# COURSE STRUCTURE
# AND
# DETAILED SYLLABUS
# (MR14 Regulations)

**For**

## B.Tech (Mining Engineering)

***(Applicable for the batches admitted from 2014-15)***

# MALLA REDDY ENGINEERING COLLEGE

(AUTONOMOUS)
(An Autonomous institution, Autonomy granted by UGC and affiliated to JNTUH, Accredited by NAAC with 'A' Grade, Accredited by NBA (2008-11) & Recipient of World Bank Assistance under TEQIP phase – II S.C.1.1for the period (2011-14))
Maisammaguda, Dhulapally (Post. Via. Kompally), Secunderabad – 500 100.
Website: www.mrec.ac.in Email: mrec.2002@gmail.com

# MALLA REDDY ENGINEERING COLLEGE
## (AUTONOMOUS)
## Academic Regulations for B. Tech. (Regular)
## (MR14 Regulations)

**(Effective for the students admitted into I year from the Academic year 2014-2015 onwards)**

1. **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 224 credits and secure 216 credits with compulsory subjects as listed in Table-1.

Table 1: Compulsory Subjects

| Serial Number | Subject Particulars |
|---|---|
| 1 | All practical subjects |
| 2 | Industry oriented mini project |
| 3 | Comprehensive Viva-Voce |
| 4 | Seminar |
| 5 | Project work |

2. 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. Courses of study**

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

| Branch Code | Branch |
|---|---|
| 1 | Civil Engineering(CE) |
| 2 | Electrical and Electronics Engineering (EEE) |
| 3 | Mechanical Engineering(ME) |
| 4 | Electronics and Communication Engineering(ECE) |
| 5 | Computer Science and Engineering (CSE) |
| 7 | Mining Engineering(MNE) |

**4. Credits**

| | Semester | |
|---|---|---|
| | **Periods/ Week** | **Credits** |
| Theory | 04 | 04 |
| | -- | -- |
| Practical | 03 | 02 |
| Drawing | Theory - 02 | 04 |

| | | |
|---|---|---|
| | Practical - 03 | |
| Mini Project | -- | 02 |
| Comprehensive Viva Voce | -- | 02 |
| Seminar | -- | 02 |
| Project | 15 | 10 |

## 5 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, industry-oriented mini-project, seminar, comprehensive viva and project work shall be evaluated for 50, 50, 100 and 200 marks, respectively.

5.2 For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 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 one objective paper, one essay paper and one assignment. The objective paper and the essay paper shall be for 10 marks each with a total duration of 1 hour 20 minutes (20 minutes for objective and 60 minutes for essay paper). The Objective paper is set with 20 bits of multiple choices and filling the blanks type of questions for a total of 10 marks. The essay paper shall contain 4 full questions out of which, the student has to answer 2 questions, each carrying 5 marks. While the first mid-term examination shall be conducted in First 2 1/2 units of the syllabus, the second mid-term examination shall be conducted in Remaining 2 1/2 units. Five (5) marks are allocated for Assignments (as specified by the subject teacher concerned). Assignment should be submitted before the end of the first mid-examination, and the second Assignment should be submitted before the conduct of the second mid-examination. The total marks secured by the student in each mid-term examination are evaluated for 25 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each student. If any student is absent for any subject of a mid-term examination, a re-exam will be conducted in the deserving cases based on the recommendations of College Academic Committee. The end examination will be conducted for 75 marks, which contains PART A and PART B. Part A for 25 marks contains 5 to 8 questions, each two marks and remaining are one mark questions covering the entire syllabus. Part B is for maximum of 50 marks with 5 questions covering from all units consisting of two parts each (a) and (b), Out of which the student has to answer either (a) or (b) not both. Each question in Part B carries 10 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 internal examiner. The external examiner shall be appointed by the principal / Chief Controller of examinations

5.5 For the subject having design and/or drawing (Machine Drawing) and Estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 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 an industry-oriented Mini-Project, in collaboration with an industry of their specialization, 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 project work in IV year II Semester. The industry oriented mini-project shall be submitted in a report form and presented before the committee. It shall be evaluated for 50 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 industry-oriented mini-project.

5.7 There shall be a seminar presentation on specific Applied Engineering Topic 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 There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is intended to assess the students understanding of the subjects he studied during the B. Tech. course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

5.9 Out of a total of 200 marks for the project work, 50 marks will be allotted for Internal Evaluation and 150 marks for the End Semester Examination (Viva Voce). The End Semester Examination of the project work shall be conducted by the same committee as appointed for the industry-oriented mini-project. In addition, the project supervisor shall also be included in the committee. The topics for industry oriented 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 II Semester. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.

5.10 Laboratory marks and the sessional marks awarded by the concerned teacher are subjected to scrutiny and scaling by the Principal / Chief Controller of examinations wherever necessary. In such cases, the sessional and laboratory marks awarded by the concerned teacher will be referred to a Committee headed by principal consisting of HOD, senior professor in that particular department. The Committee will arrive at a scaling factor and the marks will be scaled as per the scaling factor. The recommendations of the Committee are final and binding. The internal test papers including Lab end exam test papers shall be preserved in the exam branch for a minimum period of 6 years from the commencement of the batch, as per the University norms and shall be produced to the Committees as and when the same are asked for.

## 6 Attendance Requirements

6.1 A student shall be eligible to appear for End examinations only if he acquires a minimum of 75% of attendance in aggregate of all the subjects.

6.2 **Shortage of Attendance below 65% in aggregate shall in NO case be condoned.**

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

6.4 A student will not be promoted to next semester unless he satisfies the attendance requirement of the present semester as applicable.

6.4 A student who is short of attendance in a semester has to seek re-admission into that semester as and 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 shall be payable towards condonation of shortage of attendance.

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

6.8 If any candidate fulfills the attendance requirement in the present semester, shall not be eligible for readmission into the same class.

**7. Minimum Academic Requirements**

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

7.1 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 end semester exam, and minimum 40% of marks in the sum total of the mid-term and end semester exams.

7.2 A student shall be promoted from II to III year only if he fulfills the academic requirement of

34 credits (out of 84 credits) secured from all Regular and Supplementary examinations conducted upto second year first semester examination.

(or)

44 credits (out of 112) secured from all Regular and Supplementary examinations conducted upto second year second semester examination.

7.3 A student shall be **promoted from III year to IV year** only if he fulfills the academic requirements of

56 credits (out of 140 credits) secured from all Regular and Supplementary examinations conducted upto Third year First semester examination.

(or)

68 credits (out of 168) secured from all Regular and Supplementary examinations conducted upto Third year Second semester examination.

7.4 A student shall register and put up minimum attendance in all 224 credits and earn 216 credits. Marks obtained in the best 216 credits shall be considered for the calculation of percentage of marks.

7.5 Students who fail to earn 216 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.

**8 Course pattern**

8.1 The entire course of study is for four academic years. All 4 years on semester pattern.

8.2 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.

8.3 When a student is detained for lack of credits/shortage of attendance, he may be re-admitted into the next semester. However, the academic regulations under which he was readmitted shall continue to be applicable to him.

**9 Award of Class**

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

| Class Awarded | % of marks to be secured | |
|---|---|---|
| First Class with Distinction | 70% and above | From the aggregate |

| | | |
|---|---|---|
| First Class | Below 70 but not less than 60% | marks secured from 216 Credits. |
| Second Class | Below 60% but not less than 50% | |
| Pass Class | Below 50% but not less than 40% | |

(The marks obtained in internal evaluation and end semester examination shall be shown separately in the memorandum of marks.)

10 **Minimum Instruction Days**

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

11 There shall be no branch transfers after the completion of the admission process

12 Transfer from other colleges will be permitted, as per the rules stipulated by the affiliating University and the State government.

**13 WITHHOLDING OF RESULTS**

If the student has not paid the dues, if any, to the college or if any case of indiscipline is pending against him, the result of the student will be withheld and he will not be allowed into the next semester. His degree will be withheld in such cases.

14. **TRANSITORY REGULATIONS**

14.1 Discontinued, detained, or failed candidates are eligible for readmission into that Semester as and when next offered.

14.2 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.

14.3 In case of transferred students from other Universities, the credits shall be transferred to MREC (A) as per the academic regulations and course structure of the MREC (A).

**15. GENERAL**

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

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

15.3 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the College Academic Committee is final.

15.4 College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College Academic Committee.

.15.5. The students seeking transfer to MREC from various other Universities / Institutions have to pass the failed subjects which are equivalent to the subjects of MREC, and also pass the subjects of MREC 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 MREC, the candidates have to study those subjects in MREC in spite of the fact that those subjects are repeated.

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

**Maisammaguda, Dhulapally (Post via. Kompally), Secunderabad - 500100**

## ACADEMIC REGULATIONS FOR B. TECH (LATERAL ENTRY SCHEME)

**(Effective for the students admitted into II year from the Academic year 2015-2016 onwards)**

1 **Eligibility for award of B. Tech. Degree (LES)**

I. The LES candidates shall pursue a course of study for not less than three academic years and not more than six academic years.

II. They shall be permitted to write the examinations for two more years after six academic years of course work.

2. The candidate shall register for 168 credits and secure 160 credits from II to IV year B.Tech. Program (LES) for the award of B.Tech. Degree with compulsory subjects as listed in Table-1

| Serial Number | Subject Particulars |
|---|---|
| **1** | All practical subjects |
| **2** | Industry oriented mini project |
| **3** | Comprehensive Viva-Voce |
| **4** | Seminar |
| **5** | Project work |

Table 1: Compulsory Subjects

3. The students, who fail to fulfill the requirement for the award of the degree in 8 consecutive academic years (6 years of study + 2 years additionally for appearing exams only) from the year of admission, shall forfeit their seats.
4. The attendance regulations of B. Tech. (Regular) shall be applicable to B.Tech. (LES).
5. **Promotion Rule**

A student shall be promoted from second year to third year if he fulfills the minimum attendance requirement.

A student shall be promoted from III year to IV year only if he fulfills the academic requirements of

34 credits (out of 84 credits) secured from all Regular and Supplementary examinations conducted upto Third year First semester examination

(or)

44 credits (out of 112) secured from all Regular and Supplementary examinations conducted upto Third year Second semester examination.

6. **Award of Class**

After a student has satisfied the requirement prescribed for the completion of the program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

| Class Awarded | % of marks to be secured | |
|---|---|---|
| First Class with Distinction | 70% and above | **From the aggregate marks secured from 160 Credits from II year to IV year.** |
| First Class | Below 70 but not less than 60% | |
| Second Class | Below 60% but not less than 50% | |
| Pass Class | Below 50% but not less than 40% | |

(The marks obtained in the internal evaluation and the end semester examination shall be shown separately in the marks memorandum.)

7. 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**

| | **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 correlated 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 beexpelledfrom examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidates 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** | Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks. | Cancellation of the performance in that subject. |
| **6** | Refuses to obey the orders of the Chief 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 the person or to any of his relations whether bywords, either spoken or written or by signs or by visible representation, assaults the officer-in charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination. | In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police cases registered against them. |
| **7** | Leaves the exam hall taking away answer scripter 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 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 |
| **12** | If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action toward suitable punishment. | |

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***
**B.TECH. MINING ENGINEERING**
**COURSE STRUCTURE**
**I YEAR**
**COURSE STRUCTURE**

**I YEAR** **I SEMESTER**

| Code | Subject | L | T | P | C |
|---|---|---|---|---|---|
| 40E01 | English | 3 | - | - | 3 |
| 40P01 | Engineering Physics - I | 4 | - | - | 4 |
| 40C01 | Engineering Chemistry - I | 4 | - | - | 3 |
| 40M01 | Mathematics - I | 4 | - | - | 4 |
| 40501 | Computer Programming | 4 | - | - | 4 |
| 40301 | Engineering Drawing - I | 2 | 1 | 3 | 4 |
| 40502 | Computer Programming Lab | - | - | 3 | 2 |
| 40C03 | Engineering Chemistry Lab | - | - | 3 | 2 |
| 40E03 | English Language Communication Skills Lab | - | - | 3 | 2 |
| | **Total** | **21** | **1** | **12** | **28** |

**COURSE STRUCTURE**

**I YEAR** **II SEMESTER**

| Code | Subject | L | T | P | C |
|---|---|---|---|---|---|
| 40E02 | English & Professional Ethics | 4 | 1 | - | 4 |
| 40P02 | Engineering Physics - II | 3 | - | - | 3 |
| 40C02 | Engineering Chemistry - II | 3 | - | - | 3 |
| 40M02 | Mathematics - II | 4 | - | | 4 |
| 40302 | Engineering Mechanics | 4 | - | - | 4 |
| 40303 | Engineering Drawing - II | 2 | - | 3 | 4 |
| 40P03 | Engineering Physics Lab | - | - | 3 | 2 |
| 40304 | Auto CAD Lab & EM Lab | - | - | 3 | 2 |
| 40305 | Engineering & IT Workshop | - | - | 3 | 2 |
| | **Total** | **20** | **1** | **12** | **28** |

## COURSE STRUCTURE

**II Year** **I Semester**

| Code | Subject | L | T/P/D | C |
|---|---|---|---|---|
| 40109 | Environmental Studies | 4 | 0 | 4 |
| 40M05 | Probability and Statistics | 4 | 0 | 4 |
| 40314 | Mechanics of Fluids and Hydraulic Machines | 4 | 1 | 4 |
| 40701 | Mechanical Technology | 4 | 0 | 4 |
| 40702 | Fundamentals of Geology | 4 | 0 | 4 |
| 40703 | Extraction of Mineral Deposits | 4 | 0 | 4 |
| 40316 | Mechanics of Fluids and Hydraulic Machines Lab | 0 | 3 | 2 |
| 40704 | Geology Lab | 0 | 3 | 2 |
| | Total | 24 | 6 | 28 |

## COURSE STRUCTURE

**II Year** **II Semester**

| Code | Subject | L | T/P/D | C |
|---|---|---|---|---|
| 40M03 | Mathematics - III | 4 | 1 | 4 |
| 40230 | Basic Electrical and Electronics Engineering | 4 | 0 | 4 |
| 40705 | Machine Drawing and Computer Aided Graphics | 0 | 5 | 4 |
| 40307 | Mechanics of Solids | 4 | 1 | 4 |
| 40706 | Mining Geology | 4 | 1 | 4 |
| 40707 | Drilling and Blasting | 4 | 1 | 4 |
| 40231 | Electrical and Electronics Engineering Lab | 0 | 3 | 2 |
| 40310 | Mechanics of Solids Lab | 0 | 3 | 2 |
| | Total | 20 | 16 | 28 |

## COURSE STRUCTURE

**III Year** **I Semester**

| Code | Subject | L | T/P/D | C |
|---|---|---|---|---|
| 40B01 | Managerial Economics and Financial Analysis | 4 | - | 4 |
| 40708 | Mine Surveying-I | 4 | 1 | 4 |
| 40709 | Mine Environmental Engineering-I | 4 | 1 | 4 |
| 40710 | Surface Mining Technology | 4 | 1 | 4 |
| 40711 | Underground Coal Mining Technology | 4 | 1 | 4 |
| 40712 | Mine Mechanization-I | 4 | 1 | 4 |
| 40713 | Mine Surveying-I Lab | - | 3 | 2 |
| 40714 | Mine Environmental Engineering Lab | - | 3 | 2 |
| | Total | 24 | 11 | 28 |

## COURSE STRUCTURE

**III Year** **II Semester**

| Code | Subject | L | T/P/D | C |
|---|---|---|---|---|
| 40B03 | Industrial Management | 4 | - | 4 |
| 40715 | Mine Surveying-II | 3 | 1 | 4 |
| 40716 | Underground Metal Mining Technology | 3 | 2 | 4 |
| 40717 | Mine Environmental Engineering-II | 3 | 2 | 4 |
| 40718 | Mine Mechanization-II | 3 | 1 | 4 |
| 401A1<br>40B04<br>40B05 | **Elective:**<br>1. Disaster Management<br>2. Human Values and Professional Ethics<br>3.Intellectual Property Rights | 3 | 1 | 4 |
| 40719 | Mine Surveying –II Lab | - | 3 | 2 |
| 40E04 | Advanced English Communication Skills Lab | - | 3 | 2 |
| | Total | 19 | 13 | 28 |

## COURSE STRUCTURE

**IV Year** **I Semester**

| Code | Subject | L | T/P/D | C |
|---|---|---|---|---|
| 40720 | Mineral Processing | 3 | 1 | 4 |
| 40721 | Rock Mechanics | 3 | 1 | 4 |
| 30328 | Operations Research | 4 | 0 | 4 |
| 40722 | Mine Legislation | 2 | 1 | 4 |
| | **Elective-I** | 3 | 1 | 4 |
| 407A1 | Rock Slope Engineering | | | |
| 407A2 | Mine Subsidence Engineering | | | |
| 407A3 | Rock Excavation Engineering | | | |
| 407A4 | Rock Fragmentation Engineering | | | |
| | **Elective-II** | 3 | 1 | 4 |
| 407B1 | Computer Applications in Mining | | | |
| 407B2 | Mine Construction Engineering | | | |
| 407B3 | Tunneling Engineering | | | |
| 407B4 | Strata Control Technology | | | |
| 40723 | Mineral Processing Lab | 0 | 3 | 2 |
| 40724 | Rock Mechanics Lab | 0 | 3 | 2 |
| | Total | 19 | 11 | 28 |

## COURSE STRUCTURE

**IV Year** **II Semester**

| Code | Subject | L | T/P/D | C |
|---|---|---|---|---|
| 40725 | Mine Ground Control | 3 | 1 | 4 |
| | **Elective-III** | | | |
| 407C1 | Planning of Surface Mining Project | | | |
| 407C2 | Planning of Underground Coal Mining Project | 3 | 0 | 4 |
| 407C3 | Planning of Underground Metal Mining Project | | | |
| 407C4 | Mine Electrical Engineering | | | |
| | **Elective-IV** | | | |
| 407D1 | Geological & Technological factors of Coal Gasification CBM, Shale Gab | 3 | 0 | 4 |
| 407D2 | Mine Health & Safety Engineering | | | |
| 407D3 | Maintenance & Reliability Engineering | | | |
| 407D4 | Deep Seam Mining | | | |
| 40726 | Industrial Oriented Mini Project | 0 | 0 | 2 |
| 40727 | Seminar | 0 | 6 | 2 |
| 40728 | Project work | 0 | 15 | 10 |
| 40729 | Comprehensive Viva Voce | 0 | 0 | 2 |
| | Total | 9 | 22 | 28 |

**Note:** All End Examinations (Theory and Practical) are of three hours duration.

T – Theory P – Practical C – Credits

**2014-15** **Code: 40E01**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech I Sem.** **L T/P/D C**
**3 -/-/- 3**

**ENGLISH – I**
**(Common for all Branches)**

**INTRODUCTION:**

There is an increasing concern over the English language competency of Engineering students based on their academic and professional performance. The transformation and the mistreatment of language in the social networking over the last decade have greatly affected the language skills of the students. In keeping with the language skill deficiencies, the present syllabus is designed to hone not only the traditional LSRW skills but also their analytical skills that enable to think too in English. This effective approach to develop English Language competency among the Engineering students aims to kindle the thinking skills to communicate effectively. The classroom activities based on the textbook may be used to build confidence among the students as they become active participants and teachers taking the role of a facilitator.

In the English classes, the focus is on the grammar, vocabulary, reading and, writing. 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 focus is on language error detection as well as correction along with honing vocabulary, reading skills, and writing skills.

The text 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:**

a. To facilitate for the improvement of the language proficiency of the students in English with emphasis on Reading and writing skills.

b. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.

c. Analysing intensive reading strategies and discussing how to distinguish between facts and opinions and draw inferences.

d. Enable the students to improve effective writing skills.

f. To develop English Language communication skills in formal and informal situations.

**SYLLABUS:**

**TEXTBOOK PRESCRIBED:**

**In order to improve the proficiency of the student in the acquisition of Grammar error free language , the following text and course content, divided into Five Units, is prescribed.**

1. Text book **English Today** by K.Durga Bhavani & Co. Published by Foundation Books

**For Grammar practice**

2. **A Work Book on English Grammar and Composition** published by Tata Mac Graw –Hill , New Delhi 2012.
3. Headway's **Academic Skills-reading, writing and study skills-**Level-2 student's book. Oxford publications

**UNIT –I:**

Chapters entitled 'Competition Matters' and 'Light Pollution' from **English Today**, Published by Foundation Books

Vocabulary:- parts of speech

Grammar:- Articles, Prepositions

Reading :- Introduction to Reading Skills, Reading comprehension.

Writing:- Introduction to writing skills, characteristics of effective writing

**UNIT –II**

Chapters entitled 'Key to Courage' and 'The Eternal Pilgram' from **English Today**, Published by Foundation Books

Vocabulary**:**– Formation of words, prefixes, suffixes and root words,

Grammar: -Tense, aspect and concord

Reading-Skimming and Scanning

Writing: Paragraph writing- use of cohesive devises

**UNIT –III**

Chapters entitled 'The Wonders of the New Millennium' and The Lost Child' from **English Today**, Published by Foundation Books

Reading: reading for details.

Grammar: integrated exercises in error detection and correction in tenses and concord.

Vocabulary: homonyms and homophones

Writing: paragraph writing and arranging jumbled sentences into paragraphs

**UNIT –IV**

Chapters entitled 'A Special Kind of Blessing' and 'How to avoid an Argument' from **English Today**, Published by Foundation Books

Grammar: Voice – exercises

Vocabulary: Phrasal verbs.

Reading: Note making

Writing: Notice and circular writing

**UNIT –V**

Chapters entitled 'Food: Family and Culture' and 'English in India Today: Some Views' from **English Today**, Published by Foundation Books

Grammar: Speech- exercises,

Vocabulary: Idiomatic expressions

Reading: Reading for specific purposes

Writing: Letter writing- both formal and informal.

* Exercises from the texts not prescribed shall also be used for classroom tasks.

**LEARNING OUTCOMES:**

1. Usage of English Language, written and spoken.

2. Enrichment of language accuracy and fluency.

3. Gaining confidence in using flawless English language and skills for writing in real life situations..

**REFERENCE BOOKS:**


1. Murphy English Grammar (Intermediate)
2. Basic English by Michael Swan
3. Practical English Grammar by Thomson & Martinet
4. Understanding and Using English Grammar by Betty Schrampfer Azar
5. A Communicative Grammar of English by Geoffrey N. Leech
6. Practical English Usage by Michael Swan
7. Oxford Word Skills Basic by Ruth Gairns
8. Improve Your Written English by Marion Field

A Student's Introduction to English Grammar (South Asian Edition) 1st Edition by Author: Rodney Huddleston, Geoffrey K. Pullum

10. Essential English Grammar: A Self-Study Reference and Practice Book for Intermediate Students of English with Answers 2nd Edition by Murphy

11. Better English Revised Edition 1st Edition by Norman Lewis

12. Learn English: A Fun Book of Functional Language, Grammar, and Vocabulary 1st Edition (Paperback) by Santanu Sinha Chaudhuri, Tata McGraw Hill Education

13. OXFORD GUIDE TO ENGLISH GRAMMAR 1st Edition by John Eastwod

14. How to Write Correct English (Applied English Grammar) by Rajendra Prasad Sinha

15. Collins Easy Learning Grammar & Punctuation by HarperCollins

16. Vocabulary word power made easy by Norman Lewis

**2014-15** **Code: 40P01**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech I Sem.** **L T/P/D C**
**4 -/-/- 4**

**ENGINEERING PHYSICS – I**
**(Common to all branches)**

**OBJECTIVES:**

1. To teach the students classification of materials based on the arrangement of atoms, basic concepts of crystallography.
2. To make the students learn the concepts of defects in crystals.
3. To make the students understand the concept of SHM, and different kinds of oscillations.
4. To teach the students the concept of dual nature of matter and experimental support to this concept
5. To expose the students to classical free electron theory and quantum free electron theory and their drawbacks.
6. To teach the students the Band theory and classification of materials based on band theory.
7. To make the students understand the concepts of Fermi level and charge carrier concentrations in semi conductors.
8. To make the students get acquainted with the p n junction diode and its characteristics.
9. To teach the basics of Electromagnetic theory.

**UNIT – I**

**Crystallography and Crystal Structures**:

Classification of materials – Crystalline, Amorphous, Poly crystalline; Lattice point, Space Lattice, Basis, Crystal structure, Unit Cell, Crystallographic axes, Lattice Parameters; Crystal Systems – Bravais Lattices; Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC and Diamond structures; Crystal Planes and Directions - Miller Indices, Expression for interplanar distance in cubic system

**Defects in Crystals:**

Defects and their classification; Point Defects – Vacancies, Interstitial, Impurities, Electronic defects; Qualitative discussion of Schottky and Frenkel defects; Qualitative treatment of line defects (Edge and Screw dislocations); Burger's Vector

**UNIT – II**

**Oscillations** :

Introduction; Differential equation for S.H.M. and its solution; velocity and acceleration; expression for period and frequency; graphs of displacement, velocity and acceleration; energy of the simple oscillator; Damped oscillations – under damping, critical damping and over damping; Qualitative treatment of Forced vibrations; sharpness of resonance, Qualitative treatment of electrical oscillator circuit containing inductor, capacitor and resistor

**UNIT – III**

**Principles of Quantum Mechanics**:

Waves and Particles - de Broglie's concept of Matter Waves; Davisson and Germer's experiment; G.P.Thomson's experiment. Heisenberg's Uncertainty Principle; Schrödinger's Time Independent Wave Equation - Physical Significance of the Wave Function; Energy of a particle in a one dimensional infinite potential well.

**Band Theory of Solids:**

Qualitative discussion of Classical free electron theory; Expression for electrical conductivity of metals; Qualitative discussion of Quantum free electron theory; Electron in a periodic Potential (Bloch Theorem), Kronig-Penny Model (Qualitative Treatment), Origin of energy Band formation in solids, Classification of materials into Conductors, Semi Conductors & Insulators, Concept of effective mass of an electron

**UNIT – IV**

**Semiconductor Physics:**

Introduction, Classification of Semiconductors; Formation of p type and n type materials; Charge carrier concentration in Intrinsic semiconductors; Qualitative treatment of charge carrier concentration in Extrinsic semiconductors; Qualitative treatment of Fermi Level in Intrinsic and Extrinsic Semiconductors; Direct & Indirect Band Gap

Semiconductors; Hall Effect; formation of p n junction diode; forward bias and reverse bias, I-V characteristics of pn junction diode; Zener Break down, Avalanche Break down

**UNIT – V**
**Electro Magnetic Theory**:

Scalar and Vector fields, Gradient of Scalar field and its physical significance; Divergence and Curl of Vector field; Ampere's Law, Faraday's Law of electromagnetic induction; Induced E.M.F. in a conductor; Lenz's Law, Displacement current, Maxwell equations in differential and integral form, wave equation .

**OUTCOMES:**

1. Students shall learn the classification of materials into three categories. With an emphasis on Crystals, they shall learn the concepts of unit cell and Bravais lattices and evaluation of packing factors for different cubic structures and diamond structure.
2. Students shall learn in detail about various point defects like Vacancies, interstitials etc and extend their understanding up to one dimensional defect like Edge and screw dislocations.
3. Student shall understand and appreciate the physics behind the mathematical equations that govern free oscillations, damped oscillations and forced oscillations. Also they shall understand the concept of resonance
4. Students shall get introduced to the fascinating world of quantum mechanics with the basic and key concepts like de Broglie's concept of matter waves and the experimental support given by Davisson and Germer and G.P.Thomson and learn to solve the Particle in one dimensional infinite potential well problem.
5. Students shall learn the Kronig – Penney model which gives rise to Band theory of solids. Also they understand the concept of effective mass of electron.
6. Students shall learn the mathematical treatment of charge carrier concentration in intrinsic and extrinsic semi conductors. Also they shall learn a very interesting phenomenon called Hall Effect and its applications besides learning pn junction diode, its characteristics and the associated breakdown mechanisms.
7. They shall be able to understand the Faraday's laws of electromagnetism and get introduced to Maxwell's equations.

**TEXT BOOKS:**

1. Modern Engineering Physics by K. Vijaya Kumar, S. Chandralingam: S. Chand & Co.Ltd
2. Engineering Physics – P.K.Palanisamy - SciTech Publications Pvt. Ltd., 5th Print 2008.
3. Applied Physics – S.O. Pillai & Sivakami-New Age International (P) Ltd., 2nd Edition 2008.
4. Unified Physics Vol – I by S L Gupta and Sanjeev Gupta JNPN Publications.
5. Engineering Physics by B K Panedy, S Chaturvedi, Cengage learning

**REFERENCE BOOKS:**

1. Solid State Physics – M. Armugam (Anuradha Publications).
2. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar– S. Chand & Co. (for acoustics).
3. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
4. Basic Electronics and Linear Circuits by D C Kulshreshtha, S C Gupta, N N Bhargava, TTTI, Chandigarh
5. Solid State Physics – A.J. Dekker (Macmillan).
6. Applied Physics – T. Bhima Shankaram & G. Prasad (B.S. Publications, Third Edition 2008).
7. A text book of Engineering Physics – S.P. Basvaraju – Subhas store
8. Electricity and magnetism by Edward Purcell – Berkeley series vol 2
9. Physics Vol 2 – Resnick, Halliday & Krane – Fifth edition, Wiley Student edition.
10.Physics – B.Sc. First Year by Dr B Sanjeeva Rao, et al, Telugu Akademi

**2014-15** **Code: 40C01**

**MALLA REDDY ENGINEERING COLLEGE**
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**I Year B.Tech. I Sem.**

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| 3 | -/-/- | 3 |

**ENGINEERING CHEMISTRY – I**
**(Common for CE, EEE, ME, ECE, CSE & Mining)**

**Objectives:**

1. To make the students to understand the basic concepts of chemistry to develop futuristic materials for high-tech applications in the area of engineering.
2. To explore the economically viable technologies developed for utilizing water resources and to provide basic skills in chemical analysis of water and materials.
3. To study the chemistry of portable energy storage devices like various conventional as well as modern batteries and their usage in different aspects of life.
4. To gain the knowledge of corrosion science and anti corrosive techniques to protect faster corrosion and monitoring of corrosion.
5. To predict and control the properties through an understanding of atomic, molecular, crystalline and microscopic structures of engineering materials.

**UNIT –I**

**Water Technology – I:** Hardness of Water: Causes of hardness, expression of hardness – units – types of hardness, estimation of temporary & permanent hardness of water by EDTA method - numerical problems. Boiler troubles – Scale & sludges, Priming and foaming, caustic enbrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal, carbonate and calgon conditioning) .

**UNIT- II**

**Water Technology -II :** External treatment – Lime Soda process, Zeolite process and ion exchange process. Numerical Problems. Potable Water- Its Specifications – Steps involved in treatment of potable water – Disinfection of water by chlorination and ozonisation. Reverse osmosis, Electro dialysis and their significance.

**UNIT-III**

**Electrochemistry:** Electro Chemical Cells: EMF: Galvanic Cells, types of Electrodes – ( Calomel, Quinhydrone and glass electrodes); Nernst equation and its applications ; concentration cells; classification with examples, electro chemical series, Potentiometric titrations, determination of $p^H$ using glass electrode-Numerical problems. Batteries: Primary cells (dry cells) and secondary cells (lead-Acid cell, Ni-Cd cell). Applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell; Advantages and Applications.

**UNIT-IV**

**Corrosion And Its Control:** Causes and effects of corrosion; Theories of corrosion – Chemical & Electrochemical corrosion; Types of corrosion ( Galvanic, Water line, Pitting and Inter granular); Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (sacrificial anodic and impressed current). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), Cementation, cladding, electroplating ( copper plating ) Electro less plating ( Ni plating**).**

**UNIT- V**

**Material Chemistry:**Lubricants: Classification with examples- Characteristics of a good lubricant & properties of lubricants: viscosity, Cloud point, flash and fire points. Refractories: Classification, characteristics of a good refractory and applications. Nanomaterials: Introduction, preparation by sol-gel & chemical vapor deposition methods and Applications of nano materials.

**Outcomes:**

**As an outcome of completing this course, students will:**

1. Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatment plants.
2. Understand the operating principles of various types of electrochemical cells, including fuel cells and batteries.
3. 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

**TEXT BOOKS:**


1. P. C. Jain and Monica Jain, A text Book of Engineering Chemistry, Dhanapat Rai Publications, New Delhi, 12th Edition 2006.
2. R.V. Gadag and Nithyananda Shetty, A text Book of Engineering Chemistry. I.K International publishing house. Edition 2012.


**REFERENCE BOOKS:**


1. F.W. Billmeyer, Text Book of Polymer Science, John Wiley & Sons, 4$^{th}$ Edition, 1996.
2. M.G. Fontana, N. D. Greene, Corrosion Engineering, McGraw Hill Publications, New York, 3rd Edition, 1996.
3. Principles of Physical Chemistry B.R.Puri, L.R.Sharma & M.S.Pathania, S.Nagin Chand &Co., (1993)., ( 23$^{rd}$edition) New Delhi.

**2014-15** **Code: 40M01**

**MALLA REDDY ENGINEERING COLLEGE**
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**I Year B.Tech I Sem.**

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**MATHEMATICS – I**
**(Theory of Matrices & ODE)**
**Common for all**

**Objectives:**

1. Finding inverse of a matrix by elementary transformations
2. Solving system of simultaneous equations
3. Calculate the powers of the matrix & Calculate the inverse of the matrix by CHT
4. Know about the properties of the Eigen values and Vectors, Quadratic forms
5. Know the Applications of second order differential equations
6. Converts a real life problem into a differential equation

**UNIT – I**

**Matrices and Linear systems of equations**:

Rank of the matrix - Elementary transformations –Echelon form - Normal form – PAQ Form - Inverse from Elementary matrices – Solution of Linear Systems – Consistency of Linear system of equations – Linear and Orthogonal Transformations –Linearly independent and dependent of vectors-LU Decomposition- LU Decomposition from Gauss Elimination –Solution of Tri-diagonal Systems

**UNIT – II**

**Eigen Values, Eigen Vectors, Complex matrices**

Eigen values, Eigen vectors – properties – Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem. Diagonolization of matrix-Calculation of powers of matrix – Modal and spectral matrices. Real matrices – Symmetric, skew – symmetric.

Complex Matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and Eigen vectors of complex matrices and their properties.

**UNIT – III**

**Quadratic forms, Ordinary Differential Equations of First Order**

$G^{-1}$ – MP inverse- Singular value decomposition

Quadratic forms , Reduction of quadratic form to canonical form – Rank- Nature - index – signature of Quadratic forms.

**Applications of First Order Differential Equations**: Orthogonal trajectories, Newton's Law of cooling, Law of natural growth and decay.

**UNIT – IV**

**Differential Equations of Second & Higher Order**

Definitions- Complete Solutions –Rules for finding Complementary function-Particular integral ( R.H.S of the type $e^{ax}$ , $Sin\,ax$ , $Cos\,ax$ , $Polynomial\ in\ x$ , $e^{ax}V(x)$ , $x^m v(x)$ and Method of variation of Parameters.

**UNIT – V**

**Laplace Transforms**

Definition of Laplace transform, Condition for existence –L.T. of standard functions –Properties of L.T. Transforms of Periodic function , derivatives and integrals – Multiplication by $t^n$ - division by $t$ -Evalution of Integrals - Inverse Transforms- Other methods of finding Inverse Transforms . Convolution theorem –Application of Laplace transforms to ordinary differential equations - Dirac's delta function – Unit step function .

**OUTCOMES:**

1. Applies the Theory of Matrices in solving n number of equations
2 Understands how to convert problems in engineering to differential equations
3 Understands the applications of differential equations in second and higher order
4 Understands the Newton's Law of cooling, Law of Natural growth or Decay

**TEXT BOOKS:**

1. Mathematical Methods of Science and Engineering by Kanti B.Datta ,Cengage Learning
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Introduction to Matrix Analysis by Richard Bellman, Dover Publications
4. Differential Equations by Shepley L Ross, Wiley Publications

**REFERENCE BOOKS:**

1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
3. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
4. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
5. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
6. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press Taylor & Francis Group.
7. Mathematics for Engineers and Scientists, Alan Jeffrey, 6ht Edi, 2013, Chapman & Hall/ CRC
8. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

**2014-15** **Code: 40501**

**MALLA REDDY ENGINEERING COLLEGE**
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**I Year B.Tech. I Sem.**

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**COMPUTER PROGRAMMING**
**Common to CE/EEE/ME/ECE/CSE/Mining**

**Objectives**

1. Learn how to write modular, efficient and readable C programs
2. Declare and manipulate single and multi-dimensional arrays of the C data types.
3. Describe the techniques for creating program modules in C using functions and recursive functions.
4. Create and manage derived data types and perform operations on files.
5. Utilize pointers and dynamic memory allocation functions to efficiently solve problems.
6. To provide an overview on current technologies in Software Industry like Open Source-LINUX and PHP.

**UNIT I**

**Computer fundamentals**-Hardware, Software, Programming languages, Translators, Overview of Operating System, Program Development steps-Algorithm, Flow chart; Number Systems,

**Introduction to C Language** – History, Simple C Program, Identifiers, Basic data types, User defined data types, Variables, Constants, Type qualifiers, Managing Input / Output, Operators, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

**UNIT II**

**Conditional Statements** – if and switch statements, Loop Control Statements – while, for, do-while statements, C Programming examples, Other statements related to control statements – break, continue, goto, C Programming examples.

**Arrays**– Basic concepts, One-dimensional arrays, Two–dimensional arrays, Multi-dimensional arrays, C programming examples.

**Strings** – Basic concepts, String Input / Output functions, Arrays of strings, String handling functions, C programming examples.

**UNIT III**

**Introduction to Structured Programming**- Functions- Basics, User defined functions, Inter function communication, Standard functions, Storage Classes-auto, register, static, extern, Scope rules, Array and string manipulations using functions, Recursive functions, C programming examples.

**Derived types** – Structures – Basic concepts, Nested structures, Arrays of structures, Structure manipulations using functions, Unions, bit fields, C programming examples.

**UNIT IV**

**Pointers** – Basic concepts, Pointer arithmetic, Pointers and functions, Pointers and strings, Pointers and arrays, Pointers and structures, Self-referential structures, C programming examples.

**Preprocessor Directives**-include, define, etc., Dynamic Memory Allocation.

**File I/O** – Basic concepts, Text files and Binary files, File input / output operations, File status functions (error handling), Command-Line Arguments, C programming examples.

**UNIT V**

**Open Source:** Introduction to Open Standard, Open Standards Model, Standards and Applications, Open Source Software and Technology.

**Linux:** History, Properties, Flavors, Introduction to file system, Basic commands and shell programming, Execution of c programs.

**PHP:** - History, Features of PHP, Key Driver of LAMP Stack, PHP Deployment Platform – Sample web site using PHP.

**Outcomes:**

Upon completion of the course, the students are expected to:

1. Write, compile and debug programs in C language.
2. Use different data types in a computer program.
3. Design programs involving decision structures, loops, arrays and functions.
4. Explain the difference between call-by-value and call-by-reference
5. Understand the dynamic allocation of memory by using pointers.
6. Use different file operations to create/update basic data files.
7. Use the basic commands of Linux
8. Able to create basic web pages using PHP Deployment

**TEXT BOOKS:**


1. Programming in C by Pradip Dey, Manas Ghosh – Second Edition, Oxford University Press.
2. C programming: A Problem-Solving Approach by Behrouz A. Forouzan, E.V.Prasad, Richard F.Gilberg – First Edition, Cengage Learning Press
3. C How to Program by Paul Deitel and Harvey Deitel – Seventh Edition, PH.
4. C Programming and Data Structures by E Balagurusamy, Second Edition, Tata McGraw Hill.
5. Introduction to Linux-A Beginner's Guide by Machtelt Garrels
6. Beginning PHP 5.3, by Matt Doyle, SPD/Wrox Press-2011


**REFERENCE BOOKS:**


1. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie – Second Edition, PH.
2. C Programming: Absolute beginner's guide by Greg Perry and Dean Miller, Third Edition, QUE Publishers.
3. Let Us C by Yashwant Kanetkar – Fifth Edition, BPB Publications.

**2014-15** **Code: 40301**

**MALLA REDDY ENGINEERING COLLEGE**
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**I Year B.Tech. I Sem.**

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**ENGINEERING DRAWING – I**

**PRE-REQUISITE:** Mathematical Geometry

**OBJECTIVE:** The objective of this subject is to provide the basic concepts about Engineering Drawing. Detailed concepts are given in projections, technical drawing, dimensioning and specifications

**CODES/TABLES:** Nil

**UNIT – I**

**Introduction to Engineering Drawing:** Principles of Engineering Drawing/Graphics – Various Drawing Instruments – Conventions in Drawing –

**Lettering practice** – BIS Conventions.

**Curves:** Constructions of Curves used in Engineering Practice:

a) Conic Sections including the Rectangular Hyperbola – General method only.

b) Cycloid, Epicycloid and Hypocycloid

c) Involute.

**UNIT – II**

**Orthographic Projections in First Angle**

**Projection:** Principles of Orthographic Projections – Conventions – First and Third Angle projections.

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

**Projections of Lines** - Parallel, perpendicular, inclined to one plan and inclined to both planes. True length and true angle of a line. Traces of a line.

**UNIT – III**

**Projections of Planes: Plane parallel, perpendicular and inclined to one reference plane. Plane** inclined to both the reference planes.

**UNIT – IV**

**Projections of Solids:** Projections of regular solids, cube, prisms, pyramids, tetrahedran, cylinder and cone, axis inclined to both planes.

**UNIT – V**

**Isometric Projections :** Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of parts with Spherical surface.

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

**OUTCOME:** At the end of learning this course the student shall be able to understand the planes, lines, curves, projections, orthographic views, isometric views, sections of solids

**TEXT BOOK:**

1. Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing - Basant Agrawal, TMH

**REFERENCE BOOKS:**


1. Engineering drawing - P.J. Shah.S.Chand.
2. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill.
4. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. international.
5. Engineering Drawing - Grower.
6. Engineering Drawing , Venugopal / New age.

**2014-15** **Code: 40502**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech. I Sem.**

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**COMPUTER PROGRAMMING LAB**
**(Common for all branches)**

**OBJECTIVES:**

1. Gain practical knowledge of C programming to write modular, efficient and readable C programs by identifying the structural elements and layout of C source code.
2. Declare and manipulate single and multi-dimensional arrays of the C data types and derived data types like structures, unions.
3. Use functions from the portable C library and to describe the techniques for creating program modules using functions and recursive functions.
4. Manipulate character strings in C programs. Utilize pointers to efficiently solve problems.
5. Allocate memory to variables dynamically and Perform operations on text and binary files.
6. Learns basic commands of Linux
7. Learns basics of PHP

**Week l:**

Practice various DOS internal and external commands.

**Week 2:**

a) Practice various Menu items and debugging techniques in IDE.
b) Practicing sample C programs using Conversion specification.
c) Implement various programs logics using algorithms and flowcharts.

**Week 3:**

a) Write a C program to find smallest and largest of given three numbers.
**b)** Write a C program to find the roots of a quadratic equation.
c) Write a C program to implement basic arithmetic operations.

**Week 4:**

a) Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
**c)** Write a C program to find whether the given number is palindrome, perfect, Armstrong or strong.

d) Write a C program to generate all the prime numbers between n1 and n2, where n1 and n2 are values supplied by the user.

**Week 5:**

Write C programs that use both recursive and non-recursive functions

a) To find the factorial of a given integer.
b) To find the GCD (greatest common divisor) of two given integers.

**Week 6:**

**a)** Write a C program to find both the largest and smallest number in a list of integers.

**b)** Write a C program that uses functions to perform the following:

i) Addition of Two Matrices

ii) Multiplication of Two Matrices

**Week 7:**

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

i) To insert a sub-string in to given main string from a given position.

ii) To delete n Characters from a given position in a given string.

**b)** Write a C program to determine if the given string is a palindrome or not

**c)** Write a C program to find substring in a given string.

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

**Week 8:**

**a)** Write a C program to construct a pyramid of numbers.

**b)** Write a C program to generate Pascal's triangle.

**Week 9:**

Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression: $1+x+x^2+x^3+\ldots\ldots\ldots\ldots + x^n$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum

Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

**Week 10:**

**a)** 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.

**b)** Write a C program to convert a Roman numeral to its decimal equivalent.

**Week 11:**

a) Write a C program that uses functions 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
(Note: represent complex number using a structure.)

b) Write a C program to find grades of a student's using structures and unions.

**Week 12:**

**a)** Write a C program which copies one file to another.

b) Write a C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

**Week 13:**

a) Practicing basic LINUX commands
b) Write simple shell programs

**Week 14:**

a) Develop a sample web Pages using PHP

**Outcomes:**

Upon completion of the course, the students are expected to:

1. Understand the basic terminology used in computer programming and to write, compile and debug programs in C language.
2. Design programs involving decision structures, loops ,arrays and functions.
3. Understand the dynamics of memory by the use of pointers.
4. Use different file operations to create/update basic data files.
5. Familiarizes with basics of LINUX and PHP

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**MALLA REDDY ENGINEERING COLLEGE**
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**I Year B.Tech II-sem.**

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**ENGINEERING CHEMISTRY LAB**
**List of Experiments (Any 10 of the following) :**

**Titrimetry:**

1. Estimation of ferrous iron by dichrometry.

2. Estimation of hardness of water by EDTA method.

**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 acd vs strong base by potentiometry.

8. Titration of weak acid vs strong base by potentiometry.

**Physical properties:**

9.Determination of viscosity of sample oil by redwood / oswald's viscometer.

10.Determination of Surface tension of lubricants.

**Preparations:**

11. Preparation of Aspirin

**Kinetics:**

12. To determine the Rate constant of hydrolysis of methyl acetate by an acid.

**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 Harrmendra Goel, 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

**2014-15** **Code: 40E03**

**MALLA REDDY ENGINEERING COLLEGE**
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**I Year B.Tech. I Sem.**

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**ENGLISH LANGUAGE COMMUNICATION SKILLS LAB**
**(Common for all branches)**

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

**Objectives**

To sensitize the students to the intelligibility in their pronunciation of English, speech sounds, word accent, intonation and rhythm

To improve the fluency in spoken English and neutralize mother tongue influence

To facilitate honing of listening and speaking skills of students

To train students to understand nuances of both verbal and non verbal communication during all activities

To develop confidence to face the audience and participate in activities

To help the students shed inhibitions and communicate with clarity

**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 recognise them, awareness regarding stress and recognise 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

• Just A Minute(JAM) Sessions.

**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

**ICS Lab:** Ice-Breaking activity and JAM session

Listening: listening for sounds in context, for ideas.

Speaking: ideation and translation of ideas into sentences.

**UNIT – II**

**CALL Lab:** Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.

**ICS Lab:** Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Listening: listening for specific purposes, for details.

Speaking: speaking in the above situations with clarity, connectivity, maintaining voice characters.

**UNIT- III**

**CALL Lab:** Word accent and Listening Comprehension-reading(aloud) meaningfully.

**ICS Lab:** Descriptions- Narrations- Giving Directions and guidelines.

Listening: listening for intelligible English

Speaking: formal and informal conversations, register.

**UNIT – IV**

**CALL Lab:** Intonation and Common errors in Pronunciation- reading aloud( evaluating through recording).

**ICS Lab:** Extempore- Public Speaking , Oral Presentation Skills

Listening: note taking and listening for speaker's tone/attitude

Speaking: organizing , connecting ideas and sentences, short forms in spoken English, errors in spoken English

**UNIT– V**

**CALL Lab:** Neutralization of Mother Tongue Influence and Conversation Practice

**ICS Lab:** Information Transfer, Debate

Minimum Requirement of infra structural facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 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) Hard Disk – 80 GB

ii) Headphones of High quality

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

The Interactive Communication Skills 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.

**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):**

Prescribed Lab Manual: English Language Communication Skills laboratory Manual Published by Pearson, New Delhi 2012

**Learning Outcomes:**

1. Better Understanding of nuances of language through audio- visual experience and group activities

2. Neutralization of accent for intelligibility

3. Speaking with clarity and confidence thereby enhancing employability skills of the students

4. Good understanding of listening skills and speaking skills and their application in real life situations.

5. Good understanding of non-verbal communication and developing confidence to face audience, shed inhibitions.

Reference books.


1. Polyskills by Cambridge Foundation Course
2. Technical Communication by William Sanborn Pfeiffer and TVS Padmaja
3. English Language Communication, a Reader Cum Lab Manual Course Content and Practice by Dr. A Ramakrishna Rao, Dr. G. Natanam, Prof. S.A. Sankaranarayanan
4. A Course On English by K.R. Lakshminarayanan
5. Successful Presentations by John Hughes and Andrew Mallett
6. Oxford Word Skills, learn and Practise English Vocabulary by Ruth Gairns and Redman
7. Public Speaking Techniques, Speak Like a Winner by Akash Karia
8. The Art of Public Speaking by Stephen Lucas
9. Essential Communication Skills by Shalini Aggarwal, Linda Chapman
10. English Language Communication Skills, Lab Manual cum Workbook by Cengage Learning


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 college 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 sessional 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 as an internal examiner and another member from examiners' list recommended by the BOS as an external examiner.

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**I Year B.Tech II-sem.** **L T/P/D C**
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# English & Professional Ethics
**(Common to all branches)**

**INTRODUCTION:**

There is an increasing concern over the English language competency of Engineering students based on their academic and professional performance. The transformation and the mistreatment of language in the social networking over the last decade have greatly affected the language skills of the students. In keeping with the language skill deficiencies, the present syllabus is designed to hone not only the traditional LSRW skills but also their analytical skills that enable to think too in English. This effective approach to develop English Language competency among the Engineering students aims to kindle the thinking skills to communicate effectively. The classroom activities based on the textbook may be used to build confidence among the students as they become active participants and teachers taking the role of a facilitator.

In the English classes, the focus is on the grammar, vocabulary, reading and, writing. 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 focus is on language error detection as well as correction along with honing vocabulary, reading skills, and writing skills.

The text 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.

This course also has a few elements on professional ethics and human values. It helps the students know their responsibility towards the society and instills in students, a sense of respect towards harnessing values of life and spirit of fulfilling social responsibilities

**OBJECTIVES:**

a. To facilitate for the improvement of the language proficiency of the students in English with emphasis on Reading and writing skills.

b. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.

c. Analysing intensive reading strategies and discussing how to distinguish between facts and opinions and draw inferences.

d. Enable the students to improve effective writing skills.

f. To develop English Language communication skills in formal and informal situations.

g. To create an awareness on Engineering Ethics and Human Values.
h. To understand social responsibility of an engineer.
i. To appreciate ethical dilemma while discharging duties in professional life.
j. To mould the students to the needs of the world.

**SYLLABUS:**

**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

• 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

- Circular writing
- Memo writing
- Report writing

**TEXT BOOK PRESCRIBED:**

**Ignited Minds by A. P. J. Abdul Kalam, Penguin Books.**

**Ethics in Engineering** by Mike Martin and Roland Schinzinger , McGraw-Hill.

The course content and study material is divided into seven Units.

**UNIT-I**

Chapters entitled "The Dream and the Message" and "Give Us a Role Model" from **Ignited Minds** by A.P.J. Abdul Kalam, Penguin Books.

**Vocabulary**: synonyms and antonyms.

**Grammar:** question tags, exercises related to questions.

Reading: Intensive Reading and Extensive Reading.

Writing: essay writing.

**UNIT-II**

Chapters entitled "Visionary Teachers and Scientists" and "Learning from Saints and Seers" from **Ignited Minds** by A.P.J. Abdul Kalam, penguin Books.

Vocabulary: words often confused, idioms and phrases

Grammar: degrees of comparison- exercises.

Reading**:** Reading for themes and gists

Writing: summarizing

**UNIT-III**

Chapters entitled "Patriotism beyond Politics and Religion" and "The Knowledge Society" from **Ignited Minds** by A.P.J. Abdul Kalam, , Penguin Books.

Grammar: types of sentences, transformation of sentences- simple , complex and compound sentences.

Vocabulary: one word substitutions.

Reading: reading for interpretation

Writing. Writing instructions

**UNIT-IV**

Chapters entitled "Getting the Forces Together" and "Building a New State" from **Ignited Minds** by A.P.J. Abdul Kalam, , Penguin Books.

Grammar: Conditionals- exercises.

Vocabulary: e-register, foreign expressions.

Reading: critical reading.

Writing: memo writing, review writing

**UNIT-V**

Chapter entitled "To My Countrymen" from **Ignited Minds** by A.P.J. Abdul Kalam, , Penguin Books.

Grammar: Common errors and integrated exercises.

Vocabulary: gender sensitive language, integrated exercises in vocabulary.

Reading: survey, question, read, recall and review.

**Writing** - Note-making, Report writing, types of reports

**UNIT- VI**

Introduction to Engineering Ethics- Definition; Purpose of studying Ethics in Engineering. Engineers as Social Experimenters and Safety Officers, Learning from the past, Knowledge gained, Responsible Experimenters, Accountability, Assessment of Safety and Risk, Risk benefit analyses and reducing risk.

- Field work could be assigned to the students- interaction with the "real" Safety Officers

**UNIT –VII**

Responsibilities to Employers, Respect for Authority, confidentiality; conflicts of interest-Impairment of Judgment & Service, Gifts & Bribes, Moral Status; Occupational crime, Antidiscrimination Laws, Sexual harassment, Global Issues; Engineers- Leaders, Environmental/ Bio ethics, Computer Ethics, Hacking, Cyber Crime, Engineers as Managers, Moral Leadership

- Field work could be assigned – take up a role of a leader and work on any issue.

*unit VI&VII are to be tested only for internal evaluation. They are not meant for end semester examination.

*midterm I will cover unit1-3, midterm II will cover unit4-7.

* project based on field work in teams will carry 5marks.

**LEARNING OUTCOMES:**

1. Usage of English Language, written and spoken.

2. Enrichment of comprehension and fluency

3. Improving effective writing skills in personal and professional life.

4. The learners recognise ethical responsibilities of engineers and suggest ways to deal with ethical issues in engineering.
5. The learners can reach an ethically justified or morally reasoned practical solution to an ethical problem with an appropriate plan of action.

**REFERENCE BOOKS:**

1.Sharon J. Gerson Steve M. Gerson, "Technical Writing", New Delhi, Pearson education
2. Professional Report Writing by Simon Mort

3. Cambridge English for Engineering : Student's Book, Mark Ibbotson , PB + 2 ACD, ISBN:

4. English for Engineers, Regional Institute of English; Bangalore, PB + CD - ROM, ISBN:

5. Resonance: English for Engineers and Technologists, Dr. K. Elango; Dr. Veena Selvam; Dr. P. R. Sujatha Priyadarshini,

6. A Course in Communication Skills, P Kiranmai Dutt ; Geetha Rajeevan ; C.L.N. Prakash , PB

7. Developing Language and Communication Skills through Effective Small Group Work : SPIRALS: From 3-8, Marion Nash ; Jackie Lowe ; Tracey Palmer , PB

8. Technical Report Writing Today by Daniel G Reordan
9.Comprehension Connections: Bridges to Strategic Reading by Tanny McGregor

10. Keys to Comprehension: How to Help Your Kids Read It and Get It! By Susan Zimmermann

11.Deeper Reading by Kelly Gallagher

12.Notice and Note: Strategies for Close Reading by Kylene Beers

13.Cambridge English Skills Real Reading 3 with Answers by Liz Driscoll

14.Inferences & Drawing Conclusions: 35 Reading Passages for Comprehension by Linda Ward Beech

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**I Year B.Tech II-sem.**

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**ENGINEERING PHYSICS – II**
**(Common to all branches)**

**OBJECTIVES:**

1. To teach the students the phenomenon of Interference, Diffraction and Polarization.
2. To make the students aware of X – ray diffraction and different techniques of it.
3. To make the students understand the characteristics of LASER, different working LASERs.
4. To teach various applications of LASERs.
5. To teach the students, basic definitions related to Dielectric materials, different kinds of polarization, and different Dielectric materials.
6. To introduce them the phenomenon of superconductivity and its applications.
7. To teach the students the significance of nano size and its fascinating applications.
8. To teach the students working principle of optical fiber, classification of optical fibers and applications of optical fibers.
9. To teach the production and detection of ultrasonics and their applications.

**UNIT – I**

**Optics**: Introduction to Interference, Young's double slit experiment (Qualitative) – Optical path difference and Fringe width – Interference in thin films (Reflected light) Cosine law – Newton's rings experiment – Determination of wavelength of light .
Basic Principles of X – ray diffraction - Bragg's Law, Bragg's X-Ray Spectrometer. Laue Method, Powder Method. Introduction to Polarization, Polarization of Light, Plane of Polarization, Double Refraction, Nicols's prism.

**UNIT – II**

**LASER**: Characteristics of LASER; Absorption, Spontaneous and Stimulated transitions; Einstein's Coefficients and Relations between them; Population Inversion; Pumping – Optical and Electrical; Meta-stable State; Three and Four level pumping schemes; Ruby LASER; Helium-Neon LASER; Semiconductor Diode LASER; Applications of LASER – Data storage, Medical, Scientific and industrial

**UNIT – III**

**Dielectric Properties**:
Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector; Electronic, Ionic and Orientation Polarizations; Expressions for electronic and ionic Polarizabilities; Qualitative treatment of Internal Field in dielectrics; Clausius - Mossotti Equation; Piezo-electricity and Ferro- electricity
**Superconductivity:** Concept of Perfect Diamagnetism; Meissner effect – Magnetic levitation; Type I and II Superconductors; Applications of Superconductors

**UNIT – IV**

**Nano Technology:** Introduction, Surface to volume ratio, Quantum confinement, Change of Electrical, magnetic and optical properties with size, Synthesis of nano materials – Sol-gel method, PVD; Characterization by TEM, applications.
**Fiber Optics:** Principle of Optical Fiber; Acceptance angle and Acceptance cone, Numerical Aperture; Step and Graded index Optical Fibers and their Refractive Index profiles; Attenuation in Optical Fibers, Application of Optical Fibers – Medical, Level sensor and Communication system.

**UNIT –V**
**Ultrasonics:** Introduction, Production of Ultrasonic waves – Magnetostriction method, Piezo electric method; Detection of ultrasonics – Piezo electric detector, Kundt's tube, Sensitive flame method, Thermal detector; Properties of Ultrasonic waves; Applications – Communication, Industrial, Biological and medical;

**Acoustics**: Basic requirements of acoustically good Hall; Reverberation; Sabine's formula for Reverberation Time (Qualitative Treatment); Factors Affecting the Architectural Acoustics and their Remedies

**OUTCOMES:**

1. Students get introduced to the phenomenon of interference and understand the very famous Young's double slit experiment and Newton's rings experiment.
2. They shall understand the concept of X – ray diffraction and the two techniques Laue method and Powder method.
3. Students shall understand the theory of Double refraction as far as Polarization phenomenon is concerned.
4. Students shall be able to distinguish ordinary light and LASER. They shall learn the physics behind the production of LASER.
5. They shall understand and appreciate the applications of LASER.
6. The students shall be able to distinguish Electronic, Ionic and orientation polarizations, understand the significance of the Clausius – Mossotti relation.
7. The students shall learn regarding Piezo electric materials also.
8. They shall learn Meissner effect and be able to understand the classification of superconductors into two categories.
9. They shall be able to understand and appreciate the applications of Superconductivity.
10. Students shall understand the influence of size of the material on its properties.
11. Students shall understand the concept of total internal reflection based on which optical fibers work and understand the concepts of acceptance angle and numerical aperture.
12. They shall understand and appreciate various diversified applications of optical fibers like medical application, application in instrumentation and application in communication.
13. They shall be able to understand various methods of production and detection of ultrasonics besides learning their applications.
14. They shall get acquainted with the basic concepts of acoustics.

**TEXT BOOKS:**

1. Modern Engineering Physics by K. Vijaya Kumar, S. Chandralingam: S. Chand & Co.Ltd
2. Engineering Physics – P.K.Palanisamy - SciTech Publications Pvt. Ltd., 5th Print 2008.
3. Applied Physics – S.O. Pillai & Sivakami-New Age International (P) Ltd., 2nd Edition 2008.
4. Unified Physics Vol – I by S L Gupta and Sanjeev Gupta JNPN Publications.
5. Unified Physics Vol – II by S L Gupta and Sanjeev Gupta JNPN Publications.
6. Engineering Physics by B K Panedy, S Chaturvedi, Cengage learning
7. A Text book of Optics by N Subrahmanyam, Brijlal and M N Avadhanulu, S Chand & Co,

**REFERENCE BOOKS:**

1. Solid State Physics – M. Armugam (Anuradha Publications).
2. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar– S. Chand & Co. (for acoustics).
3. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
4. Engineering Physics by R K Gaur and S L Gupta, Dhanpat Rai and Sons.
5. Solid State Physics – A.J. Dekker (Macmillan).
6. Applied Physics – T. Bhima Shankaram & G. Prasad (B.S. Publications, Third Edition 2008).
7. A text book of Engineering Physics – S.P. Basvaraju – Subhas store
8. Electricity and magnetism by Edward Purcell – Berkeley series vol 2
9. Physics Vol 2 – Resnick, Halliday & Krane – Fifth edition, Wiley Student edition.

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**I Year B.Tech II-sem.**

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**ENGINEERING CHEMISTRY – II**
**(Common for CE, EEE, ME, ECE, CSE & Mining)**

**OBJECTIVES:**

1. 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.
2. Describe the fundamental aspects of colloids, surface chemistry and properties of multi-phase systems
3. Understanding how light interacts with matter and how it can be used to quantitatively understand chemical samples & engineering materials.
4. To learn about types of fuels and their characteristics, and combustion systems with emphasis on engineering applications.

**UNIT- I**

**Polymers-I :**Classification of Polymers, Types of Polymerization (Chain (Free radical Mechanism) & Step growth). Plastics**:** Thermoplastic & Thermo setting resins, Compounding & fabrication of plastics (Compression and injection moulding). Preparation, properties, engineering applications of PVC, Teflon and Bakelite.Fibers- Charcterstics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications.

**UNIT-II**

**Polymers-II**

Rubbers – Natural rubber and its processing (vulcanization). Elastomers – Buna-s, Butyl rubber. Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio-degradable Polymers- preparation and Applications of Poly vinyl acetate and Poly lactic acid .Liquid Crystal Polymers and its Application.

**UNIT- III**

**Photochemistry And Spectroscopy**

Photochemistry: Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert-Beer Law. Quantum efficiency – determination Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. UV-visible spectroscopy – principles, instrumentation and Applications (Block diagram only).

**UNIT-IV**

**Phase Rule & Surface Chemsitry**

**Phase Rule:** Definition of terms: Phase, component, degree of freedom, phase rule equation. Phase diagrams –one component system- water system. Two component system Lead- Silver System. **Adsorption**: Types of Adsorption, Isotherms – Freundlich and Langmuir adsorption isotherm, applications of adsorption. **Colloids**: Classification of Colloids; Electrical & optical properties, micelles, applications of colloids in industry.

**UNIT-V:**

**Fuels & Combustion**

Fuels – Classification – soild fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining – cracking – types – fixed bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol, Fischer-Tropsch's process: Gaseous fuels - constituents, characterstics and applications of natural gas, LPG and CNG. Analysis of flue gas by Orsat's apparatus.**Combustion** – Definition, Calorific value of fuel – HCV, LCV; Determination of calorific value by Junker's gas calorimeter – Numerical problems on combustion.

**OUTCOMES:**

**As an outcome of completing this course, students will:**

1. Ability to practice professional chemical - polymer engineering knowledge for sustainable development.
2. The student will obtain an understanding of interactions between surfaces and gases, liquids or solutions, and how interfaces are important in many technological and biological processes.
3. Students will use spectroscopic data to make meaningful observations about the chemical properties of compounds.
4. Understand and analyze the combustion mechanisms of various fuels

**TEXT BOOKS**


1. Engineering Chemistry by R.P. Mani, K.N. Mishra, B. Rama Devi /CENGAGE learning.
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).


**REFERENCE BOOKS**


1. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited, New Delhi (2006)
2. Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills Publishing Company Limited, New Delhi (2004).
3. 3. Text Book of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co Publishers, New Delhi (2006)
4. Chemistry of Engineering Materials by CV Agarwal, C.P Murthy, A.Naidu, BS Publications.

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**I Year B.Tech II-sem.**

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**MATHEMATICS – II**
**(Differential, Vector Calculus & Numerical Techniques)**
**Common for all**

**OBJECTIVES:**

1. In engineering applications, data collected from the field are usually discrete and the physical meanings of the data are not always well known. To estimate the outcomes and, eventually, to have a better understanding of the physical phenomenon, a more analytically controllable function that fits the field data is desirable.
2. The process of estimating the outcomes in between sampled data points is called interpolation; whereas the process of estimating the outcomes beyond the range covered by the existing data is called extrapolation.
3. Understand the Rolles' theorem using intermediate value theorem ,Mean using Lagrange Mean Value theorem ,Cauchy Mean value theorem
4. Understand the beta function and relation between beta and gamma functions, Applications of beta, gamma functions in finding areas etc., Applications of integration in Cartesian, Parametric & Polar co-ordinates ,Evaluation of double integrals, Evaluation of triple integrals.
5. Vector calculus studies various differential operators defined on scalar or vector fields, which are typically expressed in terms of the Del operator ($\nabla$), also known as "nabla". The five most important differential operations in vector calculus are: (a) Grad (b) Div (c) Curl (d) Vector Laplacian (e) Laplacian. , Green's theorem is mostly used to solve two-dimensional flow integrals, stating that the sum of fluid outflows at any point inside a volume is equal to the total outflow summed about an enclosing area. In plane geometry, and in particular, area surveying.
6. Green's theorem can be used to determine the area and centroid of plane figures solely by integrating over the perimeter. In vector calculus, the divergence theorem, also known as Gauss's theorem, is a result that relates the flow (that is, flux) of a vector field through a surface to the behavior of the vector field inside the surface.

**Syllabus**

**UNIT – I**

**Differential Calculus:** Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Generalized Mean Value theorem .

Differentiability of multivariable functions : Jacobian - Functional dependence - Maxima and Minima of functions of two variables with constraints and without constraints (Lagrange's method of multipliers).

**UNIT – II**

**Interpolation:** Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences-Backward differences –Central differences – Symbolic relations and separation of symbols- Difference Equations - 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 – III:**

**Solution of Non- linear Systems, Special Functions**

**Introduction :** Solution of Algebraic and Transcendental Equations, The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

Beta and Gamma Functions: Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions

**UNIT – IV**

**Multiple Integrals:** Multiple integrals - double and triple integrals – change of variables – change of order of integration – Finding Surface areas, volumes

**UNIT – V**

**Vector Calculus:** Gradient- Divergence- Curl and their related properties of sums- products- Laplacian and second order operators. Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals Vector integral theorems: Green's theorem-Stoke's and Gauss's Divergence Theorem (With out proof). Verification of Green's - Stoke's and Gauss's Theorems.

**OUTCOMES:**

1. Understands the geometrical interpretation of Rolle's, Lagrange's, Cauchy Mean value theorems,
2. Understands the Taylors theorem, Understands applications of Taylor theorem in complex analysis, understands the geometrical interpretation of all the forms of remainders, Understands the maximum and minimum concept with and without constraints.
3. Learns about the solution of transcendental equations, Understands geometrical meaning of the solution of the curves.
4. Student learn about the interpolation process, He can find the interpolating polynomial function for the given data. Student understands how to find the unknown values of y wrt x values
5. Learn about vecor and scalar fields, Grad, div and Curl and their applications and properties,
6. Study about Solenoidal and irrotational vectiors with scalar potential function.Vector integration like - Line integral, Surface and Volume integrals and their Evaluations. Study about Integral Theorems Like –Green's , Gauss's and Stokes's theorem's and their verifications

**TEXT BOOKS:**


1. Mathematical Methods of Science and Engineering by Kanti B.Datta ,Cengage Learning
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Numerical Methods using MATLAB by John H Matthews, Kurt D Fink, Pearson Education
4. Numerical Methods, Jain, SRK Iyyengar Narosa Publications


**REFERENCE BOOKS:**


1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
3. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
4. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
5. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
6. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press Taylor & Francis Group.
7. Mathematics for Engineers and Scientists, Alan Jeffrey, 6ht Edi, 2013, Chapman & Hall/ CRC
8. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

**2014-15** **Code: 40302**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech II-sem.** **L T/P/D C**
**3 1/-/- 4**

**ENGINEERING MECHANICS**

**PRE-REQUISITE:** Applied Physics

**OBJECTIVE:** The objective of this subject is to provide the basic concepts

**CODES/TABLES:** Nil

**UNIT – I**
Introduction to Engineering Mechanics – Basic Concepts, Laws of Motion, Force-types, characteristics- Principle of transmissibility.
**Systems of Forces:** Classification**,** Coplanar Concurrent Forces – Components of force in Space – Resultant- Triangle law of Forces-Polygon law of Forces- Parallelogram Law of Forces-Resolution and composition of Forces– Coplanar Non-Concurrent System of Forces, Resultant of Parallel system of Forces -Moment of Force and its Application – Varignon's theorem, Couples.

**UNIT – II**
**Equilibrium of Systems of Forces:** Free Body Diagrams, Types of Supports and their reactions, Internal and External Forces - Types of Equilibrium, Equations of Equilibrium, Conditions of Equilibrium, Equilibrium of bodies under Coplanar concurrent system of forces – Lami's Theorem, Converse of the law of Triangle of forces, converse of the law of polygon of forces. Equilibrium of Spatial Systems for concurrent forces.

**UNIT – III**
**Centroid:** Centroids of Lines and Areas (from basic principles) –simple figures– Centroid of Composite Figures-Centroid of L, T, I, Z and channel Sections.

**Centre of Gravity:** Centre of gravity of simple solids (from basic principles), centre of gravity of composite solids, Pappu's-Guldinu's theorems.

**Area moment of Inertia :** Definition –Moment of inertia of plane areas, Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Moment of Inertia of Sections, Products of Inertia, Transfer Formula for Product of Inertia.

**Mass Moment of Inertia:** Moment of Inertia of Simple solids, Transfer Formula for Mass Moments of Inertia, mass moment of inertia of composite bodies.

**UNIT – IV**
**Kinematics:** Rectilinear motion – Motion of Rigid Body under uniform and variable accelerations – motion under gravity-curvilinear motion -Projectiles-rotary motion, kinematics of general plane motion.

**Kinetics:** Analysis as a Particle and Analysis as a Rigid Body in Translation – D'Alemberts Principle – Connected bodies- Kinetics of rotating bodies- Equations of Plane Motion– Rolling Bodies.

**UNIT – V**
**Work, Power and Energy:** Work-energy equation for translation-connected bodies on horizontal and inclined planes-pulleys-Work done by a spring-Work-energy equation to rotary motion and general plane motion.

**Impulse-Momentum principle:** Linear impulse and momentum-connected bodies-force of jet on a vane-pile & hammer.

**Outcome:** At the end of this course, the student shall be able to understand the basic concepts of force, moment, couple, resultant forces, loads, supports, Lamis' theorem, Newton's theorem, De Alemrt's theorem for work-energy principles.

**TEXT BOOKS:**

1. Engineering. Mechanics / Timoshenko & Young.

2. Engineering. Mechanics / S.S. Bhavikatti & J.G. Rajasekharappa

3. Engineering. Mechanics / D.S.Kumar

**REFERENCES BOOKS:**

1. Engineering Mechanics / Fedinand . L. Singer / Harper – Collins.

2. Engineering Mechanics / K. Vijaya Kumar Reddy / J. Suresh Kumar

3. Engineering. Mechanics / R.V. Kulkarni & R.D. Askhevkar

4. Engineering. Mechanics /R.S. Khurmi / S.Chand.

5. Engineering. Mechanics / K L Kumar / Tata McGraw Hill

**2014-15** **Code: 40303**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech II-sem.**

| L | T/P/D | C |
|---|---|---|
| 2 | -/3/- | 4 |

**ENGINEERING DRAWING – II**

**Pre-requisite:** Mathematical Geometry

**Objective:** The objective of this subject is to provide the basic concepts about Engineering Drawing. Detailed concepts are given in projections, technical drawing, dimensioning and specifications

**Codes/Tables:** Nil

**UNIT-I**

**Scales**: Construction of different types of Scales, Plain, Diagonal, Vernier scale.

**UNIT-II**

**Sections And Sectional Views**: Right Regular Solids – Prism, Cylinder, Pyramid, Cone .

**Intersection Of Solids:-** Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone

**UNIT – III**

**Development Of Surfaces:** Development of Surfaces of Right Regular Solids – Prisms, Cylinder, Pyramids, Cone and their parts. frustum of solids.

**UNIT – IV**

**Perspective Projections:** Perspective View: Points, Lines, Plane and solids Figures.

**UNIT – V**

**Auto Cad Commands**:-Basic Draw Commands, Display Commands, Editing Commands Construction Commands

**Outcome:** At the end of learning this course the student shall be able to understand the planes, lines, curves, projections, orthographic views, isometric views, sections of solids

**TEXT BOOK:**

1. Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing - Basant Agrawal, TMH

**REFERENCE BOOKS:**

1. Engineering drawing - P.J. Shah.S.Chand.
2. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill.
4. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. international.
5. Engineering Drawing - Grower.
6. Engineering Drawing , Venugopal / New age.

**2014-15** **Code: 40P03**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech II-sem.**

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

## ENGINEERING PHYSICS LAB

**Objectives:**

1. To motivate the student to gain experimental skills, working with various measuring instruments.
2. To learn the basic circuit designing concepts.

(Any Ten experiments compulsory)

1. Dispersion of Light –Dispersive power of material of a given glass and calcite prism
2. Diffraction grating – Determination of the wavelength of a Sodium vapour lamp.
3. Newton's Rings – Radius of curvature of Plano convex lens
4. Melde's Experiment – Longitudinal and Transverse modes
5. Study of RC time constant and RL circuit.
6. The series RLC circuit – determination of resonant frequency, bandwidth and quality factor.
7. Magnetic field along the axis of current carrying circular coil- Stewart and Gee's experiment.
8. LASER- Diffraction due to single slit and double slit.
9. Evaluation of Numerical aperture of the given fiber.
10. Energy band –gap of a material of a P-N junction diode.
11. Torsional Pendulum- Determination of Rigidity modulus of two different wires.
12. Sonometer- Frequency of A.C supply
13. LASER diode – I-V characteristics.
14. Michelson interferometer (Demonstration only)
15. Hall Sensor (Demonstration only)

**Laboratory manual:**

Engineering Physics Practicals by Dr.B.Srinivasa Rao, KesavaVamsiKrishna.V, K.S.Rudramamba.

(University Science Press

**Outcome:**

1. Various experiments related to Optics, Mechanics, Electrical and Electronics areas help the student understand the subtle concepts in a practical way.
2. Also the labs sessions inculcate the sense of team work.
3. Working with various measuring instruments help the student gain experimental skills.
4. Interpretation and analysis of data are also learnt by the student.

**2014-15** **Code: 40304**

**MALLA REDDY ENGINEERING COLLEGE**
***(Autonomous)***

**I Year B.Tech II-sem.** **L T/P/D C**
**- -/3/- 2**

**AUTO CAD & ENGINEERING MECHANICS LAB**
**(Common for CE, ME, Mining Engg)**

**A. Engineering Mechanics Lab**

1. Verification of law of co-planar concurrent forces.
2. Equilibrium of coplanar concurrent force system-forces in the jib crane.
3. Determine the support reaction for a beam
4. Determine the moment of inertia of a flywheel.
5. Statics experiment on equilibrium
6. Dynamics experiment on momentum conservation.

**B. Auto CAD Lab**

1. Drafting: Development of part drawings for various components in the form of orthographic and isometric using Auto Cad Package. Representation of dimensioning and tolerances scanning and plotting. (From a given list of 6 Tutorials of 2D Drawing).

**2014-2015** **code: 40305**

**MALLAREDDY ENGINEERING COLLEGE**
**(Autonomous)**

**I Year B.Tech CSE – I Sem**

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

**ENGINEERING & IT WORKSHOP**
**Common to CE/EEE/ME/ECE/CSE/Mining**

## ENGINEERING WORKSHOP

**Pre-requisite:** Nil

**Objective:** The objective of this subject is to provide the basic concepts about tools used in different trades like Fitting, Carpentry, House wiring, Tin smithy etc in Engineering Workshop.

**Codes/Tables:** Nil

**1. Trades for Exercises:**

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

a) Carpentry
b) Fitting
c) Tin-Smithy and Development of jobs carried out and soldering.
d) House-wiring.
e) Foundry.

2. **Trades for Demonstration**

a) Machine shop
b) Plumbing

**Outcome:** At the end of this course the students shall be capable to do house wiring, tinsmith, fitting, foundry, carpentry and do some maintenance of wooden furniture. This subject/ practice keep the students a habit of life-long learning

**TEXT BOOKS:**


1. Work Shop Manual – P. Kanniah/ K. L. Narayana, Scitech Publishers.
2. Work Shop Manual by Venkat Reddy/B.S. Publications
3. Work Shop Practice Manual by K. Venkat Reddy,/B.S. Publications


## IT WORKSHOP

**Objectives:**

1. To study/demonstrate the concepts of computer w.r.t. its hardware, operating system, assembling and disassembling.

2. To conduct the experiments related to IT Workshop, installations

**List of Tasks:**

1. Computer Hardware: Identification of Peripherals
2. Assembling and disassembling of a PC
3. Simple diagnostic exercises – Related to hardware
4. Installation of Windows Operating System
5. Installation of Linux Operating System

6. Simple diagnostic exercises –Related to Operating System
7. Design the applications using following features of MS Word
   a) Letter
   b) Header and footer
   c) Hyperlink, Bullets and numbering
   d) Inserting various objects
   e) Spelling and grammar checking
   f) Tables
   g) Mail merge
8. Design the applications using following features of MS Excel

   a)Formulas

   b)Functions

   c)Conditional formatting

   d)Sorting

   e)Filters

9. Design the applications using following features of MS Powerpoint

   a) Design Templates

   b) Layouts

   c) Inserting Objects

   d) Custom Animation

   e) Macros

10. Designing the same applications(8,9 & 10) using Open Office.

**Outcomes:**

Students will be able to:

1. Identify, assemble, dissemble, install and
2. Write commands for a given configuration of a computer.
3. Familiarizes with MS Word, Excel, Power Point and Open Office.

**TEXTBOOKS:**


1. IT Essentials PC Hardware and Software Companion Guide Third Edition by Davis Anfinson and Ken Quamme CISC Press, Pearson Education.
2. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft).

**2014-15** **Code: 40109**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **/-/-** | **4** |

**ENVIRONMENTAL STUDIES**

**OBJECTIVES**

- An interdisciplinary approach to complex environmental problems using basic tools of the natural and social sciences including geosystems, biology, chemistry, economics, political science and international processes.
- The ability to work effectively as a member of an interdisciplinary team on complex problems involving multiple competing stakeholders and agendas.
- The ability to apply quantitative reasoning skills to environmental problems including basic calculations related to energy, water, and air issues and the use of statistical methods in data analysis and argumentation.

**UNIT-I**

**Ecosystems:** Definition, Scope and Importance of ecosystem, Concept of ecosystem, Classification of ecosystems, Structure and Structural Components of an ecosystem, Functions of ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Homeostasis / Cybernetics, Food chain concentration, Biomagnification, ecosystems value, services and carrying capacity.

**UNIT-II**

**Natural Resources:** Classification of Resources: Living and Non-Living resources, Renewable and non-renewable resources. Water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources – case studies. Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy sources – case studies. Land resources: land as a resource, land degradation, man induced landslides and land use / land cover mapping.

**Biodiversity And Biotic Resources:** Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and intrinsic 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. Food and fodder resources, Timber and non-timber forest products.

**UNIT-III**

**Environmental Pollution And Control:** Classification of pollution and pollutants, causes, effects and control technologies. Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Point and non-point sources of pollution, Major pollutant of water and their sources, drinking water quality standards, Waste water treatment methods: effluent treatment plants (ETP), Sewage treatment plants (STP), common and combined effluent treatment plants (CETP).Soil Pollution: Soil as sink for pollutants, Impact of modern agriculture on soil, degradation of soil. Marine Pollution: Misuse of International water for dumping of hazardous waste, coastal pollution due to sewage and marine disposal of industrial effluents. Noise Pollution: Sources, Industrial Noise- Occupational Health hazards, standards, Methods of control of Noise. Thermal Pollution: Thermal Comforts, Heat Island effect, Radiation effects. Nuclear Pollution: Nuclear power plants, nuclear radiation, disasters and impacts, genetical disorders. Solid waste: types, Collection processing and disposal of industrial and municipal solid wastes composition and characteristics of e-Waste and its management.

**UNIT-IV**

**Global Environmental Problems And Global Efforts :** Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances (ODS).Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol,

**Environmental Impact Assessment (Eia) And Environmental Management Plan**: Definition of Impact: classification of impacts, Positive and Negative, methods of baseline data acquisition. Impacts on different environmental components. Prediction of impacts and impact assessment methodologies. Environmental Impact Statement (EIS). Environmental Management Plan (EMP): Technological Solutions, preventive methods, Control technologies, treatment technologies: green-belt- development, rain water harvesting, Remote sensing and GIS methods.

**UNIT-V**

**Environmental Policy, Legislation, Rules And Regulations:** National Environmental Policy, Environmental Protection act, Legal aspects Air (Prevention and Control of pollution ) Act- 1981, Water( Prevention and Control of pollution ) Act-1974, Water pollution Cess Act-1977, Forest Conservation Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules .

**Towards Sustainable Future**

Concept of Sustainable Development, Threats to Sustainability, Population and its explosion, Crazy Consumerism, Over-exploitation of resources, Strategies for Achieving Sustainable development, Environmental Education, Conservation of Resources, Urban Sprawl, Sustainable Cities and Sustainable Comm**UNIT**ies, Human health, Role of IT in Environment, Environmental Ethics, Environmental Economics, Concept of Green Building, Clean Development Mechanism (CDM).

**OUTCOMES**

- To enable the students to realise the importance of the sustainable use of natural resources
- To make the students aware of the impacts of human actions on environment and measures to minimize and mitigate them

To enable the students to become aware of the current issues and problems pertaining to the environment

**TEXT BOOKS:**


1. Environmental studies , From crisis to cure by R.Rajagopalan, 2005
2. Environmental studies by Erach Bharucha 2005, University Grants Commission, University Press.


**REFERENCE BOOKS:**


1. Text book of Environmental Science and Technology by M.Anji Reddy 2007
2. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi
3. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela .2008 PHI Learning Pvt. Ltd.

**2014-15** **Code: 40M05**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **/-/-** | **4** |

**PROBABILITY & STATISTICS**

**OBJECTIVES:**

**To learn**

1. Understand a random variable that describes randomness or an uncertainty in certain realistic situation.
2. It can be of either discrete or continuous type.
3. 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.
4. 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.
5. The types of sampling, Sampling distribution of means ,Sampling distribution of variance, Estimations of statistical parameters, Testing of hypothesis of few unknown statistical parameters.
6. The mechanism of queuing system. The characteristics of queue. The mean arrival and service rates
7. The expected queue length, The waiting line
8. The random processes, The classification of random processes, Markov chain, Classification of states
9. Stochastic matrix ( transition probability matrix ),Limiting probabilities, Applications of Markov chains

**UNIT-I**

**Single Random variables and probability distributions**: Random variables – Discrete and continuous. Probability distributions, mass function/ density function of a probability distribution . Mathematical Expectation, Moment about origin, Central moments Moment generating function of probability distribution. Binomial, Poisson & normal distributions and their properties. Moment generating functions of the above three distributions, and hence finding the mean and variance.

**UNIT-II**

**Multiple Random variables, Correlation & Regression:** Joint probability distributions- Joint probability mass / density function, Marginal probability mass / density functions, Covariance of two random variables, Correlation - Coefficient of correlation, The rank correlation. Regression- Regression Coefficient, The lines of regression and multiple correlation & regression.

**UNIT-III**

**Sampling Distributions and Testing of Hypothesis**

**Sampling:** Definitions of population, sampling, statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance.

**Parameter estimations** – likelihood estimate, interval estimations.

**Testing of hypothesis**: Null hypothesis, Alternate hypothesis, type I, & type II errors – critical region, confidence interval, Level of significance. One sided test, two sided test,

**Large sample tests:**

(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)

(ii) Tests of significance of difference between sample S.D and population S.D.

(iii) Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

**Small sample tests:**

Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples, Snedecor's F- distribution and it's properties. Test of equality of two population variances, Chi-square distribution , it's properties, Chi-square test of goodness of fit

**UNIT-IV**

**Queuing Theory:** Structure of a queuing system, Operating Characteristics of queuing system, Transient and steady states, Terminology of Queuing systems, Arrival and service processes- Pure Birth-Death process Deterministic queuing models- M/M/1 Model of infinite queue, M/M/1 model of finite queue.

**UNIT-V**

**Stochastic processes:** Introduction to Stochastic Processes –Classification of Random processes, Methods of description of random processes, Stationary and non-stationary random process, Average values of single random process and two or more random processes. Markov process, Markov chain, classification of states – Examples of Markov Chains, Stochastic Matrix.

**OUTCOMES**:

1. 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 variable involved in the probability models. It is quite useful for all branches of engineering.
2. The student would be able to calculate mean and proportions (small and large sample) and to make important decisions from few samples which are taken out of unmanageably huge populations .It is
3. Mainly useful for non-circuit branches of engineering.
4. The students 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.
5. 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 nth state. It is quite useful for all branches of engineering

**TEXT BOOKS:**


1. Probability & Statistics for Engineers & Scientists –Walpole Myers Myers Ye
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers
3. Probability and Statistics for Engineers and Scientists by Sheldon M.Ross, Academic Press
4. Operations Research by S.D. Sarma,


**REFERENCE BOOKS:**


1. Mathematics for Engineers by K.B.Datta and M.A S.Srinivas,Cengage Publications
2. Probability and Statistics by T.K.V.Iyengar & B.Krishna Gandhi Et
3. Fundamentals of Mathematical Statistics by S C Gupta and V.K.Kapoor
4. Probability and Statistics for Engineers and Scientists by Jay l.Devore.

**2014-15** **Code: 30314**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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| | **4** | **1/-/-** | **4** |

## MECHANICS OF FLUIDS AND HYDRAULIC MACHINES

**PRE-REQUISITE:** Engineering Mechanics
**OBJECTIVE:** The objective of this subject is to provide the basic knowledge of fluids behavior at different conditions and their applications.
**CODES/TABLES:** Nil

**UNIT- I**
**Fluid statics:** Dimensions and units: physical properties of fluids- specific gravity, viscosity surface tension- vapor pressure and their influence on fluid motion- atmospheric gauge and vacuum pressure –measurement of pressure- Piezometer, U-tube and differential manometers.

**UNIT- II**
**Fluid kinematics:** Stream line, path line and streak lines and stream tube, classification of flows-steady & unsteady, uniform & non uniform, laminar & turbulent, rotational and irrotational flows-equation of continuity for one dimensional flow.
**Fluid dynamics** : Surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, Measurement of flow: pilot tube, venturimeter, and orifice meter, Flow nozzle, Turbine flow meter, momentum equation and its application on pipe bend.

**UNIT-III**
**Closed conduit flow:** Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line
**Boundary Layer Concepts:** Definition, thickness, characteristics alon thin plate, laminar and turbulent boundary layers (No derivation) boundary layer in transition, separation of boundary layer, submerged objects – drag and lift.

**UNIT - IV**
**Basics of turbo machinery:** Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work don and efficiency, flow over radial vanes.
**Hydraulic Turbines** : Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies , hydraulic design –draft tube theory- functions and efficiency.
**Performance of hydraulic turbines:** Geometric similarity, unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer.

**UNIT - V**
**Centrifugal pumps:** Classification, working, work done – manomertic head- losses and efficiencies specific speed- pumps in series and parallel-performance characteristic curves, NPSH.
**Reciprocating pumps:** Working, Discharge, slip, indicator diagrams.

**OUTCOME:** The student shall be able to apply the knowledge to access the performance of hydraulic machines.

**TEXT BOOKS:**

1. Fluid Mechanics /Streeter/ McGrawhill Publications
2. Hydraulics, fluid mechanics and Hydraulic machinery/MODI and SETH /Standard Book House


**REFERENCES BOOKS:**

1. Fluid Mechanics and Fluid Power Engineering / D.S. Kumar/Kotaria & Sons.
2. Fluid Mechanics and Machinery / D. Rama Durgaiah / New Age International.
3. Instrumentation for Engineering Measurements / James W. Dally, William E. Riley/John Wiley & Sons Inc. 2004 (Chapter 12 – Fluid Flow Measurements).
4. Fluid Mechanics and Hydraulic Machines / Rajput/ S.Chand Publications

**2014-15** **Code: 40701**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **/-/-** | **4** |

**MECHANICAL TECHNOLOGY**

**PRE-REQUISITE:** Engineering Mechanics

**OBJECTIVES:** To introduce fundamentals of mechanical engineering to the student emphasizing the importance of power transmitting elements, power generating engines, compressors and their applications in real life.

**UNIT-I**

**Cams:** Definitions of cam and followers – their uses – Types of followers and cams – Terminology – Types of follower motion - Uniform velocity – Simple harmonic motion and uniform acceleration. Maximum velocity and maximum acceleration during outward and return strokes in the above 3 cases.

**Analysis of motion of followers:** Roller follower – circular cam with straight, concave and convex flanks.

**UNIT - II**

**Belt, Rope and Chain Drives** : Introduction, Belt and rope drives, selection of belt drive- types of belt drives,V-belts, materials used for belt and rope drives, velocity ratio of belt drives, slip of belt, creep of belt, tensions for flat belt drive, angle of contact, centrifugal tension, maximum tension of belt, Chains- length, angular speed ratio, classification of chains.

**UNIT-III**

**Toothed gears:** types – law of gearing, condition for constant velocity ratio for transmission of motion, Form of teeth: cycloidal and involute profiles. Velocity of sliding – phenomena of interferences – Methods of interference. Condition for minimum number of teeth to avoid interference, expressions for arc of contact and path of contact – Introduction to Helical, Bevel and worm gearing.

**Gear trains:** Introduction – Train value – Types – Simple and reverted wheel train – Epicyclic gear Train. Methods of finding train value or velocity ratio – Epicyclic gear trains. Selection of gear box-Differential gear for an automobile.

**UNIT-IV**

**IC Engines:** IC Engine components and basic engine nomenclature, classification of IC Engines, otto cycle, diesel cycle, two stroke and four stoke cycle spark ignition and compression ignition engines. Application of IC Engines study of fuel supply systems in SI and CI Engines, study of fuel ignition, cooling and lubrication systems. Simple calculations of indicated power, brake power, mechanical efficiency, thermal efficiency and fuel consumption. Coal diesel, coal water, slurries as alternate fuels. Simple maintenance techniques.

**UNIT-V**

Compressed air generation and applications. Types of air compressors, reciprocating and rotary compressors like roots blower, vane type, centrifugal, axial flow, screw type. Equation for kg of air compressed with and without clearance volume in a reciprocating air compressor, two stage air compressor with inter cooling, simple problems. Distribution of compressed air, application of compressed air, in Mining machinery, maintenance of compressed air, distribution systems.

**OUTCOMES:** Mining engineering students are expected to know about the mechanism, parts involved in machinery used in mining engineering. This course gives opport**UNIT**y to learn about the machines used in mines, mechanisms involved in machines, so that student can find out the reason of failure of components of power transmitting machines, rectifying the problems.

**TEXT BOOKS:**

1. Internal Combution Engines by V. Ganeshan/Tata McGraw-Hill.
2. Theory Machines by Rattan/Tata McGraw-Hill.
3. Turbines Compressors and Fans – Prof. Yahya/Tata McGraw-Hill.
4. Elements of Mining Technology (Vol- I & II) – Prof. D.J. Deshmukh/Tata McGraw-Hill

**REFERENCE BOOKS:**

1. Thermal Engineering – R.S. Khurmi & J.K. Gupta/S Chand.
2. I.C. Engines by Heywood/McGraw Hill.

**2014-15** **Code: 40702**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | 4 | **0/-/-** | 4 |

## FUNDAMENTALS OF GEOLOGY

**PRE-REQUISITE:** Under graduate Physics and Chemistry

**OBJECTIVES:** To introduce fundamentals of geology to the student emphasizing the importance of mineralogy, structural geology, stratigraphy of earth, course is also aimed at explanation of seismic zones, geology and mineral resources of India.

**UNIT-I**

General Geology: origin, age, internal structure and composition of Earth.

Landforms: Origin or mode of development, characteristic features and engineering considerations of landforms developed by Rivers, Wind, Glaciers, Oceans and Volcanoes.

**UNIT-II**

Mineralogy: Physical properties, chemical composition and mode of occurrence of important rock-forming and ore-forming minerals. Petrology: Distinguish characteristic features, mode of formation and mode of occurrence of important igneous, sedimentary and metamorphic rocks.

**UNIT-III**

Structural Geology: Strike and Dip, Fundamental types, characteristic features and mechanics of folds, faults, joints (fractures) and unconformities. Foliation and Lineation.

**UNIT-IV**

Stratigraphy: Principles of stratigraphy , geological time scale, stratigraphic succession, description and mineral wealth of archeans, proterozoic basins, Gondwanas, Deccan traps and Himalayas.

**UNIT-V**

Groundwater: Hydrological cycle, vertical distribution of groundwater. Types of aquifers, geological formations as aquifers, springs, engineering considerations of groundwater and groundwater exploration.

Earthquakes: Mode of propagation of seismic energy, causes, effects and distribution of earthquakes, seismic Zoning Map of India.

Geology and Mineral Resources of Andhra Pradesh.

**OUTCOMES:** Mining engineering students are expected to know about the geology of the ground in which mining activity is proposed or in vogue. This course gives opport**UNIT**y to get acquainted with the geological conditions of the ground and helps students to plan better and safer mining activity as an outcome of this course.

**TEXT BOOKS:**

1. A Text Book of Geology by P.K. Mukherjee/ The word press Pvt Ltd.
2. Engineering Geology by D.V Reddy, Vikas Publishing House Pvt Limited,

**REFERENCE BOOKS:**

1 Fundamentals of Engineering Geology by F.G. Bell (1982) Butterworth Publication.

2 Principles of Physical Geology by Arthur Holmes/ Van Nostrand Reinhold (UK).

**2014-15** **Code: 40703**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **-/-/-** | **4** |

## EXTRACTION OF MINERAL DEPOSITS

**PRE-REQUISITE:** Under graduate Physics and Chemistry

**OBJECTIVES:** Course introduces underground and surface mining methods along with the associated activities such as drilling, blasting, supporting etc for mines. Modes of entry into the underground mines with special emphasis on various shaft sinking methods for development of mineral deposits are also described.

**UNIT-I**

Distribution of mineral deposits in India and other countries, mining contributions to civilization, mining terminology, stages in the life of the mine, introduction to underground and surface mining methods.

**UNIT-II**

Introduction to drilling and drilling equipment. Fundamentals of Explosive and blasting techniques.

**UNIT-III**

Objectives and limitations of mine supports, materials used for supports. Friction and hydraulic props, Roof bolts, chock supports

Roadway support, face supports, side supports, junction supports, supports in special conditions, setting and withdrawal of supports, systematic supporting

**UNIT-IV**

Modes of entry into deposits for underground mining- shafts, inclines, adits etc – their fields of applications.

Drivage of drifts, organization and cycle of operations, modern methods of drifting and tunneling, roadheaders, tunnel boring.

Location of shaft, shape and size, incline and vertical shafts. Surface arrangements for sinking shafts, tools and equipments, ordinary methods of sinking, drilling, blasting, removal of debris and water, ventilation and lighting, temporary and permanent lining.

**UNIT-V**

Widening and deepening of shafts, special methods of shaft sinking **:** piling, caisson, freezing and cementation method of shaft sinking. Modern techniques of shaft sinking.

**OUTCOMES:** Students can understand the fundamentals of drilling and blasting techniques for underground and opencast mines which can be put in practice later in the concern mining industries. As deep underground mining is inevitable in near future, students must play on active role in participating in various activities like arrangement for sinking, ventilation, lighting etc.

**TEXT BOOKS:**

1. Introductory mining engineering-, Howard L.Hartman, Jan M.Mutmansky/ wiley India (P) Ltd
2. Elements of mining technology Vol-I - D.J. Deshmukh / Denett & Company

**REFERENCE BOOKS:**

1. Roy Pijush Pal, Blasting in ground excavations and mines, Oxford and IBH, 1st ed 1993
2. C.P. Chugh, Drilling technology handbook, Oxford and IBH, 1st ed, 1977

**2014-15** **Code: 40316**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **1/-/-** | **4** |

**MECHANICS OF FLUIDS AND HYDRAULIC MACHINES LAB**

**PRE-REQUISITE:** Mechanics of Fluids and Hydraulic Machines
**OBJECTIVE:** The objective of this subject is to provide
**CODES/TABLES:** Nil

1. Impact of jets on Vanes.
2. Performance Test on Pelton Wheel.
3. Performance Test on Francis Turbine.
4. Performance Test on Kaplan Turbine.
5. Performance Test on Single Stage Centrifugal Pump.
6. Performance Test on Multi Stage Centrifugal Pump.
7. Performance Test on Reciprocating Pump.
8. Calibration of Venturimeter.
9. Calibration of Orifice meter.
10. Determination of friction factor for a given pipe line.
11. Determination of loss of head due to sudden contraction in a pipeline.
12. Verification of Bernoulli's Theorems.

**Note:** Any 10 of the above 12 experiments are to be conducted.

**OUTCOME:** The students shall be able to know how to determine the Cd of Venturi & orifice meter and Performance of Hydraulic machines.

**2014-15** **Code: 40704**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **0** | **-/3/-** | **2** |

**GEOLOGY LAB**

**List of Experiments:**

1. Identification and physical properties of impartment rock-forming and ore-forming minerals.
2. Identification and distinguish characteristics of important igneous, sedimentary and metamorphic rocks.
3. Determination of srike and dip of planar features by clinometer compass.
4. Study of models pertaining to folds, faults and unconformities.
5. Study and interpretation of Topographic Maps.
6. Study of Geological Maps of Andhra Pradesh & India.
7. Study of Geomorphologic Map of India and Tectonic Map of India.
8. Study of Seismotectonic Atlas of India.
9. Vertical Electrical sounding Survey to determine depth to water table & bed rock.
10. Determination of unconfined compressive strength of important rocks.

**2014-15** **Code: 40M03**

**MALLA REDDY ENGINEERING COLLEGE**

***(Autonomous)***

**II Year B.Tech. Mining - II –SEM**

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

**MATHEMATICS – III**

**(Numerical Differentiation, Integration & Transform Techniques)**

## Objectives

1. Understands the applications of z-transforms
2. Find the Fourier series representation of the Periodic functions
3. Find the Fourier series representation for the functions in an arbitrary interval
4. Find the applications of numerical differentiation in evaluating engineering problems
5. For the given data the student can fit the respective curves.

**UNIT – I**

**Fourier series & Transforms**

Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

Fourier Transforms: Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

**UNIT – II**

**Z-Transforms**

Z-Transforms Inverse Z-Transform properties, damping rule, shifting rule, Initial and final value theorems, convolution theorem solution of difference equation by Z-Transforms

**UNIT – III**

**Curve Fitting, Numerical Differentiation & Integration:**

Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.

Numerical Differentiation & Integration: Trapezoidal Rule, Simpson's $1/3^{rd}$, 3/8 Rule, Gaussian Integration, Evaluation of principal value integrals, Generalized Quadrature.

**UNIT – IV**

**Numerical solution of IVP's in ODE**

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Methods –Predictor-Corrector Methods- Adams- Bashforth Method.

**UNIT – V**

**Partial differential equations & Applications**

Formation of partial differential equations by eliminating arbitrary constants or arbitrary functions, Solutions of first order linear (Lagrange) equation, Solution of nonlinear first order equations (four standard types), Solution using separation of variables, Application to heat equation (one dimension), wave equation (one dimension).

**Outcomes**

1. This best-fitting curve can be obtained by the method of least squares.
2. Applications of Fourier transforms in engineering problems.
3. PDEs can be used to describe a wide variety of phenomena such as sound, heat, electrostatics, electrodynamics, fluid flow, elasticity, or quantum mechanics.

**TEXT BOOKS:**

1. Mathematical Methods of Science and Engineering by Kanti B.Datta ,Cengage Learning
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Numerical Methods using MATLAB by John H Matthews, Kurt D Fink, Pearson Education
4. Numerical Methods, Jain, SRK Iyyengar Narosa Publications

**REFERENCE BOOKS:**

1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa

Publishing House, Delhi.
3. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
4. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
5. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
6. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press Taylor & Francis Group.
7. Mathematics for Engineers and Scientists, Alan Jeffrey, 6ht Edi, 2013, Chapman & Hall/ CRC
8. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

**2014-15** **Code: 40230**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **-/-/-** | **4** |

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**
**(Common to CSE, IT, MECH, MINING, CIVIL)**

**OBJECTIVE:** The will expose basic knowledge on electrical engineering, Network theorems, DC and AC Machines, Basics of electronic devices and circuits

**UNIT – I**

**Introduction To Electrical Engineering**: Electric field; electric current, potential and potential difference, electromotive force, electric power, ohm‘s law, basic circuit components, electromagnetism related laws, Faradays laws of electromagnetic induction. Types of induced EMF‘s, Kirchhoff‘s laws, Simple problems.

**Network Analysis:** Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, series, parallel circuits, star- delta and delta - star transformation

Network theorems- Superposition, Reciprocity, Thevenins‘s, Nortons & Maximum power transfer theorems and simple problems.

**UNIT-II**

**Magnetic Circuits**: Basic definitions, analogy between electric and magnetic circuits.

Transformers: Principles of operation, Constructional Details, EMF equation, OC and SC test on transformer simple problems.

**UNIT-III**

**D.C Machines**: Principle of operation of D.C machines, armature windings, e.m.f equation in a D.C machine, Torque production in a D.C machine, Operation of a D.C machine as a generator, operation of a D.C machine as a motor.

**A.C Machines:** principle of operation, slip and rotor frequency, torque (simple Problems).

**UNIT - IV**

**Diode And It’s Characteristics:** P-N junction diode, symbol, V-I Characteristics, Diode Applications, Zener diode characteristics Rectifiers – Half wave, Full wave and Bridge rectifiers with filters and without filters(simple Problems)

**Transistors:** PNP and NPN Junction transistor, Transistor as an amplifier, SCR characteristics and applications

**UNIT - V**

**Cathode Ray Oscilloscope**: Principles of CRT (Cathode Ray Tube), Deflection, Sensitivity, electrostatic and Magnetic deflection, Applications of CRO - Voltage, Current and frequency measurements.

**Oscillators**: Condition for oscillations. RC-phase shift oscillators with Transistor, Hartley and Colpitts oscillators, Wein bridge oscillator.

**TEXT BOOKS:**

1. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin/Pearson.
2. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand & Co.

**REFERENCES BOOKS:**

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.
2. Basic Electrical Engineering by Kothari and Nagarath, TMH Publications, 2nd Edition

**2014-15** **Code: 40705**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **0** | **-/-/5** | **4** |

## MACHINE DRAWING AND COMPUTER AIDED GRAPHICS

**PRE-REQUISITE:** Engineering drawing
**OBJECTIVES:** This course introduces software (AUTOCAD) to the students to generate drawings (part & assembly) of basic elements of machines, engine parts, fastenings etc., to know their importance in real applications.

**Machine Drawing Conventions:**
Need for drawing conventions – introduction to IS conventions
Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs.

**I. Drawing of Machine Elements and simple parts**
Selection of Views, additional views for the following machine elements and parts with every drawing proportions.

a) Popular forms of Screw threads, bolts, nuts, stud bolts, tap bolts, set screws.
b) Keys, cottered joints and knuckle joint.
c) Rivetted joints for plates
d) Shaft coupling, spigot and socket pipe joint.
e) Journal, pivot and collar and foot step bearings.

**II. Assembly Drawings:**
Drawings of assembled views for the part drawings of the following using conventions and easy drawing proportions.

Engine parts – stuffing boxes, cross heads, Eccentrics, Petrol Engine connecting rod, piston assembly.
Other machine parts - Screws jacks, Machine Vices Plummer block, Tailstock.
Valves : Steam stop valve, spring loaded safety valve, feed check valve and air cock.

**III. Introduction to Computer Aided Graphics:**
Fundamentals of 2D construction- line, circular, polyline , spline, polygon, simple problems, conversion of simple pictorial views into orthographic views.

**NOTE: 1).** First angle projection to be adopted. The student should be able to provide working drawings of actual parts.
**2). UNIT** III is only for class work practice, not to be included in the final examination.

**OUTCOMES:** Students can understand the basic elements of fastenings, power transmitting elements, their applications, how to draw assembly drawings manually and using software. This will help the students to design the parts easily and effectively, to overcome the problems faced during manufacturing of components

**TEXT BOOKS:**


a) Machine Drawing – Ajeet Singh, TMH Publications
b) Machine Drawing –K.L.Narayana, P.Kannaiah & K. Venkata Reddy / New Age/ Publishers
c) Machine Drawing – N.D. Bhatt.
d) Engineering Graphics with Auto CAD – James D. Bethune – PHI 2009 Edition.


**REFERENCE BOOKS:**


1. Machine Drawing – P.S.Gill.
2. Machine Drawing – Luzzader
3. Machine Drawing - Rajput

**2014-15** **Code: 40307**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **1/-/** | **4** |

**MECHANICS OF SOLIDS**

**PRE-REQUISITE:** Engineering mechanics, Material Science

**OBJECTIVE:** The objective of this subject is to provide the basic concepts of mechanical behavior of the different materials of the objects when they are subjected to different loads.

**CODES/TABLES:** Nil

**UNIT – I**

**Simple Stresses & Strains :** Elasticity and plasticity – Types of stresses & strains–Hooke's law – stress – strain diagram for ductile and brittle material – Working stress – Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Elastic modulii & the relationship between them – Bars of varying section – composite bars – Temperature stresses .Strain energy – Resilience – Gradual, sudden, impact and shock loadings.

**UNIT – II**

**Shear Force And Bending Moment :** Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, U.D.L., uniformly varying loads and combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.

**UNIT – III**

**Bending Stresses:** Theory of simple bending – Assumptions – Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis – Determination bending stresses – section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

**Shear Stresses:** Derivation of formula – Shear stress distribution across various beams sections like rectangular, circular, triangular, I, T and angle sections.

**UNIT – IV**

**Deflection of Beams :** Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, - U.D.L - uniformly varying load.

**Torsion:** Theory of pure torsion - Assumptions – Derivation of torsion equation, polar section modulus – power transmitted by shafts – combined bending and torsion.

**UNIT – V**

**Analysis of Pin-Jointed Plane Frames:** Determination of Forces in members of plane, pin jointed, perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever& simply–supported trusses-by method of joints & method of sections.

**Thin Cylinders:** Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and volumetric strains – changes in dia, and volume of thin cylinders – Riveted boiler shells.

**OUTCOME:** The student shall be able utilize the mechanics of solids in day –to -day life for designing simple structures and for other limited applications.

**TEXT BOOKS :**

1. Strength of Materials/S.Timshenko/ D. Van Nostrand Company, inc., 1941
2. Strength of materials/Ramamrutham/Dhanpat Rai Publishing Company.

**REFERENCES BOOKS:**

1. Strength of Materials/Jindal/ Umesh Publications.
2. Analysis of structures/Vazirani and Ratwani/ Khanna Publishers
3. Mechanics of Structures Vol-III/ S.B.Junnarkar/ Charotar Publishing House Pvt. Ltd.
4. Strength of materials/ Bhavikatti/ Lakshmi publications
5. Strength of Materials /Andrew Pytel and Ferdinond L. Singer Longman.
6. Solid Mechanics/ Popov/ Prentice Hall Publisher

**2014-15** **Code: 40706**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **1/-/** | **4** |

## MINING GEOLOGY

**PRE-REQUISITE:** Under graduate Physics and Chemistry

**OBJECTIVES:** To introduce fundamentals of mining geology to the student emphasizing the importance of properties of rocks, soils and minerals. Course is also aimed at explanation of geology of tunnels, geology of bore hole drilling and excavation.

**UNIT-I**

Engineering Properties of rocks & Soils: Physical and Mechanical properties, methods of determination, numerical values and engineering uses of important rocks.

**UNIT-II**

Genesis of Mineral Deposits: Definition of ore, gangue, tenor and grade of ore, processes and formation of ore deposits including coal, petroleum and atomic minerals.

Mineral Resources of India: Major and Minor mineral resources of India, origin, environment and distribution of mineral deposits of India.

**UNIT-III**

Mineral Exploration: Geological, Geophysical and Geochemical exploration of mineral deposits.

Mineral Reserves: Estimation and determination of mineral reserves by different methods.

Rock and soil slops: models of slope failure, causes and effects of slope failures, methods of slope stabilizations.

**UNIT-IV**

Geology of Tunnels: Engineering geological investigations to drive tunnels in soft ground and hard ground, stand up time and geology of some well known Indian Tunnels, Gases in tunnels.

**UNIT-V**

Geology of Bore-hole drilling and Excavation: Ease of drillability, importance of geology in drilling soft rocks, hard and deformed rocks. Ease of excavation of different earth materials and rocks.

**OUTCOMES:** Students can understand properties of soils, rocks, mineral deposits, the exploration of minerals, estimation of different mineral reserves, investigations to drive tunnels in soft ground and hard grounds, importance of geology in drilling rocks.

**TEXT BOOKS:**

a) Mining Geology by Arogya Swamy/ Oxford & IBH Publishing Company
b) Mining Geology by Mc Kinstry/ Prentice-Hall

**REFERENCE BOOKS:**

1. Mineral Resources of India by Krishna Swamy/ Oxford & IBH
2. Engineering Geology & Geotechnics by Krynine and Hudd/McGraw-Hill.
3.

**2014-15** **Code: 40707**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **II Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **4** | **1/-/** | **4** |

**DRILLING AND BLASTING**

**PRE-REQUISITE:** Mechanical Technology, Fundamentals of Geology, Development of mineral deposits
**OBJECTIVES:** Course introduces various types of drilling equipments, factors affecting drilling, explosives used in mining, underground blasting, open pit blasting, blasting for civil construction and trenches.

**UNIT-I**
**Exploratory Drilling:** Drilling for exploration and other purposes,: various types of drilling equipment – their merits, demerits and limitations; core recovery – single and double tube core barrels, wire line drilling; directional drilling, fishing tools; borehole surveying; borehole logging; novel and special drilling techniques, Horizontal and directional drilling.

**UNIT-II**
**Production Drilling:** Production drilling; Various methods of drilling – percussive, rotary, rotary percussive.
**Drillability:** Factors affecting drilling - thrust, r.p.m., flushing, etc.; mechanics of drilling; drillability and drilling index; micro-bit drilling; physico-mechanical properties affecting drillability; design and selection of drills; bit wear; reconditioning of drill bits; drill hole economics; case studies.

**UNIT-III**
**Explosives:** Types of explosives – small diameter, large diameter. Permitted, bulk slurry, SMS, EMS, ANFO, HANFO, LOX, boosters, blasting agents. mechanics of blasting, alternatives to explosives.
**Accessories and Tools:** Accessories-detonators, safety fuses, detonating cords, relays, NONEL, exploders, sequential blasting machines and other shot firing tools, testing of explosives, storage, transportation and handling of explosives,

**UNIT-IV**
**Underground Blasting:** Drill patterns for underground excavations, shafts, blast patterns designs, smooth blasting, induced blasting, charge ratios, rock fragmentation, dangers associated with underground blasting, blasting economics, gallery blasting, statutory requirement, computer design of underground blast, precautionary measures, misfires, solid blasting.

**UNIT-V**
**Open Pit Blasting:** Methods of blasting in opencast mines, blast design, primary and secondary blasting, fragmentation studies, accidents due to blast in opencast and preventive measures, environmental impact due to blasting, ground vibrations, fly rocks, dust, fumes, water pollution, dimensional stone blasting, controlled blasting, statutory requirements, computer design of opencast blast.
**Blasting for Civil Constructions and Trenches:** Blasting for road constructions, trench cutting in soft and hard rocks, demolition of building etc., underwater blasting

**OUTCOME:** Students can understand the fundamentals of drilling and blasting techniques for underground and opencast mines which can be put in practice later in the concern mining industries. Students are going to know about types of drilling, blasting, testing of explosives used for Mining applications.

**TEXT BOOKS:**

1. Blasting in ground excavations and mines, Roy Pijush Pal, Oxford and IBH, 1st ed 1993
2. Drilling technology handbook, C.P. Chugh, Oxford and IBH, 1st ed, 1977


**REFERENCE BOOKS:**

1. Rock blasting effect and operation, Roy Pijush Pal, A.A. Balkema, 1st ed, 2005
2. Elements of mining technology, Vol-1, D.J. Deshmukh, Central techno, 7th ed, 2001
3. Blasting operations, B.Hemphill Gary, Mc-graw Hill, 1st ed 1981
4. Principles and practices of modern coal mining, R.D. Singh, New age International, 1st ed, 1977.
5. Explosive and blasting practices in mines, S.K.Das, Lovely prakashan, 1st ed, 1993

**2014-15** **Code: 40231**

**MALLA REDDY ENGINEERING COLLEGE**

***(AUTONOMOUS)***

**II Year B.Tech. Mining Engg. II-Sem**

| L | T/P/D | C |
|---|---|---|
| 0 | -/3/- | 2 |

## ELECTRICAL AND ELECTRONICS ENGINEERING LAB
**(Common to CSE, IT, MECH, MINING)**

**Any 5 experiments to be done from Section A**

**Part A:**

**Electrical Engineering:**

1. Verification of Superposition and Reciprocity theorems.
2. Verification of maximum power transfer theorem. Verification on AC and DC with Resistive and Reactive loads.
3. Verification of Thevenin's and Norton's theorem.
4. Verification of KCL and KVL
5. Magnetization characteristics of D.C. Shunt generator.
6. Brake test on DC shunt motor. Determination of performance Characteristics.
7. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
8. Brake test on 3-phase Induction motor (performance characteristics).

**Any 5 experiments to be done from Section B**

**Part - B**

**Electronics Engineering:**

1. PN Junction Diode Characteristics (Forward bias, Reverse bias)
2. Zener Diode Characteristics
3. Transistor CE Characteristics (Input and Output)
4. Rectifier without Filters (Full wave & half wave)
5. Rectifier with Filters (Full wave & half wave)
6. RC Phase Shift Oscillator

**2014-15** **Code: 40310**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**II Year B.Tech. Mining Engg. II-Sem**

| L | T/P/D | C |
|---|---|---|
| 0 | -/3/- | 2 |

## MECHANICS OF SOLIDS LAB

**PRE-REQUISITE:** Engineering Mechanics

**OBJECTIVE:** This course deals with composition of metals, mechanical properties depending upon their micro structure, heat treatment methods and their effect on micro structure of materials.

**Codes/Tables:** Nil

1. Tension test
2. Bending test on (Steel/Wood) Cantilever Beam
3. Bending Test on Simple supported beam
4. Torsion test
5. Brinells hardness test
6. Rockwell hardness test
7. Test on springs
   a) Compression spring b) Extension spring
8. Impact test
   a)Izod b) Charpy
9. Compression Test on Wood or Concrete
10. Shear Test

**OUTCOME:** Students can understand micro structures of different material, different heat treatment methods, change of mechanical properties based on micro structure of methods. Iron carbon equilibrium diagrams.

**2014-15** **Code: 40B01**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

**III Year B.Tech. Mining Engg. I-Sem**

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## MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

**Course Objective:** MEFA is a think beyond program which will make the student to examine the application of microeconomics theory as applied to the manager's responsibilities in an organization. To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making. This course should emphasize the quantitative and qualitative applications of economic principle to business analysis

**UNIT- I**

**Introduction to Managerial Economics:** Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

**Elasticity Of Demand:** Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

**UNIT- II**

**Theory Of Production And Cost Analysis:** Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

**Cost Analysis:** Cost concepts, Opport**UNIT**y cost, Fixed vs. Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

**UNIT-III**

**Introduction To Markets & Pricing Policies: Market structures:** Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.

**Objectives and Policies of Pricing - Methods of Pricing:**

Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.

**UNIT- IV**

**Business & New Economic Environment**: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

**Capital And Capital Budgeting**: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

**UNIT- V**

**Introduction To Financial Accounting:** Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

**Financial Analysis Through Ratios:** Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

**Course Outcome:**

Students understand how market forces affect price and quantity. They can also learn how to measure risk and uncertainty, and then incorporate these measures into their business decision making and by the end of the course the students will be able to:

- think in the terms of a managerial economist
- appraise economic articles in newspapers such as Economic Times
- solve quantitative problems in a business environment
- acquire an ability to apply knowledge of economic concepts, Accounting concepts.
- ability to identify, formulate, and solve financial problems
- a knowledge of Financial Concepts as applied to Business Management

**TEXT BOOKS:**

1. Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

**REFERENCES BOOKS:**

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4 Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.
5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications.
6. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson.
7. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI.
8. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech.
9. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas.
10. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley.
11. Dwivedi:Managerial Economics, 6th Ed., Vikas.

**2014-15** **Code: 40708**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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**MINE SURVEYING – I**

**PRE-REQUISITE:** Engineering drawing.
**OBJECTIVES:** Introduction to measuring techniques in surveying along with instruments, To familiarize with underground and surface surveying in mines, To apply modern instruments for mine surveying .

**UNIT – I**
Introduction: overview of Plane Surveying (Chain, compass, and plane table), Objectives, Principles and classifications, use of Field Books.
Distance and Directions: Distance measurements conventions and methods. Use of chain and compass, electronic distance measurements, meridians, Azimuths and Bearings, declination, computation of angles.

**UNIT-II**
Levelling: Levelling Instruments – component parts, Temporary and Permanent adjustments – methods of levelling – Fly levelling, Differential levelling, Reciprocal levelling.
Computation of Areas and Volumes: Areas from field notes, computation of Areas along irregular boundaries and regular boundaries. Embankments and cuttings, determination of capacity of reservoir, volume of borrow pits.

**UNIT-III**
Contouring: Characteristics and uses of contours, methods of conducting contour surveys – their plotting. L.S. and C.S. Surveying – their plotting.
Theodolite Surveying: Theodolite – description – parts, Temporary and Permanent Adjustments, Measurement of horizontal and vertical angles, Principles of Electronic Theodolite, Trigonometric levelling

**UNIT-IV**
Traversing: Principles of Traversing, open traverse and closed traverse using chain /compass / theodolite, Bowditch correction.

**UNIT-V**
Triangulation: Principles of triangulation survey, triangulation using chain, campus and theodolite.

**OUTCOMES:** Students will come to know how to do mine surveying with various types of instruments to measure contouring, traversing and Triangulation.etc.

**TEXT BOOKS:**

1. Surveying (Vol-1,2 & 3) by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain- Laxmi Pubicaions (P) Ltd., New Delhi.
2. Surveying and leveling (Vol 1 & 2) – Kanitkar, A.V.G. Prakashan
3. DUGGAL S K "Surveying (Vol-1 &2), S.K.Das, Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2004
4. Text book of surveying by C. Venkataramaiah , Universities Press.


**REFERENCE BOOKS:**

1. Elements of Plane Surveying, Arthur R. Benton and Philip J Taetly, McGraw Hill-2000
2. Surveying Vol 1 & 2 & 3, Arora K R Standard Book House, Delhi, 2004.
3. Plane Surveying, Chandra A M, New age International Pvt. Ltd., Publishers, New Delhi, 2002.
4. Higher Surveying, Chandra A M, New age International Pvt. Ltd., Publishers, New Delhi, 2002.
5. Surveying and Levelling by R Subramanian, Oxford University Press, New Delhi.

**2014-15** **Code: 40709**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

**III Year B.Tech. Mining Engg. I-Sem**

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

## MINE ENVIRONMENTAL ENGINEERING – I

**UNIT-I**

Atmospheric air-its composition, mine air – its composition and variation, origin, occurrence, physical, chemical and physiological properties and monitoring of mine gases, various types of damps. Sampling and analysis of mine air. Methane drainage and methane layering of gases.

**Heat and humidity:** Sources of heat in mines, effect of heat and humidity, psychometric, kata thermometer, methods of improving of cooling power of mine air. Air conditioning basic vapour cycle, representative layout.

**UNIT-II**

**Air flow through mine openings:** Laws of air flow, resistance of airways, equivalent orifice, distribution of air, flow control devices.

**Natural Ventilation:** Calculation of NVP from air density, artificial aids to natural ventilation.

**UNIT-III**

**Mechanical ventilation:** Principal types of mine fans and their suitability, merits, limitation, efficiency and characteristics. Selection of mine fan, fan testing, output control in fans, series and parallel operation of mine fans.

Auxiliary fan, duct, matching of fan to the duct system. Reversal of air current. Fan drift, evasee, diffuser, booster fans, Face Ventilation.

**UNIT-IV**

**Ventilation planning:** Standard of ventilation including permissible air velocities.

Ascensional, descensional, homotropal, anti-tropal ventilation. Central and boundary ventilation – layouts and comparison.

**UNIT-V**

Quantity and pressure requirement. Ventilation layout for coal mining and metal mining. Calculation of air quantity and total mine head required for ventilating a mine. Introduction to Network analysis: Hardy-Cross method, Ventilation survey.

**TEXT BOOKS:**


1. Mine Environment and Ventilation – G.B. Misra, Oxford University Press
2. Mine Ventilation and Air Condition – HL Hearlman,Wiley India (p) ltd


**REFERENCE BOOKS:**


1. Environmental Engineering in Mines, Vatukuri V.S. & Lama R.D,Cambridge Unversity Press.
2. Mining and Environment, Dhar B.B, APH Publishing

**2014-15** **Code: 40710**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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**SURFACE MINING TECHNOLOGY**

**PRE-REQUISITE:** Mining Geology, Mine environmental engineering, Mine surveying.

**OBJECTIVES:** Course introduces surface mining methods along with the associated activities such as drilling, blasting, supporting etc for mines. Opening up of deposits with Box cut, excavation for transportation, heavy earth moving machinery in the surface mines.

**UNIT-I**

**Basic concept of Surface Mining:** Status of surface mining in India. Selection between surface mining and underground mining, Preliminary evaluation of surface mining prospects; stripping ratio – concepts and significance, mine life.

**UNIT-II**

**Opening up of deposits with Box Cut:** Factors affecting selection of site of box-cut, Production benches – formation parameters and factors affecting their selection.

Preparation for Excavation: Working principle of ripper and Scraper—their cycle of operation, application and limitation. Drilling, types of blast hole drills, performance parameters of drills, estimation of number of drill for a given mine production. Problems associated with drilling and blasting.

**UNIT-III**

**Excavation and Transportation:** Cyclic methods—shovel-dumper, pay-loader, dragline. Continuous methods – bucket wheel excavator, bucket chain excavator, continuous surface miner, conveyors. Principle and operation of these machines, their advantages and limitations capacity calculations, maintenance.

**UNIT-IV**

Other equipments-dozer, grader, loader, scraper, dumper, maintenance of open pit equipment crusher.

**Design and organization:** Basic design principle of large opencast mines and their organizational structure. Mechanical quarries over underground developed zones. Placer Mining and Sea bed Mining: Ground sluicing, Hydra licking and Dredging Exploitation systems of ocean mineral resources.

**UNIT-V**

Relevant provisions of coal mines and metalliferous mines regulation; Environmental problems due to surface mining and their remedial measures. Recent developments in the deployment of heavy earth moving machineries in the surface mines.

**OUTCOMES**: Students can understand about difference of surface mining and underground mining, machinery required for mining, environmental problems due to surface mining and their remedial measures. Resent developments in the deployment of heavy earth moving machineries in the surface mines.

**TEXT BOOKS:**

1. Surface Mining Technology Samir Kumar Das, Lovely Prakashan.
2. Surface Mining – GB Misra, Dhanbad Publishers

**REFERENCE BOOKS:**

1. Principles and Practices & Modern Coal Ming, Singh R.D, New Age International.
2. Mine Planning For Coal, Mathur S.P., M.G. Consultants

Introductionary Mining Technology – H L Hartman, Wley India (p) Ltd

**2014-15** **Code: 40711**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

**III Year B.Tech. Mining Engg. I-Sem** **L T/P/D C**
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## UNDERGROUND COAL MINING TECHNOLOGY

**PRE-REQUISITE:** Mining Geology, Surface mining Technology.
**OBJECTIVES:** To understand the details of development of a mine for exploitation of mineral deposits. To Analyze design requirements of Underground Coal and metal mining methods. To Apply different support systems including backfilling techniques for underground mines for stability of workings.

**UNIT-I**
Introduction to Mine Planning; Size of mining property, reserves and production capacity.
Opening of Deposits; Developments of mine for in-seam mining and horizon mining (including shaft pillar and their comparison, advantages and disadvantages), division into levels and districts.

**UNIT-II**
Development; General principle of Bord & Pillar Development, their choice, suitability, advantages and disadvantages, layout of Bord & Pillar panel, size of panel, statutory provisions, manual and mechanized system of development: conditions suitable for application of mechanized loader and continuous miners; factor affecting the selection of equipment.

**UNIT-III**
Pillar Extraction: preparatory arrangement for depillaring operation, statutory provision for depillaring, principle and designing of pillar extraction, size of a district.
factor, affecting choice of pillar extraction, depillaring with caving, stowing, mechanized depillaring operation, organization and safety.
Layout for required outputs, types of machines, personnel and working of thick seams and blasting gallery method.

**UNIT-IV**
Longwall mining: Longwall methods of working, their choice, suitability, advantages and disadvantages.
Layout of the workings for the required output, length and orientation of longwall faces, Shape & size of development roadways and gate roads and their maintenance. Mechanized longwall face organization.

**UNIT-V**
Mechanized extraction of long wall panel with shearer and plough trepanner; support systems of long wall face and gate roads.

**OUTCOMES:** Students can understand mine planning, opening of deposits, piller development, piller extraction, layout required for out puts, long well mining, mechanized extraction of long wall panel.

**TEXT BOOKS:**

1. Principles and Practices & Modern Coal Mining, R.D. Singh,New Age International Publication.
2. Underground Mining & Coal, Singh, T.N. Singh – Oxford Publication.
3. Modern Coal Mining Technology, Das S.K. – Lovely Prakasan publication.


**REFERENCE BOOKS:**

1. Longwall mining, Peng S.S., Chiang H/S. – John Willey Publication.
2. Mine Planning for Coal, Mathur S.P. – M.J Consultant Publications.

**2014-15** **Code: 40712**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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**MINE MECHANISATION-I**

**PRE-REQUISITE:** Engineering Mechanics, Mechanical Technology,
**OBJECTIVES: This** course introduces prime movers used for moving of mining machinery. Rails, joints, crossings. Plates for track laying. Locomotives used in mines, drills used for drilling mines.

**UNIT-I**
**Prime Mover for Mining Machinery:** O.C. engine, hydraulic power, pneumatic power, elements of mechanical power transmission – gear, belt, chain, coupling, clutch and brake.

**UNIT-II**
**Rope haulage:** Construction of the wire ropes, rope haulages – gravity, direct, balanced direct, main & tail, endless, reversible endless. Suitability of these haulages and their limitations. Dimension of ropes, drums and pulleys, care and maintenance of ropes, changing of haulage ropes, rope splicing, safety appliances in haulage road, signaling, Statutory requirements of haulages.

**UNIT-III**
**Track Laying:** Rail, joints, crossings, plates, turn tables an curves, track extension
**Aerial Ropeways:** Types, construction, Application and operation.

**UNIT-IV**
**Mine Locomotives:** Types, constructional features of compressed air, diesel, battery and electric trolley-wire locomotives, comparison of various locomotive haulages. Comparison of rope and locomotive haulages.
Conveyors: Principle types and their operations, installation, shifting, maintenance and applicability, shuttle cars, stage loaders, bridge conveyors, capacity.

**UNIT-V**
**Drills for Coal and Stone:** Various types, their construction and maintenance, Jumbo drills.

**OUTCOMES**: Students can understand mechanism involved in heavy machinery ,locomotives used in mines, track laying with different techniques. Different types of drills used in mines.

**TEXT BOOKS:**
1. Elements of Mining Technology Vol. III, D.J. Deshmukh, Denett & Company,
2. Coal Mining Services Vol. 1 & II, Ernest Mason, Virtue
3. Mine Transport – N.T. Karelin, Orient Longmans,

**REFERENCE BOOKS:**
1. Mining and Transport – S. C. Walker, Elsevier
2. Introduction to Mining Engineers – Hartman. H.L, John Wiley & Sons..

**2014-15** **Code: 40713**

| **III Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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**MINE SURVEYING LAB**
**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

1. Ranging a line, measuring the distance between two points, pacing.
2. Chain triangulation, booking, calculation of areas and plotting.
3. Traversing with compass.
4. Introduction to levels.
5. Fly leveling & Reduction of level.
6. Profile leveling and plotting the section.
7. Contouring
8. Measurement of Horizontal angle.
9. Measurement of vertical angle.
10. Theodolite traversing
11. Finding distance between two inaccessible points.

**2014-15** **Code: 40714**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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| | **0** | **-/3/** | **2** |

**MINE ENVIRONMENTAL ENGINEERING LAB**

1. Detection of mine gases
2. Orsat/Haldane apparatus for gas analysis.
3. Measurement of relative humidity by hygrometer.
4. Kata thermometer.
5. Constructional features of centrifugal and axial flow fans.
6. Characteristic curves for fans.
7. Operation of fans in series and parallel.
8. Design of various ventilation devices, Airshaft, Evasese, Doors crossing regulators.
9. Reversal of Ventilation system.
10. Measurement of air quantity by anemometer velometer and smoke tube.
11. Measurement of relative humidity by hygrometer.
12. Study and analysis ventilation network circuit.
13. Study of mine air-conditioning plant.
14. Constructional features of a flame safety lamp and cap lamp.
15. Layout of lamp room.

**2014-15** **Code: 40B03**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**III Year B.Tech. Mining Engg. II-Sem**

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## INDUSTRIAL MANAGEMENT

**OBJECTIVE:** Be able to describe the most well-known theories and perspectives on management. Basic understanding the relationship between organizational structure, technology and the conditions of the organizational environment, contemporary organizational forms, Industrial Management revolves around effective leadership of innovation, operations and marketing in existing and emerging industries. It also focuses on the dominating theories on management and the organizing of industrial activities.

**UNIT- I**

**Introduction to Management:** Entrepreneurship and organization-nature and importance of management, Functions of management, Taylor's scientific Management Theory, Fayols Principles of management. Maslows Theory of Human Needs, Douglas McGregor's Theory X and Theory Y,herzbergs Two-Factor Theory of Motivation, system Approach to Management, Leadership Styles, Social responsibilities of Management.

**UNIT- II**

**Designing Organizational Structures**: Departmentation and decentralization, Types of Organizational Structures-line Organization , Line and Staff Organization, functional Organization, committee Organization, matrix Organization, Virtual Organization, Cellular Organization, Team structure, boundary less organization, inverted pyramid structure lean and flat organization structure and their merits, demerits and suitability.

**UNIT- III**

**Operations Management:** Principles and Types of Plant Layout-Methods of production (Job, batch and Mass production), Work Study –Basic procedure involved in Method Study and Work Measurement-Statistical

**Quality Control:** X chart, R chart, C chart, P chart, (simple problems), Acceptance Sampling, Deming's contribution to quality,

a) **Material Management:** Objectives, Need for Inventory Control, EOQ, ABC Analysis, Purchase procedure, Store Management and Stores Records –Supply Chain Management
b) **Marketing:** Functions of Marketing, Marketing Mix, Marketing Strategies based on Product life Cycle., Channels of Distribution

**UNIT- IV**

**Human Resource Management (HRM):** Evolution of HRM, Concepts of HRM, Basic functions of HR Manager: Manpower Planning, Recruitment, Selection, Training and Development, Placement, Wage and salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

**Project Management**: (PERT/CPM): Network Analysis, Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of completing the project within given time, Project Cost Analysis, Project Crashing. (Simple problems)

**UNIT -V**

**Strategic Management**: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of corporate planning process, Environmental Scanning, SWOT Analysis, Steps in Strategy Formulation and Implementation, generic Strategy Alternatives.

**Contemporary Management Practices:** Basic Concepts of Just -In-Time (JIT) systems, Total Quality Management (TQM), Six sigma and capability maturity modal (CMM) levels, Value Chain Analysis, Entrepreneurship Resource Planning (ERP), Performance Management, business process Outsourcing (BPO), Business process re-engineering 5s Model, Deming's PDCA, Kaizen, Poka-Yoke, Muda, Bench marking, Balanced Score Card.

**OUTCOMES:** Student should be able to describe the role of the company in the society, the different business cultures, and how companies are organized and managed from a business concept to ongoing operations with the support of strategic planning, formulation of objectives and management control, central theories within the field of industrial management, such as costing, investment analysis, the transactions of a company; how they are accounted for, how information can be analyzed, and used for annual report and a fiscal declaration for a company.

**TEXT BOOKS:**

1. Management Science, Aryasri, TMH, New Delhi, 2009.

**REFERENCE BOOKS:**

1. Management, Stoner, Person, 2009.
2. Marketing Management, Kotler philipand Keller Kevin Lane, PHI, 2009.
3. Principles of Management, Koontz, Weihrich, and Aryasri, TMH, 2009.
4. Principles and Guidelines, Thomas N.Duening & John M. Ivancevich Management, Cengeage, 2009.
5. Production and Operations management, Kaniska Bedi, Oxford University Press, 2009.
6. Personnel Management, Memoria & S.V. Ganker, Himalaya, 2009.
7. Management, Schermerhon, Wiley, 2009.
8. Stragic Management, Parnell, Biztantra, 2009.
9. PERT/CPM, L.S.Srinath, Affiliated East-West Press, 2009.
10. Introduction to Management Science, William J.Stevenson & Ceyehun Ozgur, TMH, 2007.

**2014-15** **Code: 40715**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**III Year B.Tech. Mining Engg. II-Sem**

| L | T/P/D | C |
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| 3 | 1/-/- | 4 |

## MINE SURVEYING – II

**PRE-REQUISITE:** Mine surveying-I

**OBJECTIVES:** This course introduces surveying techniques, sophisticated instruments, to familiarize with underground and surface surveying in mines, like Tacheometric surveying, Photogrammetry, Geodetic Astronomy.

**UNIT-I**

**Tacheometric surveying:** Use of the Theodolite for tacheometric Surveying – Principles, Stadia and tangential methods, measurements of heights and distances by tacheometry, Distance and Elevation formulae for Staff vertical position.

**Setting out curves:** types of curves, curve ranging, design and setting out, simple and compound curves, surface and underground curves.

**UNIT-II**

**photogrammetry:** Principles of photogrammetry, Aerial Photographs, scale of vertical photographs, Terrestial Photogrammetry, Mapping.

**Geodetic astronomy:** Latitude, Longitude, Meridian Transits, satellites and cameras, Errors – Theory of erros, adjustments.

**UNIT-III**

**Mine surveys**: Verticality of shafts, measurement of depth of shafts, Surveys for connecting national grid, survey of installations of mine structures.

**Global positioning systems**: Introduction to Global Information system (GIS), Remote Sensing – basic Principles, Integration of RS and GIS.

**UNIT-IV**

**Total station:** Description, users, Types of Surveys by Total station, Mapping of sites by Total Station Surveys – Elementary exercises only.

**UNIT-V**

**Miscellaneous**: EDM and modern instruments, slope and open pit surveys, Statutory requirements, GIS Softwares.

**OUTCOMES**: Student can understand the advanced instruments like EDM , slope and open pit surveys ,GIS software. Remote sensing, Integration of RS and GIS.

**TEXT BOOKS:**


1. surveying (Vol – 1,2 & 3), by B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain – Laxmi Publications (P) Ltd., New Delhi.
2. Surveying (Vol 1,2 & 3), Duggal S.K. Tata Mc.Graw Hill Publishing Co.Ltd. New Delhi, 2004
3. Text book of surveying by C. Venkataramaiah, Universities Press.


**REFERENCES BOOKS:**


1. Elements of Plane Surveying, Arthur R Benton and Philip J Taety, McGraw Hill-2000
2. Surveying (Vol 1,2 &3), Arora K R, standard Book House, Delhi, 2004.
3. Plane Surveying , Chandra A M. New age International Pvt. Ltd. Publisher, New Delhi, 2002
4. Higher Surveying , Chandra A M. ,New age International Pvt. Ltd. Publisher, New Delhi, 2002
5. Surveying and leveling by R. Subramanian, Oxford University Press, New Delhi

**2014-15** **Code: 40716**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **2/-/-** | **4** |

## UNDERGROUND METAL MINING TECHNOLOGY

**PRE-REQUISITE:** Underground coal mining Technology.
**OBJECTIVES:** To understand the details of development of a mine for exploitation of mineral deposits. To analyze design requirements of Underground Coal and metal Mining Methods. To apply different support systems including backfilling techniques for underground mines for stability of workings.

**UNIT-I**
Development; Mine development for working veins, lodes and tabular deposits, shape, size and position of the development working in relation to the ore body
Layout of the drifts, cross-cut, raises and winze in ore body.

**UNIT-II**
Different types of raising methods and their merits and demerits. Classification of stoping methods, factors influencing the choice of stoping method.
Stoping Methods: Room & Pillar Sublevel Open Stopping Shrinkage method of Stoping Cut & Fill method of Stoping

**UNIT-III**
Sublevel Caving Block Caving Special methods of working of thin deposits

**UNIT-IV**
Applicability of methods, stope layout stope layout, stope development, ground breaking, mucking, ventilation, support, haulage and dumping.

**UNIT-V**
Productivity and cost of mining of ores. Principles of in-situ leaching, scope and limitation of in-situ leaching.

**OUTCOMES:** Students can understand rising methods, stope methods, productivity and cost of mining of ores, layout of drifts, cross cuts, rises and winze in ore body.

**TEXT BOOKS:**

1. Mining Engineers handbook Vol.I & II, Peele , John Wiley & sons,
2. Working of Mineral deposits, Georgi Popov, International Law & Taxation Publishers.


**REFERENCE BOOKS:**

1. Underground Mining Methods handbook.
2. Underground Mining Methods and Technology – Elsevier Science publication.
3. Mine working Vol. I & II, Karmakar H. – Lovely Prakasan, Dhanbad.
4. Methods of working Coal & Metal Mines Vol-III, Seth D Woodruff , Pergamon Press

**2014-15** **Code: 40717**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
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| | **3** | **2/-/-** | **4** |

**MINE ENVIRONMENTAL ENGINEERING-II**

**PRE-REQUISITE:** Mine Environmental Engineering-I

**OBJECTIVES: THIS** course introduces spontaneous coal heating, control measures, various methods adopted to combat fires, fire fighting techniques, mine inundation, mine illumination, rescue and recovery work, principle of management.

**UNIT-I**

**Spontaneous Combustion:** Various theories, factors, various indices for determination of susceptive of coal to spontaneous heating, control measures.

**Mine Fires:** Survey of various causes of mine fires with statistical data of Indian mines, various methods adopted to combat fires and their advantages and disadvantages.

**UNIT-II**

Advances in fire fighting techniques and equipments, rescue operations in fire zones. Reopening of **Selected off areas;** Factors to be considered, methods, precautions.

Reopening of sealed-off areas: Factors to be considered, methods, precautions. Mine Explosions: Causes of firedamp explosion with statistical data of Indian mines, preventive measures against firedamp explosion.

**UNIT-III**

Production, assessment and control of mine dust and associated hazards. Causes of coal dust explosion with statistical data of Indian mines, preventive measures against coal dust explosion.

**UNIT-IV**

**Mine Inundation:** Causes of inundation with statistical data of Indian mines. Precaution to be taken while approaching old workings, preventive measures of inundation.

Noise and Vibrations: Causes and measurement of noise levels. Precautions, prevention and reduction of noise levels. Environmental aspects of blast induced vibration and noise.

**UNIT-V**

**Mine illumination:** Its effects on safety and efficiency, illumination standard, common types of flame safety lamps, their use and limitations, electric-hand and cap lamp, their maintenance and examination, lamp room design and organization. Illumination arrangement of opencast and underground working. Rescue and recovery work, equipment, short distance apparatus. Self contained oxygen-breathing apparatus. Rescue stations, principles of risk management.

**OUTCOMES:** Students can understand various indices for determination of susceptive of coal to spontaneous heating, control measures. Mine illumination, rescue procedure.

**TEXT BOOKS:**

1. Mine Fires, Explosion , Rescue, Recovery and Inundation – M.A. Ramulu, Mukharjee Publishers
2. Mine Environment & Ventilation – G.B. Misra, Oxford University Press.

**REFERENCE BOOKS:**

1. Fires in Coal Mines – Kaku, Oriental Publishers

**2014-15** **Code: 40718**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | **4** |

**MINE MECHANISATION-II**

**PRE-REQUISITE:** Mine Mechanisation -I

**OBJECTIVES:** This course introduces Mine winders, winding drums, man riding systems, cutter loaders, pumps, opencast machinery for mining to improve its output.

**UNIT-I**

Mine Winders: Koepe and Drum winders and their applications, head gear, head gear pulley, shaft fitting – Keps, rope guides, shaft sinking and bells, capping and recapping, cage and suspension gear.

**UNIT-II**

Winding Drum-types and construction, Safety devices in winders-over speed and over wind preventers, slow breaking, depth indicator, Methods of counter balancing rope. Duty cycle. Mechanical and electrical braking. Winding from different levels in shaft.

**UNIT-III**

Man riding system in underground mines.

Face Machinery: SDL & LHD – their applications, capacity, operation, fitting, control and maintenance. Cutter loaders – Shearers, Coal plough and Continuous Miners – their constructional features, applications, capacity and maintenance.

**UNIT-IV**

Layout of faces with Power loader working under varied condition, Shuttle cars.

Pumps: Types, Construction, operation, characteristics and application, Calculation of size, efficiencies and capacities. Layout of drainage system.

**UNIT-V**

Opencast Machinery: Blast Hole Drill, Ripper, Shovel, Dragline, Dumper, Bucket Wheel Excavator, Continuous Miners – their basic construction, applications and operation.

**OUTCOMES:** Students can understand winders applications, winding drum construction, face machinery, open cast machinery like blast hole drill, ripper, dumper, bucket wheel excavator, which will enhance the output of mines.

**TEXT BOOKS:**


1. Elements of Mining Technology Vol. I & II, Deshmukh D.J., Denett & Company
2. Pumps Focus Compressors Walkar wending & Transport, Cherkasky B.M.,


**REFERENCE BOOKS:**


1. Mine Mechanisation and Automation, Alemgren G, U.Kumar.
2. Coal Mining Series, Ernest Mason, London, 1952

**2014-15** **Code: 401A1**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

**III Year B.Tech. Mining Engg. II-Sem**

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

**DISASTER MANAGEMENT**
**(ELECTIVE - I)**

**OBJECTIVES**

- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
- To increase the knowledge and understanding of the International Strategy for Disaster Reduction and to increase skills and abilities for implementing the Disaster Risk Reduction (DRR) Strategy.
- To ensure skills and abilities to analyze potential effects of disasters and of the strategies and methods to deliver public health response to avert these effects.
- To ensure skills and ability to design, implement and evaluate research on disasters

**UNIT - I**

**Environmental Hazards & Disasters:** Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Different approaches & relation with human Ecology - Landscape Approach - Ecosystem Approach -
Perception approach - Human ecology & its application in geographical researches.
**Types Of Environmental Hazards & Disasters:** Natural hazards and Disasters – Man induced hazards & Disasters - Natural Hazards- Planetary Hazards/ Disasters - Extra Planetary Hazards/ disasters - Planetary Hazards- Endogenous Hazards - Exogenous Hazards

**UNIT –II**

**Endogenous Hazards** - Volcanic Eruption – Earthquakes – Landslides – Volcanic Hazards/ Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions – Earthquake Hazards/ disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - Earthquake Hazards in India - - Human adjustment, perception & mitigation of earthquake.
**Exogenous Hazards/** disasters - Infrequent events- Cumulative atmospheric hazards/ disasters, Infrequent events: Cyclones – Lightning – Hailstorms, Cyclones: Tropical cyclones & Local storms - Destruction by tropical cyclones & local storms (causes , distribution human adjustment, perception & mitigation), Cumulative atmospheric hazards/ disasters : - Floods- Droughts- Cold waves- Heat waves Floods:- Causes of floods- Flood hazards India- Flood control measures ( Human adjustment, perception & mitigation), Droughts:- Impacts of droughts- Drought hazards in India- Drought control measures- Extra Palnetary Hazards/ Disasters-
Man induced Hazards /Disasters- Physical hazards/ Disasters-Soil Erosion Soil Erosion:-- Mechanics & forms of Soil Erosion- Factors & causes of Soil Erosion- Conservation measures of Soil Erosion, Chemical hazards/ disasters:-- Release of toxic chemicals, nuclear explosion- Sedimentation processes, Sedimentation processes:- Global Sedimentation problems- Regional Sedimentation problems- Sedimentation & Environmental problems- Corrective measures of Erosion & Sedimentation, Biological hazards/ disasters:- Population Explosion.

**UNIT –III:**

**Emerging Approaches In Disaster Management**- Three Stages
1. Pre- disaster stage (preparedness)
2. Emergency Stage
3. Post Disaster stage-Rehabilitation

Natural Disaster Reduction & Management
a) Provision of Immediate relief measures to disaster affected people
b) Prediction of Hazards & Disasters
c) Measures of adjustment to natural hazards

**UNIT –IV**

**Disaster Management-** An Integrated Approach For Disaster Preparedness, Mitigation & Awareness.
Mitigation- Institutions- discuss the work of following Institution.
a. Meteorological observatory

b. Seismological observatory
c. Volcanology instituition
d. Hydrology Laboratory
e. Industrial Safety inspectorate
f. Institution of urban & regional planners
g. Chambers of Architects
h. Engineering Council
i. National Standards Committee
Integrated Planning- Contingency management Preparedness –
a) Education on disasters
b) Comm**UNIT**y involvement
c) The adjustment of Human Population to Natural hazards & disasters Role of Media Monitoring Management- Discuss the programme of disaster research & mitigation of disaster of following organizations.
a) International Council for Scientific Unions (ICSU)- Scientific committee on problems of the Environment (SCOPE), International Geosphere- Biosphere programme (IGBP)
b) World federation of Engineering Organizations(WFED)
c) National Academy of Sciences
d) World Meteorological organizations(WMO)
e) Geographical Information System(GIS)
f) International Association of Seismology & Physics of Earth's Interior (IASPEI)
g) Various U.N agencies like UNCRD, IDNDR, WHO, UNESCO, UNICEF, UNEP.

**UNIT –V**

a. A regional survey of Land Subsidence, Coastal Disaster, Cyclonic Disaster & Disaster in Hills with particular reference to India
b. Ecological planning for sustainability & sustainable development in India- Sustainable rural development: A Remedy to Disasters -Role of Panchayats in Disaster mitigations
c. Environmental policies & programmes in India- Institutions & National Centres for Natural Disaster reduction, Environmental Legislations in India, Awareness, Conservation Movement, Education & training

**OUTCOMES**

- Capacity to integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels.
- Capacity to describe, analyze and evaluate the environmental, social, cultural, economic, legal and organizational aspects influencing vulnerabilities and capacities to face disasters.
- Capacity to work theoretically and practically in the processes of disaster management (disaster risk reduction, response, and recovery) and relate their interconnections, particularly in the field of the Public Health aspects of the disasters.
- Capacity to manage the Public Health aspects of the disasters.
- Capacity to obtain, analyze, and communicate information on risks, relief needs and lessons learned from earlier disasters in order to formulate strategies for mitigation in future scenarios with the ability to clearly present and discuss their conclusions and the knowledge and arguments behind them.

**TEXT BOOKS:**

1. Disaster Mitigation: Experiences And Reflections by Pardeep Sahni

**REFERENCE BOOKS:**

1. Environmental Geography, R.B.Singh (Ed) ,Heritage Publishers New Delhi,1990
2. The Environment as Hazards, Kates,B.I & White, G.F, oxford, New York, 1978
3. Disaster Management, R.B. Singh (Ed) ,Rawat Publication, New Delhi, 2000
4. Disaster Management, H.K. Gupta (Ed), Universiters Press, India, 2003
5. Disaster Management t in Hills, Dr. Satender ,Concept Publishing Co., New Delhi, 2003
6. Action Plan For Earthquake,Disaster, Mitigation in V.K. Sharma (Ed), A.S. Arya Disaster Management IIPA Publication New Delhi, 1994
7. An overview on Natural & Manmade Disaster & their Reduction, R.K. Bhandani CSIR, New Delhi
8. Manuals on Natural Disaster management in India, National Centre for Disaster Management, M.C. Gupta, IIPA, New Delhi, 2001.

**2014-15** **Code: 40B04**

**MALLA REDDY ENGINEERING COLLEGE**
**(*AUTONOMOUS)***

**III Year B.Tech. Mining Engg. II-Sem**

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

## (30B04) HUMAN VALUES & PROFESSIONAL ETHICS
## (ELECTIVE - I)

**UNIT-I**

**Human Values:** Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Time management-Valuing Time – Cooperation – Commitment – Empathy – Self-Confidence – Character. Corporate Social responsibility, Social responsibility as a citizen of this great country.

**UNIT-II**

**Self Management:** SELF Concept Learning Enhancement Facilitation Centre, University of Weston Sydney, Australia. A New Idea of Self Constructs, Self discipline, understanding self, Self Exploration, need and purpose. Assessment procedures and types, importance of Self assessment/appraisal systems. Gardeners multiple intelligence concept. Key to success and road map to success. Untrained/Trained Memory.

**UNIT-III**

**Engineering Ethics:**Code of ethics for engineers, ASCE, ASME Codes of ethical conduct of engineers, Personal ethics, Professional ethics, Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry – moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory –uses of ethical theories– Models of Professional Roles - theories about right action - Self-interest - customs and religion professional rights - employee rights - Intellectual Property Rights (IPR), Trade marks, Patents, copy rights. Some interesting case studies.

**UNIT-IV**

**Value Education:** Concept of Value education, its intensions, the need for value education in today's context, basic guidelines for value education, the contents of value education and the process of value education. Universal Brotherhood, spirituality, Basic human aspirations, harmony: self, family and society.

**UNIT-V**

**Stress Management:** Types of Stress, Positive Stress (Eustress) and rewarding experiences, Negative Stress (Distress) and its influence on human health, Methods of Stress Management for better living. Meditation, Laughter is the best medicine, Anger management. Personality development. Study & Learning skills, need to develop a positive attitudes, brain & behaviour, respect for authority, responsibility, accountability, confidentiality etc..

**TEXT BOOKS:**


1. Engineering Ethics, Govindarajan M, Natarajan S, Senthil Kumar V. S, Prentice Hall of India, New Delhi,
2. Human Values & Professional Ethics, S.B.Gogate Vikas Publishing House Pvt., Ltd., First edition-2011


**REFERENCE BOOKS:**


1. Engineering Ethics, Charles D. Fleddermann, Pearson Education / Prentice Hall,
2. Engineering Ethics – Concepts and Cases, Charles E Harris, Michael S. Protchard and Michael J Rabins,
3. Wadsworth Thompson Learning, **UNIT**ed States, 2000 (Indian Reprint now available) 2003.
4. Engineering Ethics, C.G.Krishnadas Nair, Harishree Publishing Company, Bangalore.
5. Human Values and Professional Ethics, R.K.Shukla, Anuranjan Mishra, Published by A.B.Publication.

**2014-15** **Code: 40B05**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

**III Year B.Tech. Mining Engg. II-Sem**

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

## INTELLECTUAL PROPERTY RIGHTS
## (ELECTIVE - I)

**UNIT- I**

Introduction – Invention and Creativity – Intellectual Property (IP) – Importance – Protection of IPR – Basic types of property i. Movable Property ii. Immovable Property and iii. Intellectual Property.

**UNIT -II**

IP – Patents – Copyrights and related rights – Trade Marks and rights arising from Trademark registration – Definitions – Industrial Designs and Integrated circuits – Protection of Geographical Indications at national and International levels – Application Procedures..

**UNIT- III**

International convention relating to Intellectual Property – Establishment of WIPO – Mission and Activities – History – General Agreement on Trade and Tariff (GATT).

**UNIT- IV**

Indian Position Vs WTO and Strategies – Indian IPR legislations – commitments to WTO-Patent Ordinance and the Bill – Draft of a national Intellectual Property Policy – Present against unfair competition.

**UNIT -V**

Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and related rights – Trade Marks – Industrial design and Integrated circuits – Geographic indications – Protection against unfair competition.

**TEXT BOOKS:**

1. Handbook of Indian Patent Law and Practice ,Subbaram N.R. S. Viswanathan Printers and Publishers Pvt. Ltd., 1998.

**REFERENCE BOOKS:**

- Law of Copyright and Industrial Designs, P. Narayanan Eastern law House, Delhi, 2010
- Intellectual Property Rights , Prabhuddha Ganguli, Tata Mc-Graw –Hill, New Delhi
- Intellectual Property Right, M.Ashok Kumar and Mohd.Iqbal Ali,Serials Pub.

**2014-15** **Code: 40719**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
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| | **0** | **-/3/-** | **2** |

**MINE SURVEYING – II LAB**

1. Correlation by two shaft methods S/T
2. Correlation by two shaft methods U/T
3. Correlation by two shaft co-plantation methods
4. Correlation by single shaft weisbatch methods.
5. Correlation by single shaft weiss quadrilateral methods
6. Curve ranging offsets from long chord
7. Curve ranging Ranking methods
8. Curve Tacheometric methods
9. Curve ranging Tacheometric method
10. Finding the height of an in accessible object
11. Reading mine plans
12. Finding Horizontal & Vertical distance by Techometry

**2014-15** **Code: 40E04**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **III Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
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| | **0** | **-/3/-** | **2** |

**ADVANCED ENGLISH COMMUNICATION SKILLS LABORATORY**
**(Common for CE, ME, Mining, EEE, ECE, CSE,IT)**

**Introduction:**

Effective Communication binds any progressive organization. At the B Tech third year level, the Advanced English Communication skills laboratory is introduced to help students succeed in attaining a challenging and a professional career. Each **UNIT** aims to reinforce learning and helps the learners perform well before and after they enter the world of work. The course is designed to be practical, stimulating and challenging providing opport**UNIT**ies to the learners to go beyond the classrooms and get empowered in language skills. The course also enables the students understand the employers' expectations that are varied from company to company while giving them insight into the acceptable norms of attitude, behavior and etiquette.

**Methodology:**

Facilitator's role: Since classroom learning augments thinking process, helping them to develop written, spoken and non verbal communication, the facilitator / Faculty would briefly discuss the topics with the students and later on guide them while the students involve in activities, writing work and while making presentations. The facilitator is required to design a lot of practical/industry oriented project works for the students

*Students are required to participate, perform, write and submit the work in the form of written documents or Power Point Presentations to hone their spoken written and non verbal communication skills . Students are to take up field work and submit the project work.

**UNIT- I**

**Industry awareness-** Introduction to the world of work- Collection of information about various sectors, companies, enterprises, organizations and conglomerates; field visit to the industry they wish to work for

Instruction: Here the students are required to work in teams- Team players-participating and responding, team leader - delegates, plans and involves all the team members, Challenges the team faces -the report presented in the written form and making presentation

**UNIT- II**

**Job hunt process**

- SWOT analysis, correspondence and browsing the internet , job application-cover letter drafting, drafting a winning resume', types of resume's -electronic, video and printed resume's

- Instruction: Students are required to prepare their video resume which will be assessed by the faculty member.

**UNIT- III**

**Group Discussion-** Initiators- Contributor-Informer-Team Leader-Motivator-Creative Contributor , Importance of , Non verbal communication -eye contact, voice characters, posture, gestures, do's and don'ts, Role play and Simulation- Learners assuming the roles of characters and participating in Group discussion, analysis, or prediction with strictly defined goals.

**UNIT- IV**

**Interview skills-** Preparing for the interview, types of interviews, interview session, importance of non verbal communication during the interview, do's and don'ts of interview, follow up and thanking letter. FAQ's.

**UNIT- V**

**Office etiquette-** Formal Conversation, elevator etiquette, table manners, office attire- do's and don'ts, gossips and rumors, greetings and meetings, speaking to seniors and handshakes , offering and taking visiting cards.

**UNIT- VI**

**E- Correspondence and Email etiquette**

Common web mail services, yahoo, gmail etc, fields to pay attention- To:, Cc:, Bcc:, Reply All, Subject, Salutation, Body, Signature, Font, Caps Lock , Highlight, The 'KISS' strategy( Keep It Simple and Short,)Points to remember while signing off, Introduction to Technical Vocabulary

- This Unit is purely for internal assessment/evaluation

**UNIT- VII**

**Report writing-** types of report, project report writing, technical reports, importance of pictorial presentation- graphs , diagrams etc

Instruction: The students are required to work on a project. Field work and collection of information , prepare a project report, present the project in the form of Power Point Presentation and written document. This report will be given weightage during the external examination

**2014-15** **Code: 40720**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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| | **3** | **1/-/-** | 4 |

**MINERAL PROCESSING**

**PRE-REQUISITE:** Development of Mineral Deposits

**OBJECTIVES:** This course introduces Objectives of mineral processing, characteristics of minerals and coal, crushing methods, separation methods, methods of concentration, fields of application and limitations.

**UNIT-I**

**Introduction:** Scope, objectives and limitations of mineral processing, liberation and beneficiation characteristics of minerals and coal.

Comminution: Theory and practies of crushing and grinding; different types of crushing an grinding equipments – their applications and limitations.

**UNIT-II**

**Size Separation:** Laboratory size analysis and interpretation; settling of solids in fluids; industrial screens, mechanical classifiers and hydro cyclones.

**Gravity Concentration Methods:** Jigging, Heavy media separation, flowing film concentrators – theory, applications and limitations.

**UNIT-III**

**Froth Floatation:** Physico-chemical principles, reagents, machines, floatation of sulphides, oxides and coal.

**UNIT-IV**

**Electrical Methods of Concentration:** Principles, fields of applications and limitations.

**UNIT-V**

**Flow Sheets:** Simplified flow sheets for coal, zinc, iron, and manganese ores.

Magnetic methods of concentration Principles, Fields of Application and Limitation.

**OUTCOMES:** Student can understand characteristics and processing of minerals and size separation after crushing, different methods of separation, flow charts for coal, zinc, iron and manganese.

**TEXT BOOKS:**

1. Introduction to Mineral Processing – V. Malleswar Rao, Indian Academy of Geoscience
2. Mineral Processing – Barry AWills, Elsevier.

**REFERENCE BOOKS:**

1. Mineral Processing – S.K. Jain, CBS Publishers & Distributors

**2014-15** **Code: 40721**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | **4** |

**ROCK MECHANICS**

**PRE-REQUISITE:** Drilling and Blasting,

**OBJECTIVES**: physico-mechanical properties of rocks, elastic and time dependent behavior, mass classification, Theories of rock failure ,subsidence, mechanics of rock burst and bumps, numerical methods of geomechanics with applications.

**UNIT-I**

Physico - mechanical properties of rocks, Elastic and time dependent behavior, Rock mass classification.

**UNIT-II**

Theories of rock failure, Stress analysis, Insitu stress and stress distribution around mine openings. Ground failure and pressure on supports, Stability of wide openings, Design of supports in mine workings,.

**UNIT-III**

Subsidence: Causes and impacts of subsidence, Mechanics of surface subsidence, discontinuous and continuous subsidence. Monitoring, prediction, control and management of subsidence.

**UNIT-IV**

Mechanics of rock burst and bumps, Stability of slopes. Instrumentation and measurement of insitu stresses and rock strength, Photolasticity and scale model studies.

**UNIT-V**

Basics of numerical methods in geomechanics with applications.(Continuous models, discontinuous models).

**OUTCOMES:** Student can understand mechanical properties of rock, different theories of rock failure, Causes and impacts of subsidence , rock strength and stresses induced in rocks, numerical methods in geomechanics with applications.

**TEXT BOOKS:**


1. Fundamental of Rock Mechanics by J.C Jaeger & N.G.W. Cook, Blackwell Publishing
2. Rock Mechanics by Alfreds R. Jumikis, Trans Tech Publications


**REFERENCE BOOKS:**


1. Coal Mining ground Control by Syd S. Peng, West Virginia University,
2. Rock Mechanics for underground Mining– BHG Brady & E T Brown, George Allen & Unwin Ltd, 1992.

**2014-15** **Code: 30328**

**MALLA REDDY ENGINEERING COLLEGE**
**(*Autonomous)***

**IV Year B.Tech. Mining I-Sem** **L T/P/D C**
**4 1/-/- 4**

## OPERATIONS RESEARCH

**PRE-REQUISITE:** Mathematics
**OBJECTIVE:** The objective of this subject is to provide knowledge of solving the models for their optimal solutions.
**Codes/Tables: Nil**

**UNIT – I**
Development – Definition– Characteristics and Phases – Types of models – operation Research models – applications.
**Allocation:** Linear Programming Problem Formulation – Graphical solution – Simplex method –Artificial variables techniques -Two–phase method, Big-M method – Duality Principle.
**Transportation Problem** – Formulation – Optimal solution, unbalanced transportation problem –Degeneracy. Assignment problem – Formulation – Optimal solution - Variants of Assignment Problem-Traveling Salesman problem.

**UNIT – II**
**Sequencing** – Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines.
**Replacement:** Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, group replacement.
**Theory of Games:** Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – 2 X 2 games – dominance principle – m X 2 & 2 X n games - graphical method.

**UNIT – III**
**Waiting Lines:** Introduction – Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.

**UNIT – IV**
**Inventory :** Introduction – Single item – Deterministic models – Purchase inventory models with one price break and multiple price breaks – shortages are not allowed – Stochastic models – demand may be discrete variable or continuous variable – Instantaneous production. Instantaneous demand and continuous demand and no set up cost-single period model.

**UNIT – V**
**Dynamic Programming:** Introduction – Terminology-Bellman's Principle of optimality – Applications of dynamic programming- shortest path problem – linear programming problem.
**Simulation:** Definition – Types of simulation models – phases of simulation– applications of simulation – Inventory and Queuing problems – Advantages and Disadvantages –Brief introduction of Simulation Languages.

**OUTCOME:** By the end of the course the student should have developed the skills to consider real-world problems and determine whether or not linear programming is an appropriate modeling framework; solve the models for their optimal solutions; interpret the models' solutions and infer solutions to the real-world problems

**TEXT BOOKS:**
1. Introduction to O.R /Taha/PHI Publishers
2. Operations Research / S.D.Sharma/Kedarnath Publisher
3. Introduction to O.R/Hiller & Libermann/McGraw Hill Publications

**REFERENCES BOOKS:**
1. Operations Research /A.M.Natarajan, P.Balasubramani,A. Tamilarasi/Pearson Education.
2. Operations Research: Methods & Problems / Maurice Saseini, Arhur Yaspan & Lawrence Friedman/ Literary Licensing
3. Operations Research / R.Pannerselvam,PHI Publications.
4. Operations Research / Wagner/ PHI Publications.
5. Operation Research /J.K.Sharma/MacMilan Publisher
6. O.R/Wayne L.Winston/ Thomson/Brooks/Cole Publisher

**2014-15** **Code: 40722**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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| | 2 | **1/-/-** | **4** |

**MINE LEGISLATION**

**PRE-REQUISITE:** Industrial Management
**OBJECTIVES: THIS** course introduces laws and legislation of mines, electricity rules of India, training required, safety measures to be followed by workers, types of accidents, statistics, causes and prevention of accidents, labor rules, welfare organizations etc.

**UNIT-I**
Introduction to mining laws and legislation, General principles of mining laws, development of mining legislation of India. Acts, Rules and Regulations, Mines Act, Mines Rules.
Coal and matalliferous mines regulations, Bye-laws, Circulars, and standing orders,

**UNIT-II**
Indian electricity rules, coalmines conservation and development act, Workman's compensation act, General provisions of Mines and Minerals Regulation and Development Act, Mineral Concession Rules.

**UNIT-III**
Vocational Training. Rules, crèche rules, Maternity benefit act, Payment of Wages Act, Gratuity and P.F. Rules, Explosives act, Rescue Rules, Factory Act, Environmental protection Act.

**UNIT-IV**
Safety organization; role of management, supervisors and workers; pit safety committees; workmen's inspector; role of safety officers.
**Classification of Accidents:** Statistics, causes and prevention of accidents. Accidents rate in Indian mines. Accident enquiries and reports, health of workmen. Occupational disease in mining.

**UNIT-V**
International labor organization and its model code in the field of safety and accident prevention. Principles of management and organization. Industrial relations. Welfare organizations.
**Development of safety consciousness:** interest, publicity and propaganda for safety, audio-visual aids, safety drives campaigns.

**OUTCOMES:** Student will come to know about laws of mines, electricity rules of India, training rules, crèche rules, rescue rules, different welfare organizations.

**TEXT BOOKS:**
1. Principle Acts & Rules CMR and MMR

**REFERENCE BOOKS:**
1. Intent and Content of Mine Legislation – Prasad.

**2014-15** **Code:407A1**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
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| | **3** | **1/-/-** | 4 |

**ROCK SLOPE ENGINEERING**
**(Elective-I)**

**PRE-REQUISITE:** Mining Geology, Rock Mechanics

**OBJECTIVES:** This course introduces economic implications, geological investigations, data interpretations for stability analysis. Basic mechanism of slope failure, Mechanism of failure of jointed rock mass, Numerical analysis of slopes, use of FLAC software.

**UNIT-I**

Introduction: economic implications, geological investigation, data interpretation for slope stability analysis.

**UNIT-II**

Basic Mechanism of Slope Failure: Planer, wedge, rotational shear, toppling, buckling and rock fall.
Mechanism of failure of jointed rock mass. Determination of shear strength of discontinuities.

**UNIT-III**

Influence of ground water on slopes and techniques of depressurization, remedial and corrective measures. Remedial measures for slope stabilization.

**UNIT-IV**

Monitoring and instrumentation techniques of rock slopes. Investigations of failed slopes.

**UNIT-V**

Numerical analysis of slopes. Use of FLAC Software.

**OUTCOMES**: Students can understand about data interpretation for slope stability analysis, mechanism of failure of rock mass, influence of ground water on slopes and techniques of depressurization, instrumentation techniques of rock slopes, use of software like FLAC.

**TEXT BOOKS:**


1. Fundamental of Rock Mechanics by J.C Jaeger & N.G.W. Cook, Blackwell Publishing
2. Slope Analysis, Chowdary R.N., Elsevier Scientific Publishing co


**REFERENCE BOOKS:**


1. Cumming A.B. & Given I &V. & SME Vol. I & II, Society of Mining Engineers , USA.
2. Introduction to Mining Engineering, Heartman H.L. – John Willey & Sons.
3. Soil Slope Instability and Stabisation, Bruce F. Walker, Robin Fell, Proceedings of an Extension Course on Soil Slope Instability and Stabilisation, Sydney
4. Rock Mechanics by Alfreds R. Jumikis, Trans Tech Publications,
5. Rock Mechanics by BGH Brady,ET Brown/Springer Publishing

**2014-15** **Code: 407A2**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | 4 |

**MINE SUBSIDENCE ENGINEERING**
**(Elective-I)**

**PRE-REQUISITE:** Mining Geology, Mine Mechanisation, Surface Mining Technology.
**OBJECTIVES:** This course introduces factors influencing convergence in mine working, Subsidence mechanism, different methods of subsidence prediction, Time influence and impact on structures, Control of substance and governing laws and standards.

**UNIT-I**
**Introduction:** Strata movement at the mining horizon, convergence in mine working, factors influencing convergence in mine working.

**UNIT-II**
**Subsidence mechanism:** Zones of movement in the overlaying beds, vertical and horizontal movement, subsidence trough, angle of draw, angle of break, sub-surface subsidence.

**UNIT-III**
**Subsidence prediction:** Different methods of surface subsidence prediction – graphical, analytical, profile function, empirical and theoretical models.

**UNIT-IV**
**Time influence and impact on structures:** Influence of time on subsidence, example from long wall and bord and pillar working. Calculation of ground movement over time.
Types of stress on structures, stress-strain behaviour of soils, mining damage to buildings, industrial installations, railway lines, pipes, canals, etc.,

**UNIT-V**
**Subsidence control, governing laws and standards:** Measures to reduce mining damage, mining methods to minimise damage. Laws governing mining damage, different standards suggested fro mining and building ground in respect of subsidence. Case statues of Mine subsidence

**OUTCOMES**: Student can understand strata movement at the mining horizon, convergence in mine working, Subsidence mechanism, subsidence prediction, types of stresses on structures, stress-strain behavior of soils, measures to reduce damage, methods to minimize damage, laws governing mining damage, Case studies of mine subsidence.

**TEXT BOOKS:**

1. Subsidence: occurrence prediction and control, B.N Whittaker & D.J Reddish, Elsevier
2. Mine Subsidence Engineering, H. Kratzsch, Springer London


**REFERENCE BOOKS:**

1. Mine Subsidence, B. Singh, Parijat Mudranalaya Publications.
2. Surface subsidence Engineering, Syd S. Peng, W. M. Ma, W. L. Zhong, Society for Mining, Metallurgy & Exploration,

**2014-15** **Code: 407A3**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | 4 |

**ROCK EXCAVATION ENGINEERING**
**(Elective-I)**

**PRE-REQUISITE:** Mining Geology, Drilling and Blasting.
**OBJECTIVES: THIS** course introduces rock excavation engineering, physcio-mechanical and geotechnical properties, selection of excavation method. Mechanics of rock drilling and rock fragmentation by explosives, selection of explosives for rock excavation. Advances in blast design for underground excavation, Tunnel boring machines.

**UNIT-I**
Introduction: Scope and importance, Rock excavation engineering in mining and construction industries; Physico-mechanical and geotechnical properties of rocks Vis-à-vis excavation method; selection of excavation method.

**UNIT-II**
Drilling: Mechanics of rock drilling, design and operating parameters of surface and underground drilling, evaluation of drill performance, drill ability of rocks, mechanism of bit Wear, bit selection, problems of drilling, economics of drilling.

**UNIT-III**
Blasting: mechanics of rock fragmentation by explosives, advances in explosives and their selection criteria for rock excavation, blast design for surface excavations and optimization.
Advanced blast initiation systems, blast performance evaluation, cast blasting, technoeconomic and safety aspects of surface and underground blasting.

**UNIT-IV**
Advances in blast design for underground excavations, contour blasting, computer aided blast designs, review of tunnel blasting techniques in recent advances.

**UNIT-V**
Rock Cutting: Theories of rock tool interaction for surface excavation machinery – rippers, bucket wheel excavators, continuous surface miners; theories of rock tool interaction for underground excavation machinery- Ploughs, Shearers, road headers, continuous miners
Tunnel boring machines, selection criteria for cutting tools; advanced rock cutting techniques – high pressure water jet assisted cutting.

**OUTCOME:** Students can understand about rock excavation, excavation methods, drill ability to cut rocks, drill wear, beat design of surface excavation and optimization, Safety aspects of surface and underground blasting, Computer aided blast designs, Tunnel boring machines,selection criteria for cutting tools.

**TEXT BOOKS:**
1. Principles of Rock fragmentation, Cark G.B—John Wiley&Sons

**REFERENCE BOOKS:**
1. Diamond Drilling, Chugh C.P.- Oxford Publication.

**2014-15** **Code: 407A4**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | 4 |

**ROCK FRAGMENTATION ENGINEERING**
**(Elective-I)**

**PRE-REQUISITE:** Drilling and Blasting, Rock Excavation Engineering.
**OBJECTIVES:** This course introduces theory of rock cutting, selection, optimum penetration & tool wear characteristics. Pneumatic and hydraulic hammers, blasting accessories, computational models of blasting, controlled blasting techniques, instrumentation in blanking.

**UNIT-I**
General theory of rock cutting, selection of cutting tools for optimum penetration and wear characteristics. Mechanics of rotary, percussive an rotary-percussive drilling, short and long hole drilling equipment, different types of bits, bit wear, drilling in difficult formations, drillibality of rocks, drilling performance and costs.

**UNIT-II**
Mechanism of rock breaking machines, Pneumatic and Hydraulic rock hammers. Mechanics of rock fragmentation and fracture by explosive action, explosive.
Blasting accessories, blasting parameters, design of blasting rounds for opencast and underground mines, Blastability of rocks, blasting efficiency, mean fragment size.

**UNIT-III**
Computational models of blasting, transient ground motion, misfires, blown out shots, incomplete detonation – their cases and remedial measures.

**UNIT-IV**
Controlled blasting techniques, perimeter blasting, safety precautions, ground vibrations and air over pressure from blasting.

**UNIT-V**
Instrumentation in blasting, Borehole pressure transducer, V.O.D probe, vibration monitor, high speed video camera. Impact of ground vibration and sound on the neighboring structures and comm**UNIT**ies, and mitigative measures.

**OUTCOMES:** Student can understand general theory of rock cutting, drillibality of rocks, rock breaking mechanisms, computational models for blasting, transient ground motion, misfires, blow out shots, controlled blasting techniques, instruments used in blasting ie V.O.D prob, vibration monitor, high speed video cameras.

**TEXT BOOKS:**
1. 'Drilling & Blasting' Mine Tchnology , G. K. Pradhan, Ajoy K. Ghose, MINTECH Publications,

**REFERENCE BOOKS:**
1. Advances in Drilling & Blasting, Sastry V.R.

**2014-15** **Code: 407B1**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | **4** |

**COMPUTER APPLICATIONS IN MINING**
**(Elective-II)**

**PRE-REQUISITE:** Machine Drawing and Computer Aided Graphics, Rock slope Engineering.
**OBJECTIVES:** This course introduces algorithms , flow charts, programs, design of open pit, underground mine design, operational simulations, simulation of mining aspects, machine repairs, GPSS, SLAM, mining problems.

**UNIT-I**
Introduction to structure terminology and peripherals, algorithms, flow charts, programs, dedicated systems. Application in mining, Exploration, rock topographic models, bore hole compositing, ore reserve calculation, interpolation and geostatical models.

**UNIT-II**
Open pit design, Ultimate pit design, introductory process control, underground mine design, production scheduling.

**UNIT-III**
Operational Simulation, Introduction, Simulation overview, objective, understand the role of modeling, Understanding the basic concept in simulation. Example of simulation in mining aspects, Simulation of machine repair problems, concepts of variability and prediction, example with dumping time problem, fitting distribution with chi-square test.

**UNIT-IV**
Random number generation, properties of random number, pseudorandom number, random variates generation, Methods of random variates generation, inverse transformed method, acceptance rejection method, composition method, empirical method and rectangular approximation.

**UNIT-V**
Simulation languages, GPSS and SLAM, Logical flow diagram of different mining activities.
Coding with GPSS and SLAM of different mining problems, Computer control, Remote Control, automatic Control, application and limitations of control.

**OUTCOME:** Students can understand flow charts, programs, design of pit& underground mines, simulations ,computer control, remote control, applications and limitations of control.

**TEXT BOOKS:**

1. Digital Computer Fundamentals, T.C. Bartee, Mc Graw Hill, 4th Ed., 1984
2. Digital Principles and applications, P. Malvino and D.P. Leach, Mc Graw Hill, 5th Ed., 1994


**REFERENCE BOOK:**

1. Application of Computer Methods in the Mineral Industry, R.V. Ramani,

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | 4 |

**MINE CONSTRUCTION ENGINEERING**
**(Elective-II)**

**PRE-REQUISITE:** Environmental Studies

**OBJECTIVES :**This course introduces site selection procedure, Shaft sinking methods, Mechanization, Loose ground shaft lining, Design of lining, Surface layouts, Open pit mines opening out trenches, Scheduling for mine constructions PERT/CPM.

**UNIT-I**

Size of mine Environment and ecology, selection criteria for site of the openings geological investigation.

**UNIT-II**

Underground mine shaft sinking methods through alluvium, soft and hard rock, Mechanization, consolidation of loose ground shaft lining , ground pressure, thickness of lining.

**UNIT-III**

Design and procedure of laying the lining, construction of shaft collar heapstead.
Design and construction of insets, shaft bottom, excavation for mechanized decking of cages, skip loading, pit bottom lay outs, installation of main haulages.
Main sump size, construction under ground substation, first aid room and office.

**UNIT-IV**

Surface inclines, drivage through soft and hard rock, construction and lining of inclines, lateral and vertical and vertical pressures. Under ground development, drivage of roads in stone and coal, mechanization support systems opening of faces.
Surface layouts pit top circuits and coal handling and coal preparation plant, railway sifting and weigh bridges, surface and underground coal bunkers winding house substation, lamp room. Pit head bath, crèche dispensary: office, work-shop, material handling stowing installations, bunker, water tanks, mixing chamber.

**UNIT-V**

Open pit mines opening out trenches, haul roads, construction of benches. Assembling and transporting of draglines, shovels etc. Scheduling for mine constructions PERT/CPM

**OUTCOMES:** Students can get knowledge of selection of suitable site for mines, different sinking methods, procedure of laying lining, Scheduling for mine construction

**TEXT BOOKS:**

1. Design of Underground hard coal mine, J. Pazdziora, Elsevier.
2. Opencast Mining: unit Operations, V. V. Rzhevsky- Mir Publications.

**REFERENCE BOOKS:**

1. Working of Mineral Deposits—G. Popov, International Law & Taxation Publishers
2. Bokey “Mining”

**2014-15** **Code: 407B3**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | 4 |

**TUNNELING ENGINEERING**
**(Elective-II)**

**PRE-REQUISITE:** Environmental Engineering, Mine construction Engineering.
**OBJECTIVES:** This course introduces Geological concept of tunneling, Stresses and displacements associated with excavating tunneling, Design of supports of tunnels, Numerical techniques etc

**UNIT-I**
Introduction to tunneling; geological concept of tunneling.

**UNIT-II**
Influence of geological aspects on design & construction of tunnels.
**Tunneling Methods:** Conventional and special Drill & blast roadway drivage machines, tunnel boring machines (TBM)

**UNIT-III**
Stresses and displacements associated with excavating tunnels, Ground control or treatment in tunneling and drivages.
Design of Supports of Tunnels; Steel supports, rock enforcements, new Australian tunneling methods (NATM)

**UNIT-IV**
**Design of Tunnels:** Rock conditions, RMR, Q-system, RSR, rock mass behaviour, stress strain behaviour, and stress analysis of tunnels.
**Maintenance:** Dewatering, ventilation and illumination drivages tunnels.

**UNIT-V**
Numerical techniques: Introductory use of FLAC, PLAXIS etc.(Finite element model, finite difference model, boundary element model, prediction of stress and deformation around tunnels)

**OUTCOMES:** Student gets knowledge about design of tunnels, Stresses and displacements associated with excavating tunnels, Use of FLAC, PLAXIS etc

**TEXT BOOKS:**
1. Tunnelling and Underground Construction Techniques, Richards Lee. Bullock, Proceedings 1981 Rapid Excavation and Tunneli Conference, San Francisco, California,
2. Hand Book of Mining and Tunnelling Machinery, Stack Barbara – John Wiley & Sons.

**REFERENCE BOOKS:**
1. Rock Tunneling with Steel Supports, R.V. Proctor, T.L. White,1961
2. Modern Trends in Tunneling and Blast Design, John Johansen, C.F. Mathiesen, John Johansen publishing

**2014-15** **Code: 407B4**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | **4** |

**STRATA CONTROL TECHNOLOGY**
**(Elective-II)**

**PRE-REQUISITE:** Underground Coal Mining Technology

**OBJECTIVES:** To Identify and understand the factors contributing to strata control problems in mines, Analyze & design requirement of support system in different workings of mine, To Apply different instruments for evaluation of strata condition and organization of strata control in mines

**UNIT-I**

**Geo mining conditions**: Geological factors contributing to strata control problems in mines, Geo mechanics classification of rocks.

**UNIT-II**

**Safety status**: Status of safety in coal mines vis-à-vis strata control problems, Assessing the risk from the hazards of roof & side falls.

**UNIT-III**

**Design of support system**: Design of support system for development and depillaring workings.
Design of support system for long wall workings, application of modeling techniques to strata control problems.

**UNIT-IV**

**Strata behaviour studies**: Instrumentation for evaluation of strata condition in coal mines, Strata control techniques and its application to coal mining industry. Case studies on geotechnical instrumentation and strata control in coal mines. Demonstration of geotechnical instrumentation and computer softwares.

**UNIT-V**

**Organization of strata control cell**: strata control cell in mines, Training needs of the first line supervisors for effective implementation of the latest strata control technologies.

**OUTCOMES:** Student can understand factors contributing to strata control problems, Status of safety in mines, Design of support system for development and depillaring, Strata behaviour studies, How to organize the strata control cell.

**TEXT BOOKS:**


1. Strata mechanics in coal mining, M L Jeremic, CRC Press.
2. Strata Control in Mineral Engineering, T. Bieniawski Ziti, John Wiley & Sons


**REFERENCE BOOKS:**


1. Underground winning of Coal, T.N. Singh, Oxford and IBH New Delhi.
2. Rock Mechanics for Underground Mining, B.H.G. Brady and E.T. Brown, George Allen and Unwin Ltd., 1992.
3. Comprehensive Rock Engineering, J.A. Hudson,Pergamon Press, UK, 2000
4. Engineering Rock Mass Classifications, Bieniawski Z.T. 1989, Wiley, New York
5. Longwall mining, Peng S S and Chiang HS, Wiley, New York, 708p.

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **0** | **-/3/-** | **2** |

## MINERAL PROCESSING LABORATORY

1. Study of grab sampling and different sample division techniques like coning and quartering, riffle sampling techniques, etc.
2. Determination of crushing characteristics of a given mineral sample using jhaw crusher
3. Determination of the grinding characteristics of a given mineral sample un=sing ball mill
4. Sieve analysis of a given sample and to calculate (a) percentage sample retained on screens (b) average size of ample material and (c) to plot sizing curves
5. Concentration of a given mineral sample using mineraling
6. Concentration of a given mineral using Wilfley table
7. Concentration of a given mineral using froth flotation cell
8. concentration of a given mineral using magnetic separator
9. Study of wash ability characteristic of a coal sample using float and sink test.
10. Study of sedimentation characteristics of a given sample

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **0** | **-/3/-** | **2** |

**ROCK MECHANICS LABORATORY**

1. Determination of RQD of rocks.
2. Determination of Protodyaknov index of a given rock sample
3. Determination of point load index strength of a given rock sample
4. Determination of porosity of rocks.
5. Determination of hardness of rocks
6. Determination of uniaxial compressive strength of a given rock sample
7. Determination of tensile strength of a given rock sample using Brazilian method
8. Determination of shear strength of rocks
9. Determination of modulus of elasticity of given rock sample using strain gauge.
10. Determination of triaxial strength of rock and drawing of Mohr's envelope
11. Determination of slake durability of rocks
12. Study of time dependent properties of rocks.
13. Study of drillability index of rocks.
14. Study of different types of supports used in mines
15. Study of stress and fracture patterns around underground model opening
16. Study of design of mine pillars.
17. Prediction of Subsidence.
18. Study of measurement of in situ stresses and strengths.
19. Determination of rock anchorage capacity of a rock bolt
20. Study of different types of roof convergence and other ground control instruments.

**2014-15** **Code: 40725**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **1/-/-** | 4 |

**MINE GROUND CONTROL**

**PRE-REQUISITE:** Mine Construction Engineering, Strata Control Technology
**OBJECTIVES:** This course introduces concept of ground control in mines, modern concept of stratea pressure redistribution, roof support, design of structure in rocks, subsidence.

**UNIT-I**
Definition and concept of ground control in Mines. Ground control practice in Mines. Constraints on ground control design; characteristics of coal measure strata.

**UNIT-II**
Modern concept of stratea pressure redistribution. Manifestation of strata pressure, convergence, load on prop, creep, heave, roof fall and facture systems due to mining. Inssitu stress measurement, instrumentation.

**UNIT-III**
Roof support: Timber and steel supports, friction and hydraulic prop Arches, shotcret, roof truss, roof bolts. Powered supports stowing caving strip packing pump packing rock reinforcement.

**UNIT-IV**
Design of structures in rock; design of underground openings. Design of pillars, design of openpit slopes, waste dumps and embankments. Design of stopes.

**UNIT-V**
Subsidence: Theories of subsidence, factors affecting subsidence, prediction and measurement of subsidence. Damage and prevention of damage due to subsidence.
Bumps and rock bursts-causes, occurrence and control.

**OUTCOME:** Student can understand ground control concept, modern concepts, types of roof supports, design of complete structures, prediction, measuring and factors affecting subsidence.

**TEXT BOOKS:**
1. Rock Mechanics and Design of structures in rock , Leonard Obert, Wilbur I. Duvall, University Microfilms
2. Fundamental of Rock Mechanics, J C Jaeger, NGW Cook, Blackwell Publishing.
3. Rock Mechanics and Ground Control , V. Singh & B.P. Khare

**REFERENCE BOOKS:**
1. An Introduction to Rock Mechanics by Richard E. Goodman, Wiley
2. Coal Mining Ground Control, Syd S. Peng, West Virginia University

**2014-15** **Code: 407C1**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **-/-/-** | **4** |

**PLANNING OF SURFACE MINING PROJECT**
**(Elective-III)**

**PRE-REQUISITE:** Surface Mining Technology
**OBJECTIVES :**This course introduces concept of comparison between mining industry and other industries, Estimation, equipment required, dust control measure, Issues and challenges of mine planning in future.

**UNIT-I**
Mining industry in comparison with other industries, Principles of Planning, Mater Plan, Feasibility Report.

**UNIT-II**
Estimation, optimal Production, Life, requirement of surface equipment, selection of mining equipment

**UNIT-III**
Haul roads maintenance and dust control measures Surface facilities provision of dump yards, material handling plants

**UNIT-IV**
Surface Workshops, Mine lighting, occupational diseases remedial measures Surface environment management planning, EIA, load reclamation methods.

**UNIT-V**
Issues and challenges of Mine planning in future, mine closure planning. Blast designing, applications of SME, Nonel limitation transport of Block explosive, electronic detonators.

**OUTCOMES:** Students can understand planning of mining industry, equipments required, Future plans of mining.

**TEXT BOOKS:**
1. Open cast Mining, R.T. Deshmukh – Lovely Prakash, Dhanbad
2. Surface Mining, G.B. Misra, Dhanbad Publishers

**REFERENCE BOOKS:**
1. Surface Mining Technology Samir Kumar Das, Lovely Prakashan.
2. Introduction to Mining Engineering, hartman H.L. , John Wiley & Sons

**2014-15** **Code: 407C2**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. I-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **-/-/-** | **4** |

**PLANNING OF UNDERGROUND COAL MINING PROJECT**
**(Elective –III)**

**PRE-REQUISITE:** Mine Construction Engineering
**OBJECTIVES:** This course compares the mining industry with others, Estimation of optical prediction life, Piller extraction methods, economics of different methods extraction, surface subsidence.

**UNIT-I**
Mining industry in comparison with other industries, Principles of Planning, Features and Mine Planning, Master Plan, Feasibility Report.

**UNIT-II**
Geological factors replacing Mine Planning, Estimation of optional prediction Life. Coal extraction, different methods applicability advantages and disadvantages

**UNIT-III**
Pillar extraction by continuous miner Pillar extraction by Blasting Gallery Methods.
Pillar extraction by deploying LHDS/SDLS

**UNIT-IV**
Economics of different methods extraction. Gate Road devices and supports and extraction by longwall Advancing and retreating Methods.

**UNIT-V**
Surface subsidence, measures for subsidence control, subsidence monitoring, prediction of surface subsidence, numerical, analytical, empirical models.

**OUTCOMES:** Student can understand underground mining industry and its planning concept of piller extraction, surface subsidence control.

**TEXT BOOKS:**
1. Longwall Mining, Syd S Peng, West Virginia University,
2. Principles and Practices of Modern Coal Mining, R.D. Singh – New Age International
3. Coal Mining in India, Mathur S.P.

**REFERENCE BOOKS:**
1. Modern Coal Mining Technology, Samir Kumar Das, Lovely Prakashan
2. Thick Séance Mining Problems and Issues., BB Dhar, Singh T.N.

**2014-15** **Code: 407C3**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **-/-/-** | 4 |

**PLANNING OF UNDERGROUND METAL MINING PROJECT**

**(Elective –III)**

**PRE-REQUISITE:** Planning of Underground coal mining project
**OBJECTIVES: THIS** course introduces metalliferous mining industry in India, excavation and equipment, High productivity methods, division of mining areas, production planning scheduling of mining.

**UNIT-I**
Introduction: Status of Metalliferous Mining Industry in India, Scope and limitations of Underground Mining.
Development: Classification and choice of stopping methods, Choice of level interval and block length-shape, size, position.

**UNIT-II**
Excavation and equipping of shaft station, grizzly, ore/waste bin, main ore pass system, underground crushing and loading stations, underground chambers, sump and other subsidiary excavations, arrangements for dumping into main ore pass.

**UNIT-III**
Methods: Techno-economic analysis on choice of stopping methods, high productivity methods, blast hole stopping vertical retreat method of mining, block caving raise stopping, underground bench blasting.
Stope design and production planning in the various methods of stopping Stop layouts access development, shift/hosting haulages cross cuts, inclined developments.

**UNIT-IV**
Stope and development support, mining cycles, shift times, efficiency, utilization and estimating equipments requirements.
Division of Mining Area: Division of the mining area into working **UNIT**s on district and level pattern. Dimensions of panels and blocks.

**UNIT-V**
Production and Cycle time estimates, Production Planning and Scheduling

**OUTCOMES:** Students can understand scope of metalliferous mining industry in India, planning of equipments, different productivity methods, production planning and control of mines.

**TEXT BOOKS:**

1. A Study of Metalliferous Mining, Methods, Y.P. Chacharkar, Lovely Prakashan, Dhanbad, 1994.
2. SME Mining Engineers Hand Book, B.C. Arthur, American Institute of Mining, Metallurgical and Petroleum Engineers, New York, 1973.
3. Elements of Mining Technology, Vol.-II, D.J. Deshmukh, Central Techno Publications, Nagapur, 2001.


**REFERENCE BOOKS:**

1. Meta Mines Regulations -1961, Lovely Prakashan
2. Introductory Mining Engineering, Howard L. Hartman, Wiley.

**2014-15** **Code: 407C4**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | -/-/- | 4 |

**MINE ELECTRICAL ENGINEERING**
**(Elective-III)**

**PRE-REQUISITE:** Basic Electrical and Electronics Engineering

**OBJECTIVES:** This course introduces types of power supply systems, mining type circuit breakers, electrical power planning, illumination planning for mines, flame proof enclosures, Indian electrical rules as applied to mines.

**UNIT-I**

Types of electrical power supply systems for underground coal mines – solidly earthed, restricted neutral and insulated – neutral systems of electrical power supply; their comparisons. Earth fault protection techniques for above mine power supply systems, sensitive and fail-safe earth fault relays. On-line insulation monitoring for insulated-neutral electrical distribution system.

**UNIT-II**

Mining type circuit breakers – Air circuit breaker, vacuum and Hexa Sulfa Flouride ($Sf_{6)}$ circuit breakers, Field switch, Transwitch **UNIT**, Gate End Box, Drill Panel.

**UNIT-III**

Electrical power planning for mechanized longwall faces – general scheme of electrical power distribution, voltage drop problems and remedial measurers; Inbye substation capacity selection. General scheme of electrical power distribution in opencast projects, Quarry substation capacity selection. Choice of restricted-neutral and insulated-neutral systems in open cast mines.

**UNIT-IV**

Illumination planning for mines – underground roadway lighting system; intrinsically-safe lighting system for longwall faces, opencast mine lighting.

Earthing practice in mines – earth pits, earthing of mobile electrical equipment in mines. Mining cables – types, constructional details; layout of cables through shaft and other locations.

**UNIT-V**

Principles of flame proof enclosures. Intrinsically safe circuit methods of attaining intrinsic safety, zeener safety barriers and their applications.

Indian electricity rules as applied to mines.

**OUTCOME:** Students can understand estimation of power requirements for electrical equipments, illumination, Intrinsically Safe circuit methods of attaining intrinsic safety, zeener safety barriers and their applications

**TEXT BOOKS:**


1. A Text Book on Power Systems Engineering – Soni Gupta, Bhatnagar, Chakarbarti, Dhanpat Rai & Sons.
2. Electrical Equipment in mines- Harry Cotton, George Newnes
3. Switchgear and Protection- S.S. Rao, Khanna Publications.
4. Indian Electricity Rules.
5. Principles of Mine Planning J. Bhattacharya, Allied Publications.


**REFERENCE BOOKS:**


1. Universal Mining School Series (UK)
2. Coal Mining Practice- J.C. F Statharm Vol III, Heart Series.
3. Electrical Power Systems – C.L. Wadhwa, New Age International Publishers

**2014-15** **Code: 407D1**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
|---|---|---|---|
| | **3** | **-/-/-** | 4 |

**GEOLOGICAL & TECHNOLOGICAL FACTORS OF COAL GASIFICATION CBM, SHALE GAB**
**(Elective –IV)**

**PRE-REQUISITE:** Planning of underground coal mining.
**OBJECTIVES:** This course introduces coal Gasification concept, Technology of UCG, Mining methods of UCG, Linkage techniques, Future scope of UCG.

**UNIT-I**
Underground Coal Gasification (UCG) Concept; Chemistry, conditions suitable for UCG, Principles of UCG. UCG Process Component factors: Technology of UCG, opening up of coal seam for UCG.

**UNIT-II**
Mining methods of UCG: Chamber method, Stream method, Borehole procedure method, Blind bore hole method. Non-Mining methods of UCG: Level seams, Inclined seams.

**UNIT-III**
Linkage Techniques : Precolation linkage, Electro linkage, Boring linkage, compressed-air-linkage, Hydraulic fracture linkage.

**UNIT-IV**
Underground Coal Gasification at Great Depth, Merits and Demerits of Underground coal gasification.

**UNIT-V**
Future Scope and Development: Innovations, Blind long-Borehole method, long-Borehole procedure method, Pre-shattering method.

**OUTCOME:** Student can understand the concept of gasification, Technology involved in it, Non-mining methods of UCG, Gasification at great depth, merits and demerits, Future scope and development.

**TEXT BOOKS:**
1. Principles and Practices of Modern Coal Mining – R.D. Singh, New Age International
2. Winning and Working Coal in India Vol.II- R.T. Deshmukh and D.J.Deshmukh., Dhanbad Publishers

**REFERENCE BOOKS:**
1. Underground Coal Mining Methods – J.G. Singh, Braj-Kalpa Publishers

**2014-15** **Code: 407D2**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
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| | **3** | **-/-/-** | 4 |

**MINE HEALTH & SAFETY ENGINEERING**
**(Elective –IV)**

**PRE-REQUISITE:** Mine Environmental Engineering-II
**OBJECTIVES:** This course introduces health, safety, preventive measures in mining industry. Techniques used in safety analysis, safety polices, accidents in opencast mines, accidents due to explosives, electricity and Inundations.

**UNIT-I**
Introduction to accidents prevention and health and safety in industry : Terminology, reason for preventing accidents – moral, cost, legal. Safety scenario in Indian mines, Accidents in Indian mines, Measurement of safety performance, Statistical analysis of mine accidents.
Causes of Accidents, accident report, accident analysis and control, cost of accidents, statistical and economical analysis of accident data.

**UNIT-II**
System Engineering approach to safety, Techniques used in safety analysis, Generic approach to loss control with in mining operations.
Safety management and organization, Risk management, Risk identification, Risk estimation and evaluation, Risk minimization techniques in mines. Risk analysis using FTA, HAZOP, ETA etc; Risk analysis softwares; health risk assessment and epidemiological studied.

**UNIT-III**
Training, Human Behavioral approach in Safety, safety polices, safety audit and safety management in mines. Emergency organization for disaster management.

**UNIT-IV**
Accidents in opencast mines: Common causes and measures for prevention Accidents due to ground movement:: Falls of roof and sides in underground coal mines Accidents due to rope haulage: Common causes and measures for prevention.

**UNIT-V**
Accidents due to explosives: Common causes and measures for prevention.
Accidents due to electricity: Common causes and measures for prevention.
Inundations: Dangers from surface and underground water

**OUTCOMES:** Students can understand causes and safety measures of Mining industry, safety Policies, Emergency organization for disaster management. Dangers from surface and underground water.

**TEXT BOOKS:**

1. Mine Safety and Legislation, Samir Kumar Das, Lovely Prakashan.
2. Safety in Mines, B.K. Kejriwal, Lovely Prakashan.
3. System Safety Engineering and Risk Assessment: A Practical Approach, N.J. Bahr, Taylor and Francis, NY, 1997.


**REFERENCE BOOKS:**

1. DGMS CIRCULARS: MINES ACT
2. Occupational Safety and Health in Industries and Mines by C.P. Singh, Black Diamond Publishers
3. Indian Mining Legislation – A Critical Appraisal by Rakesh & Prasad, Tara Book Agency,

**2014-15** **Code: 407D3**

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
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| | **3** | **-/-/-** | **4** |

**MAINTENANCE AND RELIABILITY ENGINEERING**
**(Elective – IV)**

**PRE-REQUISITE:** Mine Electrical Engineering,
**OBJECTIVES:** This course introduces need of Maintenance, objectives, Maintenance in equipment life cycle, terms and definitions. Types of maintenance, concepts of reliability, system reliability models, Reliability management.

**UNIT - I**
**Introduction:** Need for Maintenance, Facts and Figures, Modern Maintenance, Problem and Maintenance Strategy for the 21st Century, Engineering Maintenance, Objectives and Maintenance in Equipment Life Cycle, Terms and Definitions.
**Maintenance Management and Control**: Maintenance Manual, Maintenance, facility Evaluation, Functions of Effective Maintenance Management, Maintenance Project Control Methods, Maintenance Management Control Indices.

**UNIT-II**
**Types of maintenance:** Preventive Maintenance, Elements of Preventive, maintenance Program, Establishing Preventive Maintenance, Program PM Program Evaluation and Improvement, PM Measures, PM Models, Corrective Maintenance, Corrective Maintenance Types, Corrective Maintenance Steps and Downtime Components, Corrective Maintenance Measures, Corrective Maintenance Models.
**Basic concepts of reliability:** Introduction, Reliability and quality ,Failures and failure modes ,Causes of failures and reliability, Maintainability and availability ,History of reliability ,reliability literature.

**UNIT-III**
**Reliability mathematics:** Introduction, Random experiment , Probability , Random variables, Distribution functions, Discrete distribution ,Continuous distribution, Numerical characteristics of random variables , Laplace transform.
**Component reliability and hazard models:** Introduction, Component reliability from test data, Mean time to failure, Time – dependent hazard models, Stress- Dependent hazard models , Derivation of reliability function using Markov, Treatment of field data.

**UNIT-IV**
**System reliability models:** Introduction - Systems with series components - Systems with parallel components - k-out – of- m systems - Non series parallel systems - Systems with - mixed – mode failures - Fault- tree technique

**UNIT-V**
**Reliability management:** Reliability programming - Management policies and decision - Reliability management by objectives - Reliability group - Reliability data : Acquisition and analysis - Managing people for reliability

**OUTCOMES:** Student can understand need of Maintenance of equipments, Kinds of maintenances, Reliability mathematics, Component reliability, Management polices and decision, Managing people for reliability.

**TEXT BOOKS:**

1. Reliability, Maintenance and Safety Engineering - Dr. A.K. Gupta/ Laxmi Publications
2. Industrial Safety Engineering – by L.M. Deshmukh/TMH
3. Reliability Engineering – Balaguruswamy- TMH
4. Mechanical Reliability - L.S.Srinath, Affiliated East-West Press Privatet Limited


**REFERENCE BOOKS:**

1. Maintenance Engineering & Management – RC Misra/ PHI
2. Reliability Engineering by Elsayed/Pearson.
3. Engineering Maintenance a Modern Approach, B.S.Dhillon,2002 CRR Publications
4. Reliability Engineering- Patrick DTO-Wiley Conor-India.
5. Reliability Engineering and life testing –Naikan-PHI

**MALLA REDDY ENGINEERING COLLEGE**
***(AUTONOMOUS)***

| **IV Year B.Tech. Mining Engg. II-Sem** | **L** | **T/P/D** | **C** |
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| | **3** | **-/-/-** | 4 |

**DEEP SEAM MINING**
**(Elective – IV)**

**PRE-REQUISITE:** Development of Mineral Deposits

**OBJECTIVES:** This course introduces techniques to identify the complex coal deposits, classification of Coal deposits, Challenges in development production in Deep seam mining, design and development of deep seam deposits, Use of modern techniques and modern instruments in deep seam mines.

**UNIT-I**

**Exploration**: Modern Exploration Techniques to Identify the Complex Coal Deposits

**Classification**: Classification of Coal Deposits Lying under Typical Geo-mining conditions.

**UNIT-II**

Challenges: Challenges to improve production and productivity from Deep Seated Deposits.

Challenges in Liquidation of Locked-up Pillars

**Experimental** Trials: Innovative Technologies for Stability Analysis.

**UNIT-III**

Design and Development of Deep Seated Deposits.(Design of long wall mining, design of chain pillars, design to reduce chances of coal bumps and rock bursts, design of stress-relieving techniques in underground mines).

**UNIT-IV**

**Modern Techniques**: Application of Numerical Modeling Techniques to Control Ground Problems of Complex Deposits.

**UNIT-V**

Use of Modern Instruments for Strata Control of deep seated deposits.

In-situ Gasification and Mineral Biotechnology for Complex Coal Deposits.

**OUTCOME:** Students can understand different techniques to find deposits, methods to improve production, modern instruments for strata control of deep seated deposits.

**TEXT BOOKS:**

1. Principles & Practices of Modern Coal Mining, R.D. Singh, New age international New Delhi, 1997
2. Underground winning of Coal, T.N. Singh, Oxford and IBH New Delhi, 1992

**REFERENCE BOOKS:**

1. Longwall mining, Peng S S and Chiang H S. Wiley, New York, 708p
2. Modern Coal Mining Technology, S.K. Das,Lovely prakashan Dhanbad, 1992
3. Legislation in Indian Mines-Acritical Appraisal, Prasad D. and rakesh S, Niskam Press, New Delhi, 1883p
4. Coal Mining in India, S.P. Mathur, M.S. Enterprises Bilaspur, 1999

**2014-15** **Code: 40726**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**IV Year B.Tech. Mining Engg II-Sem**

| L | T/P/D | C |
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**INDUSTRY ORIENTED MINI PROJECT**

**2014-15** **Code: 40727**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**IV Year B.Tech. Mining Engg II-Sem**

| L | T/P/D | C |
|---|---|---|
| - | -/6/- | 2 |

**SEMINAR**

**2014-15** **Code: 40728**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**IV Year B.Tech. Mining Engg II-Sem**

| L | T/P/D | C |
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| - | -/15/- | 10 |

**PROJECT WORK**

**2014-15** **Code: 40729**

**MALLA REDDY ENGINEERING COLLEGE**

**(*Autonomous)***

**IV Year B.Tech. Mining Engg II-Sem**

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

**COMPREHENSIVE VIVA**