –I**
**CALL Lab:** Introduction to Phonetics –Speech Sounds –Vowels and Consonants Transcriptions
**ICS Lab:** Ice-Breaking activity - JAM session

**UNIT –II**
**CALL Lab:** Pronunciation: Past Tense Markers and Plural Markers, Mispronounced sounds, Silent letters
**ICS Lab:** Situational Dialogues/Role Plays – Informal

**UNIT -III**
**CALL Lab:** Syllable and Syllabification
**ICS Lab:** Situational Dialogues/Role Plays – Formal

**WORKSHEETS FOR LETTER WRITING**
**ELCS Lab:**

1. **Computer Assisted Language Learning (CALL) Lab:**
   The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.
   **System Requirement (Hardware component):**
   Computer network with LAN with minimum 60 multimedia systems with the following specifications:
   i) P –IV Processor
   a)Speed –2.8 GHZ
   b)RAM –512 MB Minimum
   c)HardDisk –80 GB
   ii) Headphones of High quality

2. **Interactive Communication Skills (ICS) Lab :**
   A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

**DISTRIBUTION AND WEIGHTAGE OF MARKS**
**English Language Laboratory Practical Examination:**

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the other institution.

**OUTCOMES:**

- Learning with precision through computer-assisted individualized and independent language learning to work independently in engineering set up.
- Improved conversational reception and articulation techniques in the course of repetitive instruction thereby gaining confidence both in institutional and professional environment.
- Accuracy in pronunciation and restoring Standard English thereby crafting better command in English language so that the students have a cutting edge over others in society.
- Imbibing appropriate use of language in situations to work as an individual and as o leader in diverse teams

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

| I Year B. Tech CSE-II SEM | L | T/P/D | C |
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## (R17A0002) PROFESSIONAL ENGLISH

**INTRODUCTION:**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking, and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

**OBJECTIVES:**

- Provide amateur engineers with the critical faculties necessary in an academic environment, using the theoretical and practical components of English syllabus.
- Upgrade the capability of analyzing of texts from different periods and genres.
- Improve the language proficiency of the students in English with emphasis on LSRW skills to face complex engineering activities at work place.
- Understand the basics of grammar to speak correct English and communicate effectively both formally and informally.

**SYLLABUS:**

**Listening Skills:**

**Objectives**

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions. Students should be given practice in listening to the sounds of the language to be able to recognize them, to distinguish between them to mark stress and recognize and use the right intonation in sentences.

• Listening for general content
• Listening to fill up information
• Intensive listening
• Listening for specific information

**Speaking Skills:**

**Objectives**

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: Learning English: A Communicative Approach)
- Just A Minute (JAM) Sessions.

**Reading Skills:**
**Objectives**

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
    - Scanning the text
- Recognizing coherence/sequencing of sentences

**NOTE:**
The students will be trained in reading skills using the prescribed text for detailed study.
They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

**Writing Skills:**
**Objectives**

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

- Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

**TEXTBOOKS PRESCRIBED:**
In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following text and course content is prescribed.
Text book entitled "Skills Annexe: Functional English for Success", published by Orient Black Swan, Hyderabad.

**UNIT-I**
Chapter entitled "Of parents and children" from *"The essays of Francis Bacon"*, paperback-Import, 11 Oct 2008.

**and**

Listening – Listening for the theme and gist
Speaking – Describing situations and objects
Reading – Why pure science in India lags behind? – By P Rajendran

Writing – Note-taking and Note-making
Grammar – Nouns and Articles
Vocabulary – Homonyms, Homographs, Homophones

**Unit –II**
Chapter entitled "Sachin Tendulkar" from *Skills Annexe -Functional English for Success*,

**and**

Listening – listening for opinions
Speaking – Project Oral Presentations
Reading – Benefits of physical activity
Writing – Report writing
Grammar – Common Errors
Vocabulary –Technical Vocabulary

**Unit –III**
Job applications: Cover letter & Curriculum vitae

**and**

Listening – listening for main and sub-points
Speaking –Giving directions and instructions
Reading – Editorial letters from newspapers
Writing –Formal letter writing
Grammar – Tenses
Vocabulary – Collocations

**Unit – IV**
Chapter entitled "Human Values and Professional Ethics" from *Skills Annexe -Functional English for Success*

**and**

Listening – Listening for details
Speaking – Talking about hypothetical situations
Reading – What I Cherish Most
Writing – E-mail writing
Grammar – Types of verbs: Transitive, Intransitive, Ergative, finite and non – finite
Vocabulary – Commonly confused words

**Unit – V**
Chapter entitled "The fringe benefits of failure and the importance of imagination" a speech by J.K. Rowlings

**and**

Listening – listening for information
Speaking – Oral Presentations
Reading – The one thing every business executive must understand about social media
Writing –Picture composition
Grammar – Concord
Vocabulary –Commonly misspelt Words

* Exercises apart from the text book shall also be used for classroom tasks.

**REFERENCES:**

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.

2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.

**OUTCOMES:**

- Acquire and apply the critical thought process effectively on complex engineering activities.
- Utilize the analytical capability to comprehend and design any text effortlessly.
- Imbibe the English proficiency to receive clear instructions, make notes and draft letters vividly.
- Identify the basic grammatical structures and its application accurately to communicate with society at large.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B.Tech CSE -II SEM**

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## (R17A0022)MATHEMATICS-II

**Objectives**

- The objective of interpolation is to find an unknown function which approximates the given data points and the objective of curve fitting is to find the relation between the variables x and y from given data and such relationships which exactly pass through the data (or) approximately satisfy the data under the condition of sum of least squares of errors.
- The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data and also used to find the roots of an equation and to solve differential equations.
- In the diverse fields like electrical circuits, electronic communication, mechanical vibration and structural engineering, periodic functions naturally occur and hence their properties are very required. Indeed, any periodic and non periodic function can be best analyzed in one way by Fourier series method.
- PDE aims at forming a function with many variables and also their solution methods .Method of separation of variables technique is learnt to solve typical second order PDE.
- Properties of Laplace Transform, Inverse Laplace Transform and Convolution theorem

**UNIT – I: Solution of Algebraic, Transcendental Equations and Interpolation**

**Solution of Algebraic and Transcendental Equations:** Introduction – Graphical interpretation of solution of equations .The Bisection Method – Regula-Falsi Method – The Iteration Method – Newton-Raphson Method.

**Interpolation:** Introduction-Errors in polynomial interpolation-Finite differences- Forward Differences-Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae – Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

**UNIT – II: Numerical techniques**

**Numerical integration**: Generalized Quadrature-Trapezoidal rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ Rule.

**Numerical solution of Ordinary Differential equations:** Solution by Taylor's series method –Picard's Method of successive Approximation- single step methods-Euler's Method-Euler's modified method, Runge-Kutta Methods.

**Curve fitting**: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares.

**UNIT – III: Fourier series**

Definition of periodic function. Fourier expansion of periodic functions in a given interval of length $2\pi$. Determination of Fourier coefficients – Fourier series of even and odd functions – Half-range Fourier sine and cosine expansions-Fourier series in an arbitrary interval .

**UNIT-IV: Partial differential equations**

Introduction -Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and non-linear equations (Charpit's method), Method of separation of variables for second order equations and Applications of PDE to one dimensional (Heat equation).

**UNIT – V: Laplace Transforms and Applications**

Definition of Laplace transform- Domain of the function and Kernel for the Laplace transforms-Existence of Laplace transform- Laplace transform of standard functions- first shifting Theorem,-Laplace transform of functions when they are multiplied or divided by "t"- Laplace transforms of derivatives and integrals of functions – Unit step function – second shifting theorem – Dirac's delta function- Periodic function – Inverse Laplace transform by Partial fractions-Inverse Laplace transforms of functions when they are multiplied or divided by "s", Inverse Laplace Transforms of derivatives and integrals of functions- Convolution theorem –Solving ordinary differential equations by Laplace transforms.

**TEXT BOOKS:**

1. Mathematics-II, Special Edition-MRCET, Mc Graw Hill Publishers 2017.
2. Mathematical Methods by T.K.V Iyenger ,B.Krishna Gandhi and Others ,S Chand.

**REFERENCES:**

1. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
2. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.

**Outcomes:**

- From a given discrete data, one will be able to predict the value of the data at an intermediate point and by curve fitting, one can find the most appropriate formula for a guesses relation of the data variables. This method of analysis data helps engineers to understand the system for better interpretation and decision making.
- The student will be able to find a root of a given equation and will be able to find a numerical solution for a given differential equation. Helps in describing the system by an ODE, if possible. Also, suggests to find the solution as a first approximation.
- One will be able to find the expansion of a given function by Fourier series.
- One will be able to find a corresponding Partial Differential Equation for an unknown function with many independent variables and to find their solution.
- The student is able to solve certain differential equations using Laplace Transform. Also able to transform functions on time domain to frequency domain using Laplace transforms

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B.Tech CSE -II SEM**

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## (R17A0012) ENGINEERING PHYSICS-II

**OBJECTIVES:**

- To understand the basics of bonding in solids, crystal structures and characterization techniques.
- To make the students aware of X-ray diffraction and different techniques of it.
- To understand the behavior of dielectric materials, magnetic materials and nano materials.

**UNIT-I**

**BONDING IN SOLIDS:**

Types of bonds - Primary, Secondary, Forces between atoms, Expression for cohesive energy between two atoms**.**

**CRYSTALLOGRAPHY:**

Space lattice, Basis, Unit cell, lattice parameters, Crystal systems, Bravais lattices, Atomic number, coordination number, packing factor of SC,BCC,FCC crystals, Crystal planes and directions - Miller indices. Expression for inter planar distance in cubic crystal, Structure of NaCl and Diamond.

**UNIT- II**

**X-RAY DIFFRACTION:**

Bragg's law**,** Experimental techniques -Laue's method, powder method**,** Applications of x-ray diffraction.

**DEFECTS IN CRYSTALS:**

Classification of crystal defects**,** Point defects-Vacancies & Interstitials, Concentrations of Schottky and Frenkel defects, Line defects- edge dislocation and screw dislocation**,** Burger's vector.

**UNIT-III**

**DIELECTRIC PROPERTIES:**

Electric dipole, Dipole moment, Polarization vector (P), Displacement vector (D), Dielectric constant (K), Electric susceptibility (χ), Types of polarizations-Expression for Electronic and Ionic polarization, Internal fields in dielectrics, Classius Mosotti relation, Piezo electricity and Ferro electricity, Applications of dielectric materials.

**UNIT-IV**

**MAGNETIC PROPERTIES:**

Magnetic permeability, Field intensity, Magnetic field induction, Magnetization, Magnetic susceptibility, Origin of Magnetic moment - Bhor magneton**,** Classification of magnetic materials-Dia, Para and Ferro**,** Ferri and Anti ferro magnetic materials, Explanation of Hysteresis loop on the basis of domain theory of ferromagnetism. Soft and hard magnetic materials.

**SUPER CONDUCTIVITY:**

Super conductivity, Properties of super conductors, Meissner effect**,** Types –I Type-II super conductors**,** Applications of super conductors.

**UNIT-V**

**NANO SCIENCE & NANO TECHNOLOGY:** Nano scale, Types of Nano materials, Surface to volume ratio and Quantum confinement, Bottom up Fabrication- Sol gel ,Top down Fabrication- Physical Vapour Deposition, Characterisation of Nano particles –TEM and SEM, Applications of Nano materials.

**TEXT BOOKS:**

1. Engineering Physics - S Mani Naidu- Pearson Publishers.
2. A Text Book of Engineering Phyiscs- P.G. Kshirsagar, Avadhanulu – S.Chand

**REFERENCES:**

1. Solid State Physics, Kittel- Wiley International.
2. Solid State Physics – AJ DekKer-Macmillan Publishers.
3. Engineering Physics, P.K. Palaniswamy, Scitech Publishers

**OUTCOMES:**

- The students would be able to learn the fundamental concepts on behavior of crystalline solids.
- The student will be able to think about the applications of dielectric, magnetic and nano materials.
- Finally Engineering physics course helps the student to develop problem solving skills and analytical skills.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B.Tech CSE-II SEM**

| L | T/P/D | C |
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## (R17A0502)OBJECT ORIENTED PROGRAMMING THORUGH C++

**Objectives**

- To teach the student the concepts of object oriented and generic programming.
- To differentiate between object oriented programming andprocedural programming.
- To design applications using object oriented features
- To teach the student to implement object oriented concepts

**UNIT I**

**Concepts of Object Oriented programming:** Object oriented paradigm - differences between Object Oriented Programming and Procedure oriented programming, Basic concepts of Object Oriented Programming , Encapsulation, Inheritance and Polymorphism. Benefits of OOP.Structure of a C++ program, namespace, Data types, identifiers, variables, constants, enum, operators, typecasting, control structures &loops.

**UNIT-II**

**Functions, Classes and Objects:**

Introduction of Classes,Class Definition, Defining a Members,Objects,Access Control, Class Scope,Scope Resolution Operator,Inline functions,Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Default Arguments,Friend Functions

**UNIT-III**

**Constructors, Destructors, Inheritance:**

Introduction to Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic initialization of Objects, Copy Constructors, Dynamic Constructors, Destructors.

**Inheritance :**Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi-Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Constructors in Derived Classes.

**UNIT-IV**

**Pointers, Virtual Functions and Polymorphism:**

Introduction, Memory Management, new Operator and delete Operator, Pointers to Objects, this Pointer, Pointers to Derived Classes, Polymorphism, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions, Abstract Classes, Virtual Base Classes, Virtual Destructors. Function Overloading, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators .

**UNIT-V**

**Templates and Exception handling:**

Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Member Function Templates.

**Exception handling:**

Basics of Exception Handling, Types of exceptions, Exception Handing Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions

**TEXT BOOKS:**

1. Object Oriented Programming, Special Edition - MRCET, Tata Mc Graw Hill Publishers 2017.
2. Object Oriented Programming with C++ by Balagurusamy.

**REFERENCES:**

1. C++ Primer, 3rd Edition, S.B.Lippman and J.Lajoie, Pearson Education.
2. The C++ Programming Language, 3rd Edition, B.Stroutstrup, Pearson Educ
3. C++, the Complete Reference, 4th Edition, Herbert Schildt, TMH.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B.Tech CSE -II SEM**

| L | T/P/D | C |
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## (R17A0201) ELECTRICAL CIRCUITS

**Objective:**

This course introduces the basic concepts of network and circuit analysis which is the foundation of the Electrical Engineering discipline. The emphasis of this course if laid on the basic analysis of circuits which includes network analysis, single phase AC circuits, network theorems and magnetic circuits.

**UNIT –I: Introduction to Electrical Circuits:**

Concept of Network and Circuit, Types of elements, Types of sources, Source transformation. R-L-C Parameters, Voltage–Current relationship for Passive Elements (for different input signals –Square, Ramp, Saw tooth and Triangular), Kirchhoff's Laws.

**UNIT –II: Network Analysis:**

Network Reduction Techniques-Resistive networks, Inductive networks and capacitive networks-Series, Parallel, Series-Parallel combinations, Star–to-Delta and Delta-to-Star Transformation. Mesh Analysis and Super mesh, Nodal Analysis and Super node for DC Excitation. Network topology-Definitions, Graph, Tree, Basic Cut set and Basic Tie set Matrices for Planar Networks.

**UNIT-III: Single Phase A.C. Circuits:**

Average value, R.M.S. value, form factor and peak factor for different periodic wave forms. J-notation, Complex and Polar forms of representation. Steady State Analysis of series R-L-C circuits. Concept of Reactance, Impedance, Susceptance, Admittance, Phase and Phase difference. Concept of Power Factor, Real, Reactive and Complex power.

**UNIT –IV: Network Theorems (D.C&A.C):**

Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity, Tellegen's, Substitution, Compensation and Milliman's theorems.

**UNIT –V:**

**MAGNETIC CIRCUITS:** Faraday's laws of electromagnetic induction, concept of self and mutual inductance, dot convention, coefficient of coupling, composite magnetic circuit, analysis of series and parallel magnetic circuits.

**TEXT BOOKS:**

1. Electrical Circuits, Special Edition-MRCET,Mc Graw Hill Publishers 2017.
2. Electric Circuits - A.Chakrabarhty, Dhanpat Rai & Sons.
3. A Text book of Electrical Technology by B.L Theraja and A.K Theraja, S.Chand publications.

**REFERENCE BOOKS:**

1. Network analysis by M.E Van Valkenburg,PHI learning publications.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. Electrical Circuits by A Sudhakar ,Shyammohan and S Palli,Mc Graw Hill Companies.
4. Principles of Electrical Engineering by V.K Mehta,RohitMehta,S.Chand publications.

**OUTCOME:**

After going through this course the student gets a thorough knowledge on basics of network and circuit concepts, circuit elements, network analysis, single phase AC circuits, network theorems, magnetic circuits with which he/she can able to apply the above conceptual things to real-world problems and applications

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

| I Year B.Tech. CSE - II Sem | L | T/P/D | C |
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## (R17A0014)ENVIRONMENTAL STUDIES

**Objectives:**

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding the environmental policies and regulations

**UNIT-I:**

**Introduction:** Definition of Environment and multidisciplinary nature of environmental sciences.
**Ecosystems**: Definition, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles (Carbon, Nitrogen, Water cycle) Bioaccumulation and Biomagnification with examples.

**UNIT-II:**

**Natural Resources**: Classification of Resources: water resources:types: surface and ground water and over utilization effects of ground water. Dams: benefits and problems. Forest resources: functions, causes and effects of Deforestation, Energy resources: renewable and non-renewable energy sources, use of alternate energy resources.

**UNIT-III:**

**Biodiversity and Biotic Resources**: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. Hot spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

**UNIT-IV:**

**Environmental Pollution and Control Technologies: Environmental Pollution**: **Classification of pollution, Air Pollution**: Primary and secondary pollutants, sources, causes, effects and control measures **Water pollution**: Sources and types of pollution, causes and effects, water treatment methods. **Soil Pollution**: Sources and types, Impacts of modern agriculture. Solid waste management, e-Waste management.
**Global Environmental Problems**: Green house effect, Global warming, Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS).

**UNIT-V:**

**Environmental Policy, Legislation & EIA**: Environmental Protection act1986, Air act 1981, Forest conservation act 1980, Biomedical waste management and handling rules, International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol.
EIA: EIA structure, methods of baseline data acquisition. Concepts of Environmental Management Plan (EMP).
**Towards Sustainable Future**: Concept, threats and strategies of Sustainable Development, Environmental Education.

**TEXT BOOKS**:

1. Environmental Studies by Anubha Kaushik, 4th Edition, New age international Publishers.
2. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
3. Environmental Studies by R. Rajagopalan, Oxford University Press.

**REFERENCE BOOKS**:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela .2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B.Botkin& Edward A.Keller, Wiley INDIA edition.
4. Principles of Environmental Science by William . P. Cunnningham& Mary Inn Cunnningham Tata McGRAW –Hill Publishing Company Ltd.
5. Environmental Studies by S. Rama Lakshmi & Purnima Smarath Kalyani Publishers.

**OUTCOME:**

Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of Ecological principles and environmental regulations which in turn helps in sustainable development

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**I Year B.Tech. CSE- II Sem** **L T/P/D C**
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## (R17A0582) OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB

**Objectives:**

- To strengthen problem solving ability by using the characteristics of an object-oriented approach.
- To design applications using object oriented features
- To handle Exceptions in programs.
- To teach the student to implement object oriented concepts

**Week 1**:
Basic C++ Programs

**Week2:**

a) Write a C++ program to find the sum of individual digits of a positive integer.
b) Write a C++ program to generate the first n terms of the sequence.

**Week 3:**

a) Write a C++ program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
b) Write a C++ program to find both the largest and smallest number in a list of integers.

**Week 4:**

a) Write a C++ program to sort a list of numbers in ascending order.
b) Write aProgram to illustrate New and Delete Keywords for dynamic memory allocation

**Week 5**

a) Write a program Illustrating Class Declarations, Definition, and Accessing Class Members.
b) Program to illustrate default constructor, parameterized constructor and copy constructors
c) Write a Program to Implement a Class STUDENT having Following Members:

| Member | Description |
|---|---|
| **Data members** | |
| Sname | Name of the student |
| Marks array | Marks of the student |
| Total | Total marks obtained |
| Tmax | Total maximum marks |
| **Member functions** | |
| Member | Description |
| assign() | Assign Initial Values |
| compute() | to Compute Total, Average |
| display() | to Display the Data. |

**Week 6:**

a) Write a Program to Demonstrate the i)Operator Overloading.ii) Function Overloading.
b) Write a Program to Demonstrate Friend Function and Friend Class.

**Week 7:**

a) Write a Program to Access Members of a STUDENT Class Using Pointer to Object Members.
b) Write a Program to Generate Fibonacci Series use Constructor to Initialize the Data Members.

**Week 8:**

Revision laboratory

**Week 9**

Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:

a) Reading a matrix. b) Addition of matrices. c) Printing a matrix.
d) Subtraction of matrices. e) Multiplication of matrices

**Week 10**

Write C++ programs that illustrate how the following forms of inheritance are supported:

a)Single inheritance b)Multiple inheritance
c)Multi level inheritance d)Hierarchical inheritance

**Week 11**

a.)Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.
b) Write a Program to Invoking Derived Class Member Through Base Class Pointer.

**Week 12**

a) Write a Template Based Program to Sort the Given List of Elements.
b) Write a C++ program that uses function templates to find the largest and smallest number in a list of integers and to sort a list of numbers in ascending order.

**Week 13**

a) Write a Program Containing a Possible Exception. Use a Try Block to Throw it and a Catch Block to Handle it Properly.
b) Write a Program to Demonstrate the Catching of All Exceptions.

**Week 14**

Revision

**TEXT BOOKS:**

1. Object Oriented Programming with C++ by Balagurusamy
2. C++, the Complete Reference, 4th Edition, Herbert Schildt, TMH.

**REFERENCES:**

1. C++ Primer, 3rd Edition, S.B.Lippman and J.Lajoie, Pearson Education.
2. The C++ Programming Language, 3rd Edition, B.Stroutstrup, Pearson Education.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B. Tech CSE -II Sem**

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## (R17A0084) IT WORKSHOP / ENGINEERING WORKSHOP

**OBJECTIVES:**

The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point.

**PC HARDWARE**

**Week 1:**

Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral

**Week 2:**

a) Every student should individually install MS windows on the personal computer.
b) Basic DOS Commands

**Week 3:**

a) Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals
b) Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

**INTERNET & WEB BROWSERS**

**Week 4:**

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers And How to access the websites and email& Search Engines & various threats on the internet and would be asked to configure their computer to be safe on the internet, Antivirus downloads to avoid viruses and/or worms.

**MS OFFICE**

**Week 5:**

a) Word Orientation: an overview of Microsoft (MS) office 2007/ 10: Importance of MS office 2007/10, overview of toolbars, saving files, Using help and resources, rulers, format painter. Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

b) Using Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in Word &Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

# ENGINEERING WORKSHOP

**1. TRADES FOR EXERCISES:**

**At least two exercises from each trade:**

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Black Smithy
5. House-wiring

**2. TRADES FOR DEMONSTRATION & EXPOSURE:**

1. Plumbing
2. Machine Shop
3. Welding
4. Foundry
5. Metal Cutting (Water Plasma)

**TEXT BOOK:**

1. Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers.
2. Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B. Tech CSE -II Sem**

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## (R17A0082) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB- II

The Language Lab focuses on the production and practice of sounds of the English language and familiarizes the students with its use in everyday situations and contexts.

**Objectives:**

- To make students acquire language skills at their own pace with the usage of authentic learning environment through different media, e-materials and language lab.
- To make learners acquire listening and speaking skills in both formal and informal contexts through diverse interactive sessions and computer aided multi-media training.
- To impart nuances of linguistics to help novices to resolve mother tongue interference by ensuring precision in pronunciation to befit Standard English.
- To help develop the students communication skills by familiarizing them with different strategies to suit academic as well as workplace contexts.

**Syllabus:** English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab
b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

**Exercise –IV**
**CALL Lab:** Word Accent – Rules of Stress and Stress shift
**ICS Lab:** Describing Object, Places, Persons, Events and Experiences.

**Exercise –V**
CALL Lab: Intonation
ICS Lab: Etiquette – Professional and telephone

**Exercise –VI**
**CALL Lab:** Neutralization of Mother Tongue Influence
**ICS Lab**: Oral Presentations (Team or Individual)

**PROJECTS**

## PROJECTS

Students have to choose one of the following projects for their External Examinations, and submit before the end of the semester. This project carries 10 marks in the Lab External Examinations.

1. **Conduct interview using interrogative sentences.**
   Students should interview any teacher, or HOD, or Principal, record their responses and submit the project with those questions and answers. The questions asked should not be less than ten.
2. **Project on differences between group discussion and debate.**
   Students are supposed to do research on the differences between GD and debate and submit a project on it. There should a minimum of ten points with detailed explanation. Students can use pictures as well.
3. **Book Review**
   Choose any fiction of your choice and write a book review on the following parameters.
   - Characterization, plot, theme, message

Please note that the review is not the summary of the story. The project should not be less than 250 words.

**4.Idioms and Phrasal Verbs**

Collect at least ten idioms and ten phrasal verbs and concoct a story using those expressions. Word limit is 250.

**5.Project on Kinesics**

Students are expected to read and research on body language and their implications. You have to make a list of at least ten body movements with pictures and explain them properly.

**6.UK and US vocabulary**

Find words that are used differently in UK and US English. Make separate lists for different spellings and different pronunciations. The project can answer one or more of the following questions:

- Which pronunciation do you think are Indians following?
- Which one is your choice? Which one do you feel comfortable in speaking?
- Are we Indians influenced by both UK and US English? How can you prove it?

**7.Magazine Article Review**

Pick a magazine article with a social relevance, which has around 2500 words. Write a review of 250 words as a project. Make sure you voice your opinion in the review.

**8.Career Guidance Project**

Browse the net and gather information on any professional competitive exam of your choice, like UPSC or GRE. Prepare and present a paper on the scope and relevance of the exam of your choice. The paper should have a minimum of 300-400 words. Students are expected to answer the questions asked by the audience after the paper presentation.

**9.Mother Tongue Influence**

Choose a particular paragraph of 250 words and ask five of your friends, from different states, to read that. One has to record their accent and pronunciation to check the difference. Make a list of ten words that each one pronounces differently. Find out the reasons behind the differences in pronunciations.

Also, mention the correct pronunciation in your project with transcription.

**10. Correction of Letter Writing: Language, Sentences, Spelling, Tone and Format**

Teacher will distribute a set of five letters with errors in spelling, tone, grammar and sentence construction. Give the correct form of the letters as the project

**ELCS LAB:**

**3. Computer Assisted Language Learning (CALL) Lab:**

The Computer aided Language Lab for 60 students with 60 systems, one master console, LAN facility and English language software for self-study by learners.

**System Requirement (Hardware component):**

Computer network with LAN with minimum 60 multimedia systems with the

Following specifications:

i) P –IV Processor

a)Speed –2.8 GHZ

b)RAM –512 MB Minimum

c)HardDisk –80 GB

ii) Headphones of High quality

**4. Interactive Communication Skills (ICS) Lab :**

A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

**REFERENCES:**

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):


1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories. New Delhi: Foundation
2. Speaking English Effectively 2ndEdition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
3. Sasi Kumar, V & Dhamija, P.V. How to Prepare for Group Discussion and Interviews. Tata McGraw Hill
4. Hancock, M. 2009. English Pronunciation in Use. Intermediate. Cambridge: CUP
5. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013.Orient Blackswan. Hyderabad.
6. Hewings, M. 2009. English Pronunciation in Use. Advanced. Cambridge: CUP
7. Marks, J. 2009. English Pronunciation in Use. Elementary. Cambridge: CUP
8. Nambiar, K.C. 2011. Speaking Accurately. A Course in International Communication. New Delhi: Foundation
9. Soundararaj, Francis. 2012. Basics of Communication in English. New Delhi: Macmillan
10. Spoken English(CIEFL) in 3 volumes with 6 cassettes, OUP.
11. English Pronouncing DictionaryDaniel Jones Current Edition with CD.
12. A textbook of English Phonetics for Indian Studentsby T.Balasubramanian (Macmillan)


**DISTRIBUTION AND WEIGHTAGE OF MARKS**

**English Language Laboratory Practical Examination:**

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the other institution.

**OUTCOMES:**

- Learning with precision through computer-assisted individualized and independent language learning to work independently in engineering set up.
- Improved conversational reception and articulation techniques in the course of repetitive instruction thereby gaining confidence both in institutional and professional environment.
- Accuracy in pronunciation and restoring Standard English thereby crafting better command in English language so that the students have a cutting edge over others in society.
- Imbibing appropriate use of language in situations to work as an individual and as o leader in diverse teams

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**I Year B. Tech CSE -II Sem**

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## (R17A0003) HUMAN VALUES AND SOCIETAL PERSPECTIVES

**(MANDATORY COURSE)**

**Objective: This introductory course input is intended**

- To help the students appreciate the essential complementarily between 'VALUES' and skills' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- To facilitate the development of a Holistic perspective among students towards life, profession and happiness, based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective form the basis of value based living in a natural way.
- To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually satisfying human behavior and mutually enriching interaction with Nature.

**Unit-I**

**Course Introduction–Need, Basic Guidelines, Content and Process of Value Education:** Understanding the need, basic guidelines, content and process for value Education. Animal consciousness vs Human consciousness, Self Exploration -What is it? Its content and process; Continuous Happiness and Prosperity-A look at basic Human Aspirations. Right understanding, Relationship and physical Facilities –the basic requirements for fulfillment of aspirations of every human being with their correct priority. Understanding Happiness and prosperity correctly –A critical appraisal of the current scenario. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

**Unit-II**

**Understand Harmony in the Human Being –Harmony in Myself:** Understanding human being as a co-existence of the sentient 'I' and the material 'Body', understanding the needs of self ('I') and 'Body'-Sukh and Suvidha. Understanding the body as an instrument of 'I' (I being the does, seer and enjoyer). Understanding the characteristics and activities of 'I' and harmony in 'I' . Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of physical needs, meaning of prosperity in detail. Programs to ensure Sanyam and Swasthya.

**Unit-III**

**Understanding Harmony in the Family and Society-Harmony in Human-Human Relationship:** Understanding harmony in the Family –the basic unit of human interaction. Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti: Trust (Vishwas) and Respect (Samman) as the foundational values of relationship. Understanding the meaning of Vishwas: Difference between intention and competence. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship. Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals. Visualizing a universal harmonious order in society –Undivided society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) –from family to world family!

**Unit-IV**

**Understanding Harmony in the Nature and Existence –Whole existence as Co-existence:** Understanding the harmony in the Nature. Interconnectedness and mutual fulfillment among the four orders of nature, Recyclability and Self-regulation in nature. Understanding Existence as

Co-existence (Sah-astiva) of mutually interacting units in all –pervasive space. Holistic perception of harmony at all levels of existence.

**Unit-V**

**Implications of the above Holistic Understanding of Harmony on Societal Perspectives:** Natural acceptance of human values. Definitiveness of Ethical Human Conduct. Basis of Humanistic Education, Humanistic Constitution and Humanistic Universal Order.

**TEXT BOOKS**

1. R R Gaur, R Sangal, G P BAgaria, 2009 A Foundation Course in Human Values and Professional Ethics.
2. Prof.KV Subba Raju, 2013, Success secrets for Engineering students , Smart student Publications, 3rd Edition.

**REFERENCE BOOKS**

1. Ivan llich, 1974, Energy & Equity, The Trinity press, Worcester and Harpercollins, USA.
2. E.F. Schumacher, 1973, small is Beautiful: a study of economics as if people mattered, Blond, Briggs, & Britain.
3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya path Sansathan Amarkantak.
4. Sussan George, 1976, How the other Half Dies, Penguin press Reprin ted 1986, 1991
5. PL Dhar, RR Gaur, 1990 Science and Humanism Commonwealth Publishers.
6. A.N.Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati.
8. Done lla H.Meadows, Dennis L. Meadows, Jorgen Randers, Willian A. Behrens lll, 1972, Limits to Growth – Club of Rome's report Universe Books.
9. E.G Seebauer & Robert L. Beery, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.
10. M Govindrajran , S Natrajan & V.S Senthil kuma, Engineering Ethichs (including Human Values), Eastern Economy Edition, prentice Hall of India Ltd.

**Relevant CDs, Movies, Documentaries & other Literature:**

1. Value Education website http://www.uptu.ac.in
2. Story of stuff, http://www.storyofstuff.com
3. Al Gore, An Inconvenient Truth, Paramount classics, USA
4. Charlie Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology - the Untold Story

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE -I Sem**

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## (R17A0503) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

**Objectives:**

- To explain with examples the basic terminology of functions, relations, and sets.
- To perform the operations associated with sets, functions, and relations.
- To relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.
- To describe the importance and limitations of predicate logic.
- To relate the ideas of mathematical induction to recursion and recursively defined structures.
- To use Graph Theory for solving problems

**UNIT-I**

**Mathematical Logic:** Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. **Predicates** : Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

**UNIT-II**

**Relations**: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties,

**Algebraic structures:** Algebraic systems Examples and general properties, Semigroups and monads, groups sub groups' homomorphism, Isomorphism.

**UNIT-III**

**Elementary Combinatorics:** Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application.

**UNIT-IV**

**Recurrence Relation:** Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, Solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

**UNIT-V**

**Graph Theory:** Representation of Graph, DFS, BFS, Spanning 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. Elements of DISCRETE MATHEMATICS- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker, PHI.

**REFERENCE BOOKS:**

1. Discrete Mathematics and its Applications, Kenneth H. Rosen, Fifth Edition.TMH.
2. Discrete Mathematical structures Theory and application-Malik & Sen, Cengage.
3. Discrete Mathematics with Applications, Thomas Koshy, Elsevier.
4. Logic and Discrete Mathematics, Grass Man & Trembley, Pearson Education.

**Outcomes:**

- Ability to Illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
- Ability to Demonstrate in practical applications the use of basic counting principles of permutations, combinations, inclusion/exclusion principle and the pigeonhole methodology.
- Ability to represent and Apply Graph theory in solving computer science problems.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

| L | T/P/D | C |
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## (R17A0504) DATA STRUCTURES USING C++

Objectives:

- To understand the basic concepts such as Abstract Data Types, Linear and Non-Linear Data structures.
- To understand the notations used to analyze the Performance of algorithms.
- To understand the behavior of data structures such as stacks, queues, trees, hash tables, search trees, Graphs and their representations.
- To choose the appropriate data structures for a specified application
- To write programs in C++ to solve problems using data structures such as arrays, linked lists, stacks, queues, trees, graphs, hash tables, search trees.

**Unit I:**

Algorithms, performance analysis- time complexity and space complexity,

Searching: Linear and binary search methods.

Sorting: Bubble sort, selection sort, Insertion sort, Quick sort, Merge sort, Heap sort. Time complexities.

**Unit II:**

basic data structures- The list ADT, Stack ADT, Queue ADT, array and linked list Implementation using template classes in C++.Trees-Basic terminology Binary Tree ADT, array and linked list Implementation, Binary tree traversals, threaded binary tree.

**Unit III:**

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

**Unit IV:**

Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

**Unit V:**

Search Trees:-

Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching.

Graphs: Basic terminology, representation of graphs, graph search methods DFS,BFS

**TEXT BOOKS:**

1. Data Structures using C++, Special Edition-MRCET, Tata McGraw-Hill Publishers 2017.
2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.

**REFERENCES:**

1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
4. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
5. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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## (R17A0510) COMPUTER ORGANIZATION

**Objectives:**

- To understand basic components of system
- To explore the memory organization
- To explore I/O organization in depth
- Ability to analyze the hardware and software issues related to computers and the interface between the two.

**UNIT I:**

**BASIC STRUCTURE OF COMPUTERS :** Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

**REGISTER TRANSFER LANGUAGE AND MICRO OPERATIONS :** Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

**UNIT-II:**

**Basic Computer Organization and Design:**

Instruction codes. Computer Registers Computer instructions, Timing and Control, Instruction cycle. Memory Reference Instructions, Input – Output and Interrupt, Complete Computer Description.

**Micro Programmed Control:** Control memory, Address sequencing, micro program example, design of control unit, micro Programmed control

**UNIT-III:**

**Computer Processing Unit Organization:** General Register Organization ,STACK organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation ,Program Control. CISC and RISC. **Computer Arithmetic:** Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. BCD Adder

**UNIT-IV:**

**Input-Output Organization:** Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP)

**Pipeline And Vector Processing:** Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Dependencies, Vector Processing.

**UNIT-V:**

**Memory Organization:** Memory Hierarchy, Main Memory –RAM And ROM Chips, Memory Address map, Auxiliary memory-magnetic Disks, Magnetic tapes, Associate Memory,-Hardware Organization, Match Logic, Cache Memory –Associative Mapping , Direct Mapping, Set associative mapping ,Writing in to cache and cache Initialization , Cache Coherence ,Virtual memory-Address Space and memory Space ,Address mapping using pages, Associative memory page table ,page Replacement .

**TEXT BOOKS:**

1. Computer Organization – Special Edition-MRCET, Tata McGraw Hill Publishers 2017.
2. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI

**REFERENCES:**

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

**Outcomes:**

Upon completion of this course, students should be able to:

- Student will learn the concepts of computer organization for several engineering applications.
- Student will develop the ability and confidence to use the fundamentals of computer organization as a tool in the engineering of digital systems.
- An ability to identify, formulate, and solve hardware and software computer engineering problems using sound computer engineering principles

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

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## (R17A0024) PROBABILITY AND STATISTICS

**Objectives: To learn**

- Understand a random variable that describes randomness or an uncertainty in certain realistic situation. It can be either discrete or continuous type.
- In the discrete case, study of the binomial and the Poisson random variables and the normal random variable for the continuous case predominantly describe important probability distributions. Important statistical properties for these random variables provide very good insight and are essential for industrial applications.
- Most of the random situations are described as functions of many single random variables. In this unit, the objective is to learn functions of many random variables, through joint distributions.
- The types of sampling, Sampling distribution of means, Sampling distribution of variance, Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.
- The mechanism of queuing system, The characteristics of queue, The mean arrival and service rates, The expected queue length, The waiting line, The random processes, The classification of random processes, Markov chain, Classification of states, Stochastic matrix (transition probability matrix),Limiting probabilities, Applications of Markov chains.

**UNIT -I: Random variable and Probability distributions**

**Random Variables**

Single and multiple Random variables -Discrete and Continuous. Probability distribution function, mass function and density function of probability distribution. mathematical expectation and variance.

Probability distributions: Binomial distribution – properties, mean and variance, Poisson distribution – properties, mean and variance and Normal distribution – properties, mean and variance

**UNIT -II: Correlation and Regression**

Correlation -Coefficient of correlation , Rank correlation, Regression- Regression Coefficients , Lines of Regression**.**

**UNIT -III: Sampling Distributions and Statistical Inferences**

Sampling: Definitions of population ,sampling ,statistic ,parameter-Types of sampling – Expected values of sample mean and variance,Standard error- Sampling distribution of means and variance

Parameter Estimations : likelihood estimate , interval estimate.

Testing of hypothesis: Null and Alternative hypothesis-Type I and Type II errors, Critical region – confidence interval – Level of significance,One tailed and Two tailed test

Large sample Tests: i) Test of significance of single mean and equality of means of two samples(cases of known and unknown variance whether equal or unequal) ii) Tests of significance difference between sample proportion and population proportion and difference between two sample proportions

**UNIT -IV: Exact Sampling Distributions(Small samples)**

Exact Sampling Distributions(Small samples) Student t- distribution – properties

i)Test of significant difference between sample and population mean

ii)Test of difference between means of two small samples(independent and dependent samples)

F- distribution - properties –test of equality of two population variances

Chi-square distribution -properties –i)Test of goodness of fit

ii)Test of independence of attributes

**UNIT-V: Queuing Theory and Stochastic process**

**Queuing Theory**

Structure of a queuing system its characteristics-Arrival and service process-Pure Birth and Death process Terminology of queuing system -Queuing model and its types-M/M/1 model of infinite queue (without proofs)and M/M/1 model of finite queue (without proofs).

**Stochastic Process**

Introduction to stochastic process-classification and methods of description of Random process i.e,stationary and non-stationary Average values of single and two or more random process

Markov process, Markov chain, Examples of Markov chains, Stochastic matrix.

**TEXT BOOKS:**

1. Probability and Statistics by T.K..V Iyengar& B.Krishna Gandhi S.Ranganatham,MVSSAN Prasad. S Chand Publishers.
2. Fundamentals of Mathematical Statistics by SC Gupta and V.K. Kapoor

**REFERENCES:**

1. Higher Engineering Mathematics By Dr.B.S.Grewal, Khanna Publishers
2. Probability and Statistics for Engineers and Scientists by Sheldon M.Ross,Academic Press.

**Outcomes:**

- Students would be able to identify distribution in certain realistic situation. It is mainly useful for circuit as well as non circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
- The student would be able to calculate mean and proportions(small and large samples)and to make important decisions from few samples which are taken out of unmanageably huge populations.It is mainly useful for non-branches of engineering.
- The student would be able to find the expected queue length, the ideal time the traffic intensity and the waiting time. these are very useful tools in many engineering and data management problems in the industry. it is useful for all branches of engineering.
- The student would able to understand about the random process, markov process and markov chains which are essentially models of many time dependent processes such as signals in communications, time series analysis, queuing systems. The student would be able to find the limiting probabilities and the probabilities in $n^{th}$ state. It is quite useful for all branches of engineering.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

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## (R17A0401) ELECTRONIC DEVICES AND CIRCUITS

**Objectives:**

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers this course focuses:

- To familiarize the student with the principal of operation, analysis and design of junction diode .BJT and FET transistors and amplifier circuits.
- To understand diode as a rectifier.
- To study basic principal of filter of circuits and various types

**UNIT-I**

**P-N Junction diode**: Qualitative Theory of P-N Junction, P-N Junction as a diode , diode equation , volt-amper characteristics temperature dependence of V-I characteristic , ideal versus practical –resistance levels( static and dynamic), transition and diffusion capacitances, diode equivalent circuits, load line analysis ,breakdown mechanisms in semiconductor diodes , zener diode characteristics.

**Special purpose electronic devices:** Principal of operation and Characteristics of Tunnel Diode with the help of energy band diagrams, Varactar Diode, SCR and photo diode

**UNIT-II**

**RECTIFIERS, FILTERS:** P-N Junction as a rectifier ,Half wave rectifier, , full wave rectifier, Bridge rectifier , Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter, ⍰- section filter and comparison of various filter circuits, Voltage regulation using zener diode.

**UNIT-III**

**BIPOLAR JUNCTION TRANSISTOR**: The Junction transistor, Transistor current components, Transistor as an amplifier, Transistor construction, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations. α and β Parameters and the relation between them, BJT Specifications. BJT Hybrid Model, h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of Ai, Ri, Av and Ro,

**UNIT-IV**

**TRANSISTOR BIASING AND STABILISATION:** Operating point , the D.C and A.C Load lines, Need for biasing, criteria for fixing, operating point, B.J.T biasing, Fixed bias, Collector to base bias, Self bias techniques for stabilization, Stabilization factors, (s, $s^{I}$, $s^{II}$), Bias Compensation using diode and transistor, (Compensation against variation in $V_{BE}$, $I_{CO}$,) Thermal run away, Condition for Thermal stability.

**UNIT-V**

**FIELD EFFECT TRANSISTOR AND FET AMPLIFIER**

JFET (Construction, principal of Operation and Volt –Ampere characteristics). Pinch- off voltage-Small signal model of JFET. FET as Voltage variable resistor, Comparison of BJT and FET. MOSFET

(Construction, principal of Operation and symbol), MOSFET characteristics in Enhancement and Depletion modes. **FET Amplifiers**: FET Common source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, FET biasing.

**TEXT BOOKS:**

1. Integrated Electronics Analog Digital Circuits, Jacob Millman and D. Halkias, McGraw Hill.
2. Electronic Devices and Circuits Theory, Boylsted, Prentice Hall Publications.
3. Electronic Devices and Circuits, S.Salivahanan, N.Suresh kumar, McGraw Hill.
4. Electronic Devices and Circuits, Balbir kumar, shail b.jain, PHI Privated Limted, Delhi.

**REFERENCE BOOKS:**

1. Electronic Devices and Circuits, K.Lal Kishore B.S Publications
2. Electronic Devices and Circuits, G.S.N. Raju, I.K. International Publications, New Delhi, 2006.
3. Electronic Devices and Circuits,A.P Godse, U.A Bakshi , Technical Publications
4. Electronic Devices and Circuits K.S. Srinivasan Anurdha Agencies

**Outcomes:**

- Understand and analyze the different types of diodes, operation and its characteristics
- Design and analyze the DC bias circuitry of BJT and FET
- Design biasing circuits using diodes and transistors
- To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem** **L T/P/D C**

**3 -/ - / - 3**

## (R17A0061) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

**OBJECTIVES:**

1. To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations that are needed for sound economic decision making.
2. The main purpose is to provide inputs on an overall analysis of an individual firm namely: demand and supply, production function, cost analysis, markets etc.
3. To understand and analyse the financial formats of the organisation for smooth running of the business.

**Unit-I**

**Introduction to Managerial Economics:** Definition, Nature and scope of Managerial economics, Micro and Macroeconomic concepts.

Demand Analysis: Demand Determinants, Law of Demand and exceptions. Elasticity Of Demand: Definition, Types, Measurement and Significance of elasticity of Demand. Demand Forecasting, Factors governing demand Forecasting, methods of demand Forecasting.

**Unit-II**

**Production & Cost Analysis:** Production Function- Isocost and Isoquants MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

**Unit-III**

**Markets & New Economic Environment:** Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Objectives and Policies of Pricing- Methods of Pricing.

Business: Features of different forms of Business Organisation, Changing Business Environment in Post-liberalization scenario.

**Unit-IV**

**Introduction to Capital and Financial Accounting:** Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance – Trading forecast, Capital Budget, Cash Budget.

Accounting Definition, Concepts and Conventions (GAAP); Formats for preparation of Trial Balance and Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet).

**Unit-V**

**Investment Decision:** Features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems). Financial

Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios.

**TEXTBOOKS:**

1. Varsheney & Maheswari, Managerial Economics, Sultan Chand, 2009.
2. S.A. Siddiqui & A.S. Siddiqui, Managerial Economics and Financial Analysis, New Age International Publishers, Hyderabad 2013
3. M. Kasi Reddy & Sarawathi, Managerial Economics and Financial Analysis, PHI, New Delhi, 2010.

**REFERENCES:**

1. S.N.Maheswari & S. K. Maheswari, Financial Accounting, Vikas, 2012.
2. D.N. Dwivedi, Managerial Economics, Vikas, 2012.
3. Justin Paul, Leena, Sebastian, Managerial Economics, Cengage, 2012
4. A,R.Aryasri: Managerial Economics and Financial Analysis, McGraw-Hill, 2011.

**OUTCOMES:**

Students should be able

1. To understand the basic economic principles, forecast demand and supply.
2. Should be able to estimate cost and understand market structure, pricing practices.
3. Able to interpret the financial results of the organization.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| - | -/ 3 / - | 2 |

## (R17A0282) ELECTRICAL AND ELECTRONICS LAB

**PART – A**

1. Verification of KVL and KCL.
2. Verification of Superposition and Reciprocity theorems.
3. Verification of Maximum power transfer theorem.
4. Verification of Thevenin's and Norton’s theorems.
5. OC and SC tests on single phase transformer.
6. Load test on single phase transformer.

**PART – B**

7. PN Junction diode characteristics.
8. Zener diode characteristics.
9. Half wave rectifier with and without filter.
10. Full wave rectifier with and without filter.
11. Transistor CB characteristics (Input and Output).
12. Transistor CE characteristics (Input and Output).

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| - | -/ 3 / - | 2 |

## (R17A0583) DATA STRUCTURES USING C++ LAB

**Objectives:**

- To make the student learn a object oriented way of solving problems.
- To make the student write ADTS for all data structures.

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space
- C++ compiler and STL Recommended

**Week1 :**

Write C++ programs to implement recursive and non recursive i) Linear search ii) Binary search

**Week2 :**

Write C++ programs to implement i) Bubble sort ii) Selection sort iii) quick sort iv) insertion sort

**Week3 :**

Write C++ programs to implement the following using an array.

a) Stack ADT b) Queue ADT

**Week4 :**

Write C++ programs to implement list ADT to perform following operations

a) Insert an element into a list.

b) Delete an element from list

c) Search for a key element in list

d)count number of nodes in list

**Week5 :**

Write C++ programs to implement the following using a singly linked list.

a) Stack ADT b) Queue ADT

**Week6 :**

Write C++ programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.

**Week 7 :**

Write a C++ program to perform the following operations:

a) Insert an element into a binary search tree.

b) Delete an element from a binary search tree.

c) Search for a key element in a binary search tree.

**Week8 :**

Write C++ programs for implementing the following sorting methods:

a) Merge sort b) Heap sort

**Week9 :**

Write C++ programs that use recursive functions to traverse the given binary tree in

a) Preorder b) inorder and c) postorder.

**Week10 :**

Write a C++ program to perform the following operations

a) Insertion into a B-tree b) Deletion from a B-tree

**Week11 :**

Write a C++ program to perform the following operations

a) Insertion into an AVL-tree b) Deletion from an AVL-tree

**Week12 :**

Write a C++ program to implement all the functions of a dictionary (ADT) using hashing.

**(Note: Use Class Templates in the above Programs)**

**TEXT BOOKS :**

1. Data Structures and Algorithms in C++, Third Edition, Adam Drozdek, Thomson.
2. Data Structures using C++, D.S. Malik, Thomson

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 2 | -/ - / - | - |

## (R17A0004) FOREIGN LANGUAGE-FRENCH

**INTRODUCTION:**

Au vu de l'importance croissante des langues étrangères comme outil de communication dans certains pays du globe, le français a été identifié comme l'une des langues les plus sollicitées après l'anglais. De ce fait, tout en insistant sur la formation en compétences communicatives, le programme a été élaboré pour développer des aptitudes linguistiques et communicatives des étudiants ingénieurs. Le cours de français, sera centré sur les compétences orales de base.

**Objectives:**

- To improve the basic speaking skills of the French language.
- To hone the basic sentence constructions in day to day expressions for communication in their work place.

**UNIT-I:**

- **Objectif communicatifs (LSRW)**

  -Se présenter / Présenter quelqu'un - Entrer en contact – Saluer – Epeler - poser des questions - comprendre et remplir un formulaire
  - **Grammaire**

    - Les formules de politesse
    - L'alphabet
    - Les nombres de 1 à 30
    - Le verbe ''être'' et ''avoir'' au présent de l'indicatif
  - **Vocabulaire**

    **-** Les professions
    - Les nationalités

**UNIT-II**

- **Objectif communicatifs (LSRW)**

Parler de sa famille – décrire quelqu'un – exprimer ses gouts et les préférences – écrire et comprendre un message court – compter jusqu'à 100 – exprimer la possession – exprimer la négation

- **Grammaire**
  - Les articles
  - Les verbes en –er- au présent
  - Les noms (genre et nombre)
  - Les adjectifs possessifs
  - Les adjectifs qualificatifs
  - « Qu'est ce que c'est ? » / « Qui est ce ? »/ « c'est… »
  - La négation
- **Vocabulaire**
  - La famille
  - Les vêtements
  - Les couleurs
  - Les nombres de 1 à 100
  - La salle de classe

**UNIT-III**

- **Objectif communicatifs (LSRW)**
  Parler de ses activités quotidiennes – se situer dans le temps – demander et indiquer la date et l'heure – parler des sports et des loisirs – exprimer la fréquence.
  - **Grammaire**
    - L'expression du temps (l'heure)
    - Les verbes en –ir- au présent
    - Les verbes faire, aller, prendre, venir,
    - Les adverbes
    - Les verbes pronominaux
  - **Vocabulaire**
    - Les jours et les mois de l'année
    - La vie quotidienne
    - Les sports
    - Les loisirs

**UNIT-IV**

- **Objectif communicatifs (LSRW)**
  Exprimer la quantité – demander et donner le prix- exprimer la nécessité, la volonté et la capacité – comparer (adjectif) – s'exprimer au restaurant / dans les magasins
  - **Grammaire**
    - Pouvoir, vouloir, il faut
    - Exprimer la capacité / la possibilité
    - Exprimer la volonte / le désir
    - Le futur proche
  - **Vocabulaire**
    - La nourriture
    - Les repas
    - Les fruits et légumes
    - Les parties du corps

**UNIT-V**

- **Objectif communicatifs (LSRW)**
  Exprimer l'interdiction et l'obligation- décrire un appartement – parler du temps qu'il fait / demander le temps qu'il fait – demander l'opinion – donner son avis – exprimer son accord ou son désaccord
  - **Grammaire**
    - Les adjectifs démonstratifs
    - Les prépositions
    - Le verbe ' devoir' et 'falloir' au présent
    - « Il y a » et « Depuis »
  - **Vocabulaire**
    - Les saisons
    - Les vacances
    - La ville
    - Le logement

**REFERENCE BOOKS:**

1. Apprenons le Français 1& 2, New Saraswati House, 2015|
2. A propos, A1, Langers International, 2010
3. Easy French Step-by-step by Myrna Bell Rochester-
4. Ultimate French Beginner-Intermediate (Coursebook) By Livid Language
5. Ã L'Aventure: An Introduction to French Language and Francophone Cultures By by Evelyne Charvier-Berman, Anne C. Cummings.

**Outcomes**

- The student will be in a position to speak in French, Which is the second most widely learned foreign language after English, and the ninth most widely spoken language in the world. French is also the only language, alongside English, that is taught in every country in the world.
- The Student will get the ability to speak French is an advantage on the international job market.
- Students with a good level of French are eligible for French government scholarships to enroll in postgraduate courses in France in any discipline and qualify for internationally recognized French degrees.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 2 | -/ - / - | - |

## (R17A0005) FOREIGN LANGUAGES: GERMAN

**Objectives:**

1. To familiarize the students with a modern foreign language.
2. To familiarize the students with the sounds of German and their symbols.
3. To familiarize students with German for basic communication and functions in everyday situations.
4. To familiarize students with the basic of writing simple, direct sentences and short compositions.

**UNIT I**

Current trends in German orthography, German grammar and lexical units, discourse models, oral and written.

**UNIT- II**

Communication patterns, prose passages, etc.

**UNIT- III**

Communication skills in everyday situations

**UNIT-IV**

Training in creative writing in German.

**UNIT- V**

Training in creative speaking in German.

**TEXT BOOKS**

Lernziel Deutsch

**Reference books:**

Themen

Tangram

Sprachkurs Deutsch

Schulz-Griesbach

**Outcomes**

1. Students familiarize with a modern foreign language – German
2. The students with German get acquainted for basic communication in everyday situations.
3. Students will know with the basics of writing simple direct sentences and short compositions.
4. Students get to know the basics of German language to communicate in the work place when they find the necessity.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

| L | T/P/D | C |
|---|---|---|
| 4 | 1/-/- | 4 |

## (R17A0506) Formal Languages and Automata Theory

**Objectives:**

- To teach the student to identify different formal language classes and their relationships
- To teach the student the theoretical foundation for designing compilers.
- To teach the student to use the ability of applying logical skills.
- Teach the student to prove or disprove theorems in automata theory using its properties
- To teach the student the techniques for information processing.
- Understand the theory behind engineering applications.

**UNIT I:**

**Fundamentals:** Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, FA, transition diagrams and Language recognizers.

**Finite Automata:** Deterministic finite automaton, Non deterministic finite automaton and NFA with Є transitions - Significance, acceptance of languages.

Conversions and Equivalence : Equivalence between NFA with and without Є transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSMs, Finite Automata with output- Moore and Melay machines.

**UNIT II:**

**Regular Languages:** Regular sets, regular expressions, identity rules, Conversion finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets **(proofs not required).**

**UNIT III:**

**Grammar Formalism:** Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

**Context Free Grammars:** Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL **(proofs omitted).**

**UNIT IV:**

**Push Down Automata:** Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, interconversion. **(Proofs not required)**. Introduction to DCFL and DPDA.

**Linear Bounded Automata (LBA):** LBA, context sensitive grammars, CS Languages

**UNIT V:**

**Turing Machine:** Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

**Computability Theory:** Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability

of posts. Correspondence problem, Turing reducibility, **Definition of P and NP problems, NP complete and NP hard problems.**

**TEXT BOOKS:**

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J.D. Pearson Education.
2. Introduction to Theory of Computation - Sipser 2nd edition Thomson

**REFERENCE BOOKS:**

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation ,John C Martin, TMH
3. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
4. Theory of Computer Science and Automata languages and computation -Mishra and Chandrashekaran, 2nd edition, PHI.
5. Theory of Computation, By K.V.N. Sunitha and N.Kalyani

**Outcomes:**

Student will have the ability to

- Apply knowledge in designing or enhancing compilers.
- Design grammars and automata (recognizers) for different language classes.
- Apply knowledge in developing tools for language processing or text processing.
- Mapping real time systems to mathematical models.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | 1/-/- | 3 |

## (R17A0507) JAVA PROGRAMMING

**Objective:**

This subject aims to introduce students to the Java programming language. Upon successful completion of this subject, students should be able to create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism; use data types, arrays and other data collections; implement error-handling techniques using exception handling, create and event-driven GUI using Swing components.

**UNIT-I**

**OOP Concepts:-** Data abstraction, encapsulation, inheritance, Benefits of Inheritance, Polymorphism, classes and objects, Procedural and object oriented programming paradigms.

**Java Programming-** History of Java, comments, Data types, Variables, Constants, Scope and Lifetime of variables, Operators, Operator Hierarchy, Expressions, Type conversion and casting, Enumerated types, Control flow- block scope, conditional statements, loops, break and continue statements, simple java stand alone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, building strings, exploring string class.

**UNIT – II**

**Inheritance –** Inheritance hierarchies super and sub classes, Member access rules, super keyword, preventing inheritance: final classes and methods, the Object class and its methods.

**Polymorphism – dynamic** binding, method overriding, abstract classes and methods**.**

**Interfaces-** Interfaces Vs Abstract classes, defining an interface, implement interfaces, accessing implementations through interface references, extending interface.

**Inner classes-** Uses of inner classes, local inner classes, anonymous inner classes, static inner classes, examples.

**Packages-** Defining, creating and accessing a package, Understanding CLASSPATH, importing packages.

**UNIT-III**

**Exception handling-** Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception sub classes.

**Multithreading –** Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern, Exploring java.net and java.text.

**UNIT-IV**

**Collection Framework in Java** – Introduction to java collections, Overview of java collection framework, Generics, Commonly used collection classes- Array List, Vector, Hash table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, Calendar and Properties.

**Files-** Streams**-** Byte streams, Character streams, Text input/output, Binary input/output, random access file operations, File management using File class.

**Connecting to Database –** JDBC Type 1 to 4 drivers, Connecting to a a database, querying a a database and processing the results, updating data with JDBC.

**UNIT-V**

**GUI Programming with Java-** The AWT class hierarchy, Introduction to Swing, Swing Vs AWT, Hierarchy for Swing components, Containers – Jframe, JApplet, JDialog, JPanel, Overview of some Swing components – Jbutton, JLabel, JTextField, JTextArea, simple Swing applications, Layout management – Layout manager types – border, grid and flow

**Event Handling-** Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Examples: Handling a button click, Handling Mouse events, Adapter classes.

**Applets –** Inheritance hierarchy for applets, differences between applets and applications, Life cycle of an applet, Passing parameters to applets, applet security issues.

**TEXT BOOK:**

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.

**REFERENCE BOOKS:**

1. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel, PHI
2. Object Oriented Programming through Java, P. Radha Krishna, Universities Press.
3. Thinking in Java, Bruce Eckel, PE
4. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.

**Outcomes:**

- An understanding of the principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements;
- A competence to design, write, compile, test and execute straightforward programs using a high level language;
- An appreciation of the principles of object oriented programming;
- An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
- Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
- Demonstrate the ability to use simple data structures like arrays in a Java program.
- Be able to make use of members of classes found in the Java API (such as the Math class).
- Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
- Able to develop applications using Applet, AWT, JDBC and Swings

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

| L | T/P/D | C |
|---|---|---|
| 4 | 1/-/- | 4 |

## (R17A0508) DESIGN AND ANALYSIS OF ALGORITHMS

**Objectives:**

- To analyze performance of algorithms.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To understand how the choice of data structures and algorithm design methods impacts the performance of programs.
- To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound.
- Prerequisites (Subjects) Data structures, Mathematical foundations of computer science.

**UNIT I:**

**Introduction:** Algorithm, Psuedo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

**Searching and Traversal Techniques:** Efficient non - recursive binary tree traversal algorithm, Disjoint set operations, union and find algorithms, Spanning trees

**UNIT II:**

**Divide and conquer:** General method , applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

**Greedy method:** General method, applications - Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

**UNIT III:**

**Dynamic Programming:** General method, applications-Matrix chain multiplication, Multi stage graphs, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

**UNIT IV:**

**Graph traversals** - Breadth first search and Depth first search, AND / OR graphs, game trees, Connected Components, Bi - connected components.

**Backtracking:** General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

**UNIT V:**

**Branch and Bound:** General method, applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

**NP-Hard and NP-Complete problems:** Basic concepts, non deterministic algorithms, NP - Hard and NPComplete classes, Cook's theorem.

**TEXT BOOKS:**

1. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and Rajasekharam,Galgotia publications pvt. Ltd.

2. Foundations of Algorithm, 4th edition, R. Neapolitan and K. Naimipour, Jones and Bartlett Learning.
3. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, Pearson Education, 2008.

**REFERENCES:**

1. Computer Algorithms, Introduction to Design and Analysis, 3rd Edition, Sara Baase, Allen, Van, Gelder, Pearson Education.
2. Algorithm Design: Foundations, Analysis and Internet examples, M. T. Goodrich and R. Tomassia, John Wiley and sons.
3. Fundamentals of Sequential and Parallel Algorithm, K. A. Berman and J. L. Paul, Cengage Learning.
4. Introduction to the Design and Analysis of Algorithms, A. Levitin, Pearson Education.
5. Introduction to Algorithms, 3rd Edition, T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, PHI Pvt. Ltd.
6. Design and Analysis of algorithm, Aho, Ullman and Hopcroft, Pearson Education, 2004.

**Outcomes:**

- Be able to analyze algorithms and improve the efficiency of algorithms.
- Apply different designing methods for development of algorithms to realistic problems, such as divide and conquer, greedy and etc. Ability to understand and estimate the performance of algorithm.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | 1/-/- | 3 |

## (R17A0509) DATABASE MANAGEMENT SYSTEMS

**Objectives:**

- To understand the basic concepts and the applications of database systems
- To Master the basics of SQL and construct queries using SQL
- To understand the relational database design principles
- To become familiar with the basic issues of transaction processing and concurrency control
- To become familiar with database storage structures and access techniques

**UNIT- I:**

Database System Applications, Purpose of Database Systems, View of Data – Data Abstraction – Instances and Schemas – Data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – Database Users and Administrator – Transaction Management – Database Architecture – Storage Manager – the Query Processor.

Introduction to the Relational Model – Structure – Database Schema, Keys – Schema Diagrams.

Database design and ER diagrams – ER Model - Entities, Attributes and Entity sets – Relationships and Relationship sets – ER Design Issues – Concept Design – Conceptual Design with relevant Examples. Relational Query Languages, Relational Operations.

**UNIT II:**

Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple Relational Calculus (TRC) – Domain relational calculus (DRC).

Overview of the SQL Query Language – Basic Structure of SQL Queries, Set Operations, Aggregate Functions – GROUPBY – HAVING, Nested Sub queries, Views, Triggers, Procedures.

**UNIT III:**

Normalization – Introduction, Non loss decomposition and functional dependencies, First, Second, and third normal forms – dependency preservation, Boyce/Codd normal form.

Higher Normal Forms - Introduction, Multi-valued dependencies and Fourth normal form, Join dependencies and Fifth normal form

**UNIT IV:**

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability- Lock –Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

**UNIT V:**

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Check Points - Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems-ARIES Algorithm, Remote Backup systems.

File organization – various kinds of indexes - B+ Trees- Query Processing – Relational Query Optimization.

**TEXT BOOKS:**

1. Data base System Concepts, Silberschatz, Korth, McGraw hill, Sixth Edition.(All UNITS except III th)
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.

**REFERENCE BOOKS:**

1. Fundamentals of Database Systems, Elmasri Navathe Pearson Education.
2. An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson, Eight Edition for UNIT III.

**Outcomes:**

- Demonstrate the basic elements of a relational database management system
- Ability to identify the data models for relevant problems
- Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data
- Apply normalization for the development of application software's

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

## (R17A0461) DIGITAL LOGIC DESIGN

**Objectives:**

- To understand basic number systems codes and logical gates.
- To introduce the methods for simplifying Boolean expressions
- To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits
- To introduce the concept of memories and programmable logic devices.

**UNIT-I**

**Number System and Boolean Algebra:** Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code, Unit Distance Codes, Error Detecting and Correcting Codes.

Digital Logic Gates (AND,NAND,OR,NOR,EX-OR,EX-NOR),Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

**UNIT-II**

**Minimization Techniques:**

Introduction, The Minimization with theorems, The Karnaugh Map Method, Three ,Four and Five Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Quine- Mccluskey Method, Multilevel NAND/NOR realizations.

**UNIT-III**

**Combinational Circuits:**

Design procedure – Half adder, Full Adder, Half subtractor, Full subtractor, Parallel binary adder, parallel binary Subtractor, Binary Multiplier, Multiplexer/Demultiplexer, decoder, encoder, Code converters, Magnitude Comparator.

**UNIT-IV**

**Sequential circuits:**

Introduction, Basic Architectural Distinctions between Combinational and Sequential circuits, latches, Flip-Flops, SR,JK,D,T and master slave, characteristic tables and equations, Conversion from one type of Flip-Flop to another.

Counters - Design of Single mode Counter, Ripple Counter, Ring Counter, Shift Register, Ring Counter Using Shift Register.

**UNIT-V:**

**Memory Devices:**

Classification of memories – ROM: ROM organization, PROM, EPROM, EEPROM, RAM: RAM organization, Write operation, Read operation, Static RAM, Programmable Logic Devices: Programmable Logic Array (PLA) - Programmable Array Logic, Implementation of combinational logic circuits using ROM, PLA, PAL.

**TEXT BOOKS**

1. M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 /Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
2. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.

**REFERENCES**

1. John F.Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006
2. John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.
3. Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.
4. Donald P.Leach and Albert Paul Malvino, Digital Principles and Applications, 6th Edition, TMH, 2003.
5. William H. Gothmann, Digital Electronics, 2nd Edition, PHI, 1982.
6. Thomas L. Floyd, Digital Fundamentals, 8th Edition, Pearson Education Inc, New Delhi, 2003
7. Donald D.Givone, Digital Principles and Design, TMH, 2003.

**Outcomes:**

- Understand the basic postulates of Boolean algebra and shows the correlation between Boolean expressions
- Learn the methods for simplifying Boolean expressions
- Understand the formal procedures for the analysis and design of combinational circuits and sequential circuits
- Learn the concept of memories and programmable logic devices.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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## (R17A0584) DATABASE MANAGEMENT SYSTEMS LAB

**Objectives:**

Students will have the ability to:

- Keep abreast of current developments to continue their own professional development.
- To engage themselves in lifelong learning of Database management systems theories and technologies this enables them to purse higher studies.
- To interact professionally with colleagues or clients located abroad and the ability to overcome challenges that arises from geographic distance, cultural differences, and multiple languages in the context of computing.
- Develop team spirit, effective work habits, and professional attitude in written and oral forms, towards the development of database applications

**A. Practice on SQL Queries to acquire knowledge on RDBMS.**

**B. Case Study:**

**Objective:** This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database -Roadway travels". Students are expected to use "Mysql" database.

**Roadway Travels:** "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.

The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations
- **Reservations & Cancellation:**

Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family).

Cancellations are also directly handed at the booking office.

In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above Process involves many steps like 1. Analyzing the problem and identifying the Entitites and Relationships, 2. E-R Model, 3. Relational Model 4. Normalization 5. Creating the database 6. Querying. Students are supposed to work on these steps week wise and finally create a complete "Database System" to Roadway Travels. Examples are given at every experiment for guidance to students.

**A. Practice on SQL Queries to acquire knowledge on RDBMS.**

**B. Case Study:**

**Objective:** This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a

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**Experiment 1: E-R Model**

Analyze the problem carefully and come up with the entities in it using software design tool. Identify what data has to be persisted in the database. This contains the entities, attributes etc.

Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example:

**Entities:**

1. B U S
2. Ticket
3. Passenger

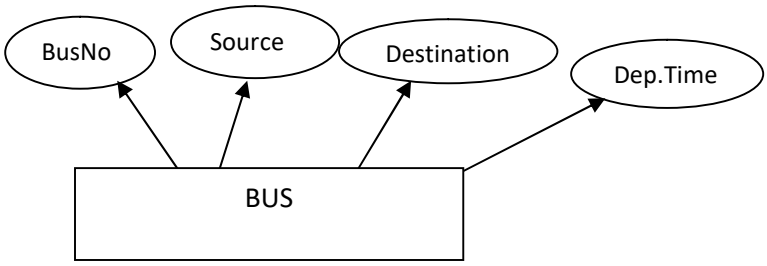
**Relationships:**

1. Reservation
2. Cancellation

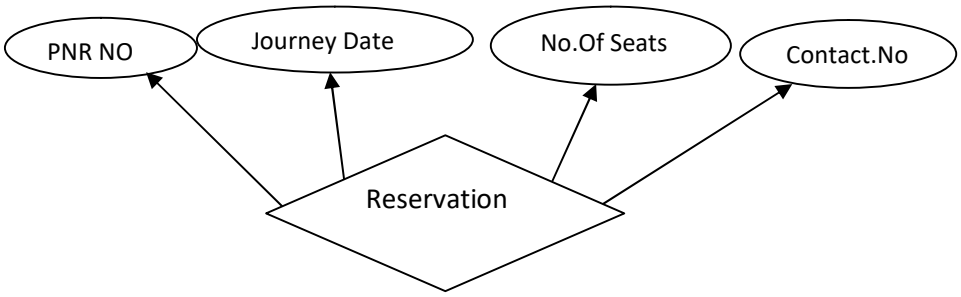
**PRIMARY KEY ATTRIBUTES:**

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO(Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.




Ex: Bus Entity




Ex: Reservation relationship

**Note:** ***The student is required to submit a document by writing the Entities and Keys to the lab teacher***

**Experiment 2: Installation of Mysql and practicing DDL, commands**

Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.

CREATE TABLE Passenger (

Passport_id INTEGER PRIMARY KEY,

Name VARCHAR (50) Not NULL,

Age Integer Not NULL,

Sex Char,

Address VARCHAR (50) Not NULL);

Similarly create all other tables.

**Note: Detailed creation of tables is given at the end.**

**Experiment 3: Practicing DML commands**

DML commands are used to for managing data within schema objects.

Some examples:

- SELECT - retrieve data from the a database
- INSERT - insert data into a table
- UPDATE - updates existing data within a table
- DELETE - deletes all records from a table, the space for

The records remain

**Inserting values into "Bus" table:**

Insert into Bus values(1234,'hyderabad', ‘tirupathi');

Insert into Bus values (2345,’hyderabd’ ‘Banglore’);

Insert into Bus values (23,'hyderabd','Kolkata');

Insert into Bus values (45,'Tirupathi,'Banglore');

Insert into Bus values (34,'hyderabd','Chennai');

**Inserting values into "Passenger" table:**

Insert into Passenger values (1, 45,'ramesh', 45,'M', 'abc123');

Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');

Insert into Passenger values (45, 90,' ram', 30,'M','abc12');

Insert into Passenger values (67, 89,' ravi', 50,'M','abc14');

Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');

**Few more Examples of DML commands:**

Select * from Bus; (selects all the attributes and display)

UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

**Experiment 4: Querying**

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

**Practice the following Queries:**

Display unique PNR_no of all Passengers.

Display all the names of male passengers.

Display the ticket numbers and names of all the passengers.

Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.

Find the names of passengers whose age is between 30 and 45.

Display all the passengers names beginning with 'A'

Display the sorted list of passengers names

**Experiment 5: Aggregate Functions and Number Functions, Nested Query and Co-related Queries**

You are going to practice queries using Aggregate functions and number functions(COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Write a Query to display the Information present in the Passenger and cancellation tables. Hint: Use UNION Operator.

Display the number of days in a week on which the 9W01 bus is available.

Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. Hint: Use GROUP BY on PNR_No.

Find the distinct PNR numbers that are present.

Find the number of tickets booked by a passenger where the number of seats is greater than 1.Hint: Use GROUP BY, WHERE and HAVING CLAUSES.

Find the total number of cancelled seats.

**Nested Query and Co-related Queries**

Use the tables sailors, reserves, boats for implementing the following

Sailors(sid: integer, sname: string, rating: integer, age: real);
Boats(bid: integer, bname: string, color: string);
Reserves(sid: integer, bid: integer, day: date).

a. Find the names of sailors who have reserved boat 103

b. Find the name and the age of the youngest sailor

c. Find the names and ratings of sailor whose rating is better than some sailor called Horatio

d. Find the names of sailors who have reserved all boats

**Experiment 6**: **VIEWS and JOIN**

In this week, we are going to implement views and also perform various operations like alter, update and delete commands.

**View:**

Write a query to execute and verify the SQL commands using Views (Use Employee Table)

(a) Alter (b) Update (c) Delete

**Join:**

Write a query to execute and verify the SQL commands using Join (Use Customer Table)

(a) Inner join, (b).Left join, (c).Right join (d).Full join

**Experiment 7**: **Triggers**

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

**Eg: CREATE TRIGGER updcheck BEFORE UPDATE ON passenger**

**FOR EACH ROW BEGIN**

IF NEW.Tickent N0 > 60 THEN SET New.Tickent no = Ticket no;

ELSE

SET New.Ticket no = 0;

END IF;

END;

**Experiment 8: Procedures**

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

**Eg: CREATE PROCEDURE myProc()**

BEGIN

SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;

End;

**Experiment 9: Cursors**

In this week you need to do the following: Declare a cursor that defines a result set.

Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

CREATE PROCEDURE myProc (in_customer_id INT) B E G I N

DECLARE v_id INT;

DECLARE v_name VARCHAR(30);

DECLARE cl CURSOR FOR SELECT ppno,name FROM Passenger WHERE ppno=in_customer_id;

OPEN cl;

FETCH cl into v_id, v_name;

Close cl;

END;

**Tables**

**BUS**

Bus No: Varchar: PK (Primary key)
Source: Varchar
Destination: Varchar
DeptTime:Varchar

**Passenger**

PPNO: Varchar(15)) : PK
Name: Varchar(15)
Age : int (4)
Sex:Char( I 0) : Male/Female
Address: VarChar(20)

**Passenger_Tickets**

PPNO: Varchar( 15)) : FK Ticket No: Numeric (9)

**Reservation**

PNR_No: Numeric(9) : PK
Journey_date : datetime(8)
No_of_seats : int (8)
Address: Varchar (50)
Contact_No: Numeric (9) —> Should not be less than 9 and Should not accept any other character other than Integer
Status: Char (2) : Yes / No

**Cancellation**

PNR_No:Numeric(9): FK
Journey_date: datetime (8)
No_of_seats : int (8)
Address : Varchar (50)
Contact_No: Numeric (9) —> Should not be less than 9 and should not accept any other character other than Integer
Status: Char (2) : Yes / No

**Ticket**

Ticket_No: Numeric(9): PK
Journey_date : datetime(8)
Age : int (4)
Sex:Char(10) : Male/Female
Source : Varchar
Destination : Varchar
Dep_time : Varchar

**Experiment 10: Normalization**

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

**First Normal Form: The above table can be divided into two tables as shown below.**

Passenger

| Name | Age | Sex | Address | Passport ID |
|---|---|---|---|---|

| Passport_id | Ticket_id |
|---|---|

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

**Experiment 11: PL/SQL Programs**

In this week, you are going to learn and work on PL/SQL procedures.

a. Write a PL/SQL procedure to find the average of marks?
b. Write a PL/SQL procedure to find the factorial of a number?
c. Write a PL/SQL code to calculate tax for an employee of an organization – XYZ and to display his/her name & tax, by creating a table under employee database as below.

Employee_salary Emp_no Basic HRA DA Total_deduction Net_salary Gross_salary

**Experiment 12: Revoke/Grant/Commit/Rollback**

In this week, you need to do the following: Declare a table that defines a result set using revoke, grant, savepoint, commit, rollback operations

Consider the following tables namely “DEPARTMENTS” and “EMPLOYEES”
Their schemas are as follows, Departments ( dept _no , dept_ name , dept_location );
Employees ( emp_id , emp_name , emp_salary );

a. Develop a query to grant all privileges of employees table into departments table
b. Develop a query to grant some privileges of employees table into departments table
c. Develop a query to revoke all privileges of employees table from departments table
d. Develop a query to revoke some privileges of employees table from departments table
e. Write a query to implement the save point
f. Write a query to implement the commit
g.Write a query to implement rollback

**Reference Books:**

1. Introduction to SQL,Rick F.Vander Lans,Pearson education..
2. Oracle PL/SQL, B.Rosenzweig and E.Silvestrova,Pearson education.
3. Oracle PL/SQL Programming,Steven Feuerstein,SPD.
4. SQL & PL/SQL for Oracle 10g,B lack Book, Dr.P.S.Deshpande, Dream Tech.
5. Oracle Database 11g PL/SQL Programming,M.Mc Laughlin,TMH.
6. SQL Fundamentals, J.J.Patrick,Pearson Education.

**Outcomes:**

Students will be able to demonstrate their skills

- In drawing the ER, EER, and UML Diagrams.
- In analyzing the business requirements and producing a viable model for the implementation of the database.
- In converting the entity-relationship diagrams into relational tables.
- To develop appropriate Databases to a given problem that integrates ethical, social, legal, and economic concerns.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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## (R17A0585) JAVA PROGRAMMING LAB

**Objectives:**

- To prepare students to become familiar with the Standard Java technologies of J2SE
- To prepare students to excel in Object Oriented programming and to succeed as a Java Developer through global rigorous education.
- To provide Students with a solid foundation in OOP fundamentals required to solve programming problems and also to learn Advanced Java topics like J2ME, J2EE, JSP, JavaScript
- To train Students with good OOP programming breadth so as to comprehend, analyze, design and create novel products and solutions for the real life problems.
- To inculcate in students professional and ethical attitude, multidisciplinary approach and an ability to relate java programming issues to broader application context.
- To provide student with an academic environment aware of excellence, written ethical codes and guidelines and lifelong learning needed for a successful professional career.

**Week 1**

a) Write a java program that prompts the user for an integer and then printouts all prime numbers up to that integer.

b) Write a java program to multiply two given matrices.

Use Eclipse or Net bean Platform and acquaint with the various menus. Create a test project, and a test class and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.

**Week 2**

Write a java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +,-,*,% operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.

**Week 3**

a) Develop an applet in java that displays a simple message.

b) Develop an applet in Java that receives an integer in one text field, and computes its factorial value and returns it in another text field, when the button named “Compute” is clicked.

**Week 4**

Write a java program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the result field when the Divide button is clicked. If Num1 and Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were zero, the program would throw an arithmetic Exception. Display the exception in a message dialog box.

**Week 5**

Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.

**Week 6**

Write a java program that connects to a database using JDBC and does add,delete, modify and retrieve operations.

**Week 7**

Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow or green with radio buttons. On selecting a button, an appropriate message with "Stop", "Ready" or "Go" should appear above the buttons in selected color. Initially there is no message shown.

**Week 8**

Write a java program to create an abstract class named Shape that contains two integers and an emplty method named printArea().Provide three classes named Rectangle,Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method printArea() that prints the area of the given shape.

**Week 9**

a)Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.

b) Write a java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired.(Use Adapter classes).

**Week 10**

Write a Java Program that loads names and phone numbers from a text file where the data is organized as one line per record and each filed in a record are separated by a tab(\t). It takes a name or phone number as input and prints the corresponding other value from the hash table.(hint: Use hash tables).

**Week 11**

a) Implement the above program with database instead of a text file.

b) Write program how to handle mouse and keyboard events?

**Week 12**

a) Write a program to draw the components using Layout Manager?

b) Write a Java program that takes tab separated data (one record per line) from a text file and inserts them into a database

c) Write a Java Program that prints the meta-data of a given table.

**TEXT BOOK:**

1. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
2. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel, PHI

**REFERENCE BOOKS:**

1. Object Oriented programming through Java, P. Radha Krishna, Universities Press.
2. Thinking in Java, Bruce Eckel, PE
3. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.

**Outcomes:**

Upon successful completion of this course, the students will be able to:

- Able to analyze the necessity for Object Oriented Programming paradigm and over structured programming and become familiar with the fundamental concepts in OOP.
- Demonstrate an ability to design and develop java programs, analyze, and interpret object oriented data and report results.
- Demonstrate an ability to design an object oriented system, AWT components or multithreaded process as per needs and specifications.
- Demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks like console and windows applications both for standalone and Applets programs

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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## (R17A0006) GENDER SENSITIZATION

(An Activity-based Course)

**Objectives:**

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

**Unit-I:**

**UNDERSTANDING GENDER:**

Gender: Why Should We Study It? *(Towards a World of Equals:* Unit -1)

Socialization: Making Women, Making Men *(Towards a World of Equals:* Unit -2)

Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities. Just Relationships: Being Together as Equals *(Towards a World of Equals:* Unit -12)

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Further Reading: Rosa Parks-The Brave Heart.

**Unit — II:**

**GENDER AND BIOLOGY:**

Missing Women: Sex Selection and Its Consequences *(Towards a World of Equals:* Unit -4) Declining Sex Ratio. Demographic Consequences.

Gender Spectrum: Beyond the Binary *(Towards a World of Equals:* Unit -10)

Two or Many? Struggles with Discrimination.

Additional Reading: Our Bodies, Our Health *(Towards a World of Equals:* Unit -13)

**Unit — III:**

**GENDER AND LABOUR:**

Housework: the Invisible Labour *(Towards a World of Equals:* Unit -3)

"My Mother doesn't Work.° 'Share the Load."

Women's Work: Its Politics and Economics *(Towards a World of Equals:* Unit -7)

Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

**Unit — IV:**

**ISSUES OF VIOLENCE:**

Sexual Harassment: Say No! *(Towards a World of Equals:* Unit -6)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: *"Chupulu".* Domestic Violence: Speaking Out *(Towards a World of Equals:* Unit -8)

Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Further Reading: New Forums for Justice. Thinking about Sexual Violence *(Towards a World of Equals:* Unit -11)

Blaming the Victim-"I Fought for my Life...." - Further Reading: The Caste Face of Violence.

**Unit —V:**

**GENDER STUDIES:**

Knowledge: Through the Lens of Gender *(Towards a World of Equals:* Unit -5)

Point of View. Gender and the Structure of Knowledge. Further Reading: Unacknowledged Women Artists of Telangana.

Whose History? Questions for Historians and Others *(Towards a World of Equals:* Unit -9)

Reclaiming a Past. Writing other Histories. Further Reading: Missing Pages from Modern Telangana History.

Essential Reading: All the Units in the Textbook, *"Towards a World of Equals: A Bilingual Textbook on Gender"* written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

**Note**: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

**REFERENCE BOOKS:**


1. Sen, Amartya. More than One Million Women are Missing." New York Review of Books 37.20 (20 December 1990). Print. *'We Were Making History.... Life Stories of Women in the Telangana People's Struggle.* New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." *Women's Studies Journal* (14 November 2012) Available online at: http:// blogs.wsj.com/ India real time/2012/11/14/by —the-numbers-where-Indan-womenwork/>
3. K. Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada http://harpercollins.co.in/BookDetail.asp?Book Code=3732
4. Vimala. "Vantillu (The Kitchen)". *Women Writing in India: 600 BC to the Present. Volume II:* The 20th Century. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.
5. Shatrughna, Veena et al. *Women's Work and its Impact on Child Health and Nutrition,* Hyderabad, National Institute of Nutrition, Indian Council of Medical Research. 1993.
6. Stree Shakti Sanghatana. *"We Were Making History ....' Life Stories of Women in the Telangana People's Struggle.* New Delhi: Kali for Women, 1989.
7. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
8. Jayaprabha, A. "Chupulu (Stares)". *Women Writing in India: 6008C to the Present. Volume II:* The 20th Century Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.
9. Javeed, Shayan and Anupam Manuhaar. Women and Wage Discrimination in India: A Critical Analysis." *International Journal of Humanities and Social Science Invention* 2.4(2013)
10. Gautam, Liela and Gita Ramaswamy. °A 'conversation' between a Daughter and a Mother." *Broadsheet on Contemporary Politics.* Special Issue on *Sexuality and Harassment: Gender Politics on Campus Today.* Ed. Madhumeeta Sinha and Asma Rasheed. Hyderabad: Anveshi Research Center for Women's Studies, 2014.
11. Abdulali Sohaila. "*I Fought For My Life...and* Won."Available online at: http://www.thealternative.in/lifestvle/i-fought-for-my-lifeand-won-sohaila-abdulal/
12. Jeganathan Pradeep, Partha Chatterjee (Ed). *"Community, Gender and Violence Subaltern Studies XI* Permanent Black and Ravi Dayal Publishers, New Delhi, 2000

13. K. Kapadia. The *Violence of Development: The Politics of Identity, Gender and Social Inequalities in India.* London: Zed Books, 2002
14. S. Benhabib. *Situating the Self: Gender, Community, and Postmodernism in Contemporary Ethics,* London: Routledge, 1992
15. Virginia Woolf. *A Room of One's Own.* Oxford: Black Swan. 1992.
16. T. Banuri and M. Mahmood, *Just Development: Beyond Adjustment with a Human Face,* Karachi: Oxford University Press, 1997

**Outcomes:**

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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**OPEN ELECTIVE - I**

## (R17A0451) DIGITAL ELECTRONICS

**OBJECTIVES:**

The main objectives of the course are:

1. To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions.
2. To introduce the methods for simplifying Boolean expressions.
3. To outline the formal procedures for the analysis and design of combinational and sequential circuits.
4. To introduce the concept of memories and programmable logic devices.
5. To illustrate the concept of synchronous and asynchronous sequential circuits.

**UNIT I**

**BINARY SYSTEMS AND LOGIC GATES:**

Binary Systems: The Advantage of Binary, Number Systems, The Use of Binary in Digital Systems,

AND, OR, NOT, NAND, NOR, Exclusive-OR, Exclusive-NOR and Exclusive-NAND implementations of Logic Functions using gates, NAND-NOR implementations.

**UNIT II**

**MINIMIZATION TECHNIQUES:**

Minimization Techniques: Boolean postulates and laws-De-Morgan's Theorem-Principle of Duality-Boolean expression-Minimization of Boolean expressions-Minterm-Maxterm-Sum of Products (SOP)-Product of Sums (POS)-Karnaugh map minimization-Don't care conditions-Quine Mc-Cluskey method of minimization.

**UNIT III**

**COMBINATIONAL CIRCUITS:**

Design Procedure-Half Adder-Full Adder-Half Subtractor-Full Subtractor-Parallel binary adder-Parallel Binary Subtractor-Multiplexer/ Demultiplexer-Decoder-Encoder.

**UNIT IV**

**SEQUENTIAL CIRCUITS:**

Latches, Flip-flops-SR, JK, D, T and Master-Slave-Characteristic table and equation-Application Table-Edge Triggering-Level Triggering-Realization of one flip-flop using other flip-flops-serial adder/subtractor-Asynchronous Counter-Asynchronous Up/Down Counter, Decade counter-Synchronous Counters-Synchronous Up/Down Counters, Decade Counters

**UNIT V**

**MEMORY DEVICES:**

Classification of Memories-ROM_ROM Organization, PROM-EPROM-EEPROM-EAPROM, RAM-RAM Organization-Write operation-Read Operation-Programmable Logic Devices-

Programmable Logic Array (PLA), Programmable Array Logic (PAL)-Implementation of combinational logic circuits suing ROM, PLA, PAL.

**OUTCOMES**

After the completion of the course, the student will be able to:

1. Analyse different methods used for simplification of Boolean expressions
2. Design and implement Combinational and Sequential circuits.
3. Design and implement Synchronous and Asynchronous Sequential Circuits.

**TEXT BOOK:**

1. M Morris Mano, "Digital Design", 4th Edition, Prentice Hall of India PVt., Ltd., 2008/Pearson Education (Singapore) Pvt., Ltd., New Delhi, 2003.
2. Donald P Leach and Albert Paul Malvino, "Digital Principles and Applications", 6th Edition, TMH, 2006.

**REFERENCES:**

1. John F Wakerly. "Digital Design, Fourth Edition, Pearson/PHI, 2008
2. John M Yarbrough, "Digital Logic Applications and Design", Thomson Learning, 2006
3. Charles H Roth, "Fundamentals of Logic Design", 6th Edition, Thomson Learning, 2013
4. Thomas L Floyd, "Digital Fundamentals", 10th Edition, Pearson Education Inc, 2011.
5. Donald D Givone, "Digital Principles and Design", TMH, 2003.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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**OPEN ELECTIVE - I**

## (R17A0251) ELEMENTS OF ELECTRICAL ENGINEERING

**OBJECTIVES:**

1. To introduce the fundamental concepts of electromechanical energy conversion
2. To familiarize the students with the principle of operation, constructional features and operational characteristics of various types of Motors used in the engineering and consumer Industry

**UNIT – I:**

**Electromechanical Energy Conversion:** Electromechanical Energy conversion – forces and torque in magnetic field systems – energy balance – energy and force in a singly excited magnetic field system, determination of magnetic force - co-energy – multi excited magnetic field systems.

**UNIT – II:**

**D.C. Generators & Motors :**

D.C. Generators – Principle of operation – Action of commutator – constructional features – armature windings –– simplex and multiplex windings – use of laminated armature – E. M.F Equation

D.C. Motors**:** Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation. Speed control of DC Motors**:** Armature voltage and field flux control methods. Ward-Leonard system. – protective devices.

**UNIT – III:**

**Single Phase Transformers:**

Single phase transformers-principle of operation-constructional details- types-emf equation-equivalent circuit – operation on no load and on load-phasor diagrams –losses- minimization of hysteresis and eddy current losses-efficiency-all day efficiency-regulation-effect of variations of frequency and supply voltage on iron losses.

**UNIT – IV:**

**Polyphase Induction Motors &Their Speed control**

Polyphase induction motors:construction details of cage and wound rotor machines-production of a rotating magnetic field – principle of operation – rotor emf and rotor frequency –Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation – expressions for maximum torque and starting torque – torque slip characteristic – double cage and deep bar rotors

Speed control:change of frequency; change of poles and methods of consequent poles; cascade connection. injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation

**UNIT – V:**

**Single Phase Motors & Special Machines:** Single phase Motors: Single phase induction motor – Constructional features-Double revolving field theory Equivalent circuit - split-phase motors - Capacitor start Capacitor run motors. Principles of A.C. Series motor-Universal motor, Stepper motor shaded pole motor, Reluctance Motors, Brushless DC motors (Qualitative Treatment only).

**TEXT BOOKS:**

1. Electrical Machines, P.S. Bimbra, Khanna Publishers.
2. Principles of Electrical Machines, V. K. Mehta, Rohit Mehta, S. Chand Publishing.
3. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers.

**REFERENCE BOOKS:**

1. Electric Machines, Mulukutla S. Sarma, Mukesh K. Pathak, Cengage Learning.
2. Fundamentals of Electric Machines, B. R. Gupta, Vandana Singhal, New Age International Publishers.
3. Electric machinery – A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition.
4. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition

**OUTCOMES:**

At the end of the course the student will

1. Have a clear understanding of the materials used and features in the construction of the electrical machines like transformers, DC and AC motors and special purpose motors.
2. Acquire a basic knowledge on the principle of operation of all these machines
3. Have a basic knowledge on the Torque speed relations and the effect of load torque on their performance.
4. Will have fundamental concept on the speed control of the various types of motors.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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**OPEN ELECTIVE - I**

## (R17A0551) DATABASE SYSTEMS

**OBJECTIVES**

1. To understand the basic concepts and the applications of database systems
2. To Master the basics of SQL and construct queries using SQL
3. To understand the relational database design principles
4. To become familiar with the basic issues of transaction processing and concurrency control
5. To become familiar with database storage structures and access techniques

**UNIT I: INTRODUCTION**

**Data- Database**: File Processing System Vs DBMS, History, Characteristic-Three schema Architecture of a database, Functional components of a DBMS.DBMS Languages-Database users and DBA.

**UNIT II: DATABASE DESIGN**

**ER Model:** Objects, Attributes and its Type. Entity set and Relationship set-Design Issues of ER model-Constraints. Keys-primary key, Super key, candidate keys. Introduction to relational model-Tabular, Representation of Various ER Schemas. ER Diagram Notations- Goals of ER Diagram- Weak Entity Set- Views.

**UNIT III: STRUCTURED QUERY LANGUAGE**

**SQL:** Overview, The Form of Basic SQL Query -UNION, INTERSECT, and EXCEPT– join operations: equi join and non equi join-Nested queries - correlated and uncorrelated-Aggregate Functions-Null values.

**UNIT IV: DEPENDENCIES AND NORMAL FORMS**

**Importance of a good schema design,:**- Problems encountered with bad schema designs, Motivation for normal forms- functional dependencies, -Armstrong's axioms for FD's- Closure of a set of FD's,- Minimal covers-Definitions of 1NF,2NF, 3NF and BCNF- Decompositions and desirable properties -

**UNIT V:**

**Transactions:** Transaction concept, transaction state, System log, Commit point, Desirable Properties of a Transaction, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, Testing for serializability**,** Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

**TEXT BOOK:**

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan," Database System Concepts", McGraw-Hill, 6th Edition , 2010.
2. Fundamental of Database Systems, by Elmasri, Navathe, Somayajulu, and Gupta, Pearson Education.

**REFERENCES:**

1. Raghu Ramakrishnan, Johannes Gehrke, "Database Management System", McGraw Hill., 3rd Edition 2007.
2. Elmasri&Navathe,"Fundamentals of Database System," Addison-Wesley Publishing, 5th Edition, 2008.
3. Date.C.J, "An Introduction to Database", Addison-Wesley Pub Co, 8th Edition, 2006.
4. Peter rob, Carlos Coronel, "Database Systems – Design, Implementation, and Management", 9th Edition, Thomson Learning, 2009.

**OUTCOMES:**

1. Demonstrate the basic elements of a relational database management system
2. Ability to identify the data models for relevant problems
3. Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem** **L T/P/D C**

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**OPEN ELECTIVE - I**

## (R17A0351) ELEMENTS OF MECHANICAL ENGINEERING

**OBJECTIVES:**

1. To give an insight to students about the behaviour of materials under external forces.
2. The concept of stress, strain, elasticity etc. as applied to various structures under loading are included.
3. The student able to learn about concept of fluids, turbines and engines.

**UNIT - I**

**Stresses and strains:** kinds of – stress-strains, elasticity and plasticity, Hooks law, stress –strain diagrams, modules of elasticity, Poisson's ratio, linear and volumetric strain, relation between E, N, and K, bars of uniform strength, compound bars and temperature stresses.

**Shear force and bending moment:** Types of supports – loads – Shear force and bending moment for cantilever and simply supported beams without overhanging for all types of loads.

**UNIT - II**

**Theory of simple bending:** simple bending formula, Distribution of Flexural and Shear stress in Beam section – Shear stress formula – Shear stress distribution for some standard sections.

**Thin cylindrical shells:** stress in cylindrical shells due to internal pressures, circumferential stress, longitudinal stress, design of thin cylindrical shells, spherical shells, change in dimension of the shell due to internal pressure, change in volume of the shell due to internal pressure

**Thick Cylinders:** Lame's equation- cylinders subjected to inside and outside pressures Columns and Struts.

**UNIT - III**

**Properties of Fluid** : Stream line , streak line , path line , continuity equation pipes are in series, pipes are in parallel, HGL, TGL , Bernoullis equation .

**Hydraulic pumps and turbines:** working principles and velocity diagrams.

**UNIT - IV**

**Internal combustion engines:** classification of IC engines, basic engine components and nomenclature, working principle of engines, Four strokes and two stroke petrol and diesel engines, comparison of CI and SI engines, comparison of four stroke and two stroke engines, simple problems such as indicated power, brake power, friction power, specific fuel consumption, brake thermal efficiency, indicated thermal efficiency and mechanical efficiency.

**UNIT - V**

**Belts - Ropes and chain:** belt and rope drives, velocity ratio, slip, length of belt , open belt and cross belt drives, ratio of friction tensions, centrifugal tension in a belt, power transmitted by belts and ropes, initial tensions in the belt, simple problems.

**Gear trains:** classification of gears, gear trains velocity ratio, simple, compound –reverted and epicyclic gear trains.

**TEXT BOOKS:**

1. "Strength of Materials and Mechanics of Structures", B.C.Punmia, Standard Publications and distributions, 9 th ed.
2. Thermal Engineering, Ballaney,P.L., Khanna Publishers, 2003 .

3. Theory of Machines , S.S. Rattan , Tata McGraw Hill.
4. Fluid Mechanics and Hydraulic Machinery R.K. Bansal .

**REFERENCE BOOKS:**

1. Thermal Engineering, R.K. Rajput , Laxmi Publications .
2. Theory of Machines, R.S. Khurmi, S. Chand Publications.
3. Fluid Mechanics and Hydraulic Machinery, Modi & Seth.

**OUTCOMES:**

1. The student would be exposed to basic mechanical engineering machinery.
2. The student learned about mechanical components.
3. Student understand about engines and turbines.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem** | **L T/P/D C** | **3 -/-/- 3**

**OPEN ELECTIVE - I**

## (R17A0352) GREEN ENERGY SYSTEMS

**OBJECTIVES:**

1. The course aims to highlight the significance of alternative sources of energy.
2. Green energy systems and processes and provides the theory and working principles of probable sources of renewable and green energy systems that are environmental friendly.

**UNIT-I**

**Introduction:**

**Solar Radiation:** Role and potential of new and renewable sources, the solar energy option, Environmental impact of solar power, structure of the sun, the solar constant, sun-earth relationships, coordinate systems and coordinates of the sun, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data, numerical problems. Photo voltaic energy conversion – types of PV cells, I-V characteristics.

**Solar Energy Collection**: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

**UNIT – II**

**Solar Energy Storage And Applications**: Different methods, sensible, latent heat and stratified storage, solar ponds, solar applications- solar heating/cooling technique, solar distillation and drying, solar cookers, central power tower concept and solar chimney.

**Wind Energy:** Sources and potentials, horizontal and vertical axis windmills, performance characteristics, betz criteria, types of winds, wind data measurement.

**UNIT – III**

**Bio-Mass**: Principles of bio-conversion, anaerobic/aerobic digestion, types of bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, bio fuels, I.C. engine operation and economic aspects.

**Geothermal Energy:** Resources, types of wells, methods of harnessing the energy, potential in India.

**Ocean Energy**: OTEC, Principles of utilization, setting of OTEC plants,thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

**UNIT –IV**

**Energy Efficient Systems: (A) Electrical Systems:** Energy efficient motors, energy efficient lighting and control, selection of luminaire, variable voltage variable frequency drives (adjustable speed drives), controls for HVAC (heating, ventilation and air conditioning), demand site management.

**(B) Mechanical Systems**: Fuel cells- principle, thermodynamic aspects, selection of fuels & working of various types of fuel cells, Environmental friendly and Energy efficient compressors and pumps.

**UNIT-V**

**Energy Efficient Processes:** Environmental impact of the current manufacturing practices and systems, benefits of green manufacturing systems, selection of recyclable and environment friendly materials in manufacturing, design and implementation of efficient and sustainable green production systems with examples like environmental friendly machining, vegetable based cutting fluids, alternate casting and joining techniques, zero waste manufacturing.

**Green Buildings:** Definition, features and benefits. Sustainable site selection and planning of buildings for maximum comfort. Environmental friendly building materials like bamboo, timber, rammed earth, hollow blocks, lime & lime pozzolana cement, agro materials and industrial waste, Ferro cement and Ferro-concrete, alternate roofing systems, paints to reduce heat gain of the buildings. Energy management.

**TEXT BOOKS:**

1. Sukhatme S.P. and J.K.Nayak, Solar Energy – Principles of Thermal Collection and Storage, TMH.
2. Khan B.H., Non-Conventional Energy Resources, Tata McGraw Hill, New Delhi, 2006.
3. Green Manufacturing Processes and Systems, Edited by J. Paulo Davim, Springer 2013.

**REFERENCES:**

1. Alternative Building Materials and Technologies / K.S Jagadeesh, B.V Venkata Rama Reddy and K.S Nanjunda Ra.
2. Principles of Solar Energy / Frank Krieth & John F Kreider.
3. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
4. Renewable Energy Technologies /Ramesh & Kumar /Narosa
5. Renewable Energy Technologies/ G.D Roy

**OUTCOMES:**

1. The student shall understand the principles and working of solar, wind, biomass, geo-thermal, ocean energies.
2. Green energy systems and appreciate their significance in view of their importance in the current scenario and their potential future applications.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**II Year B. Tech CSE - II Sem**

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**OPEN ELECTIVE - I**

## (R17A0051) INTELLECTUAL PROPERTY RIGHTS

**OBJECTIVES:**

1. The objective of this course is to provide the knowledge on International IPR's and to make students efficient to take decisions in Global Corporate.

**Unit-I**

**Introduction:** Intellectual property rights basics, the role and value of IP in international commerce, Issues affecting IP internationally. Agreement on trade related aspects of Intellectual Property Rights. (TRIPS) - Agreement on TRIPS and India.

**Unit-II**

**Parties to IP Rights:** Owner, customer, authorized user, licensee, attorney, protection of the weak and strong, finalizing ownership and use rights.

**Unit-III**

**Ensuring the value of IP:** Ensuring the value of IP at creation stage, after creation stage, precise contractual protection of IP rights. Key issues related to IP internationally. IP rights in international forums. Fundamentals in Country legal systems, generalities. Validity of IP rights locally: specifics.

**Unit-IV**

**Managing IP Rights:** Acquiring IP Rights: letters of instruction, joint collaboration agreement, work made for hire agreement - Protecting IP Rights: non disclosure agreement, cease and desist letter, settlement memorandum. Transferring IP Rights: assignment contract, license agreement, deed of assignment or license agreement, addendum to unrecorded assignment or license.

**Unit-V**

**Remedies** and IPR Evaluation - GATT - WTO - Role of WTO in solving IPR issues.

**REFERENCES:**


- A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2nd Edition.
- Intellectual Property Rights – Heritage, Science, & Society under international treaties – A. Subbian, - Deep & Deep Publications – New Delhi.
- Intellectual Property Rights: N K Acharya: ISBN: 9381849309
- Intellectual Property Rights: C B Raju : ISBN-8183870341
- Intellectual Property : Examples and Explanation – Stephen M McJohn, 2/e, ISBN-13: 978-0735556652
- Intellectual Property Rights in the Global Economy – Keith E Maskus, PIIE, ISBN paper 0-88132-282-2

**OUTCOMES**

1. It allows students how to prepare and protect the Inventions , start up ideas and rights of patents and copy rights etc.,
2. This subject brings awareness to the students the basic legal aspects at present following at Global level.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

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## (R17A0511)Software Engineering

**Objectives:**

- To understand software process models such as waterfall and evolutionary models.
- To understand software requirements and SRS document.
- To understand different software design and architectural styles.
- To understand software testing approaches such as unit testing and integration testing.
- To understand quality control and how to ensure good quality software through quality assurance.

**UNIT - I:**

**Introduction to Software Engineering:** The evolving role of software, Changing Nature of Software, Software myths.

**A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**Process models:** The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

**UNIT - II:**

**Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

**Requirements engineering process:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

**System models:** Context Models, Behavioral models, Data models, Object models, structured methods.

**UNIT - III:**

**Design Engineering:** Design process and Design quality, Design concepts, the design model.

**Creating an architectural design:** Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**Performing User interface design:** Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

**UNIT - IV:**

**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

**Risk management:** Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

**UNIT - V:**

**Quality Management:** Software Quality**,** Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

**TEXT BOOKS :**

1. Software Engineering A practitioner's Approach, Roger S Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering, Ian Sommerville, 7th edition, Pearson education.

**REFERENCE BOOKS :**

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modelling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition 2006.
7. Software Engineering Foundations, Yingux Wang, Auerbach Publications, 2008.
8. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
9. Software Engineering3: Domains, Requirements, and Software Design, D. Bjorner, Springer International Edition.
10. Introduction to Software Engineering, R. J. Leach, CRC Press.

**Outcomes:**

- Ability to identify the minimum requirements for the development of application.
- Ability to develop, maintain, efficient, reliable and cost effective software solutions.
- Ability to critically thinking and evaluate assumptions and arguments.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

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## (R17A0512) Compiler Design

**Objectives:**

• To provide an initial Understanding of language translators, Knowledge of various techniques used in compiler construction and also use of the automated tools available in compilers construction.

**UNIT – I:**

**Language Translation:** Basics, Necessity, Steps involved in atypical language processing system, Types of translators, **Compilers:** Overview and Phases of a Compiler, Pass and Phases of translation, bootstrapping, data structures in compilation

**Lexical Analysis (Scanning):** Functions of Lexical Analyzer, **Specification of tokens:** Regular expressions and Regular grammars for common PL constructs. **Recognition of Tokens:** Finite Automata in recognition and generation of tokens. **Scanner generators:** LEX-Lexical Analyzer Generators. **Syntax Analysis (Parsing) :** Functions of a parser, Classification of parsers. Context free grammars in syntax specification, benefits and usage in compilers.

**UNIT – II:**

**Top down parsing** –Definition, types of top down parsers: Backtracking, Recursive descent, Predictive, LL (1), Preprocessing the grammars to be used in top down parsing, Error recovery, and Limitations. **Bottom up parsing:** Definition, types of bottom up parsing, Handle pruning. Shift Reduce parsing, **LR parsers:** LR(0), SLR, CALR and LALR parsing, Error recovery, Handling ambiguous grammar, **Parser generators:** YACC-yet another compiler compiler. .

**UNIT – III:**

**Semantic analysis:** Attributed grammars, Syntax directed definition and Translation schemes, Type checker: functions, type expressions, type systems, types checking of various constructs.

**Intermediate Code Generation:** Functions, different intermediate code forms- syntax tree, DAG, Polish notation, and Three address codes. Translation of different source language constructs into intermediate code.

**Symbol Tables:** Definition, contents, and formats to represent names in a Symbol table. Different approaches used in the symbol table implementation for block structured and non block structured languages, such as Linear Lists, Self Organized Lists, and Binary trees, Hashing based STs.

**UNIT – IV:**

**Runtime Environment:** Introduction, Activation Trees, Activation Records, Control stacks. Runtime storage organization: Static, Stack and Heap storage allocation. Storage allocation for arrays, strings, and records etc.

**Code optimization:** goals and Considerations for Optimization, Scope of Optimization: Local optimizations, DAGs, Loop optimization, Global Optimizations. Common optimization techniques: Folding, Copy propagation, Common Sub expression eliminations, Code motion, Frequency reduction, Strength reduction etc

**UNIT – V:**

**Control flow** and **Data flow analysis:** Flow graphs, Data flow equations, global optimization: Redundant sub expression elimination, Induction variable eliminations, Live Variable analysis.

**Object code generation:** Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

**TEXT BOOKS:**

1. Compilers, Principle, Techniques, and Tools. – Alfred.V Aho, Monica S.Lam, Ravi Sethi, Jeffrey D. Ullman ; 2nd Edition, Pearson Education.
2. Modern Compiler implementation in C , - Andrew N.Appel Cambridge University Press.

**REFERENCES:**

1. **lex & yacc** , -John R Levine, Tony Mason, Doug Brown; O'reilly.
2. **Compiler Construction**,- LOUDEN, Thomson.
3. Engineering a compiler – Cooper & Linda, Elsevier
4. Modern Compiler Design – Dick Grune, Henry E.Bal, Cariel TH Jacobs, Wiley Dreatech

**Outcomes:**

By the end of the semester, the student will be able to:

- Understand the necessity and types of different language translators in use.
- Apply the techniques and design different components (phases) of a compiler by hand.
- Solve problems, Write Algorithms, Programs and test them for the results.
- Use the tools Lex, Yacc in compiler construction.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

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## (R17A0513) Operating Systems

**Objectives:**

- To understand main components of OS and their working
- To study the operations performed by OS as a resource manager
- To understand the different scheduling policies of OS
- To understand the different memory management techniques
- To understand process concurrency and synchronization
- To understand the concepts of input/ output, storage and file management
- To study different OS and compare their features.

**UNIT - I:**

**Operating System Introduction:** Operating Systems Objectives and functions, Computer System Architecture, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Special - Purpose Systems, Operating System services, user OS Interface, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, OS Structure, Virtual machines.

**UNIT - II:**

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Threads, Process Scheduling - Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Dispatcher, Scheduling Criteria, Scheduling algorithms, Multiple-Processor Scheduling, Real-Time Scheduling, Thread scheduling, Case studies: Linux, Windows.
Process Coordination - Process Synchronization, The Critical section Problem, Peterson's solution, Synchronization Hardware, Semaphores, and Classic Problems of Synchronization, Monitors, Case Studies: Linux, Windows.

**UNIT - III:**

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement - Page Replacement Algorithms, Allocation of Frames, Thrashing.

**UNIT - IV:**

File System Interface - The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance.
Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap space Management.

**UNIT - V:**

Deadlocks - System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

**Protection** - System Protection, Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.

**TEXT BOOKS:**

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

**REFERENCES BOOKS:**

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
6. Operating Systems, S, Haldar and A. A. Arvind, Pearson Education.
7. Operating Systems, R. Elmasri, A. G. Carrick and D. Levine, Mc Graw Hill.
8. Operating Systems in depth, T. W. Doeppner, Wiley.

**Outcomes:**

- Apply optimization techniques for the improvement of system performance.
- Ability to understand the synchronous and asynchronous communication mechanisms in their respective OS.
- Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput with keeping CPU as busy as possible.
- Ability to compare the different OS

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

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## (R17A0514) Computer Networks

**Objectives:**

- To introduce the fundamental types of computer networks.
- To demonstrate the TCP/IP & OSI model merits & demerits.
- To know the role of various protocols in Networking.

**UNIT - I:**

**Introduction:** Network, Uses of Networks, Types of Networks, Reference Models: TCP/IP Model, The OSI Model, Comparison of the OSI and TCP/IP reference model. Architecture of Internet.

**Physical Layer:** Guided transmission media, Wireless transmission media, Switching

**UNIT - II:**

**Data Link Layer -** Design issues, Error Detection & Correction, Elementary Data Link Layer Protocols, Sliding window protocols

**Multiple Access Protocols -** ALOHA, CSMA,CSMA/CD, CSMA/CA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, Data link layer switching: Use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

**UNIT - III:**

**Network Layer:** Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Count to Infinity Problem, Link State Routing, Path Vector Routing, Hierarchical Routing; Congestion control algorithms,

IP addresses, CIDR, Subnetting, SuperNetting, IPv4, Packet Fragmentation, IPv6 Protocol, Transition from IPv4 to IPv6, ARP, RARP.

**UNIT - IV:**

**Transport Layer:** Services provided to the upper layers elements of transport protocol-addressing connection establishment, Connection release, Error Control & Flow Control, Crash Recovery.

The Internet Transport Protocols: UDP, Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Sliding Window, The TCP Congestion Control Algorithm.

**UNIT - V:** Application Layer- Introduction, providing services, Applications layer paradigms: Client server model, HTTP, E-mail, WWW, TELNET, DNS; RSA algorithm,

**TEXT BOOKS:**

1. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.
2. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.

**REFERENCES BOOKS:**

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Education.

**Outcomes:**

- Students should be understand and explore the basics of Computer Networks and Various Protocols. Student will be in a position to understand the World Wide Web concepts.
- Students will be in a position to administrate a network and flow of information further Student can understand easily the concepts of network security, Mobile, and ad hoc networks.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

| L | T/P/D | C |
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**CORE ELECTIVE – I**

## (R17A0515) Advanced Computer Architecture

**Objectives:**

- To learn the fundamental aspects of computer architecture design and analysis.
- The course focuses on processor design, pipelining, superscalar, out-of-order execution, caches (memory hierarchies), virtual memory, storage systems, and simulation technique

**Unit – I**

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

**Unit – II**

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

**Unit – III**

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP,ILP software approach- compiler techniques- static branch protection – VLIW approach – H.W support for more ILP at compile time- H.W verses S.W Solutions

**Unit – IV**

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM. Multiprocessors and thread level parallelism-symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

**Unit – V**

Storage systems- Types – Buses – RAID- errors and failures- bench marking a storage device-designing a I/O system. Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

**TEXT BOOK:**

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

**REFERENCES:**

1. "Computer Architecture and parallel Processing" Kai Hwang and A. Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
3. Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier

**Outcomes:**

- Will know about computer performance, instruction set architecture design and implementation
- Will know about und processor implementation alternatives (single- cycle, multiple-cycle, and pipelined implementations)

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

**CORE ELECTIVE – I**

## (R17A0516) Distributed Data Bases

**Objectives:**

The aim of the course is to

- Enhance the previous knowledge of database systems by deepening the understanding of the theoretical and practical aspects of the database technologies, and showing the need for distributed database technology to tackle deficiencies of the centralized database systems;
- Introduce basic principles and implementation techniques of distributed database systems
- Expose active and emerging research issues in distributed database systems and application development
- Apply theory to practice by building and delivering a distributed database query engine, subject to remote Web service calls.

**UNIT – I**

Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases. Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

**UNIT – II**

Optimization of Access Strategies, a Framework for Query Optimization, Join Queries, General Queries. The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions. Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, and Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

**UNIT –III**

Reliability, Basic Concepts, No blocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

**UNIT –IV**

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

**UNIT –V**

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

**TEXT BOOKS:**

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

**REFERENCES:**

1. An Introduction to Database Systems, C. J. Date, 8$^{th}$ Edition, Addison-Wesley, 2003, PP. 651 - 660

**Outcomes:**

After the completion of the course, the students are expected to

- Get familiar with the currently available models, technologies for and approaches to building distributed database systems and services;
- Have developed practical skills in the use of these models and approaches to be able to select and apply the appropriate methods for a particular case;
- Be aware of the current research directions in the field and their possible outcomes; 4) be able to carry out research on a relevant topic, identify primary references, analyze them, and come up with meaningful conclusions;
- Be able to apply learned skills in solving practical database related tasks.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

**CORE ELECTIVE – I**

## (R17A0517) Computer Graphics

**Objectives:**

- To make students understand about fundamentals of Graphics to enable them to design animated scenes for virtual object creations.
- To make the student present the content graphically.

**UNIT-I:**

**Introduction:** Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

**Output primitives**: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

**UNIT-II:**

**2-D geometrical transforms**: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems

**2-D viewing** : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm

**UNIT-III:**

**3-D object representation** : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

**3-D Geometric transformations**: Translation, rotation, scaling, reflection and shear transformations, composite transformations.3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

**UNIT-IV:**

**Visible surface detection methods**: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

**UNIT-V:**

**Computer animation**: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

**TEXT BOOKS:**

1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker, Pearson Education
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

**REFERENCES:**

1. Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. rocedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

**Outcomes:**

- Students can animate scenes entertainment.
- Will be able to work in computer aided design for content presentation..
- Better analogy data with pictorial representation.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem** **L T/P/D C**

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**OPEN ELECTIVE – II**

## (R17A0452) Industrial Electronics

**COURSE OBJECTIVES:**

1. To get an overview of semi-conductor devices (such as PN junction diode & Transistor) and their switching characteristics.
2. To understand the characteristics of AC to DC converters.
3. To understand about the practical applications Electronics in industries.

**UNIT I**

Scope of industrial Electronics, Semiconductors, Merits of semiconductors, crystalline structure, Intrinsic semiconductors, Extrinsic semiconductors, current flow in semiconductor, Open-circuited p-n junction, Diode resistance, Zener diode, Photoconductors and junction photo diodes, Photo voltaic effect, Light emitting diodes (LED)

**UNIT II**

Introduction, The junction transistor, Conventions for polarities of voltages and currents, Open circuited transistor, Transistor biased in the active region, Current components in transistors, Currents in a transistor, Emitter efficiency, Transport factor and transistor-α, Dynamic emitter resistance, Transistor as an amplifier, Transistor construction, Letter symbols for semiconductor Devices, Characteristic curves of junction transistor in common configuration, static characteristic curves of PNP junction transistor in common emitter configuration, The transistor in common collector Configuration.

**UNIT III**

AC to DC converters- Introduction, Classification of Rectifiers, Half wave Rectifiers, Full wave Rectifiers, Comparison of Half wave and full wave rectifiers, Bridge Rectifiers, Bridge Rectifier meter, Voltage multiplying Rectifier circuits, Capacitor filter, LC Filter, Metal Rectifiers, Regulated Power Supplies, Classification of Voltage Regulators, Short period Accuracy of Regulators, Long period .Accuracy of Voltage Regulator, Principle of automatic voltage Regulator, Simple D.C. Voltage stabilizer using Zener diode, D.C. Voltage Regulators, Series Voltage Regulators, Complete series voltage regulator circuit, Simple series voltage regulator.

**UNIT IV**

**Resistance welding controls:** Introduction, Resistance welding process, Basic Circuit for A.C. resistance welding, Types of Resistance welding, Electronic welding control used in Resistance welding, Energy storage welding. **Induction heating:** Principle of induction heating, Theory of Induction heating merits of induction heating, Application of induction heating, High frequency power source of induction heating. **Dielectric heating**: Principle of dielectric heating, theory of dielectric heating, dielectric properties of typical materials, electrodes used in dielectric heating, method of coupling of electrodes to the R.F. generator, Thermal losses in Dielectric heating, Applications.

**UNIT V :**

**Ultrasonics:** Introduction, Generation of Ultrasonic waves, Application of Ultrasonic waves, Ultrasonic stroboscope, ultrasonic as means of communication, ultrasonic flaw detection, Optical image on non-homogeneities, ultrasonic study of structure of matter, Dispersive study of structure of matter, Dispersive and colloidal effect of Ultrasonic, Coagulating action of Ultrasonic, separation of mixtures by ultrasoni8c waves, cutting and machining of hard

materials by ultrasonic vibrations, Degassing of liquids by ultrasonic waves, Physico-chemical effects of ultrasonics, chemical effects of ultrasonics, Thermal effects of Ultrasonics, soldering and welding by ultrasonics, Ultrasonic Drying

**TEXT BOOKS:**

1. G. K. Mithal, "Industrial Electronics", Khanna Publishers, Delhi, 2000.
2. J.Gnanavadivel, R.Dhanasekaran, P.Maruthupandi, "Industrial Electronics", Anuradha Publications, 2011.

**REFERENCE BOOKS:**

1. F. D. Petruzulla, "Industrial Electronics", McGraw Hill, Singapore, 1996.
2. M. H. Rashid, "power Electronics Circuits, Devices and Application", PHI, 3rd edition, 2004.
3. G. M. Chute and R. D. Chute, "Electronics in Industry", McGraw Hill Ltd, Tokyo, 1995.

**COURSE OUTCOMES**

After completion of the course the students will be able to

1. Get an overview of semi-conductor devices (such as PN junction diode & Transistor) and their switching characteristics.
2. Understand the characteristics of AC to DC converters.
3. Understand about the practical applications Electronics in industries.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

| III Year B.Tech. I Sem | L | T/P/D | C |
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## OPEN ELECTIVE II
## (R17A0453) COMMUNICATION NETWORKS

**COURSE OBJECTIVES**

1. To understand the concept of computer communication.
2. To learn about the networking concept, layered protocols.
3. To understand various communications concepts.
4. To get the knowledge of various networking equipment.

**UNIT – I: Overview of Computer Communications and Networking:** Introduction to Computer Communications and Networking, Introduction to Computer Network, Types of Computer Networks, Network Addressing, Routing, Reliability, Interoperability and Security, Network Standards, The Telephone System and Data Communications.

**UNIT – II: Essential Terms and Concepts:** Computer Applications and application protocols, Computer Communications and Networking models, Communication Service Methods and data transmission modes, analog and Digital Communications , Speed and capacity of a Communication Channel, Multiplexing and switching, Network architecture and the OSI reference model.

**UNIT – III: Analog and Digital Communication Concepts:** Representing data as analog signals, representing data as digital signals, data rate and bandwidth reduction, Digital Carrier Systems.

**UNIT – IV: Physical and Data Link Layer Concepts:** The Physical and Electrical Characteristics of wire, copper media, fiber optic media, Wireless communications. Introduction to data link layer, logical link control and medium access control sub-layers.

**UNIT – V: Network Hardware Components:** Introduction to Connectors, Transreceivers and media convertors, repeaters, network interference cards and PC cards, bridges, switches, Switches vs Routers.

**TEXT BOOKS:**

1. Computer Communications and Networking Technologies, Michel A.Gallo and William H.Hancock, Thomson Brooks/Cole.
2. Data Communications and Networking – Behrouz A Forouzan, Fourth Edition, McGraw Hill Education, 2006.

**REFERENCE BOOKS:**

1. Principles of Computer Networks and Communications, M Barry Dumas, Morris Schwartz, Pearson.
2. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose, K W Ross, 3rd Edition, Pearson Education.

**COURSE OUTCOMES**

1. The student can get the knowledge of networking of computers, data transmission between computers.
2. Will have the exposure about the various communication concepts.
3. Will get awareness about the structure and equipment of computer network structures.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

| III Year B.Tech. I Sem | L | T/P/D | C |
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## OPEN ELECTIVE II

## (R17A0552) INTRODUCTION TO JAVA PROGRAMMING

**COURSE OBJECTIVES:**

This subject aims to introduce students to the Java programming language. Upon successful completion of this subject, students should be able

1) to create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism;
2) use data types, arrays and strings;
3) implement error-handling techniques using exception handling,
4) create and event-driven GUI using AWT components.

**UNIT I: OOP Concepts:** Data abstraction, encapsulation, inheritance, Polymorphism, classes and objects, Procedural and object oriented programming paradigms.

**Java Basics** History of Java, Java buzzwords, data types, variables, constants, scope and life time of variables, operators, expressions, control statements, type conversion and casting, simple java programs, concepts of classes, objects, arrays, strings, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, BufferedReader class, Scanner class, StringTokenizer class, inner class.

**UNIT II: Inheritance** – Types of Inheritance, super keyword, and preventing inheritance: final classes and methods.

**Polymorphism –** Dynamic binding, method overriding, abstract classes and methods.

**Interfaces-** Interfaces Vs Abstract classes, defining an interface, implement interfaces, extending interface.

**Packages-** Defining, creating and accessing a package, importing packages.

**UNIT III: Exception handling** - Concepts of exception handling, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, checked exceptions and unchecked exceptions, built in exceptions.

**Multi threading**: Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, inter thread communication.

**UNIT IV: Applets** – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

**Event Handling:** Events, Handling mouse and keyboard events, Adapter classes.

**Files-** Streams- Byte streams, Character streams, Text input/output.

**UNIT V: GUI Programming with Java** – AWT class hierarchy, component, container, panel, window, frame, graphics.

**AWT controls:** Labels, button, text field, check box, and graphics.

**Layout Manager –** Layout manager types: border, grid and flow.

**Swing** – Introduction, limitations of AWT, Swing vs AWT.

**TEXT BOOKS:**

1. Java- the complete reference, 7th editon, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, pearson eduction.
3. Core Java an integrated approach, dreamtech publication, Dr. R.Nageswara Rao.

**REFERENCE BOOKS:**

5. Java for Programmers, P.J.Deitel and H.M.Deitel, PEA (or) Java: How to Program , P.J.Deitel and H.M.Deitel, PHI
6. Object Oriented Programming through Java, P. Radha Krishna, Universities Press.
7. Thinking in Java, Bruce Eckel, PE
8. Programming in Java, S. Malhotra and S. Choudhary, Oxford Universities Press.

**COURSE OUTCOMES:**

1) An understanding of the principles and practice of object oriented programming and design in the construction of robust, maintainable programs which satisfy their requirements;
2) A competence to design, write, compile, test and execute straightforward programs using a high level language;
3) An appreciation of the principles of object oriented programming;
4) An awareness of the need for a professional approach to design and the importance of good documentation to the finished programs.
5) Be able to implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
6) Be able to make use of members of classes found in the Java API.
7) Demonstrate the ability to employ various types of selection constructs in a Java program. Be able to employ a hierarchy of Java classes to provide a solution to a given set of requirements.
8) Able to develop applications using Applet, awt and GUI Programming.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**III Year B.Tech. I Sem**

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## OPEN ELECTIVE II
## (R17A01251) INTRODUCTION TO SCRIPTING LANGUAGES

**COURSE OBJECTIVES:**

1) Learning the basics of scripting languages like PERL, JAVASCRIPT, PYTHON
2) Understanding the requirements and uses of Scripting.
3) In-depth knowledge of programming features of Perl and Python.
4) Knowing the implementation model for scripting and design of applications.

**UNIT I**

**Introduction** to PERL and Scripting Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

**UNIT II**

**HTML:** HTML basics, Elements, Attributes and Tags, Basic Tags, Advanced Tags, Frames, Images.
**Cascading style sheets:** Adding CSS, CSS and page layout.
**JavaScript:** Introduction, Variables, Literals, Operators, Control structure, Conditional statements, Arrays, Functions, Objects, Predefined objects, Object hierarchy, Accessing objects.

**UNIT III**

**JavaScript programming of reactive web pages elements:** Events, Event handlers, multiple windows and Frames, Form object and Element, Advanced JavaScript and HTML, Data entry and Validation, Tables and Forms.
**Introduction to Python Programming:** History of Python, Need of Python Programming, Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation, Types - Integers, Strings, Booleans.

**UNIT IV**

**Operators and Expressions(Java Script):** Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations.

**UNIT V**

**Control Flow(Java Script)** - if, if-else, for, while, break, continue, **pass Functions(Java Script)** - Defining Functions, Calling Functions, Passing Arguments, Default Arguments, Variable-length arguments, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. Development of sample scripts and web applications.

**TEXT BOOKS:**

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Learning Python, Mark Lutz, Orielly
3. Web Programming, building internet applications, Chris Bates 2nd Edition, WILEY
4. Beginning JavaScript with Dom scripting and AJAX, Russ Ferguson, Christian Heilmann, Apress.
5. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.

**REFERENCES:**

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python, M.Lutz, SPD.
3. Core Python Programming, Chun, Pearson Education.
4. Guide to Programming with Python, M.Dawson, Cengage Learning.
5. Perl by Example, E.Quigley, Pearson Education.
6. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD.

**COURSE OUTCOMES:**

1. Analyze the differences between typical scripting languages and application programming languages.
2. Application of knowledge of scripting languages to design programs for simple applications.
3. Create software systems using scripting languages, including Perl and Python.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

| III Year B.Tech. I Sem | L | T/P/D | C |
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## OPEN ELECTIVE II

## (R17A01252) SOFTWARE PROJECT MANAGEMENT

**COURSE OBJECTIVES:**

The Main goal of software development projects is to create a software system with a predetermined functionality and quality in a given time frame and with given costs. For achieving this goal, models are required for determining target values and for continuously controlling these values. This course focuses on principles, techniques, methods & tools for model-based management of software projects, assurance of product quality and process adherence (quality assurance), as well as experience - based creation & improvement of models (process management).

The Objectives of the course can be characterized as follows:

1) Understanding the specific roles within a software organization as related to project and process management
2) Understanding the basic infrastructure competences (e.g., process modeling and measurement)
3) Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships

**UNIT-I**

Conventional Software Management: The 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**

Conventional And Modern Software Management: Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an interactive Process, Life Cycle Phases: Engineering and Production Stages Inception, Elaboration, Construction, Transition phases .

**UNIT-III**

Artifacts of the Process: The Artifact Sets. Management Artifacts, Engineering Artifacts, Programmatic Artifacts. Model Based Software Architectures: A Management Perspective and Technical Perspective.

**UNIT-IV**

Flows of the Process: Software Process Workflows. Inter Trans Workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic Status Assessments. Interactive Process Planning: Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Interaction Planning Process, Pragmatic Planning.

**UNIT-V**

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, and Evolution of Organizations. Process Automation Building Blocks, the Project Environment. Project Control and Process Instrumentation: Server Care Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software Metrics Automation.

**Text Books:**

1. Walker Royce, “Software Project Management”, 1998, PEA.
2. Henry, “Software Project Management”, Pearson.

**Reference Books:**

1. Richard H.Thayer.” Software Engineering Project Management”, 1997, IEEE Computer Society.
2. Shere K.D.: “Software Engineering and Management”, 1998, PHI.
3. S.A. Kelkar, “Software Project Management: A Concise Study”, PHI.
4. Hughes Cotterell, “Software Project Management”, 2e, TMH. 88 5. Kaeron Conway, “Software Project Management from Concept to D

**COURSE OUTCOMES:**

At the end of the course, the student shall be able to:

1) Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project
2) Compare and differentiate organization structures and project structures.
3) Implement a project to manage project schedule, expenses and resource with the application of suitable project management tools

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

| III Year B.Tech. I Sem | L | T/P/D | C |
|---|---|---|---|
| | 3 | -/-/- | 3 |

## OPEN ELECTIVE II

## (R17A0353) ENTERPRISE RESOURCE PLANNING

**COURSE OBJECTIVES**

1) To know the basics of ERP
2) To understand the key implementation of ERP
3) To know the business modules of ERP
4) To evaluate the current and future trends in ERP

**UNIT 1**

**INTRODUCTION:** Overview and Benefits of ERP, ERP Related Technologies- Business Process Reengineering (BPR), Online Analytical Processing (OLAP), Supply chain Management (SCM). Applications of ERP.

**UNIT II**

**ERP IMPLEMENTATION:** Implementation and Product Lifecycle, Implementation Methodology, Planning Evaluation and selection of ERP systems, Organizing the Project Management and Monitoring. Case Study on Manufacturing.

**UNIT III**

**ERP MODULES:** Business modules in an ERP Package- Manufacturing, Human Resources, Plant Maintenance, Materials Management, Data Warehousing, Data Mining, Quality Management, Sales and Distribution. Case Study in Banking Sector.

**UNIT IV**

**POST IMPLEMENTATION:** Overview of ERP software solution. Maintenance of ERP-Organizational and Industrial impact; Success and Failure factors of ERP Implementation. Case Study of Success Story and Failure of Processing Sector.

**UNIT V**

**EMERGING TRENDS IN ERP:** Extended ERP system, ERP add–ons –Customer Relations Management (CRM), Customer satisfaction (CS). Business analytics etc- Future trends in ERP systems-web enabled, Wireless technologies. Case Study in Service Sector.

**TEXT BOOKS:**

1. Jagan Nathan Vaman, ERP in Practice, Tata McGraw-Hill, 2008
2. Alexis Leon, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000
3. Mahadeo Jaiswal and Ganesh Vanapalli, ERP Macmillan India, 2009.

**REFERENCE BOOKS**:

1. Alexis Leon, Enterprise Resource Planning, second edition, Tata McGraw-Hill, 2008.
2. Vinod Kumar Grag and N.K. Venkitakrishnan, ERP- Concepts and Practice, Prentice Hall of India,2 nd edition, 2006.
3. Joseph A Brady, Ellen F Monk, Bret Wagner, “Concepts in Enterprise Resource Planning”, Thompson Course Technology, USA, 2001.

**Course Outcomes:**

1) To know the strategic importance of Enterprise Resource Planning
2) To Understand and implement ERP in various Sectors.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem** **L T/P/D C**

**- -/3/- 2**

## (R17A0586) Compiler Design Lab

**Objectives:**

- To provide an Understanding of the language translation peculiarities by designing complete translator for an abstract mini language whose syntax by BNF notation in following lines.

**SOURCE (MINI) LANGUAGE ( A Case Stdudy)**

Consider the following mini language, a simple procedural High Level Language, operating on integer data with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar:

<program> ::= <block>
<block> ::= { <variable definition> <slist> }
| { <slist> }
<variable definition> ::= int <vardeflist> ;
<vardeflist> ::= <vardec> | <vardec>, <vardeflist>
<vardec> ::= <identifier> | <identifier> [<constant>]
<slist> ::= <statement> |<statement> ; <slist>
<statement> ::= <assignment> | <ifstatement> | <whilestatement> | <block>
| <printstatement> | <empty>
<assignment> ::= < identifier> = <expression>
| <identifier> [<expression>] = [<expression>
<ifstatement> ::= if <bexpression> then <slist> else <slist> endif
| if <bexpression> then <slist> endif
<whilestatement> ::= while <bexpression> do <slist> enddo
<printstatement> ::= print{ <expression> }
<expression> ::= <expression> <addingop> <term> | <term> | <addingop> <term>
<bexpression> ::= <expression> <relop> <expression>
<relop> ::= < | <= | = = | >= | > |!=
<addingop> ::= + | -
<term> ::= <term> <multop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> |<identifier> [<expression>
| (<expression>)
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= a|b|c|….|y|z
<digit> ::= 0|1|2|3|…|8|9
<empty> ::= has the obvious meaning

Comments : zero or more characters enclosed between the standard C/Java style comment brockets /*…*/. The language has the rudimentary support for 1-Dimensional arrays. Ex: int a[3] declares a as an array of 3 elements, referenced as a[0],a[1],a[2].

**Sample Program written in this language is :**

```
{
 int a[3],t1,t2;
t1=2;
a[0]=1; a[1]=2; a[t1]=3;
t2= -(a[2]+t1*6) / a[2]-t1);
if t2>5 then
print(t2);
else
 {
  int t3;
  t3=99;
  t2=25;
   print(-11+t2*t3);  /* this is not a comment on two lines */
}
 endif
}
```

1. Write a C Program to scan and count the number of characters, words, and line of a file.
2. Write a program for implementation of NFAs that recognize identifiers, constants, and operators of the mini language.
3. Write a program for the implementation of DFAs that recognize identifiers, constants, and operators of the mini language.
4. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
5. Implement the lexical analyzer using JLex, flex, flex or lex or other lexical analyzer generating tools.
6. Design Predictive parser for the given language.
7. Design LALR bottom up parser for the above language.
8. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree or Three Address code.
9. Write program to generate machine code from the abstract syntax tree generated by the parser. The following instruction set may be considered as target code.

The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below.

In the description of the individual instructions below, instruction argument types are specified as follows:

R specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc).
L specifies a numerical label (in the range 1 to 9999).

V specifies a "variable location" (a variable number, or a variable location pointed to by a register - see below).

A specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a # symbol. An indirect address is specified by an @ followed by a register.

So, for example an A-type argument could have the form 4 (variable number 4), #4 (the constant value 4), r4 (register 4) or @r4 (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:
LOAD A, R : Loads the integer value specified by A into register R.
STORE R, V : Stores the value in register R to variable V.
OUT R : Outputs the value in register R.
NEG R : Negates the value in register R.
ADD A, R : Adds the value specified by A to register R, leaving the result in register R.
SUB A, R : Subtracts the value specified by A from register R, leaving the result in register R.
MUL A, R : Multiplies the value specified by A by register R, leaving the result in register R.
DIV A, R : Divides register R by the value specified by A, leaving the result in register R.
JMP L : Causes an unconditional jump to the instruction with the label L.
JEQ R, L : Jumps to the instruction with the label L if the value in register R is zero.
JNE R, L : Jumps to the instruction with the label L if the value in register R is not zero.
JGE R, L : Jumps to the instruction with the label L if the value in register R is greater than or equal to zero.
JGT R, L : Jumps to the instruction with the label L if the value in register R is greater than zero.
JLE R, L : Jumps to the instruction with the label L if the value in register R is less than or equal to zero.
JLT R, L : Jumps to the instruction with the label L if the value in register R is less than zero.
NOP : Is an instruction with no effect. It can be tagged by a label.
STOP : Stops execution of the machine. All programs should terminate by executing a STOP instruction.

**RECOMMENDED SYSTEM / SOFTWARE REQUIREMENTS:**

1. Intel based desktop PC with minimum of 166MHz or faster processor with at least 64 MB RAM and 100 MB free disk space.
2. C ++ Compiler and JDK kit, Lex or Flex and YACC tools ( Unix/Linux utilities )

**USEFUL TEXT BOOKS / REFERECES / WEBSITES :**

1. Modern compiler implementation in C, Andrew w.Appel, Revised Edn, Cambridge University Press
2. Principles of Compiler Design. – A.V Aho, J.D Ullman ; Pearson Education.
3. **lex&yacc** , -John R Levine, Tony Mason, Doug Brown; O'reilly.
4. **Compiler Construction**,- LOUDEN, Thomson.
5. Engineering a compiler – Cooper& Linda, Elsevier
6. Modern Compiler Design – Dick Grune,Henry E.Bal, Cariel TH Jacobs, Wiley Dreatech

**Outcomes:**

By the end of the semester the student will be able to

- Understand the practical approach of how a compiler is designed.
- Apply the techniques used in compiler construction.
- Construct components(few phase) of the compiler for the mini language

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem** **L T/P/D C**

**- -/3/- 2**

## (R17A0587) Computer Networks & Operating Systems Lab

**Objectives:**

- To understand the functionalities of various layers of OSI model
- To explain the difference between hardware, software; operating systems, programs and files.
- Identify the purpose of different software applications.

**Part A:**

1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate MVT and MFT
3. Simulate all page replacement algorithms
   a) FIFO b) LRU c) LFU
4. Simulate all File Organization Techniques
   a) Single level directory b) Two level
5. Simulate all file allocation strategies
   a) Sequential b) Indexed c) Linked
6. Simulate Bankers Algorithm for Dead Lock Avoidance

**Part B:**

1. Implement the data link layer framing methods such as character, character stuffing and bitstuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP
3. Implement Dijkstra's algorithm to compute the Shortest path through a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
5. Take an example subnet of hosts . Obtain broadcast tree for it.
6. Using RSA algorithm Encrypt a text data and Decrypt the same.

**Outcomes:**

The student will have the ability to:

- Understand fundamental underlying principles of computer networking.
- Understand details and functionality of layered network architecture.
- Apply mathematical foundations to solve computational problems in computer networking.
- Describe and demonstrate the functions and features of current operating systems Demonstrate proficiency in common industry software applications (word processing, spreadsheet, presentation, and database) to effectively communicate in a professional business setting
- Demonstrate skills that meet industry standards and certification requirements in the use of system hardware, operating systems technologies, and application systems.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - I Sem** **L T/P/D C**

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## (R17A0007) Technical Communication and Soft Skills

**INTRODUCTION:**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

**Objectives:**

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to approach academic subjects more professionally using the theoretical and practical components of the English syllabus.
- To develop the professional skills and communication skills in formal and informal situations and hone the required professional ethics.

**Unit- 1:**Factors affecting information and document design, Principles of effective writing , Technical Writing, Grammar and Editing- Technical writing process, Writing drafts and revising, Collaborative writing, technical writing style and language.

**Unit- 2:** Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication.

**Unit-3:** Communication and Technical Writing- Public speaking, Group discussion, Oral; presentation, Interviews, Graphic presentation, Presentation aids. Writing reports, Email writing, official notes, business letters, memos, progress reports, minutes of meetings, event report.

**Unit- 4:** Self Development and Assessment- Self assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, career planning, self esteem.

**Unit- 5:**Ethics- Business ethics, , Personality Development in social and office settings, netiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work culture in jobs, Rapid reading, Complex problem solving, Creativity, leadership skills ,cubicle Etiquettes, team building.

**Text Books:**

1. David F. Beer and David Mc Murrey, Guide to writing as an Engineer, John Willey. New York, 2004
2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)

**Reference Books:**

1. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4)
2. Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi 2002.
3. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN 0402213)

**Outcomes:**

- The student will become proficient in LSRW skills.
- They develop formal LSRW skills approach to different situations.
- They hone professional ethics and learn to be proficient formally.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem**

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## (R17A0518) Object Oriented Analysis and Design

**Objectives:**

- To understand the object oriented life cycle.
- To know how to identify objects, relationships, services and attributes through UML.
- To understand the use-case diagrams.
- To know the Object Oriented Design process.
- To know about software quality and usability

**UNIT-I**

Introduction to UML, Importance of Modeling, Principles of Modeling, Object oriented modeling, Conceptual model of the UML, Architecture of UML, Software Development Life Cycle.

**UNIT-II**

Basic Structural Modeling, Classes, Relationships, Common Mechanisms, Basic Diagrams, Advanced Structural Modeling, Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages.

Class and Object Diagrams, Terms, Concepts, Modeling Techniques for Class Diagrams

**UNIT-III**

Basic Behavioral Modeling-I, Interactions, Interaction Diagrams.

Basic behavioral Modeling-II, Usecases, Use case Diagrams, Activity Diagrams.

**UNIT-IV**

Advanced Behavioral Modeling, Events and Signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams.

Architectural Modeling, Component, Deployment, Component Diagrams, Deployment Diagram.

**UNIT V**

Case Study, The Unified Library application.

**TEXT BOOKS:**

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.

**REFERENCES :**

1. Grady Booch, James Rumbaugh and Ivar Jacobson, “The Unified Modeling Languages User Guide”, Addison Wesley, 2004.
2. Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw Hill, New Delhi.
3. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

**Outcomes:**

Upon successful completion of this course, students should be able to:

- Apply fundamental concepts of object-oriented analysis and design approach.
- Understand Unified Modeling Language Notation.
- Apply models for object-oriented system development
- Identify system development design patterns.
- Create use case diagram to represent the scope of development problem domain.
- Develop domain model, sequence diagram, activity diagram and state chart diagram based on use case narrative.
- Apply Unified Modeling Language Notation to object-oriented models.
- Build up experience on adopting object-oriented approach as an alternative methodology for system development.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem** **L T/P/D C**
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## (R17A0519) Information Security

**Objectives:**

- Explain the objectives of information security
- Explain the importance and application of each of confidentiality, integrity, authentication and availability
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks
- Describe public-key cryptosystem.
- Describe the enhancements made to IPv4 by IPSec
- Understand Intrusions and intrusion detection
- Discuss the fundamental ideas of public-key cryptography.
- Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
- Discuss Web security and Firewalls

**UNIT — I**

**Attacks on Computers and Computer Security:** Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security

**Cryptography: Concepts and Techniques:** Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, key range and key size, possible types of attacks.

**UNIT — II**

**Symmetric key Ciphers:** Block Cipher principles & Algorithms(DES, AES), Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, **Asymmetric key Ciphers:** Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman), Key Distribution.

**UNIT — III**

**Message Authentication Algorithms and Hash Functions:** Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, HMAC, CMAC, Digital signatures, **Authentication Applications:** Kerberos, X.509 Authentication Service, Public — Key Infrastructure.

**UNIT — IV**

**E-Mail Security:** Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, key management

**UNIT — V**

**Web Security:** Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls **Case Studies on Cryptography and security:** Secure **Inter-branch** Payment Transactions.

**TEXT BOOKS:**

1. Cryptography and Network Security : William Stallings, Pearson Education,$4^{11}$i Edition
2. Cryptography and Network Security : Atul Kahate, Mc Graw Hill, 2" Edition

**REFERENCE BOOKS:**

1. Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, lst Edition.
2. Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2"d Edition
3. Information Security, Principles and Practice: Mark Stamp, Wiley India.
4. Principles of Computer Sceurity: WM.Arthur Conklin, Greg White, TMH
5. Introduction to Network Security: Neal Krawetz, CENGAGE Learning
6. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning

**Outcomes:**

- Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
- Ability to identify information system requirements for both of them such as client and server.
- Ability to understand the current legal issues towards information security.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem**

| L | T/P/D | C |
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## (R17A0520) Web Technologies

**Objectives:**

- Giving the students the insights of the Internet programming and how to design and implement complete applications over the web.
- It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side
- Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
- Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

**UNIT I:**

**Web Basics and Overview:** Introduction to Internet, World Wide Web, Web Browsers, URL, MIME, HTTP, Web Programmers Tool box.

**HTML Common tags:** List, Tables, images, forms, frames, Cascading Style Sheets (CSS) & its Types. Introduction to Java Script, Declaring variables, functions, Event handlers (onclick, onsubmit, etc.,) and Form Validation.

**UNIT II:**

**Introduction to XML:** Document type definition, XML Schemas, Presenting XML , Introduction to XHTML, Using XML Processors: DOM and SAX.

**PHP:** Declaring Variables, Data types, Operators, Control structures, Functions.

**UNIT III:**

**Web Servers and Servlets:** Introduction to Servlets, Lifecycle of a Servlet, JSDK, Deploying Servlet, The Servlet API, The javax. Servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Cookies and Session Tracking.

**UNIT IV:**

**Database Access:** Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Connecting to database in PHP, Execute Simple Queries, Accessing a Database from a Servlet. Introduction to struts frame works.

**UNIT V:**

**JSP Application Development:** The Anatomy of a JSP Page, JSP Processing. JSP Application Design and JSP Environment, JSP Declarations, Directives, Expressions, Scripting Elements, implicit objects. **Java Beans:** Introduction to Beans, Deploying java Beans in a JSP page.

**TEXT BOOKS:**

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNITs 1, 2)
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 3, 4, 5)

**REFERENCE BOOKS:**

1. Programming world wide web-Sebesta, Pearson Education, 2007.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, S P D O' Reilly for chap 8.
4. March's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to WEB Design and Programming – Wang-Thomson
6. PHP: The Complete Reference Steven Holzner Tata McGraw-Hill.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem** **L T/P/D C**
**3 -/1/- 3**

## (R17A0521) Software Testing Methodologies

**Objectives:**

- This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry. The course will prepare students to be leaders in software testing. Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testing techniques

**UNIT I:**
**Introduction:** Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

**UNIT II:**
**Flow graphs and Path testing:** Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.
**Transaction Flow Testing:** Transaction flows, transaction flow testing techniques.

**UNIT III:**
**Dataflow testing:** Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. **Domain Testing:** domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domains and testability.

**UNIT IV:**
**Paths, Path products and Regular expressions :** Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.
**Logic Based Testing:** Overview, decision tables, path expressions, kv charts, specifications.

**UNIT V:**
**State, State Graphs and Transition testing :** State graphs, good & bad state graphs, state testing, Testability tips. **Graph Matrices and Applications:** Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.

**TEXT BOOKS:**

1. Software Testing techniques - Boris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

**REFERENCES:**

1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.

5. Art of Software Testing – Meyers, John Wiley.

**Outcomes:**

- Ability to test a process for continuous quality improvement
- Generation of test cases from requirements
- Analysis of Modeling techniques: UML: FSM and State charts, Combinatorial design etc.
- Test generation from models.
- Test adequacy assessment.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem**

| L | T/P/D | C |
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## Core Elective 2
## (R17A0522) Natural Language Processing

**Pre-requisites:** Data structures, finite automata and probability theory

**Course Objectives**: Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.

**Course Outcomes:**

- Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
- Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems.
- Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
- Able to design, implement, and analyze NLP algorithms.
  Able to design different language modeling Techniques.

**UNIT - I**

**Finding the Structure of Words:** Words and Their Components, Issues and Challenges, Morphological Models

**Finding the Structure of Documents:** Introduction, Methods, Complexity of the Approaches, Performances of the Approaches

**UNIT - II**

**Syntax Analysis:** Parsing Natural Language, Treebanks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

**UNIT - III**

**Semantic Parsing:** Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

**UNIT - IV**

Predicate-Argument Structure, Meaning Representation Systems, Software.

**UNIT - V**

**Discourse Processing:** Cohension, Reference Resolution, Discourse Cohension and Structure

**Language Modeling:** Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Cross lingual Language Modeling

**TEXT BOOKS:**

1. Multilingual natural Language Processing Applications: From Theory to Practice – Daniel M. Bikel and Imed Zitouni, Pearson Publication.

2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui, U.S. Tiwary.

**REFERENCE:**

1. Speech and Natural Language Processing - Daniel Jurafsky & James H Martin, Pearson Publications.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem**

| L | T/P/D | C |
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## Core Elective 2
## (R17A0523) Distributed systems

**Objectives:**

- To learn the principles, architectures, algorithms and programming models used in distributed systems.
- To examine state-of-the-art distributed systems, such as Google File System.
- To design and implement sample distributed systems.

**UNIT I**

**Characterization of Distributed Systems:** Introduction, Examples of Distributed systems, Resource sharing and web, challenges.

**System models:** Introduction, Architectural and Fundamental models, networking and Internetworking.

**UNIT II**

**Time and Global States:** Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global States.

Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

**UNIT III**

**Inter process Communication:** Introduction ,The API for the Internet Protocols, External Data Representation and Marshalling, Client –Server Communication, Group Communication, Case Study: IPC in UNIX.

**Distributed Objects and Remote Invocation:** Introduction, Communication between distributed objects, Remote Procedure Call, Events and Notifications, Case Study: JAVA RMI

**UNIT IV**

**Distributed File Systems:** Introduction, File Service Architecture, Case Study 1: Sun Network File System,

**Name Services:** Name Services: Introduction, Name Services and the Domain Name System, Case study of the Global Name Service

**Distributed Shared Memory:** Introduction, Design and Implementation issues, Sequential consistency, Release consistency and, Other consistency models.

**UNIT V**

**Transactions and Concurrency control:** Introduction, Transactions, Nested Transactions, Locks, optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

**Distributed Transactions:** Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

**TEXT BOOKS:**

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education. 2009.

**REFERENCES:**

1. Distributed Systems, Principles and paradigms, Andrew S.Tanenbaum, Maarten Van Steen, Second Edition, PHI.
2. Distributed Systems, An Algorithm Approach, Sikumar Ghosh, Chapman & Hall/CRC, Taylor & Fransis Group, 2007.

**Outcomes:**

- Students will identify the core concepts of distributed systems: the way in which several machines orchestrate to correctly solve problems in an efficient, reliable and scalable way.
- Students will examine how existing systems have applied the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem**

| L | T/P/D | C |
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## Core Elective 2
## (R17A0524) Artificial Intelligence & Neural Networks

**Course Objectives:**

1. Introduction to Artificial Intelligence, Autonomous Agents
2. Problem solving techniques, Search & Heuristic methods
3. State space Learning, CSP's, Game Playing techniques
4. Fundamental concepts of neural networks and different network models
5. Biological Neuron, Comparison between brain and computer
6. Detailed study of Learning Laws, Single Layer & Multilayer Perceptron's

**UNIT I**

Introduction to AI – Foundations of AI – History of AI - Intelligent Agents – Agents and Environments – Nature of Environments – Structure of Agents – Problem solving Agents – Problem formulation – Example Problems

**UNIT II**

Search Techniques – Uninformed Search Strategies – Breadth first search – Depth first search – Depth limited search – Iterative deepening depth first search - Bi-directional search – comparison – Search with partial information - Heuristic search – Greedy best first search – A* search – Memory bounded heuristic search - Heuristic functions - Local search algorithms - Hill climbing – Simulated annealing search - Local beam search – Genetic algorithms

**UNIT III**

Constraint satisfaction problems – Backtracking search for CSP's - local search for constraint satisfaction problem.

Adversarial search – Games - Minimax algorithm - optimal decisions in multiplayer games - Alpha beta pruning - evaluation functions - cutting off search.

**UNIT IV**

What is a neural network, Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Artificial Intelligence and Neural Networks. Learning Laws, Error Correction learning, Memory based learning, Hebbian learing, Competitive, Boltzmann learning.

**UNIT V**

Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, Perceptron and its convergence theorem, Introduction to Multilayer Perceptron, Back propagation algorithm.

**Course Outcomes :**

Upon completion of this course, students should be able to:

1. Describe the key components of the artificial intelligence.
2. Enumerate the types of Agents and Environments
3. Explain search strategies and solve problems by applying a suitable search method
4. Relate the functioning of brains and artificial neural network models.
5. Explain and contrast the most common architectures and learning algorithms
6. Develop simple Single Layer and Multi-Layer Perceptron models.

**TEXT BOOKS**

1. Artificial Intelligence: A modern approach by Stuart Russell and Peter Norvig. 3rd Edition, Prentice Hall, 2010.

2. Fundamentals of new Artificial Intelligence (second edition) by Toshinori Munakata. Springer Second Edition.

3. "Artificial Intelligence", 2nd Edition., E.Rich and K. Knight (TMH).

4. Neural networks A comprehensive foundations, Simon Haykin, Pearson Education, 2"d Edition, 2004

5. Neural networks in Computer intelligence, Li Min Fu TMII2003

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**III Year B.Tech. II Sem**

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## OPEN ELECTIVE III
## (R17A0454) ROBOTICS & AUTOMATION

**COURSE OBJECTIVES:**

1. This introductory course is valuable for students who wish to learn about robotics through a study of industrial robot systems analysis and design.
2. This course is suited to students from engineering and science backgrounds that wish to broaden their knowledge through working on a subject that integrates multi-disciplinary technologies.

**UNIT – I**

**Introduction & Basic Definitions:** History pf robots-robot anatomy, Coordinate Systems, Human arm Characteristics, Cartesian, Cylindrical, Polar, coordinate frames, mapping transform.

**UNIT – II**

**Kinematics – Inverse Kinematics:** Kinematics, Mechanical structure and notations, description of links and joints, Denavit Hatenberg notation, manipulator transformation matrix, examples inverse kinematics.

**UNIT – III**

**Differential Motion – Statics – Dynamic Modeling:** Velocity Propagation along links, manipulator Jacobian – Jacobian singularities – Lagrange Euler formulation Newton Euler formulation basics of trajectory planning.

**UNIT – IV**

**Robot Systems :** Actuators Sensors and Vision: Hydraulic and Electrical Systems Including Pumps, valves, solenoids, cylinders, stepper motors, Encoders and AC Motors Range and use of sensors, Micro switches, Resistance Transducers, Piezo-electric, Infrared and Lasers Applications of Sensors : Reed Switches, Ultrasonic, Barcode Readers and RFID – Fundamentals of Robotic vision.

**UNIT – V**

**Robots and Applications:** Industrial Applications – Processing applications – Assembly applications, Inspection applications, Non Industrial applications.

**TEXTBOOKS**

1. Robotics and Control: R.K. Mittal and I.J. Nagarath, TMH 2003.
2. Introduction to Robotics – P.J. Mckerrow, ISBN: 0201182408

**REFERENCES**

1. Robotics – K.S. Fu, R.C. Gonzalez and C.S.G. Lee, 2008, TMH.
2. Introduction to Robotics – S. Nikv, 2001, Prentice Hall,
3. Mechatronics and Robotics: Design & Applications – A. Mutanbara, 1999, CRC Press.

**COURSE OUTCOMES:**

Upon the completion of this course, the student will be able to:

1. Describe the various elements that make an industrial robot system
2. Discuss various applications of industrial robot systems
3. Analyze robot manipulators in terms of their kinematics, kinetics, and control

4. Model robot manipulators and analyze their performance, through running simulations using
   a MATLAB-based Robot Toolbox
5. Select an appropriate robotic system for a given application and discuss the limitations of such a system
6. Program and control an industrial robot system that performs a specific task.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**III Year B.Tech. II Sem**

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## OPEN ELECTIVE III
## (R17A0455) EMBEDDED SYSTEMS

**COURSE OBJECTIVES:**

For embedded systems, the course will enable the students to:

1) To understand the basics of microprocessors and microcontrollers architecture and its functionalities
2) Understand the core of an embedded system
3) To learn the design process of embedded system applications.
4) To understands the RTOS and inter-process communication.

**UNIT-I:INTRODUCTION TO MICROPROCESSORS AND MICROCONTROLLERS: 8086 Microprocessor:** Architecture of 8086, Register Organization, Programming Model, Memory Segmentation, Signal descriptions of 8086, Addressing modes, Instruction Set.

**8051 Microcontroller:** 8051 Architecture, I/O Ports, Memory Organization, Instruction set of 8051, memory interfacing to 8051.

**UNIT-II: INTRODUCTION TO EMBEDDED SYSTEMS:**

History of embedded systems, Classification of embedded systems based on generation and complexity, Purpose of embedded systems, Applications of embedded systems, and characteristics of embedded systems, Operational and Non-operational attributes of embedded systems.

**UNIT-III: TYPICAL EMBEDDED SYSTEM**

Core of the embedded system-general purpose and domain specific processors, ASICs, PLDs, COTs; Memory-ROM, RAM, memory selection for embedded systems; Sensors and actuators , Onboard communication interfaces-I2C, SPI. External communication interfaces: RS232, WIFI.

**UNIT-IV: EMBEDDED FIRMWARE DESIGN AND DEVELOPMENT:** Embedded firmware design approaches-super loop based approach, operating system based approach; embedded firmware development languages-assembly language based development, high level language based development.

**UNIT-V RTOS BASED EMBEDDED SYSTEM DESIGN**

Operating system basics, types of operating systems, tasks, process and threads, multiprocessing and multitasking, task scheduling: non-preemptive and pre-emptive scheduling; Device drivers, How to choose an RTOS.

**TEXT BOOKS:**

1. D. V. Hall, Microprocessors and Interfacing, TMGH, 2nd Edition 2006.
2. Kenneth. J. Ayala, The 8051 Microcontroller , 3rd Ed., Cengage Learning
3. Introduction to Embedded Systems - shibu k v, Mc Graw Hill Education.

**REFERENCE BOOKS:**

1. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandi, TMH, 2nd Edition 2006
2. Embedded Systems- An integrated approach - Lyla B Das, Pearson education 2012.

**COURSE OUTCOMES:**

After going through this course the student will be able to

1) The student will learn the internal organization of popular 8086/8051 microprocessors/microcontrollers.
2) Understand and design the Embedded systems
3) Understand Embedded Firmware design approaches
4) Learn the basics of RTOS

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**III Year B.Tech. II Sem**

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## OPEN ELECTIVE III
## (R17A0520) WEB TECHNOLOGIES

**COURSE OBJECTIVES:**

1) Giving the students the insights of the Internet programming and how to design and implement complete applications over the web.
2) It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side
3) Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
4) Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

**UNIT I:**

**Web Basics and Overview:** Introduction to Internet, World Wide Web, Web Browsers, URL, MIME, HTTP, Web Programmers Tool box.

**HTML Common tags:** List, Tables, images, forms, frames, Cascading Style Sheets (CSS) & its Types. Introduction to Java Script, Declaring variables, functions, Event handlers (onclick, onsubmit, etc.,) and Form Validation.

**UNIT II:**

**Introduction to XML:** Document type definition, XML Schemas, Presenting XML , Introduction to XHTML, Using XML Processors: DOM and SAX.

**PHP:** Declaring Variables, Data types, Operators, Control structures, Functions.

**UNIT III:**

**Web Servers and Servlets:** Introduction to Servlets, Lifecycle of a Servlet, JSDK, Deploying Servlet, The Servlet API, The javax. Servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Cookies and Session Tracking.

**UNIT IV:**

**Database Access:** Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Connecting to database in PHP, Execute Simple Queries, Accessing a Database from a Servlet. Introduction to struts frame works.

**UNIT V:**

**JSP Application Development:** The Anatomy of a JSP Page, JSP Processing. JSP Application Design and JSP Environment, JSP Declarations, Directives, Expressions, Scripting Elements, implicit objects. **Java Beans:** Introduction to Beans, Deploying java Beans in a JSP page.

**TEXT BOOKS:**

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNITs 1, 2)
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 3, 4, 5)

**REFERENCE BOOKS:**

1. Programming world wide web-Sebesta, Pearson Education, 2007.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, S P D O' Reilly for chap 8.
4. March's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to WEB Design and Programming – Wang-Thomson
6. PHP: The Complete Reference Steven Holzner Tata McGraw-Hill.

**COURSE OUTCOMES:**

1) Understand the insights of the Internet programming and how to design and implement complete applications over the web.
2) Understands the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side
3) Understand Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
4) Understand Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**III Year B.Tech. II Sem**

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## OPEN ELECTIVE III
## (R17A0553) DATA STRUCTURES

**COURSE OBJECTIVES:**

1) Exploring basic data structures such as stacks and queues.
2) Introduces a variety of data structures such as hash tables, search trees, heaps, graphs.
3) Introduces sorting algorithms

**UNIT - I**

Introduction to Data Structures: Data types, data structures basics, abstract data types, the running time of a program, the running time and storage cost of algorithms, complexity, asymptotic complexity, big O notation, obtaining the complexity of an algorithm.

Searching- Linear Search, Binary Search.

Sorting-Insertion Sort, Selection Sort, bubble sort, Quick sort, Merge sort, Comparison of Sorting methods.

**UNIT - II**

Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack applications, Queues-operations, array and linked representations, queue applications

**UNIT – III**

Dictionaries: linear list representation, skip list representation, operations - insertion, deletion and searching. Hash table representation: hash functions, collision resolution-separate chaining, open addressing- linear probing, quadratic probing, double hashing, and rehashing, extendible hashing.

**UNIT - IV**

Graphs – Introduction, Definition, Terminology, Graph Representations-Adjacency matrix, Adjacency lists, Graph traversals- DFS and BFS. Trees – Terminology, Representation of Trees, Properties of Binary Trees, Binary Tree Representations-array and linked representations, Binary Tree traversals.

**UNIT - V**

Priority Queue ,Different Types , Heap-Definition, types, insertion and Deletion operation on heaps. Search Trees: Binary Search Trees, Definition, Implementation, Operations-Searching,

Insertion and Deletion. AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching.

**TEXTBOOKS**

1. Fundamentals of data structures in C, 2 nd edition, E.Horowitz, S.Sahni and Susan Anderson
Freed, Universities Press.
2. Data structures using c – A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/pearson education.

**REFERENCES**

1. Data structures: A Pseudo code Approach with C, 2 nd edition, R.F.Gilberg and B.A.Forouzan,
Cengage Learning.
2. Introduction to data structures in c, 1/e Ashok Kamthane.

**COURSE OUTCOMES:**

1. Ability to select the data structures that efficiently model the information in a problem.
2. Ability to assess efficiency trade-offs among different data structure implementations or Combinations.
3. Implement and know the application of algorithms for sorting.
4. Design programs using a variety of data structures, including hash tables, binary and general
tree structures, search trees, heaps, graphs, and AVL-trees.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech II Sem**

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## OPEN ELECTIVE III

## (R15A0354) NANO TECHNOLOGY

**COURSE OBJECTIVES:**

1) To learn about basis of Nano Materials.
2) In this course we focus on synthetic aspects for the design of nanostructured materials.
3) We describe different approaches including both the bottom-up(includes both chemical and physical methods) and the top-down methods(mainly physical methods) for the synthesis of nanostructured materials.
4) The course will then focus on different type of nanostructures with a special emphasis on carbon nanotubes(CNT), metal and metal oxide nanoparticles, core-shell nanostructures and self assembly of these nanostructures.
5) The dependence of various properties (dielectric, magnetic and optical) with size will be discussed.

**UNIT-I**

**General Introduction:** Basics of Quantum Mechanics, Harmonic oscillator, magnetic Phenomena, band .structure in solids, Mossbauer and Spectroscopy, optical phenomena bonding in solids, Anisotropy.

**Silicon Carbide:** Application of Silicon carbide, nano materials preparation, Sintering of SiC, X-ray Diffraction data, electron microscopy sintering of nano-particles,nano particles of Alumina and Zirconia: Nano materials preparation, Characterization, Wear materials and nano-composites,

**UNIT-II**

**Mechanical properties:** Strength of nano crystalline SiC, Preparation for strength measurements, Mechanical properties, Magnetic properties.

**Electrical properties:** Switching glasses with nanoparticles, Electronic conduction with nano-particles.

**Optical properties:** Optical properties, special properties and the coloured glasses.

**Magnetic Properties:** Soft magnetic Nanocrystalline alloy, Permanent magnetic Nanocrystalline materials, Giant Magnetic Resonance, Electrical Properties, Optical Properties, Thermal Properties, and Mechanical Properties.

**UNIT–III Synthesis Routes:** Top &Bottom up approaches: Physical Vapor Deposition, Micromulsion, Laser Ablation, Chemical Vapor Deposition, Molecular Beam Epitaxy, Solgel method, Spray Pyrolysis, Template Based synthesis, Lithography.

**UNIT–IV Tools to Characterize Nanomaterials:** X-Ray Diffraction (XRD), Small Angle X-ray scattering (SAXS), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM), Field Ion Microscope (FEM), Three-dimensional Atom Probe (3DAP), Nanoindentation

**UNIT–V Applications of Nanomaterials:** Nano-electronics, Micro- and Nano-electromechanical systems (MEMS/NEMS), Nanosensors, Nanocatalysts, Cosmetic and Consumer Goods, Structure and Engineering, Automotive Industry, Water Treatment and the environment, Nano-medical applications, Textiles, Paints, Energy, Defence and Space Applications.

**TEXT BOOKS:**

1) Text Book of Nano Science and Nano Technology – B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, University Press-IIM.
2) Introduction to Nanotechnology – Charles P. Poole, Jr., and Frank J. Owens, Wiley India Edition, 2012.
3) Guozhong Cao, Nanostructures and Nano-materials:Synthesis, Properties and Applications, Imperial College Press 2004.

**REFERENCES BOOKS:**

1) Nano: The Essentials by T. Pradeep, McGraw- Hill Education.
2) Nanomaterials, Nanotechnologies and Design by Michael F. Ashby, Paulo J. Ferreira and Daniel L. Schodek.
3) Transport in Nano structures- David Ferry, Cambridge University press 2000
4) Nanofabrication towards biomedical application: Techniques, tools, Application and impact – Ed. Challa S.,S. R. Kumar, J. H. Carola.
5) Carbon Nanotubes: Properties and Applications- Michael J. O'Connell.
6) Electron Transport in Mesoscopic systems – S. Dutta, Cambridge University press.
7) Nanomaterials Synthesis, Properties and Applications Edited by A S Edelstein and R C Cammarata, IOP Publishing Ltd 1996.

**COURSE OUTCOMES**:

1) Will familiarize about the science of Nano Technology.
2) Will demonstrate the preparation of Nano Technology.
3) Will develop knowledge in characteristic Nano Technology & Nano Materials.

# MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

**III Year B.Tech. II Sem**

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## OPEN ELECTIVE III
## (R17A0355) TOTAL QUALITY MANAGEMENT

**COURSE OBJECTIVES:**

1) To facilitate the understanding of Quality Management principles and process.
2) To understand Customer focus, Employee focus and their involvement and Supplier Management.

**UNIT – I**

Introduction, The concept of TQM, Quality and Business performance, attitude, and involvement of top management, communication, culture and management systems. Management of Process Quality: Definition of quality, Quality Control, a brief history, Product Inspection vs. Process Control, Statistical Quality Control, Control Charts and Acceptance Sampling.

**UNIT -II**

Customer Focus and Satisfaction: internal customer conflict, quality focus, Customer Satisfaction, role of Marketing and Sales, Buyer – Supplier relationships. Bench Marking: Evolution of Bench Marking, meaning of bench marking, benefits of bench marketing, the bench marking procedure, pitfalls of bench marketing.

**UNIT- III**

Organizing for TQM: The systems approach, organizing for quality implementation, making the transition from a traditional to a TQM organization, Quality Circles, seven Tools of TQM: Stratification, check sheet, Scatter diagram, Kepner &Tregoe Methodology.

**UNIT- IV**

**The Cost of Quality:** Definition of the Cost of Quality, Quality Costs, Measuring Quality Costs, use of Quality Cost information, Accounting Systems and Quality Management.

**UNIT –V**

**ISO9000:** Universal Standards of Quality: ISO around the world, The ISO9000 ANSI/ASQC Q-90. Series Standards, benefits of ISO9000 certification, the third party audit, Documentation ISO9000 and services, the cost of certification implementing the system.

**TEXT BOOK:**

- Total Quality Management / Joel E. Ross/Taylor and Franscis Limited
- Total Quality Management/P. N. Mukherjee/PHI

**REFERENCE BOOKS:**

- Beyond TQM / Robert L.Flood
- Total quality management by Paneer Selvam
- Statistical Quality Control / E.L. Grant.
- Total Quality Management:A Practical Approach/H. Lal
- Quality Management/Kanishka Bedi/Oxford University Press/2011
- Total Engineering Quality Management/Sunil Sharma/Macmillan

**COURSE OUTCOMES:**

1) The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.
2) To give the students an overview of TQM, various Quality aspects and importance of Top Management Commitment in any organization for maintaining product / services quality.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem** **L T/P/D C**
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## (R17A0588) Web Technologies Lab

**Objectives:**
- To enable the student to program web applications using the following technologies HTML, Javascript ,XML, PHP ,Tomcat Server, Servlets ,JSP, Beans and Struts.

**Week 1**
**Design the following static web pages required for an online book store web site.**
**1) HOME PAGE:** The static home page must contain three **frames**.
**2) LOGIN PAGE**
**3) CATOLOGUE PAGE:** The catalogue page should contain the details of all the books available in the web site in a table.
**4) REGISTRATION PAGE**

**Week 2**
Develop and demonstrate the usage of inline, internal and external style sheet using CSS.

**Week 3**
**Write *JavaScript* to validate the following fields of the Registration page.**
**1. First Name** (Name should contains alphabets and the length should not be less than 6 characters).
**2. Password** (Password should not be less than 6 characters length).
**3. E-mail id** (should not contain any invalid and must follow the standard pattern name@domain.com)
**4. Mobile Number** (Phone number should contain 10 digits only).
**5. Last Name and Address** (should not be Empty).

**Week 4**
**Develop and demonstrate JavaScript with POP-UP boxes and functions for the following problems:**
**a)** Input: Click on Display Date button using onclick( ) function
Output: Display **date** in the textbox
**b)** Input: A number n obtained using **prompt**
Output: **Factorial** of n number using **alert**

**Week 5**
**a)** Input: A number n obtained using **prompt**
Output: A **multiplication table** of numbers from 1 to 10 of n using **alert**
**b)** Input: A number n obtained using **prompt** and add another number using **confirm**
Output: **Sum** of the entire n numbers using **alert**

**Week 6**

Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next in the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

**Week 7**

**Write an XML file which will display the Book information which includes the following:**

1) Title of the book
2) Author Name
3) ISBN number
4) Publisher name
5) Edition
6) Price

Write a **Document Type Definition (DTD)** to validate the above XML file. Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

**Note:** Give at least for 4 books. It should be valid syntactically

**Week 8**

**Develop and demonstrate PHP Script for the following problems:**

a) Write a PHP Program to display current Date, Time and Day.

b) Write a PHP Script to check whether the given number is Palindrome or not

c) A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with “Hello <name>, you are not authorized to visit the site” message, where <name> should be replaced with the entered name. Otherwise it should send “Welcome <name> to this site” message.

**Week 9**

Implement the following web applications using Servlets

(i) A web application that takes a name as input and on submit it shows a hello <name> page where name is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name > message with the duration of usage (hint: Use session to store name and time).

(ii) Write a servlet Program to display current Date, Time and Day.

(iii) A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with “Hello <name>, you are not authorized to visit the site” message, where <name> should be replaced with the entered name. Otherwise it should send “Welcome <name> to this site” message.

(iv) A web application that lists all cookies stored in the browser on clicking “List Cookies” button. Add cookies if necessary.

**Week 10**
Execute simple queries with Database using (a) PHP, (b) Servlets

**Week 11**
Implement the following web applications using JSP
(i) Write a JSP Program to display current Date, Time and Day.
(ii) A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with "Hello <name>, you are not authorized to visit the site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name> to this site" message.
(iii) Write a program for deploying **Java Beans** in a JSP page.

**Week 12**
Write a program to design a simple calculator using (a) JavaScript (b) PHP (c) Servlet and (d) JSP.

**TEXT BOOKS:**
1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP — Steven Holzner, Tata McGraw-Hill

**REFERENCE BOOKS:**
1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
2. Java Server Pages —Hans Bergsten, SPD O'Reilly
3. Java Script, D.Flanagan, O'Reilly, SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming world wide web, R.W.Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web — How to program, Dietel and Nieto, Pearson.

**Outcomes:**
- Use WAMP Stack for web applications
- Use Tomcat Server for Servlets and JSPs
- Write simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets and JSPs
- Connect to Database and get results
- Parse XML files using Java (DOM and SAX parsers)

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**III Year B. Tech CSE - II Sem**

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## (R17A0589) Case Tools & Software Testing Methodologies Lab

**Objectives:**

Understand how UML supports the entire GOAD process.

Become familiar with all phases of GOAD.

Understand different software testing tools and their features

Students are divided into batches of 5 each and each batch has to
draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:

1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
4. Collaboration Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.
9. Test Design.

**Description for an ATM System**

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine

by an operator. Approval must be obtained from the bank before physically accepting the envelope.

3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer.
When the switch is moved to the "off' position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

**Outcomes:**

- Ability to understand the history, cost of using and building CASE tools.
- Ability to construct and evaluate hybrid CASE tools by integrating existing tools.

## Software Testing Methodologies Lab

Objectives:

- This course is designed to enable a clear understanding and knowledge of the foundations, techniques, and tools in the area of software testing and its practice in the industry.
- Whether you are a developer or a tester, you must test software. This course is a unique opportunity to learn strengths and weaknesses of a variety of software testing techniques.

**WEEK 1:** Introduction to Testing

**WEEK 2:** Write a program in C language to demonstrate the working of the following constructs:

i) Do…while ii) while…do

iii) If…else iv) switch v) for

**WEEK 3:** "A program written in C language for matrix multiplication fails" introspect the causes for its failure and write down the possible reasons for its failure.

**WEEK 4:** Write atleast 30 test cases to test the functionality of ATM machine

**Week 5:** Banking application test cases

**Week 6:** Prepare a test plan document for any application (eg: Library management system)

**Week 7:** Study of any testing tool (Load runner)

**Week 8:** Study of any web testing tool (Selenium)

**Week 9:** Study of any bug tracking tool (Bugzilla)

**Week 10:** Study of any test management tool(Test link)

**Week 11:** a) write minimum 20 test cases for gmail application

b) test facebook manually

**Week 12:** Take a mini project and execute it. During SDLC create the various UML diagrams required for designing and all testing documents like test plan, TCD etc

**Outcomes:**

1. The students understands the process to be followed in the software development life cycle
2. Finds practical solutions to the problems
3. Manage a project from beginning to end
4. Define, formulate and analyze a problem

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
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## (R17A0525)Data Warehousing and Data Mining

**Objectives:**
Study data warehouse principles and its working learn data mining concepts understand association rules mining. Discuss classification algorithms learn how data is grouped using clustering techniques.

**UNIT-I**

**Data warehouse:** Introduction to Data warehouse, Difference between operational database systems and data warehouses, Data warehouse Characteristics, Data warehouse Architecture and its Components, Extraction-Transformation-Loading, Logical(Multi-Dimensional), Data Modeling, Schema Design, Star and Snow-Flake Schema, Fact Constellation, Fact Table, Fully Addictive, Semi-Addictive, Non Addictive Measures; Fact-Less-Facts, Dimension Table Characteristics; OLAP Cube, OLAP Operations, OLAP Server Architecture-ROLAP, MOLAP and HOLAP.

**UNIT-II**

**Introduction:** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or Data Warehouse System, Major issues in Data Mining.

**Data Preprocessing**: Need for Preprocessing the Data, Data Cleaning, Data Integration &Transformation, Data Reduction, Discretization and Concept Hierarchy Generation**.**

**UNIT-III**

**Association Rules:** Problem Definition, Frequent Item Set Generation, The APRIORI Principle, Support and Confidence Measures, Association Rule Generation; APRIOIRI Algorithm, The Partition Algorithms, FP-Growth Algorithms, Compact Representation of Frequent Item Set- Maximal Frequent Item Set, Closed Frequent Item Set.

**UNIT-IV**

**Classification:** Problem Definition, General Approaches to solving a classification problem, Evaluation of Classifiers , Classification techniques, Decision Trees-Decision tree Construction, Methods for Expressing attribute test conditions, Measures for Selecting the Best Split, Algorithm for Decision tree Induction ; Naive-Bayes Classifier, Bayesian Belief Networks; K- Nearest neighbor classification-Algorithm and Characteristics.

**Prediction**: Accuracy and Error measures. Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

**UNIT-V**

**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, Outlier Analysis.

**TEXT BOOKS:**

1) Data Mining- Concepts and -1.chniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.
2) Introduction to Data Mining, Psng-Ning Tan, Vipin Kumar, Michael Steinbanch, Pearson Educatior.

**REFERENCE BOOKS:**

1) Data Mining Techniques, Arun KPujari, 3rd Edition, Universities Press.
2) Data Warehousing Fundament's, Pualraj Ponnaiah, Wiley Student Edition.
3) The Data Warehouse Life CycleToolkit — Ralph Kimball, Wiley Student Edition.
4) Data Mining, Vikaram Pudi, P Rddha Krishna, Oxford University Press

**Outcomes:**

- Student should be able to understand why the data warehouse in addition to database systems.
- Ability to perform the pre-processing of data and apply mining techniques on it.
- Ability to identify the association rules, classification and clusters in large data sets.
- Ability to solve real world problems in business and scientific information using data mining

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
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## (R17A0526) LINUX Programming

**Objectives:**

- To develop the skills necessary for Unix systems programming including file system programming, process and signal management, and interprocess communication.
- To make effective use of Unix utilities and Shell scripting language such as bash.
- To develop the basic skills required to write network programs using Sockets.

**UNIT I**

**Linux Utilities -** File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

**Sed -** Scripts, Operation and addresses. **Awk -** Execution, Fields and Records, Scripts, Operation, Patterns and Actions.

**Shell programming with Bourne again shell(bash)-** Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples.

**UNIT II**

**Files and Directories-** File Concept, File types, File System Structure, file metadata-Inodes, kernel support for files, system calls for file I/O operations- open, create, read, write, close, lseek, dup2,file status information-stat family, file and record locking-lockf and fcntl functions, file permissions - chmod, fchmod, file ownership-chown, lchown, fchown, links-soft links and hard links – symlink, link, unlink.

**Directories-** Creating, removing and changing Directories-mkdir, rmdir, chdir, obtaining current working directory-getcwd, Scanning Directories-opendir, readdir, closedir, rewinddir, seekdir, telldir functions.

**UNIT III**

**Process –** Process concept, Kernel support for process, process identification, process hierarchy, process states, process control - process creation, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait, exec family.

**Signals –** Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, kill, raise , alarm, pause, abort, sleep functions.

**UNIT IV**

**Interprocess Communication -** Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, **pipes-**creation, IPC between related processes using unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs (Named pipes),differences between unnamed and named pipes, popen and pclose library functions.

**Message Queues-** Kernel support for messages, APIs for message queues, client/server example.

**Semaphores -** Kernel support for semaphores, APIs for semaphores.

**UNIT V**

**Shared Memory-** Kernel support for shared memory, APIs for shared memory, shared memory exampl . Comparison of IPC mechanisms

**Sockets-** Introduction to Berkeley Sockets, Client-Server model, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server program,.

**TEXT BOOKS:**

1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH,2006.
3. Unix Network Programming, W.R.Stevens, PHI

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/1/- | 3 |

## (R17A0527) Design Patterns

**Objectives:**

- Design patterns are a systematic approach that focus and describe abstract systems of interaction between classes, objects, and communication flow
- Given OO design heuristics, patterns or published guidance, evaluate a design for applicability, reasonableness, and relation to other design criteria.
- Comprehend the nature of design patterns by understanding a small number of examples from different pattern categories, and to be able to apply these patterns in creating an OO design.
- Good knowledge on the documentation effort required for designing the patterns.

**UNIT I:**

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

**UNIT II:**

**A Case Study:** Designing a Document Editor: Design Problems, Document Structure, Formatting, Embellishing the User Interface, and Supporting Multiple Look – and - Feel Standards, Supporting Multiple Window Systems, User Operations Spelling Checking and Hyphenation, Summary.

**UNIT III:**

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

**Structural Pattern Part - I:** Adapter, Bridge, and Composite

**UNIT IV:**

**Structural Pattern Part - II:** Decorator, Façade, Flyweight, Proxy.

**Behavioral Patterns Part - I:** Chain of Responsibility, Command, Interpreter, Iterator

**UNIT V:**

**Behavioral Patterns Part – II:** Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns. What to Expect from Design Patterns, A Brief History, The Pattern Community An Invitation, A Parting Thought.

**TEXT BOOK:**

1. Design Patterns by Erich Gamma, Pearson Education

**References:**

1. Pattern's in Java Vol-I by Mark Grand, Wiley DreamTech.
2. Pattern's in Java Vol-II by Mark Grand, Wiley DreamTech.
3. Java Enterprise Design Patterns Vol-III by Mark Grand, Wiley DreamTech.
4. Head First Design Patterns by Eric Freeman – Oreilly-spd.
5. Design Patterns Explained by Alan Shalloway, Pearson Education.

**Outcomes:**

Upon completion of this course, students should be able to:

- Have a deeper knowledge of the principles of object - oriented design
- Understand how these patterns related to object - oriented design.
- Understand the design patterns that are common in software applications.
- Will able to use patterns and have deeper knowledge of patterns.
- Will be able to document good design pattern structures.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
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| 3 | -/1/- | 3 |

## (R17A0528) Cloud Computing

**Objectives:**

- To explain the evolving computer model called cloud computing.
- To introduce the various levels of services that can be achieved by cloud.
- To describe the security aspects in cloud.

**UNIT- I**

**Systems Modeling** :**Distributed System Models and Enabling Technologies**- Scalable Computing over the Internet- System Models for Distributed and Cloud Computing- Software Environments for Distributed Systems and Clouds-- Performance, Security, and Energy Efficiency

**Computer Clusters for Scalable Parallel Computing: Clustering**- Clustering for Massive Parallelism-Computer Clusters and MPP Architectures-Design Principles of Computer Clusters-Cluster Job and Resource Management.

**UNIT- II**

**Virtualization: Virtual Machines and Virtualization of Clusters and Data Centers**- Implementation Levels of Virtualization -Virtualization Structures/Tools and Mechanisms-Virtualization of CPU, Memory, and I/O Devices-Virtual Clusters and Resource Management-Virtualization for Data-Center Automation

**UNIT- III**

**Foundations:** Introduction to Cloud Computing- Migrating into a Cloud-The Enterprise Cloud Computing Paradigm.

**UNIT- IV**

**Infrastructure as a Service (IAAS) & Platform (PAAS):** Virtual machines provisioning and Migration services-On the Management of Virtual machines for Cloud Infrastructures- Aneka—Integration of Private and Public Clouds

**UNIT- V**

**Software as a Service ( SAAS) & Data Security in the Cloud:**

Google App Engine – Centralizing Email Communications- Collaborating via Web-Based Communication Tools-An Introduction to the idea of Data Security- The Current State of Data Security in the Cloud- Cloud Computing and Data Security Risk- Cloud Computing and Identity.

**TEXT BOOKS:**

1. Distributed and Cloud Computing, Kaittwang Geoffrey C.Fox and Jack J Dongrra, Elsevier India 2012.
2. Mastering Cloud Computing- Raj Kumar Buyya, Christian Vecchiola and S.Tanurai Selvi, TMH, 2012.
3. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

**Outcomes:**

- Ability to understand the virtualization and cloud computing concepts.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

## Core Elective 3
## (R17A0529) Big-Data Analytics

**UNIT I**

**INTRODUCTION TO BIG DATA AND ANALYTICS**

Classification of Digital Data, Structured and Unstructured Data - Introduction to Big Data: Characteristics – Evolution – Definition - Challenges with Big Data - Other Characteristics of Data - Why Big Data - Traditional Business Intelligence versus Big Data - Data Warehouse and Hadoop Environment Big Data Analytics: Classification of Analytics – Challenges - Big Data Analytics important - Data Science - Data Scientist - Terminologies used in Big Data Environments - Basically Available Soft State Eventual Consistency - Top Analytics Tools

**UNIT II**

**INTRODUCTION TO TECHNOLOGY LANDSCAPE**

NoSQL, Comparison of SQL and NoSQL, Hadoop -RDBMS Versus Hadoop - Distributed Computing Challenges – Hadoop Overview - Hadoop Distributed File System - Processing Data with Hadoop - Managing Resources and Applications with Hadoop YARN - Interacting with Hadoop Ecosystem

**UNIT III**

**INTRODUCTION TO MONGODB AND MAPREDUCE PROGRAMMING**

MongoDB: Why Mongo DB - Terms used in RDBMS and Mongo DB - Data Types - MongoDB Query Language

MapReduce: Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression

**UNIT IV**

**INTRODUCTION TO HIVE AND PIG**

Hive: Introduction – Architecture - Data Types - File Formats - Hive Query Language Statements – Partitions – Bucketing – Views - Sub- Query – Joins – Aggregations - Group by and Having - RCFile Implementation - Hive User Defined Function - Serialization and Deserialization. Pig: Introduction - Anatomy – Features – Philosophy - Use Case for Pig - Pig Latin Overview - Pig Primitive Data Types - Running Pig - Execution Modes of Pig - HDFS Commands - Relational Operators - Eval Function - Complex Data Types - Piggy Bank - User-Defined Functions - Parameter Substitution - Diagnostic Operator - Word Count Example using Pig - Pig at Yahoo! - Pig Versus Hive

**UNIT V**

**INTRODUCTION TO DATA ANALYTICS WITH R**

Machine Learning: Introduction, Supervised Learning, Unsupervised Learning, Machine Learning Algorithms: Regression Model, Clustering, Collaborative Filtering, Associate Rule Making, Decision Tree, Big Data Analytics with BigR.

**Reference Book:**

1. Judith Huruwitz, Alan Nugent, Fern Halper, Marcia Kaufman, “Big data for dummies”, John Wiley & Sons, Inc. (2013)
2. Tom White, “Hadoop The Definitive Guide”, O’Reilly Publications, Fourth Edition, 2015
3. Dirk Deroos, Paul C.Zikopoulos, Roman B.Melnky, Bruce Brown, Rafael Coss, “Hadoop For Dummies”, Wiley Publications, 2014
4. Robert D.Schneider, “Hadoop For Dummies”, John Wiley & Sons, Inc. (2012)
5. Paul Zikopoulos, “Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGraw Hill, 2012 Chuck Lam, “Hadoop In Action”, Dreamtech Publications, 2010

**Text Book:**

1. Seema Acharya, SubhashiniChellappan, “Big Data and Analytics”, Wiley Publications, First Edition,2015

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

## Core Elective 3
## (R17A0530) Mobile Computing

**Objectives**:

- Introduction of an advanced element of learning in the field of wireless communication. Expose the students to the concepts of wireless devices and mobile computing.

**UNIT I: Introduction:** Mobile Communications, Mobile Computing: Paradigm, Promises/Novel Applications and Impediments and architecture. Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices. GSM: Services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services, GPRS.

**UNIT II: (Wireless) Medium Access Control (MAC):** Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA. MAC Protocols for GSM, Wireless LAN (IEEE802.11) Collision Avoidance (MACA, MACAW) Protocols.

**UNIT III: Mobile Network Layer:** IP and Mobile IP network Layers, packet delivery, and Handover Management, Location Management Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

**UNIT IV: Mobile Transport Layer:** Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.
**Database Issues:** Database Hoarding & Caching techniques, C-S Computing & Adaptation, Transactional Models, Query Processing, Data Recovery Process & QoS Issues.

**UNIT V:** Data Dissemination and Synchronization, Communications asymmetry, classification of data delivery mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Methods, Digital Audio and Video Broadcasting (DAB &DVB). Data Synchronization – Introduction, software, and Protocols.

**TEXT BOOKS:**

1. Raj Kamal, “Mobile Computing”, oxford University Prwess, 2007, ISBN: 0195686772.

**REFERENCE BOOKS:**

1. Jochen Schiller, “Mobile Communications, Addison-Wesley, Second Edition, 2004.
2. Stojmenovic and Cacute, “Handbook of wireless Networks and Mobile Computing”, Wiley, 2002, ISBN 0471419028.
3. Reza Behravanfar, “Mobile Computing Principles: Designing and Developing Mobile. Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, October 2004.

**Outcomes**:

At the end of this course the student should be able

- To understand the concept of mobile computing and architecture of mobile communication.
- Apply the concepts of mobile communications to the transactions and transaction management.
- Apply the concepts of mobile computing and conventional wired network and simulate it on the simulator.
- To understand the working of heterogeneous networks.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE – I Sem**

| L | T/P/D | C |
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## Core Elective 5
## (R17A0531) Database Security

**Objectives:**

- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

**UNIT- I**

**Introduction:** Introduction to Databases Security Problems in Databases Security Controls Conclusions

**Security Models -1:** Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

**UNIT- II**

**Security Models -2:** Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model The Lattice Model for the Flow Control conclusion

**Security Mechanisms :** Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation Criteria

**UNIT- III**

**Security Software Design :** Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design

**Statistical Database Protection & Intrusion Detection Systems:** Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison. Introduction IDES System RETISS System ASES System Discovery

**UNIT- IV**

**Models For The Protection Of New Generation Database Systems -1:** Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object-Oriented Systems SORION Model for the Protection of Object-Oriented Databases

**UNIT- V**

**Models For The Protection Of New Generation Database Systems -2: A**

Model for the Protection of New Generation Database Systems: the Orion Model Jajodia and Kogan's Model A Model for the Protection of Active Databases Conclusions

**TEXT BOOKS:**

1. Database Security by Castano *Pearson Edition* (1/e)
2. Database Security and Auditing: Protecting Data Integrity and Accessibility, 1st Edition, Hassan Afyouni, THOMSON Edition.

**REFERENCE BOOK:**

1. Database security by alfred basta, melissa zgola, CENGAGE learning.

**Outcomes:**

- Ability to carry out a risk analysis for large database.
- Ability to set up, and maintain the accounts with privileges and roles

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

## Core Elective 4
## (R17A0532) Parallel Processing

**Objectives:**

- To understand the basic concepts in parallel computing architecture
- To be familiar with the taxonomies and parallel programming models
- To be able to identify promising applications of parallel computing
- To develop parallel algorithms & implement prototype parallel programs using MPI & OpenMP
- To evaluate the performance metrics of parallel programs with various measures

**UNIT-I**

**Parallel computing**

parallelism, parallel architecture - scope of parallel computing, parallel programming platform, implicit parallelism, limitations of system memory - physical organization of parallel platforms, communication cost in parallel machines, analytical modelling of parallel programs.

**UNIT-II**

**Parallel algorithm design**

Decomposition techniques, recursive, data, explorative, speculative, hybrid - tasks and interaction, characteristics, mapping techniques, load balancing, static mapping, dynamic, mapping, interaction overhead, algorithm models - foster's design methodology

**UNIT-III**

**Message passing paradigm**

Principles of programming, Basic building block, send and receive, MPI, Library, Communicators, Examples - circuit satisfiability, functions, compile and run ,topologies and embedding, collective communication, shared memory programming, parallel loops, data parallelism, critical section, functional parallelism

**UNIT-IV**

**Parallel programming**

Sieve of Eratosthenes, sequential algorithm, Data Decomposition, parallel algorithm, analysis - Floyd's Algorithm, Design parallelism, analysis, Matrix Multiplication - Sorting - parallel quicksort, hyper quicksort, regular sampling, Combinatorial search, parallel Backtracking, parallel branch and bound- parallel alpha-beta search, analysis.

**UNIT –V**

**Performance analysis and applications**

Sources of overhead, Performance Metrics, Parallel overhead, speed up, efficiency, cost,

Amdahl's law, Asymptotic analysis, GPU computing, Introduction to Parallel Search - Met heuristic Algorithm, Principles, Parallel Models, Design of GPU based algorithm, Parallelisation control, Memory management, Application to TSP, Comparison, Execution time approximation, Overview, EMMA method, Comparison, Case Study.

**TEXT BOOKS:**

1. Ananth Grama, George Karypis, Vipin Kumar, and Anshul Gupta, “Introduction to Parallel Computing”, Addison Wesley, Second Edition ,2003
2. Ted G. Lewis and H. El-Rewini, “Introduction to Parallel Computing'', Prentice-Hall, 1992

**REFERENCES:**

1. Ananth Grama, George Karypis, Vipin Kumar, and Anshul Gupta, “Introduction to Parallel Computing”, Addison Wesley, Second Edition ,2003
2. M J Quinn, “Parallel Programming in C with MPI and OpenMP “,McGraw-Hill Higher Education, first edition, 2004.
3. D. Kirk and W. Hwu, “Programming Massively Parallel Processors”, Snir, Otto, Huss-Lederman, Walker, and Dongarra, MPI The Complete Reference, The MIT Press, 1994
4. Ted G. Lewis and H. El-Rewini, “Introduction to Parallel Computing'', Prentice-Hall, 1992
5. Ian Foster, “Designing and Building Parallel Programs'', Addison Wesley, 1995
2. Van Luong, Nouredine Melab, and El-Ghazali Talbi, “ GPU Computing for Parallel Local Search
3. Metaheuristic Algorithms”,IEEE Transactions on Computers, vol. 62, no. 1, pages 173-185,
4. January 2013.
5. Junqing Sun and Gregory D. Peterson,“An Effective Execution

**Outcomes:**

- Express the need for parallel computing with its issues
- Acquire knowledge to design a parallel algorithm using decomposition and mapping techniques
- Interpret message passing paradigm for a parallel algorithm
- Design a parallel algorithm for an existing sequential problem
- Analyze the complexity and performance metrics of code when parallelization is done

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

## Core Elective 6
## (R17A0533) Scripting Languages

**Objectives:**

- The course demonstrates an in depth understanding of the tools and the scripting languages
- Necessary for design and development of applications dealing with Bio- information/ Bio - data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development
- Relevant program capabilities are embedded in the learning outcomes for this course. In meeting these learning outcomes you will gain or improve your capabilities in: Enabling Knowledge: effectively apply knowledge of Perl, Python, PHP and TCL/Tk to new situations and learn from the experience.
- The main objective of this advanced course is assisting Perl programmer or database administrator to compile large programming set. Other tasks include implementing complex data structure, compiling object-oriented programming.
- Incorporate PHP into HTML files, Write basic PHP scripts, Process form input, Write and use functions. The advanced PHP training course further develops the skills of experienced PHP Programmers by introducing them to advanced techniques, tools, and methodologies that can be used to build complex, scalable, PHP applications.
- The goal of this course is to teach students the skills required to write Taylor Control Language (TCL) sequences using fundamental and advanced language features.

**UNIT I**

Introduction to PERL and Scripting Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages. Web Scripting, and the universe of Scripting Languages. PERL-Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines, advance perl -finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

**UNIT II**

**PHP Basics**

PHP Basics - Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Datatypes, Variables, Constants, expressions, string interpolation, control

structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

**UNIT III**

**Advanced PHP Programming**

Php and Web Forms, Files, PHP Authentication and Methodologies-Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

**UNIT IV**

**TCL –Tk**

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures , strings , patterns, files, Advance TCL-eval, source, exec and up level commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface. Tk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

**UNIT V**

**Python**

Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in python, Exception Handling, Integrated Web Applications in Python –Building Small, Efficient Python Web Systems ,Web Application Framework.

**TEXT BOOKS:**

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Python Web Programming, Steve Holden and David Beazley, New Riders Publications.
3. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dreamtech)

**REFERENCE BOOKS:**

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware (Addison Wesley) Pearson Education.
2. Programming Python, M.Lutz, SPD.
3. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
4. PHP 5.1, I.Bayross and S.Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.
6. Guide to Programming with Python, M.Dawson, Cengage Learning.
7. Perl by Example, E.Quigley, Pearson Education.
8. Programming Perl, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD

9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E.Quigley, Prentice Hall(Pearson).
11. Perl Power, J.P.Flynt, Cengage Learning.

**Outcomes:**

- Students will also learn to develop, maintain, and scale the performance of web sites using Smarty templates.
- Student will be able to identify database and environment modifications to use TCL. Develop, debug, test, and execute sequences using the Editor and Runtime Console Support.
- Develop TCL sequences that: Perform process control calculations, manipulate arrays, and access recipes.
- Monitor and access functional elements and access/modify sequence parameters.
- Tk is a platform-independent GUI framework developed for Tcl. From a Tcl shell (tclsh), Tk may be invoked using this command: package requires Tk.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem**

| L | T/P/D | C |
|---|---|---|
| 3 | -/-/- | 3 |

## Core Elective 4
## (R17A0534) Internet of Things

**Objectives:**

To introduce the terminology, technology and its applications
To explain the concept of M2M (machine to machine) with necessary protocols
To introduce the Python Scripting Language which is used in many IoT devices
To elucidate the Raspberry PI platform, that is widely used in IoT applications
To explain the implementation of web based services on IoT devices

**Unit I**

Introduction to Internet of Things –Definition and Characteristics of IoT,
Physical Design of IoT – IoT Protocols, IoT communication models, Iot Communication APIs
IoT enabaled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates
Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

**Unit II**

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT
Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER

**Unit III**

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling
Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

**Unit IV**

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C)
Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

**Unit V**

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs
Webserver – Web server for IoT, Cloud for IoT, Python web application framework
Designing a RESTful web API

**Course Outcomes :**

Upon completion of this course, students should be able to:

1. Explain the importance and usage of IOT.
2. Describe the various IOT levels and protocols.
3. Develop programs in Python.
4. Illustrate the functioning of IOT devices.

5. Relate IOT to cloud computing and web applications.

**TEXT BOOK:**

Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759
www.universityupdates.in || www.android.universityupdates.in www.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem** **L T/P/D C**

**- -/3/- 2**

## (R17A0590) Data Ware Housing and Data Mining Lab

**Objectives:**

Learn how to build a data warehouse and query it (using open source tools like Pentaho Data Integration and Pentaho Business Analytics), Learn to perform data mining tasks using a data mining toolkit (such as open source WEKA), Understand the data sets and data preprocessing, Demonstrate the working of algorithms for data mining tasks such association rule mining, classification, clustering and regression, Exercise the data mining techniques with varied input values for different parameters.

**LIST OF EXPERIMENTS**:-

Experiments using Weka & Clementine Tools

1. Data Processing Techniques :
   (i) Data cleaning (ii) Data transformation - Normalization (iii) Data integration
2. Data Warehouse schemas – star, snowflake, fact constellation
3. Data cube construction – OLAP operations
4. Data Extraction, Transformations & Loading operations
5. Implementation of Attribute oriented induction algorithm
6. Implementation of apriori algorithm
7. Implementation of FP – Growth algorithm
8. Implementation of Decision Tree Induction
9. Calculating Information gain measures
10. Classification of data using Bayesian approach
11. Classification of data using K – nearest neighbour approach
12. Implementation of K – means algorithm
13. Implementation of PAM algorithm

**Outcomes:**

- Ability to add mining algorithms as a component to the existing tools
- Ability to apply mining techniques for realistic data.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - I Sem** **L T/P/D C**

**- -/3/- 2**

## (R17A0591) Linux Programming Lab

**Objectives:**

- To write shell scripts to solve problems
- To implement some standard Linux utilities such as ls, cp etc using system calls.
- To develop network-based applications using C.

**List of Sample Problems:**

**Week 1:**

Practice File handling utilities, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.

**Week 2:**

a) Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or directory and reports accordingly. Whenever the argument is a file it reports no of lines present in it.

b) Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

**Week 3:**

a) Write a shell script to list all of the directory files in a directory

b) Write a shell script that deletes all lines containing the specified word in one or more files supplied as arguments to it.

c) Write a shell script to find factorial of a given number.

**Week 4:**

Write an awk script to count number of lines in a file that does not contain vowels

Write an awk script to find the no of characters ,words and lines in a file

**Week 5:**

Implement in c language the following Unix commands using system calls

a) cat b) ls c) Scanning Directories (Ex: opendir(), readdir(),etc.)

**Week 6:**

Write a C program that takes one or more file/directory names as command line input and reports following information

A) File Type B) Number Of Links

C) Time of last Access D) Read, write and execute permissions

**Week 7:**

a) Write a C program to implement kill(), raise() and sleep() functions.

b) Write a C program to implement alarm(), pause() and abort() functions.

**Week 8:**

a) Write a C program to create child process and allow parent process to display "parent" and the child to display "child" on the screen

b) Write a C program to create zombie process

c) Write a C program to illustrate how an orphan process is created

**Week 9:**

a) Write a C program that illustrate communication between two process using unnamed pipes

b) Write a C program that illustrates communication between two process using named pipes or FIFO.

**Week 10:**

a) Write a C program for File Locking.

b) Write a C program that receives a message from message queue and display them.

**Week 11:**

Write a C program that illustrates two processes communicating using Shared memory.

**Week 12:**

Write client server programs using c for interaction between server and client process using sockets

**Outcomes:**

- Ability to understand the Linux environment
- Ability to perform the file management and multiple tasks using shell scripts in Linux environment.

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - II Sem**

| L | T/P/D | C |
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| 4 | -/-/- | 4 |

## Core Elective 5
## (R17A0535) Machine Learning

**Course Objectives:**

- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To understand the basic theory underlying machine learning.

**Course Outcomes:**

- Student should be able to understand the basic concepts such as decision trees and neural networks.
- Ability to formulate machine learning techniques to respective problems.
- Apply machine learning algorithms to solve problems of moderate complexity

**UNIT – I**

**Introduction**: An illustrative learning task, and a few approaches to it. What is known from algorithms? Theory, Experiment. Biology. Psychology. Overview of Machine learning, related areas and applications. Linear Regression, Multiple Regression, Logistic Regression, logistic functions. **Concept Learning**: Version spaces. Inductive Bias. Active queries. Mistake bound/ PAC model. basic results. Overview of issues regarding data sources, success criteria.

**UNIT – II**

**Decision Tree Learning**: - Minimum Description Length Principle. Occam's razor. Learning with active queries Introduction to information theory, Decision Trees, Cross Validation and Over fitting. **Neural Network Learning**: Perceptions and gradient descent back propagation, multilayer networks and back propagation.

**UNIT – III**

**Sample Complexity and Over fitting**: Errors in estimating means. Cross Validation and jackknifing VC dimension. Irrelevant features: Multiplicative rules for weight tuning.
**Support Vector Machines**: functional and geometric margins, optimum margin classifier, constrained optimization, Lagrange multipliers, primal/dual problems, KKT conditions, dual of the optimum margin classifier, soft margins, and kernels.
**Bayesian Approaches**: The basics Expectation Maximization. Bayes theorem, Naïve Bayes Classifier, Markov models, Hidden Markov Models.

**UNIT - IV**

**Instance-based Techniques**: Lazy vs. eager generalization. K nearest neighbor, case- based reasoning. **Clustering and Unsupervised Learning:** K-means clustering, Gaussian mixture density estimation, model selection

**UNIT - V**

**Genetic Algorithms**: Different search methods for induction - Explanation-based Learning:

using prior knowledge to reduce sample complexity.
**Dimensionality reduction:** feature selection, principal component analysis, linear discriminant analysis, factor analysis, independent component analysis, multidimensional scaling, manifold learning.

**TEXT BOOKS:**

1. Tom Michel, Machine Learning, McGraw Hill, 1997
2. Trevor Has tie, Robert Tibshirani & Jerome Friedman. The Elements of Statically Learning, Springer Verlag, 2001

**REFERENCE BOOKS:**

1. Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh, Cambridge Univ Press.
2. Richard o. Duda, Peter E. Hart and David G. Stork, pattern classification, John Wiley & Sons Inc.,2001
3. Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - II Sem**

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## Core Elective 5
## (R17A0536) Web Services

**Objectives:**

- To Understand the details of web services technologies: SOAP, WSDL, UDDI
- To learn how to implement and deploy web services clients and servers
- To explore interoperability between different frameworks
- To learn basic concepts of SOA.

**UNIT I**

**Evolution and Emergence of Web Services:** Evolution of distributed computing, Core distributed computing technologies, client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

**Introduction to Web Services:** The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

**UNIT II**

**Web Services Architecture:** Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services.

**Fundamentals of SOAP:** SOAP Message Structure, SOAP Encoding, Encoding of different data types, SOAP message exchange models, SOAP communication and messaging, Java and Axis, Limitations SOAP.

**UNIT III**

**Describing Web Services:** WSDL, WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

**UNIT IV**

**Discovering Web Services:** Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI: UDDI Registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, Publishing API, Publishing information to a UDDI Registry, searching information in a UDDI Registry, limitations of UDDI.

**UNIT V**

**Web Services Interoperability**: Means of ensuring Interoperability, Creating Java Client for a web service, Challenges in Web Services Interoperability.

**Services Security:** XML security frame work, Goals of cryptography, Digital Signature, Digital Certificate, XML encryption.

**TEXT BOOKS:**

1. 1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India, rp 2008.
2. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education, 2008.
3. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.

**REFERENCES:**

1. Building Web Services with Java, Second Edition, S. Graham and others, Pearson Edn., 2008.
2. Java web services ,D.A. Chappell and T.Jewell, O'Reilly,SPD.
3. Java Web Services Architecture, McGovern,Sameer Tyagi etal..,Elsevier.
4. Web Services, G. Alonso, F. Casati and others, Springer, 2005.

**Outcomes:**

- Basic details of WSDL, UDDI, SOAD
- Implement WS client and server with interoperable systems

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - II Sem**

| L | T/P/D | C |
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## Core Elective 5
## (R17A0537) Computer Forensics

**Objectives:**

- A brief explanation of the objective is to provide digital evidences which are obtained from digital media
- In order to understand the objectives of computer forensics, first of all people have to recognize the different roles computer plays in a certain crime.
- According to a snippet from the United States security service, the functions computer has in different kinds of crime.

**UNIT – I:**

**Computer Forensics Fundamentals:** What is Computer Forensics?, Use of Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists

**Types of Computer Forensics Technology:** Types of Military Computer Forensic Technology, Types of Law Enforcement — Computer Forensic Technology — Types of Business Computer Forensic Technology.

**UNIT-II:**

**Computer Forensics Evidence and Capture:** Data Recovery Defined — Data Back-up and Recovery — The Role of Back-up in Data Recovery — The Data-Recovery Solution.

**Evidence Collection and Data Seizure:** Why Collect Evidence? Collection Options — Obstacles — Types of Evidence — The Rules of Evidence — Volatile Evidence — General Procedure — Collection and Archiving — Methods of Collection — Artifacts — Collection Steps — Controlling Contamination: The Chain of Custody.

**UNIT – III:**

**Duplication and Preservation of Digital Evidence:** Preserving the Digital Crime Scene — Computer Evidence Processing Steps — Legal Aspects of Collecting and Preserving Computer Forensic Evidence

**Computer Forensics analysis and validation:** Determining what data to collect and analyze, validating forensic data, addressing data-hiding techniques, performing remote acquisitions

**UNIT-IV:**

**Network Forensics:** Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

**Processing Crime and Incident Scenes:** Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case

**UNIT –V:**

**Current Computer Forensic tools:** evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software

**E-Mail Investigations:** Exploring the role of e-mail in investigation, exploring the roles of the client and server in e-mail, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools.

**Cell phone and mobile device forensics:** Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

**TEXT BOOKS**

- Computer Forensics, Computer Crime Investigation by John R. Vacca, Firewall Media, New Delhi.
- Computer Forensics and Investigations by Nelson, Phillips Enfinger, Steuart, CENGAGE Learning

**REFERENCE BOOKS**

- Real Digital Forensics by Keith J. Jones, Richard Bejtiich, Curtis W. Rose, Addison Wesley Pearson Education
- Forensic Compiling, A Tractitioneris Guide by Tony Sammes and Brian Jenkinson, Springer International edition.
- Computer Evidence Collection & Presentation by Christopher L.T. Brown, Firewall Media.
- Homeland Security, Techniques & Technologies by Jesus Mena, Firewall Media.
- Software Forensics Collecting Evidence from the Scene of a Digital Crime by Robert M. Slade, TMH 2005
- Windows Forensics by Chad Steel, Wiley India Edition

**Outcomes:**

- Student will understand the usage of computers in forensic and how to use various forensic tools for a wide variety of investigations.
- It gives an opportunity to students to continue their zeal in research in computer forensics

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE -II Sem**

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## Core Elective 6
## (R17A0538) Semantic Web and Social Networks

**Objectives:**

- To learn Web Intelligence
- To learn Knowledge Representation for the Semantic Web
- To learn Ontology Engineering
- To learn Semantic Web Applications, Services and Technology
- To learn Social Network Analysis and semantic web

**UNIT –I:** Web Intelligence

Thinking and Intelligent Web Applications, The Information Age ,The World Wide Web, Limitations of Today's Web, The Next Generation Web, Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

**UNIT -II:** Knowledge Representation for the Semantic Web

Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web – Resource Description Framework(RDF) / RDF Schema, Ontology Web Language(OWL), UML, XML/XML Schema.

**UNIT-III:** Ontology Engineering

Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

**UNIT-IV:** Semantic Web Applications, Services and Technology

Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base ,XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

**UNIT-V:** .Social Network Analysis and semantic web

What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.

**TEXT BOOKS:**

1. Thinking on the Web - Berners Lee, Godel and Turing, Wiley inter science, 2008.
2. Social Networks and the Semantic Web, Peter Mika, Springer, 2007.

**REFERENCE BOOKS:**

1. Semantic Web Technologies, Trends and Research in Ontology Based Systems, J.Davies, R.Studer, P.Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.
4. Programming the Semantic Web, T.Segaran, C.Evans, J.Taylor, O'Reilly, SPD.

**Outcomes:**

- Ability to understand and knowledge representation for the semantic web
- Ability to create ontology
- Ability to build a blogs and social networks

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - II Sem**

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## Core Elective 6
## (R17A0539) Storage Area Networks

**Objectives:**

- Evaluate storage architectures,
- Define backup, recovery, disaster recovery, business continuity, and replication
- Examine emerging technologies including IP-SAN
- Understand logical and physical components of a storage infrastructure
- Identify components of managing and monitoring the data center
- Define information security and identify different storage virtualization technologies

**UNIT I**

Information Storage, Evolution of Storage Technology and Architecture, Data Center Infrastructure, Virtualization and Cloud Computing, Key Challenges in Managing Information, Information Lifecycle Components of Storage System Environment, Disk Drive Components, Disk Drive Performance, Fundamental Laws Governing Disk Performance, Logical Components of the Host, Application Requirements and Disk Performance.

**UNIT II**

Implementation of RAID,RAID Array Components, RAID Levels, RAID Comparison, RAID Impact on Disk Performance, Hot Spares Components of an Intelligent Storage System, Intelligent Storage Array.

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options.

**UNIT III**

List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

**UNIT IV**

Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities.

**UNIT V**

Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center. Information security, Critical security

attributes for information systems, Storage security domains, List and analyzes the common threats in each domain. Virtualization technologies, block-level and file-level virtualization technologies and processes.

**TEXT BOOKS:**

1. Information Storage and Management, Author :EMC Education Services, Publisher: Wiley ISBN: 9781118094839
2. 2. Storage Virtualization, Author: Clark Tom, Publisher: Addison Wesley Publishing Company ISBN : 9780321262516

**REFERENCES:**

1. Storage Networks: The Complete Reference, Robert Spalding, Ta McGraw Hill , Osborne, 2003.
2. Building Storage Networks, Marc Farley, Tata McGraw Hi Osborne, 2001.
3. Storage Area Network Fundamentals, Meeta Gupta, Pearso Education Limited, 2002.

**Outcomes:**

- Ability to demonstrate the storage area networks and their products
- Ability to provide the mechanisms for the backup/recovery

# MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

**IV Year B. Tech CSE - II Sem**

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## Core Elective 6
## (R17A0540) Software Project Management

**Objectives:**

- Understanding the specific roles within a software organization as related to project and process management
- Understanding the basic infrastructure competences (e.g., process modeling and measurement)
- Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships

**UNIT-I**

Conventional Software Management: The 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**

Conventional And Modern Software Management: Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an interactive Process, Life Cycle Phases: Engineering and Production Stages Inception, Elaboration, Construction, Transition phases .

**UNIT-III**

Artifacts of the Process: The Artifact Sets. Management Artifacts, Engineering Artifacts, Programmatic Artifacts. Model Based Software Architectures: A Management Perspective and Technical Perspective.

**UNIT-IV**

Flows of the Process: Software Process Workflows. Iteration Workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic Status Assessments. Interactive Process Planning: Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Interaction Planning Process, Pragmatic Planning.

**UNIT-V**

Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, and Evolution of Organizations. Process Automation Building Blocks, the

Project Environment. Project Control and Process Instrumentation: seven coreMetrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software Metrics Automation.

**Text Books**:

1. Walker Rayce, “Software Project Management”, 1998, PEA.
2. Henrey, “Software Project Management”, Pearson.

**Reference Books:**

1. Richard H.Thayer.” Software Engineering Project Management”, 1997, IEEE Computer Society.
2. Shere K.D.: “Software Engineering and Management”, 1998, PHI.
3. S.A. Kelkar, “Software Project Management: A Concise Study”, PHI.
4. Hughes Cotterell, “Software Project Management”, 2e, TMH. 88 5. Kaeron Conway, “Software Project Management from Concept to D

**Outcomes:**

At the end of the course, the student shall be able to:

- Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project
- Compare and differentiate organization structures and project structures.
- Implement a project to manage project schedule, expenses and resource with the application of suitable project management tools