MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
Sponsored by CMR Educational Society
(Affiliated to JNTU, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2008 Certified)
Maisammaguda, Dhulapally (Post Via Hakimpet), Secunderabad – 500100, Telangana State, India.
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BACHELOR OF TECHNOLOGY
MINING ENGINEERING

ACADEMIC REGULATIONS
COURSE STRUCTURE AND SYLLABUS
(Batches admitted from the academic year 2015 - 2016)

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

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- ”Autonomous Institution /College” means an institution/college designated as autonomous institute / college by University Grants Commission (UGC), as per the UGC Autonomous College Statutes.
- “Academic Autonomy” means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.
- “Commission” means University Grants Commission.
- “AICTE” means All India Council for Technical Education.
- “University” the Jawaharlal Nehru Technological University, Hyderabad.
- “College” means Malla Reddy College of Engineering & Technology, Secunderabad unless indicated otherwise by the context.
- “Program” means:
    - Bachelor of Technology (B.Tech) degree program
    - UG Degree Program: B.Tech
- “Branch” means specialization in a program like B.Tech degree program in Electronics & Communication Engineering, B.Tech degree program in Computer Science and Engineering etc.
- “Course” or “Subject” means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester.
- T–Tutorial, P–Practical, D–Drawing, L-Theory, C-Credits

FOREWORD

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

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

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

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

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

PRINCIPAL

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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VISION

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

MISSION

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

QUALITY POLICY

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

For more information: www.mrcet.ac.in

ACADEMIC REGULATIONS FOR B. TECH. (REGULAR)

Applicable for the students of B. Tech. (Regular) from the Academic Year 2015-16 and 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.

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

1.3 The candidate shall register for **192 credits** and secure **192 credits** with compulsory subjects as listed in Table-1

Table 1: Compulsory Subjects

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

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

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:

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

4. Credits

Particulars	Semester	
	Periods per week	Credits
Theory	05	04
	04	03
Practical	03	02
Drawing	03	02
	06	04
Mini Project	--	04
Technical Seminar	06	02
Major Project	15	10

***Duration of each period is 50 minutes.**

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, Mini Project, Technical seminar and Major Project work shall be evaluated for 100, 50 and 300 marks, respectively.

5.2 For theory subjects the distribution shall be 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 a descriptive paper and assignment. The descriptive paper shall be for 20 marks with a total duration of 2 hours. The descriptive paper shall contain 6 full questions out of which, the student has to answer 4 questions, each carrying 5 marks. While the first mid-term examination shall be conducted from 1 to 2 units of the syllabus, the second mid-term examination shall be conducted from 3 to 5 units**.** Five (5) marks are allocated for Assignments (as specified by the subject teacher concerned). The first Assignment should be submitted before the conduct of the first mid-examination, and the second Assignment should be submitted before the conduct of the second mid-examination. 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 candidate.
However, if any student is absent/scoring internal marks less than 40% in any subject of a mid-term examination he/she will be given a chance to write the internal exam once again after he/she re-registering for the internal exam in the concerned subject and paying stipulated fees as per the norms.

The end examination will be conducted for 75 marks with Part A as a compulsory question for 25 marks. Part B is for maximum of 50 marks with 5 questions consisting of two parts each (a) and (b), out of which the student has to answer either (a) or (b), not both. 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 the laboratory teacher. The external examiner shall be appointed from the clusters of colleges which are decided by the examination branch of the College.

5.5 For the subject having design and/or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and Estimation, the distribution shall be 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 a MiniProject to be taken up during the vacation after III year II Semester examination. However, the Mini-Project and its report shall be evaluated along with the Major Project work in IV year II Semester. The Mini Project shall be submitted in a report form and presented before the committee. It shall be evaluated for 100 marks. The committee consists of an External Examiner, Head of the Department, and the Supervisor of the Mini Project and a SeniorFaculty member of the department. There shall be no internal marks for Mini Project.

5.7 There shall be a Technical Seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing

his understanding of the topic, and submit it to the department. It shall be evaluated by the departmental committee consisting of head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for the seminar.

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

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

6. Attendance Requirements

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

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

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

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

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

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

6.7 **A student will be promoted to the next semester if he 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, he shall not be eligible for readmission into the same class.**

7. Course Registration:

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

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

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

7.4 Interchanging of Course Registrations are not permitted.

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

8.Minimum Academic Requirements

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

8.1 A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the end semester exam, and minimum 40% of marks in the sum total of the mid-term and end semester exams.

8.2 A student will not be promoted from I Year to II Year unless he fulfills the academic requirement of 24 credits out of 48 credits of I year two semesters from all the examinations and secures prescribed minimum attendance in I year.

8.3 A student will not be promoted from II year to III year unless he fulfills the academic requirement of 48 credits out of 96 credits up to II year II semester, from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.

8.4 A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 72 credits out of 144 credits up to III year II semester, from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.

8.5 A student shall register and put up minimum attendance in all 192 credits and earn 192 credits. Marks obtained in the 192 credits shall be considered for the calculation of percentage of marks.

8.6 Students who fail to earn 192 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.

However, the minimum academic requirements in terms of percentage of credits and attendance for the promotion to the next higher semester/year will adhere to affiliating university JNTUH, Hyderabad

9. Course pattern

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

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

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

10. Award of Class

In assessing the performance of the students in examinations, the usual approach is to award marks based on the examinations conducted at various stages (sessional, mid-term, end-semester etc.,) in a semester. As per UGC Autonomous guidelines, the following system is implemented in awarding the grades and CGPA under the **Choice Based Credit System (CBCS).**

Letter Grades and Grade Points:

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

Grades	Points	Marks secured (%)
O (Outstanding)	10	≥ 90
A+(Excellent)	9	85 – 89
A(Very Good)	8	75 – 84
B+(Good)	7	70 – 74
B(Above Average)	6	60 – 69
C(Average)	5	50 – 59
P(Pass)	4	40 – 49
F(Fail)	0	<40
Ab(Absent)	0	-

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

Computation of SGPA and CGPA

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

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

SGPA (Si) = Σ(Ci x Gi) / ΣCi

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

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

CGPA = Σ(Ci x Si) / Σ Ci

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

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

11 Minimum Instruction Days

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

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

13 WITHHOLDING OF RESULTS

If the student has not paid the dues, if any, to the university 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 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 JNTUH as per the academic regulations and course structure of the MRCET.

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 Principal is final.

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

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

16. PRE-REQUISITES FOR CORE ELECTIVES

Core Elective Number	Subject Code	Title of the Subject	Pre-Requisite Subject Code	Pre-Requisite Subject Title
1	R15A2517	Maintenance & Reliability Engineering	R15A2503	Underground Coal Mining Technology
	R15A2518	Mine Subsidence Engineering	R15A2503	Underground Coal Mining Technology
	R15A2519	Mine health and safety engineering	R15A2508	Surface Mining Technology
2	R15A2520	Mine Economics	R15A0061	Managerial Economics & Financial Accounts Mefa
	R15A2521	Strata Control Technology	R15A2503	Underground Coal Mining Technology
	R15A2522	Deep Seam Engineering	R15A2503	Underground Coal Mining Technology
3	R15A2523	Planning and Design of Surface Mining.	R15A2508	Surface Mining Technology
	R15A2524	Planning and Design of Underground Metal Mining.	R15A2512	Underground Metal Mining Methods.
	R15A2525	Planning and Design of Underground Coal Mining	R15A2503	Underground Coal Mining Technology
4	R15A2526	Clean Coal Technology	R15A2514 R15A2503	Mineral Processing , Underground Coal Mining Technology
	R15A2527	Rock Excavation Engineering.	R15A2508	Surface Mining Technology
	R15A2528	Rock Fragmentation Engineering	R15A2505	Drilling & Blasting
5	R15A2529	Mine Electrical Engineering.		Eee
	R15A2530	Advanced Surface Mining Technology.	R15A2508	Surface Mining Technology
	R15A2531	Computer Application in Mining.	R15A2503 R15A2508	Underground Coal Mining Technology Surface Mining Technology
6	R15A2532	Small Scale and Marine Mining	R15A2508	Surface Mining Technology
	R15A2533	Tunnelling Engineering	R15A2501	Introduction to Mining
	R15A2534	Environmental Management in Surface Mines	R15A2507 R15A2511 R15A2508	Mine Environmental Engineering-I Mine Environmental Engineering-II Surface Mining Technology

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

S.No	Nature of Malpractices/Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University.
3.	Impersonates any other candidate in connection with the examination.	The candidate who hasim personated shall be expelled from 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 practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining

		subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Using objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-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	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 case is registered against them.

	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.	
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate 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 to award suitable punishment.	

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions: (if the squad reports that the college is also involved in encouraging malpractices)

(i) A show cause notice shall be issued to the college.

(ii) Impose a suitable fine on the college.

(iii) Shifting the examination centre from the college to another college for a specific period of not less than one year.

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: PROFESSIONALISM & CITIZENSHIP To create and sustain a community of learning in which students acquire knowledge and learn to apply it professionally with due consideration for ethical, ecological and economic issues.
PEO2: TECHNICAL ACCOMPLISHMENTS To provide knowledge based services to satisfy the needs of society and the industry by providing hands on experience in various technologies in core field.
PEO3: INVENTION, INNOVATION AND CREATIVITY To make the students to design, experiment, analyze, interpret in the core field with the help of other multi disciplinary concepts wherever applicable.
PEO4: PROFESSIONAL DEVELOPMENT To educate the students to disseminate research findings with good soft skills and become a successful entrepreneur.
PEO5: HUMAN RESOURCE DEVELOPMENT To graduate the students in building national capabilities in technology, education and research.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. **Engineeringknowledge**:Applytheknowledgeofmathematics,science,engineeringfundamentals,andanengineeringspecializationtothesolutionofcomplexengineering problems.
2. **Problemanalysis**:Identify,formulate,reviewresearchliterature,andanalyzecomplex engineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics,naturalsciences,andengineeringsciences.
3. **Design/developmentofsolutions**:Designsolutionsforcomplexengineeringproblems anddesignsystemcomponentsorprocessesthatmeetthespecifiedneedswithappropriateconsiderationfor the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conductinvestigationsofcomplexproblems**: Useresearch-basedknowledgeandresearchmethodsincludingdesignofexperiments,analysisandinterpretation of data, and synthesis of the information to provide valid conclusions.
5. **Moderntoolusage**:Create,select,andapplyappropriatetechniques,resources,andmodernengineeringandITtoolsincludingpredictionandmodelingtocomplexengineering activitieswithanunderstandingofthelimitations.
6. **Theengineerandsociety**:Applyreasoninginformedbythecontextualknowledgetoassesssocietal,health,safety,legalandculturalissuesandtheconsequentresponsibilitiesrelevanttotheprofessionalengineeringpractice.
7. **Environmentandsustainability**:Understandtheimpactoftheprofessionalengineering solutionsinsocietalandenvironmentalcontexts,anddemonstratetheknowledgeof,andneedforsustainabledevelopment.
8. **Ethics**:Applyethicalprinciplesandcommittoprofessionalethicsandresponsibilitiesandnormsoftheengineeringpractice.
9. **Individualandteamwork**:Functioneffectivelyasanindividual,andasamemberorleaderindiverseteams,andinmultidisciplinarysettings.
10. **Communication**:Communicateeffectivelyoncomplexengineeringactivitieswiththeengineeringcommunity andwith societyatlarge, suchas, being abletocomprehend andwriteeffective reportsanddesigndocumentation,makeeffectivepresentations,andgiveandreceiveclearinstructions.
11. **Projectmanagementandfinance**:Demonstrateknowledgeandunderstandingoftheengineeringandmanagementprinciplesandapplythesetoone'sownwork,asamember andleaderinateam,tomanageprojectsandinmultidisciplinaryenvironments.
12. **Life-longlearning**:Recognizetheneedfor,andhavethepreparationandabilitytoengageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

COURSE STRUCTURE

I Year B. Tech (MN) – I Semester

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX.MARKS	
						Int	Ext
1	R15A0001	English	3		2	25	75
2	R15A0021	Mathematics-I	5	1	4	25	75
3	R15A0011	Engineering Physics-I	3		2	25	75
4	R15A0014	Environmental Studies	4		3	25	75
5	R15A0501	Computer Programming With C	4		3	25	75
6	R15A0301	Engineering Mechanics	5	1	4	25	75
7	R15A0581	Computer Programming Lab	-	-3-	2	25	50
8	R15A0084	Engineering Workshop/IT Workshop	-	-3-	2	25	50
9	R15A0081	English Language Communication Skills Lab-I	-	-3-	2	25	50
10	R15A0003	Human Values and Societal Perspectives	2	-	-	50	-
		TOTAL	26	11	24	275	600

I Year B. Tech (MN) – II Semester

S.NO	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX.MARKS	
						Int	Ext
1	R15A0002	Professional English	3		2	25	75
2	R15A0022	Mathematics-II	5	1	4	25	75
3	R15A0012	Engineering Physics-II	3		2	25	75
4	R15A0013	Engineering Chemistry	4		3	25	75
5	R15A0502	Object Oriented Programming	4	1	3	25	75
6	R15A0302	Engineering Drawing	2	-3-	4	25	75
7	R15A0582	Object Oriented Programming Lab	-	-3-	2	25	50
8	R15A0083	Engineering Physics/ Chemistry Lab	-	-3-	2	25	50
9	R15A0082	English Language Communication Skills Lab-II	-	-3-	2	25	50
		TOTAL	21	14	24	225	600

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

II Year B. Tech (MN) – I Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A0361	Mechanical Technology	3	1	3	25	75
2	R15A0206	Electrical Electronics Engineering	5		4	25	75
3	R15A2501	Introduction to Mining	4		3	25	75
4	R15A2502	Fundamentals of Geology	4		3	25	75
5	R15A0310	Machine Drawing	3	3	4	25	75
6	R15A0061 R15A0507 R15A0569	Open Elective 1: 1. Managerial Economics & Financial Accounts 2. Java Programming 3. Apps Design & Development.	4		3	25	75
7	R15A2581	Geology Lab	-	3	2	25	50
8	R15A0282	Electrical Electronics Engineering Lab	-	3	2	25	50
*9	R15A0004/ R15A0005	Foreign Language: French/ Foreign Language: German	2	-	-	50	
Total			25	10	24	250	550

II Year B. Tech (MN) – II Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A0309	Fluid Mechanics and Hydraulic Machines	3	1	3	25	75
2	R15A2503	Underground Coal Mining Technology	4		3	25	75
3	R15A0305	Mechanics of Solids	3	1	3	25	75
4	R15A2504	Mining Geology	4		3	25	75
5	R15A2505	Drilling & Blasting	4		3	25	75
6	R15A0006	Gender Sensitizations	-	3	2	75	
7	R15A0070 R15A0065 R15A0069	Open Elective 2: 1. Production Management. 2. Management Sciences 3. Intellectual Property Rights	4		3	25	75
8	R15A0383	Fluid Mechanics and Hydraulic Machines Lab	-	3	2	25	50
9	R15A0381	Mechanics of Solids lab	-	3	2	25	50
Total			22	11	24	275	550

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

III Year B. Tech (MN) – I Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A2506	Basic Engineering Surveying	3	1	3	25	75
2	R15A2507	Mine Environmental Engineering-I	4		3	25	75
3	R15A2508	Surface Mining Technology	3	1	3	25	75
4	R15A2509	Mine Mechanisation-I	4	1	4	25	75
5	R15A2517 R15A2518 R15A2519	Core Elective 1: 1. Maintenance & Reliability Engineering 2. Mine Subsidence Engineering 3. Mine health and safety engineering	4		4	25	75
6	R15A0312 R15A0064 R15A0068	Open Elective 3: 1. Industrial Engineering 2. Enterprise Resource Planning 3. Total Quality Management	4		3	25	75
7	R15A2582	Basic Engineering Surveying Lab-I	-	3	2	25	50
8	R15A2583	Mine Environmental Engineering Lab-I	-	3	2	25	50
		Total	22	9	24	200	550

III Year B. Tech (MN) – II Semester

S.NO.	SUBJECT CODE	SUBJECT	L	T/P/D	C	MAX MARKS	
						INT	EXT
1	R15A2510	Mine Surveying	3	1	3	25	75
2	R15A2511	Mine Environmental Engineering-II	4		3	25	75
3	R15A2512	Underground Metal Mining Method	4	1	4	25	75
4	R15A2513	Mine Mechanisation- II	4	1	4	25	75
4	R15A2520 R15A2521 R15A2522	Core Elective 2: 1. Mine Economics 2. Strata Control Technology 3. Deep Seam Engineering	4		3	25	75
6	R15A0522 R15A0062 R15A0067	Open Elective 4: 1. Web Technology 2.Logistics & Supply Chain Management 3. Technology Management	3	1	3	25	75
7	R15A2584	Mine Surveying Lab-II	-	3	2	25	50
8	R15A2585	Mine Environmental Engineering Lab-II	-	3	2	25	50
Total			24	10	24	250	550

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

IV Year B. Tech (MN) – I Semester

S.No.	Subject Code	SUBJECT	L	T/P/D	C	Max. Marks	
						Int	Ext
1	R15A2514	Mineral Processing	4		3	25	75
2	R15A2515	Mine Legislation and Safety	4		3	25	75
3	R15A0333	Operation Research	3	1	3	25	75
4	R15A2516	Rock Mechanics & Ground Control	3	1	3	25	75
5	R15A2523 R15A2524 R15A2525	Core Elective 3: 1. Planning and Design of Surface Mining 2. Planning and Design of Underground Metal Mining. 3. Planning and Design of Underground Coal Mining	4		4	25	75
6	R15A2526 R15A2527 R15A2528	Core Elective 4: 1. Clean Coal Technology 2. Rock Excavation Engineering. 3. Rock Fragmentation Engineering	4		4	25	75
7	R15A2586	Mineral Processing Lab	-	3	2	25	50
8	R15A2587	Rock Mechanics and Ground Control Lab	-	3	2	25	50
Total			22	8	24	200	550

IV Year B. Tech (MN) – II Semester

S.No.	Subject Code	SUBJECT	L	T/P/D	C	Max. Marks	
						Int	Ext
1	R15A2529 R15A2530 R15A2531	Core Elective 5: 1. Mine Electrical Engineering. 2. Advanced Surface Mining Technology. 3. Computer Application in Mining.	4	_	4	25	75
2	R15A2532 R15A2533 R15A2534	Core Elective 6: 1. Small Scale and Marine Mining. 2. Tunnelling Engineering 3. Environmental Management in Surface Mines.	4	_	4	25	75
3	R15A2588	Mini Project		-	4	-	100
4	R15A2589	Technical Seminar	-	6	2	50	-
5	R15A2590	Major Project	-	15	10	100	200
Total			8	21	24	200	450

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

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

3 - / - / - 2

(R15A0001) ENGLISH

Introduction:

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

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

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

OBJECTIVES:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

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

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.
   - Oral practice
   - Describing objects/situations/people
   - Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: Learning English : A Communicative Approach)
   - Just A Minute (JAM) Sessions.

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
   - Skimming the text
   - Understanding the gist of an argument
   - Identifying the topic sentence
   - Inferring lexical and contextual meaning
   - Understanding discourse features
   - Scanning the text
   - Recognizing coherence/sequencing of sentences

NOTE : The students will be trained in reading skills using the prescribed text for detailed study.

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:

Objectives

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.
   - Writing sentences
   - Use of appropriate vocabulary
   - Paragraph writing
   - Coherence and cohesiveness
   - Narration / description
   - Note Making
   - Formal and informal letter writing
   - Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units are prescribed in each semester:

For Detailed study

First text book entitled "Skills Annexe: Functional English for Success", published by Orient BlackSwan, Hyderabad.

For Non-detailed study

Second textbook titled "Epitome of Wisdom", published by Maruthi Publications, Guntur.

Unit –I:

1. Chapter entitled 'Mokshagundam Visvesvaraya' from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Jam session
R- Reading – The Palm Islands
W- Writing – Writing Paragraphs
G- Grammar – Conjunctions and Adverbs

V- Vocabulary – Prefixes and Suffixes

Unit – II

1. Chapter entitled "Never Never Nest" by Cedric Mount, published in *Ten One Act Plays, 1937*, Willett, Clark and Company, 1937.

L- Listening – Project Based Assignment
S- Speaking – Role plays—Introduction, Greetings, Requests, Permission
R- Reading – Reading for the plot
W- Writing – Note writing
G- Grammar – Articles, Finite and Non-finite Verbs, Auxiliary Verbs and Nouns
V- Vocabulary – Homophones, Homographs and Homonyms

Unit – III

1. Chapter entitled "Risk Management" from *Skills Annexe -Functional English for Success*, published by Orient Black Swan, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Role plays – Refusal, Apology, and Complimenting
R- Reading – Shivakasi Accident
W- Writing – Note Making and Note Taking
G- Grammar – Tenses and Punctuation
V- Vocabulary – Synonyms and Antonyms

Unit – IV

1. Chapter entitled 'Leela's Friend' from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Role plays—Congratulating, Consolation, and Social Etiquettes
R- Reading – Forensic Science
W- Writing – Letter Writing
G- Grammar – Contractions, Questions, Prepositions
V- Vocabulary – Phrasal Verbs

Unit –V

1. Chapter entitled "Three Days to See" from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Professional and Telephone Etiquettes
R- Reading – Reading for Facts
W- Writing – Business Letters, Complaints, Apologies, Requests
G- Grammar – Correction of Sentences and Modal Auxiliaries
V- Vocabulary – Confused Words

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

REFERENCES :

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.
11. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixson, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw – Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
19. A Grammar Book for You And I, C. Edward Good, MacMillan Publish.

OUTCOMES:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency.
- Gaining confidence in using language in verbal situation.

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I Year B. Tech MN -I Sem	**L**	**T/P/D**	**C**
	5	**1 / - / -**	**4**

(R15A0021) MATHEMATICS – I

OBJECTIVES:

To learn

- The rank of a matrix and applying the concept of rank to know the consistency of linear equations and to find all possible solutions if exist and concept of eigen values and eigen vectors of a matrix
- The mean value theorems and to understand the concepts geometrically, functions of several variables and optimization of these functions.
- Methods of solving the differential equations of 1^{st} and higher order cooling, Natural growth and decay, bending of beams etc.
- Properties of Laplace Transform, Inverse Laplace Transform and Convolution theorem

UNIT - I: Matrix Theory

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

UNIT – II: Differential Calculus

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

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

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

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

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

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

UNIT – V Laplace Transforms and Applications

Definition of Laplace transform- Domain of the function and Kernel for the Laplace transforms-Existence of Laplace transform- Laplace transform of standard functions- first shifting Theorem,- Laplace transform of functions when they are multiplied or divided by "t"- Laplace transforms of

derivatives and integrals of functions – Unit step function – second shifting theorem – Dirac's delta function- Periodic function – Inverse Laplace transform by Partial fractions-Inverse Laplace transforms of functions when they are multiplied or divided by "s", Inverse Laplace Transforms of derivatives and integrals of functions- Convolution theorem –Solving ordinary differential equations by Laplace transforms.

TEXT BOOKS:

1. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.

2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.

REFERENCES:

1. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
2. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
3. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.

OUTCOMES:

- After learning the contents of this Unit the student is able to write the matrix representation of a set of linear equations and to analyze solutions of system of equations.
- The student will be able to understand the methods of differential calculus to optimize single and multivariable functions.
- The student is able to identify the type of differential equation and uses the tight method to solve the differential equations. Also able to apply the theory of differential equations to the real world problems.
- The student is able to solve certain differential equations using Laplace Transform. Also able to transform functions on time domain to frequency domain using Laplace transforms.

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I Year B. Tech MN -I Sem	**L**	**T/P/D**	**C**
	3	**- / - / -**	**2**

(R15A0011) ENGINEERING PHYSICS-I

OBJECTIVES:

It gives

- To understand wave nature of light in designing powerful light sources for various Engineering applications and enable them to develop communication systems by understanding the working of laser beams as well as Fibre Technology.
- To understand the behaviour of electron in a solids and classification of solids based on band theory thereby one can realize conductivity and specific heat values of solids.
- To understand the basics of working and design of semiconductor devices.

UNIT-I

OPTICS: Introduction to Interference**-**Coherence-Coherent sources. Theory of interference fringes .Types of interference-Interference by division of wave front. Interference in thin films by reflected light. Interference due to division of amplitude- Newton's rings applications of Newton's rings. Diffraction-types of diffraction. Difference between interference and diffraction, Diffraction due to single slit, Diffraction-Plane transmission grating.

POLARIZATION: Introduction to Polarization, representation of various polarized lights, Brewster law, and law of Mauls.

UNIT-II

LASERS: Basic principle in lasers, Characteristics of lasers. Spontaneous and stimulated emissions. Population inversion, Meta stable state, pumping, lasing action. Components of lasers, Types of lasers-Ruby, He-Ne &semi conductor lasers. Application of lasers- Medical, Communication, Industrial, Defence, etc.

FIBER OPTICS: Advantages of optical fibre over conventional communication system. Basic principle of an optical fibre, Construction and working of optical fibre. Types of optical fibres -step and graded index. Numerical aperture and Acceptance angle of an optical fibre. Attenuation, applications of optical fibre in sensors.

UNIT-III

PRINCIPLES OF QUANTUM MECHANICS: Inadequacy of classical mechanics. Fundamentals of wave mechanism-wave nature and particle nature-Debrogile dual nature of light, Experimental evidence of debrogile dual nature Davisson & Germer's experiment. Heisenberg uncertainty principle. One dimensional time independent Schrodinger wave equation-Physical significance of wave function. Schrödinger equation in one dimensional infinite potential box.

UNIT-IV

ELEMENTS OF STATISTICAL MECHANICS:

Statistical distribution-Micro and Macro states, Ensembles. M.B, B.E, and F.D distributions. Inadequacy of electron theory of metals. Band theory-Kronig Penny model-EK curve-Effective mass of electron. Density of state factor. Formation of energy bands in solids. Classification of solids in conductors, semi conductors and insulators with energy level diagrams.

UNIT-V

SEMICONDUCTOR PHYSICS: Types of semi conductors**,** Carrier concentration of electrons in intrinsic semi conductor**.** Fermi level in intrinsic semi conductor**.** Carrier concentration & Fermi level of extrinsic semi conductors**.** Direct and Indirect band gaps of semi conductor. Hall Effect.

SEMICONDUCTORDEVICES: Formation of PN junction diode, Energy level diagram of PN junction diode. I-V characteristics of PN junction diode-PN junction as half wave rectifier and full wave rectifier.PN junction diode as LED and Solar cell.

TEXT BOOKS:

1. Engineering Physics, V. Rajendran, Tata Mc Graw Hill Book Publishers
2. A Text Book of Engineering Physics –P. G. Khirsagar, Avadhanulu– S. Chand

REFERENCES:

1. Engineering Physics ,P.K. Palaniswamy, Scitech Publishers
2. Solid State Physics, Kittel- Wiley International
3. Applied Physics for Engineers – P. Madhusudana Rao (Academic Publishing company, 2013)

OUTCOME:

- The students would be able to learn the fundamental concepts of wave optics.
- The knowledge on fundamentals of quantum mechanics, statistical mechanics enables the student to apply to various systems like communications solar cells, LED's and so on.
- Finally, Engineering physics course helps the student to develop problem solving skills and analytical, practical skills

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I Year B.Tech. MN - I Sem	**L**	**T/P/D**	**C**
	4	**-/-/-**	**3**

(R15A0014) ENVIRONMENTAL STUDIES

OBJECTIVES:

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

Unit-I:

Introduction: Definition of Environment and Environmental Sciences.

Ecosystems: Definition, Scope and Importance of ecosystem. Brief Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles (Carbon, Oxygen, Nitrogen, Water cycle) Bioaccumulation, Biomagnifications, and carrying capacity, Field visits.

Unit-II:

Natural Resources: Classification of Resources: water resources: use and over utilization of surface and ground water, Dams: benefits and problems. Forest resources, Deforestation, Energy resources: renewable and non renewable energy sources, use of alternate energy source,

Unit-III:

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

Unit-IV:

Environmental Pollution and Control Technologies: Environmental Pollution: **Classification of pollution, Air Pollution**: Primary and secondary pollutants, Automobile and Industrial pollution, **Water pollution**: Sources and types of pollution, **Soil Pollution**: Sources and types, Impacts of modern agriculture, degradation of soil. Solid waste and its effect, composition and characteristics of e-Waste and its management.

Global Environmental Problems and Global Efforts: Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Acid rain

Natural Hazards (Droughts, Floods, Cyclone, Landslides, Earthquake, Tsunami) and Disaster Management, Carbon Footprint.

Unit-V:

Environmental Policy, Legislation & EIA: Environmental Protection act, Air Act- 1981, Water Act, Forest Act, Wild life Act-Endangered species act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. International conventions / Protocols: Earth summit, Kyoto protocol and Montréal Protocol.

EIA: EIA structure, methods of baseline data acquisition. Concepts of Environmental Management Plan (EMP).

Towards Sustainable Future: Concept of Sustainable Development, Population and its explosion, Environmental Education, Concept of Green Building.

SUGGESTED TEXT BOOKS:

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

REFERENCE BOOKS:

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

OUTCOMES:

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

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

4 -/-/- 3

(R15A0501) COMPUTER PROGRAMMING WITH C

Objectives

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

UNIT - I

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

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

UNIT-II

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

UNIT – III

Arrays – Declaration and Initialization, Inter Function Communication, Array Applications, Two dimensional arrays, Multi dimensional arrays.

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

String manipulation functions.

UNIT-IV

Pointers-Introduction, Definition and uses of pointers, address operator, Pointer variables, Pointer constants ,dereferencing pointers, void pointers, Pointer arithmetic, Pointers to Pointers, Pointers and Arrays, Pointers and Functions, Pointers to functions, Array of pointers, Pointers and Strings.

UNIT-V

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

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

TEXT BOOKS:

1. Computer Science: A Structured Programming Approach Using C, B.A. Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. *Mastering C*, K.R. *Venugopal*,S R Prasad, Tata McGraw-Hill Education.

REFERENCE BOOKS:

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

Outcomes:

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

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I Year B. Tech MN - I Sem

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(R15A0301) ENGINEERING MECHANICS

OBJECTIVES:

- It consists of basic mechanisms, types of system of forces and friction.
- It deals with the bodies in motion and rest under the action of forces
- It deals vibrations of body under the action of forces.

UNIT – I

Introduction to Engineering Mechanics – Basic Concepts. Resultants of Force System: Parallelogram law –Forces and components- Resultant of coplanar Concurrent Forces – Components of forces in Space – Moment of Force - principle of moments – Coplanar Applications – Couples - Resultant of any Force System.

UNIT – II

Equilibrium of Force Systems: Free Body Diagrams, Equations of Equilibrium - Equilibrium of planar Systems - Equilibrium of Spatial Systems.

FRICTION: Introduction – Theory of Friction – Angle of friction - Laws of Friction – Static and Dynamic Frictions – Motion of Bodies: Wedge, Screw, Screw-jack, and Differential Screw-jack.

UNIT – III

Centroids and Centres of Gravity: Introduction – Centroids and Centre of gravity of simple figures (from basic principles) – Centroids of Composite Figures - Theorem of Pappus – Centre of gravity of bodies and centroids of volumes.

UNIT – IV

Moments of Inertia: Definition – Polar Moment of Inertia –Radius of gyration - Transfer formula for moment of inertia - Moments of Inertia for Composite areas - Products of Inertia, Transfer Formula for Product of Inertia.

Mass Moment of Inertia: Moment of Inertia of Masses- Transfer Formula for Mass Moments of Inertia - mass moment of inertia of composite bodies.

UNIT – V

Kinematics of a Particle: Motion of a particle – Rectilinear motion – motion curves – Rectangular components of curvilinear motion– Kinematics of Rigid Body - Types of rigid body motion -Angular motion - Fixed Axis Rotation

Kinetics of particles: Translation -Analysis as a Particle and Analysis as a Rigid Body in Translation – Equations of plane motion - Angular motion - Fixed Axis Rotation – Rolling Bodies.

TEXT BOOKS:

1. Engineering Mechanics/ S. Timoshenko and D.H. Young, McGraw Hill Book Company.
2. Engineering Mechanics - Statics and Dynamics by Vijaya Kumar Reddy K , Suresh Kumar J.BS Publications

REFERENCES:

1. Engg. Mechanics / S.S. Bhavikati& K.G. Rajasekharappa

2. A text of Engineering Mechanics / YVD Rao / K. GovindaRajulu/ M. ManzoorHussain, Academic Publishing Company
3. Engg. Mechanics / M.V. SeshagiriRao& D Rama Durgaiah/ Universities Press
4. Engineering Mechanics, UmeshRegl / Tayal.
5. Engg. Mechanics / KL Kumar / Tata McGraw Hill.
6. Engineering Mechanics / Irving Shames / Prentice

OUTCOMES:

- Student can understand the basic mechanisms, types of system of forces and friction.
- It gives solid knowledge to the students about the bodies in motion and rest under the action of forces
- It gives good knowledge about centroid, centre of gravity and moment of inertia of a particle.

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I Year B. Tech MN -I Sem	**L**	**T/P/D**	**C**
	-	**-/3/-**	**2**

(R15A0581) COMPUTER PROGRAMMING LAB

Objectives:

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

Week 1:

a) Write a C program to find sum and average of three numbers.

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

c) Write a C program to generate the first n terms of the Fibonacci sequence.

Week 2:

a) Write a C program to generate prime numbers between 1 to n.

b) Write a C program to Check whether given number is Armstrong Number or Not.

c) Write a C program to evaluate algebraic expression (ax+b)/(ax-b).

Week 3:

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

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

Week 4:

a) Write a C program to find the roots of a quadratic equation.

b) Write a C program perform arithmetic operations using switch statement.

Week 5:

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

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

Week 6:

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

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

Week 7:

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

b) Write a C Program to Sort the Array in an Ascending Order

c) Write a C Program to find whether given matrix is symmetric or not.

Week 8:

Revision of programs

Week 9:

a) Write a C program to perform addition of two matrices.

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

Week 10:

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

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

Week 11:

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

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

Week 12:

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

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

Week 13:

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

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

Week 14:

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

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

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

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

Week 15:

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

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

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

Week 16:

Revision Of Programs

TEXT BOOKS

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

OUTCOMES

Understand the basic concept of C Programming, and its different modules that includes conditional and looping expressions, Arrays, Strings, Functions, Pointers, Structures and File programming

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

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(R15A0084) IT WORKSHOP LAB / ENGINEERING WORKSHOP

Objective:

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

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows , Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents; excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX.

PC Hardware

Week 1:

Task 1: Generations of computers, Types of Computers, applications of computers Von Neumann architecture. Identify the different hardware components of a PC & their functions.

Task 2: practice to disassemble and assemble the components of a PC to working condition.

Week 2:

Task 3: Installation of windows operating system in PC.

Task 4: Exposure to Basic commands in MS-DOS commands like ver, vol, date, time, cls, dir, md, cd, path, rd, copy con, type, copy, move, del, ren, prompt, ipconfig etc.

Week 3:

Task 5: Installation of operating systems LINUX and different packages on a PC.

Task 6: Exposure to Basic commands in Linux General Purpose utilities like man, who, tty, clear, date, cal, passwd; FileHandling utilities like pwd, mkdir, rmdir, cp, rm, mv, cat, cd, ls, ln; Filters like wc, cmp, diff, head, tail, sort.

Week 4:

Task 7: Practice hardware troubleshooting exercises related to various components of computer like monitor,drives, memory devices, printers etc. and software troubleshooting related to BIOS etc.

NETWORKING

Week 5:

Task 8: Students should get to know about some of the Communication and Transmission devices, Network cabling, Features of Networking, Communication Protocols, Types of Network Topologies and Types of Networks.

Internet & World Wide Web

Week 6:

Task 9: Orientation & Connectivity Boot Camp and surfing the Web using Web Browsers: Students should get connected to their Local Area Network and access the Internet. In the process they should configure the TCP/IP setting and demonstrate how to access the websites and email. Students customize their web browsers using bookmarks, search toolbars and pop up blockers.

Week 7:

Task 10: Search Engines and Netiquette (Demonstration): Students should know about different search engines and their usage. A few topics would be given to the students for which they need to search on Google etc.

Week 8:

Task 11: Cyber Hygiene (Demonstration): Awareness of various threats on the internet. To install antivirus software and to configure their personal firewall and windows update on their computers.

Productivity Tools

Documentation

Week 9:

Task 12: Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007.Importance of LaTeX and MS office 2007. Give the details about LaTeX/MS word accessing, overview of toolbars, saving files and Using help and resources.

Week 10:

Task 13: Using LaTeX /Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option and Mail merge in LaTeX /Word.

Week 11:

Task 14: Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Presentation

LaTeX /MS Power Point

Week 12:

Task15: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Week 13:

Task 16: Second week helps students in making their presentations interactive. Topic covered during this weekincludes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts.

Excel

Week 14:

Task 17: Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) toolExcel as a Spreadsheet tool, give the details of the two tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

Week 15:

Task 18: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, FormattingText.

Week 16:

Task 19 : Calculating GPA - .Features to be covered:- Cell Referencing, Formulae in excel–average, standarddeviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Sorting, Conditional formatting.

REFERENCE BOOKS:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken.
3. Quamme. – CISCO Press, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft).

Outcomes:

- Apply knowledge for computer assembling and software installation
- Ability how to solve the trouble shooting problems.
- Apply the tools for preparation of PPT, Documentation and budget sheet etc.

ENGINEERING WORKSHOP

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

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

1. TRADES FOR DEMONSTRATION & EXPOSURE:

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

TEXT BOOK:

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

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(R15A0081) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB-I

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 facilitate computer aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

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

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

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

Exercise –I

CALL Lab: Introduction to Phonetics –Speech Sounds –Vowels and Consonants- Transcriptions

ICS Lab: Ice-Breaking activity - JAM session

Exercise –II

CALL Lab: Pronunciation- Mispronounced sounds, Silent letters-Past Tense Markers and Plural Markers

ICS Lab: Situational Dialogues –Role Plays - Expressions in Various Situations –Self-introduction and Introducing Others –Greetings –Apologies –Requests- Refusal- Permissions – Complementing – Congratulating - Consoling

Exercise -III

CALL Lab: Syllable and Syllabification

ICS Lab: Etiquette – Social and Professional Telephone Etiquette

Outcomes:

- *Better Understanding of nuances of language through audio-visual experience and group activities.*
- *Neutralization of accent for intelligibility*

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

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MANDATORY COURSE – I

(R15A0003) HUMAN VALUES AND SOCIETAL PERSPECTIVES

OBJECTIVE: This introductory course input is intended

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

Unit-I:

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

Unit-II:

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

Unit-III:

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

Unit-IV:

Understanding Harmony in the Nature and Existence – Whole existence as Co-existence: Understanding the harmony in the Nature. Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature. Understanding Existence as Co-existence (SAh-astiva) of mutually interacting units in all –pervasive space. Holistic perception of harmony at all level of existence.

Unit-V:

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

a) Ability to utilize the professional competence for augmenting universal human order.
b) Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems.
c) Ability to identify and develop appropriate technologies and management patterns for above production system.

Case studies of typical holistic technologies, management models and production systems. Strategy for transition from the present state to Universal Human Order:

a) At the level of individual: as socially and ecologically responsible engineers, technologists and managers.
b) At the level of society: as mutually enriching institutions and organizations.

TEST BOOKS

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

REFERENCE BOOKS

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

Relevant CD,s Movies, Documentaries & other Literature:

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

OUTCOMES:

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

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(R15A0002) PROFESSIONAL ENGLISH

Introduction:

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

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

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

Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

3. 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.
4. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions. Students should be given practice in listening to the sounds of the language to be able to recognize them, to distinguish between them to mark stress and recognize and use the right intonation in sentences.
    - Listening for general content
    - Listening to fill up information
    - Intensive listening
    - Listening for specific information

Speaking Skills:

Objectives

3. To make students aware of the role of speaking in English and its contribution to their success.
4. To enable students to express themselves fluently and appropriately in social and professional contexts.
   - Oral practice
   - Describing objects/situations/people
   - Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text: Learning English : A Communicative Approach)
   - Just A Minute (JAM) Sessions.

Reading Skills:

Objectives

3. To develop an awareness in the students about the significance of silent reading and Comprehension.
4. To develop the ability of students to guess the meanings of words from context and grasp the Overall message of the text, draw inferences etc.
   - Skimming the text
   - Understanding the gist of an argument
   - Identifying the topic sentence
   - Inferring lexical and contextual meaning
   - Understanding discourse features
   - Scanning the text
   - Recognizing coherence/sequencing of sentences

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

Writing Skills:

Objectives

3. To develop an awareness in the students about writing as an exact and formal skill
4. To equip them with the components of different forms of writing, beginning with the lower order ones.
   - Writing sentences
   - Use of appropriate vocabulary
   - Paragraph writing
   - Coherence and cohesiveness
   - Narration / description
   - Note Making
   - Formal and informal letter writing
   - Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Five Units are prescribed in each semester:

For Detailed study

First text book entitled "Skills Annexe: Functional English for Success", published by Orient BlackSwan, Hyderabad.

For Non-detailed study

Second textbook titled "Epitome of Wisdom", published by Maruthi Publications, Guntur.

Unit –I:

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

L- Listening – Project Based Assignment on poem 'If' by Rudyard Kipling
S- Speaking – Describing Persons and Places
R- Reading – Comprehending Poem
W- Writing – Business Circulars and Notices
G- Grammar – Adjectives, Comparison of Adjectives
V- Vocabulary – Similes and Metaphors

Unit – II

1. Chapter entitled "Human Values and Professional Ethics" from *Skills Annexe -Functional English for Success*, published by Orient Black Swan, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Description of Objects, Events and Experiences
R- Reading – What I Cherish the Most
W- Writing – CV and Cover Letter (Self-Appraisal Letter)
G- Grammar – Transitive and Intransitive Verbs
V- Vocabulary – Collocations

Unit – III

1. Chapter entitled "The Convocation Speech" from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Giving Directions and Instructions
R- Reading – What is meant by Entrepreneurship?
W- Writing – Essay Writing (On-the-Spot Organization of Thoughts)
G- Grammar – Active and Passive Voices
V- Vocabulary – One-word Substitutes

Unit – IV

1. Chapter entitled "The Last Leaf" from *Epitome of Wisdom*, published by Maruthi Publications, Hyderabad.

L- Listening – Project Based Assignment
S- Speaking – Oral Presentations
R- Reading – Reading Comprehension
W- Writing – Report Writing
G- Grammar – Concord
V- Vocabulary – Idiomatic Expressions

Unit –V

1. Chapter entitled "Sachin Tendulkar" from *Skills Annexe -Functional English for Success*, published by Orient Black Swan, Hyderabad.

L- Listening – Project Based Assignment

S- Speaking – Project Oral Presentations

R- Reading – Reading Articles

W- Writing – E-mail Writing

G- Grammar – Common Errors

V- Vocabulary – Misspelt Words

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

REFERENCES:

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.
4. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
5. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
6. Handbook of English Grammar& Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
7. Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
8. Technical Communication, Meenakshi Raman, Oxford University Press
9. Objective English Edgar Thorpe & Showick Thorpe, Pearson Education
10. Grammar Games, Renuvolcuri Mario, Cambridge University Press.
11. Murphy's English Grammar with CD, Murphy, Cambridge University Press.
12. Everyday Dialogues in English, Robert J. Dixson, Prentice Hall India Pvt Ltd.,
13. ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
14. Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education
15. Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw – Hill.
16. An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
17. A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
18. Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
19. A Grammar Book for You And I, C. Edward Good, MacMillan Publish.

OUTCOMES:

- Usage of English Language, written and spoken.
- Enrichment of comprehension and fluency.
- Gaining confidence in using language in verbal situations.

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(R15A0022) MATHEMATICS-II

OBJECTIVES:

- The objective of interpolation is to find an unknown function which approximates the given data points and the objective of curve fitting is to find the relation between the variables x and y from given data and such relationships which exactly pass through the data (or) approximately satisfy the data under the condition of sum of least squares of errors.
- The aim of numerical methods is to provide systematic methods for solving problems in a numerical form using the given initial data and also used to find the roots of an equation and to solve differential equations.
- In the diverse fields like electrical circuits, electronic communication, mechanical vibration and structural engineering, periodic functions naturally occur and hence their properties are very required. Indeed, any periodic and non periodic function can be best analyzed in one way by Fourier series method.
- In many engineering fields the physical quantities involved are vector valued functions. Hence the unit vector calculus aims at basic properties of vector-valued functions and their applications to line, surface and volume integrals.

UNIT – I: Interpolation and Curve fitting

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

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

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

UNIT – II : Numerical techniques

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

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

UNIT – III: Fourier series

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

UNIT-IV: Partial differential equations

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

UNIT – V : Vector Calculus

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

PRESCRIBED TEXT BOOKS:

1. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi & Others, S. Chand.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.

REFERENCES:

1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
3. Higher Engineering Mathematics by B.S. Grewal, Khanna Publications.

OUTCOMES:

- From a given discrete data, one will be able to predict the value of the data at an intermediate point and by curve fitting, one can find the most appropriate formula for a guesses relation of the data variables. This method of analysis data helps engineers to understand the system for better interpretation and decision making.
- The student will be able to find a root of a given equation and will be able to find a numerical solution for a given differential equation. Helps in describing the system by an ODE, if possible. Also, suggests to find the solution as a first approximation.
- One will be able to find the expansion of a given function by Fourier series.
- After studying this unit, one will be able to find a corresponding Partial Differential Equation for an unknown function with many independent variables and to find their solution.
- The student will be able to evaluate multiple integrals(line, surface volume integrals) and convert line integrals to area integrals and surface integrals to volume integrals.

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(R15A0012) ENGINEERING PHYSICS-II

OBJECTIVES:

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

UNIT-I

BONDING IN SOLIDS: Matter-interatomic distance-resultant force between two atoms-variation of force with inter atomic distance-equilibrium distance and expression**.** Expression for potential energy-cohesive energy of diatomic molecule**,** Structure of NaCl.

CRYSTALLOGRAPHY: Introduction to crystals-Lattice points, Space lattice, Basis, Unit cell, primitive cell, multiple cells, lattice parameter. Crystal structures-Bravias lattice. Lattice planes, miller indices. Expression for inter planar distance in cubic crystal. Atomic no, coordination no, packing factor of SC,BCC,FCC.

UNIT- II

X-RAY DIFFRACTION: Basic principle of x-ray diffraction-Bragg's law**,** Experimental techniques for crystallography-Laue's method and powder method**.** Applications of x-ray diffraction in determining structural parameters in crystals-Lattice constant.

IMPERFECTIONS IN CRYSTALS: Crystal defects**,** Advantages of crystal defects**,** Types of crystal defects**-**Point defects- Schottky defects, Frenkel defects, compositional defects**.** Concentration of Schottky and Frenkel defects**.** Line defects- edge dislocation and screw dislocation**.** Burger's vector and applications.

UNIT-III

DIELECTRIC PROPERTIES: Electric dipole, Dipole moment ,Polarization vector (P) Displacement vector (D), Dielectric constant (K), Electric susceptibility (χ). Relation between D,E and P. Definition and types of polarizations-Electronic polarization with polarizabilty,Ionic polarization with polarizabilty and Orientation polarization. Internal fields in solids- Lorentz field, Classius Mosotti relation. Ferro electricity and Piezo electricity. Applications of Ferro and Piezo electric materials.

ULTRASONICS: Introduction-generation of Ultrasonic waves-piezoelectric and magneto-striction method. Properties and Detection of Ultrasonic waves, NDT.

Unit-IV

MAGNETIC PROPERTIES: Basic definitions in magnetism**.** Bhor magneton**.** Types of magnetic materials-Dia, Para and Ferro**.** Ferri and Anti ferro magnetic materials. Domain theory of Ferro magnetism**.** Hysteresis loop in Ferro magnetism**.** Kinds of magnetic materials-soft and hard magnets.

SUPER CONDUCTIVITY: Super conductivity, General properties of super conductivityMeissner effect**,** Isotope effect, Types of super conductors**,** Applications of super conductors.

UNIT-V

NANO SCIENCE & NANO TECHNOLOGY: Nano science and Nano technology- Nano scale. Types of Nano materials-Bulk verses Nano materials. Surface to volume ratio and Quantum confinement. Synthesis of Nano materials-Bottom up Fabrication and Top down Fabrication- Sol gel Chemical Vapour Deposition. Characterisation of Nano particles –XRD and SEM. Physical,Electrical and Magnetic properties and applications.

TEXT BOOKS:

1 .Engineering Physics , P.K. Palaniswamy, Scitech Publishers

2. A Text Book of Engineering Physics –P. G. Khsirsagar– S. Chand

REFERENCES:

4. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
5. Nanotechnology – M. Ratner & D. Ratner (Pearson Ed.).

OUTCOMES:

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

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(R15A0013) ENGINEERING CHEMISTRY

OBJECTIVES:

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

UNIT -I

Electrochemistry: Concept of Electrochemistry – Conductance - Specific, Equivalent and Molar conductance and their units. Applications of Conductance (Conductometric titrations). Single electrode potential; E**MF:** Galvanic Cells, Types of Electrodes–(Calomel, Quinhydrone and glass electrodes); determination of P^H using glass electrode; Potentiometric titrations, Nernst equation and its applications; electro chemical series and its applications; Numerical problems.

Batteries: Primary and secondary cells (lead-Acid cell, Ni-Cd cell, lithium cells). **Fuel cells** - Hydrogen - Oxygen fuel cell; Advantages and Applications.

UNIT- II:

Corrosion and its Control: Causes and effects of corrosion; Theories of corrosion – Chemical (oxidation corrosion) & Electrochemicalcorrosion; Factors affecting rate of corrosion – Nature of metal (position of metal in galvanic series, overvoltage, relative areas of anodic and cathodic parts, purity of metal and passivity) and Nature of Environment (temperature, humidity and pH effect)

Corrosion control methods: Cathodic protection (sacrificial anodic and impressed current cathodic protection). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), cladding, electroplating (Cu plating) and Electroless plating – advantages and applications (Ni plating)

UNIT- III:

Engineering Materials

Polymers: Classification of Polymers, Types of Polymerization (Chain growth, Step growth & Zeigler Natta) **Plastics:** Thermoplastic & Thermosetting resins, Preparation, properties, engineering applications of PVC, Teflon and Bakelite. **Fibers-** Characteristics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications. **Rubbers**–Natural rubber and vulcanization. **Elastomers**–Buna-S, Butyl and Thiokol rubber; Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio-degradable Polymers- Applications of Poly vinyl acetate and Poly lactic acid.

Lubricants: Classification with examples- Characteristics of a good lubricant & properties of lubricants: viscosity-viscosity index, Cloud point, pour point, flash and fire points.

Refractories: Classification, characteristics of a good refractory and applications.

Nano materials: Introduction and applications of nano materials.

UNIT- IV:

Water and its Treatment:

Hardness of Water: Causes of hardness, expression of hardness – units – types of hardness, determination of hardness of water by EDTA method - numerical problems. Boiler troubles – Scale & sludges, Priming and foaming, caustic embrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal and Calgon conditioning) – External treatment– Zeolite process and ion exchange process. **Potable Water**- Its Specifications–Disinfectation of water by chlorination and ozonisation, break point chlorination; Desalination-Reverse Osmosis, and its significance.

UNIT-V:

Fuels & Combustion:

Fuels – Characteristics of a good fuel, Classification – solid fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining – cracking – types – fixed bed catalytic cracking. Knocking – octane and cetane rating, anti-knocking agents, synthetic petrol, Fischer-Tropsch's process: Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG.
Definition-Calorific value of fuel – HCV, LCV; Determination of calorific value by Junker's gas calorimeter.

TEXT BOOKS:

1. Engineering Chemistry by Bharathi Kumari and Jyotsna Cherukuri, VGS Techno Series (2013)
2. Engineering Chemistry by R.P. Mani, K.N. Mishra, B. Rama Devi /CENGAGE learning (2013)

REFERENCE BOOKS

1. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).
2. Engineering Chemistry by Shashi Chawla, Dhanpat Rai & Co.
3. Text Book of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co Publishers, New Delhi(2006)

OUTCOMES:

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

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(R15A0502) OBJECT ORIENTED PROGRAMMING

Objectives

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

Unit I

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

Unit-II

Functions, Classes and Objects:

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

Unit-III

Constructors, Destructors, Inheritance:

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

Inheritance : Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi-Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Abstract Classes, Constructors in Derived Classes, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators .

Unit-IV

Pointers, Virtual Functions and Polymorphism:

Introduction, Memory Management, new Operator and delete Operator, Pointers to Objects, this Pointer, Pointers to Derived Classes, Polymorphism, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions, Virtual Base Classes, Virtual Destructors.

Unit-V.

Templates and Exception handling:

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

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

Streams I/O: Stream classes hierarchy, Stream I/O, File streams and String streams, Error handling during file operations

Text Books:

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

References:

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

OUTCOMES:

- Understand the concepts of object oriented and generic programming.
- Differentiate between object oriented programming and procedural programming.
- Design applications using object oriented features
- Understand to implement object oriented concepts

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(R15A0302) ENGINEERING DRAWING

UNIT – I

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

a) Polygons-Construction of Regular Polygons (General methods only no special methods).
b) Conic Sections Including Rectangular Hyperbola
c) Cycloid, Epicycloid and Hypocycloid
d) Scales-Plain, Diagonal and Vernier Scales

UNIT – II

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

Projections of Points- 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.

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

UNIT – III

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

Sections and sectional views: Right regular solids-prism, Cylinders, Pyramid, Cone,

Development of surfaces: Development of surfaces of Right Regular solids-Prism, Cylinder, Pyramids, Cone and their parts. Frustum of solids.

UNIT – IV

Intersection of solids: Intersection of cylinders Vs cylinder, Cylinders Vs Prism , Cylinder Vs Cone.

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

UNIT – V

Persespective projections: Perspective view: Points, Lines, Planes and solids, Visual Ray and vanishing point methods.

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

TEXT BOOKS

1. Engineering Drawing – Basant, Agrawal, TMH

2. Engineering Drawing, N.D. Bhatt

3. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.

REFERENCES:

1. Engineering drawing – P.J. Shah .S.Chand Publishers.
2. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.
3. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson.

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(R15A0582)OBJECT ORIENTED PROGRAMMING LAB

Objectives:

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

Week 1:
Study of C++ Standard library functions.

Week2:

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

Week 3:

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

Week 4:

a) Write a C++ program to sort a list of numbers in ascending order.
b) Write a C++ program that uses function templates to find the largest and smallest number in a list of integers.and to sort a list of numbers in ascending order.
c) Write aProgram to illustrate New and Delete Keywords for dynamic memory allocation

Week 5

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

Member	Description
Data members	
sname	Name of the student
Marks array	Marks of the student
total	Total marks obtained
tmax	Total maximum marks

Member functions	
Member	Description
assign()	Assign Initial Values
compute()	to Compute Total, Average
display()	to Display the Data.

Week 6:

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

Week 7:

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

Week 8:
Revision laboratory

Week 9
Write a C++ program to implement the matrix ADT using a class. The operations supported by this ADT are:
a) Reading a matrix. b) Addition of matrices. c) Printing a matrix.
d) Subtraction of matrices. e) Multiplication of matrices

Week 10
Write C++ programs that illustrate how the following forms of inheritance are supported:
a) Single inheritance b) Multiple inheritance
c) Multi level inheritance d) Hierarchical inheritance

Week 11
a.)Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.
b) Write a Program to Invoking Derived Class Member Through Base Class Pointer.

Week 12
Write a Template Based Program to Sort the Given List of Elements.

Week 13
a) Write a Program Containing a Possible Exception. Use a Try Block to throw it and a Catch Block to handle it properly.
b) Write a Program to Demonstrate the Catching of All Exceptions.

Week 14
Write a C++ program that uses functions to perform the following operations to:
i. Insert a sub-string in to the given main string from a given position.
ii. Delete n characters from a given position in a given string.

Week 15
a) Write a C++ program to display the contents of a text file.
b) Write a C++ program which copies one file to another.

Week 16
Revision laboratory

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

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

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(R15A0083) ENGINEERING PHYSICS / ENGINEERING CHEMISTRY LAB

ENGINEERING PHYSICS LAB
(Any EIGHT experiments compulsory)

Objectives:

This course on Physics lab is designed with 10 experiments in an academic year. It is common to all branches of Engineering in B.Tech 1st year.

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

The experiments are selected from various area of Physics like Physical Optics, Lasers, Fiber Optics, Sound, Mechanics, Electricity & Magnetism and Basic Electronics.

Also the student is exposed to various tools like Screw gauge, Vernier Callipers, Physics Balance, Spectrometer and Microscope.

1. The Rigidity modulus (η) of the material of the wire using a Torsion pendulum.
2. Frequency of a vibrating bar, or a tuning fork using Melde's Experimental Arrangement
3. CR Circuit
4. Dispersive power of the material of the given prism-Spectrometer
5. Solar cell characteristics
6. Single slit diffraction Using laser
7. L.C.R. Circuit
8. Determination of the wavelength of sodium light and or (b) the radius of curvature of the surface of the Plano convex lens by forming Newton's rings.
9. Numerical Aperture In Optical Fibres
10. LED Characteristics

LABORATORY MANUAL:

1. Laboratory Manual of Engineering Physics by Dr.Y.Aparna & Dr.K.Venkateswara Rao

(V.G.S Publishers)

2. Engineering Physics Lab Manual by Dr. C .V. Madhusudhana Rao & V.Vasanth Kumar

(SciTech Publishers)

Outcomes:

The student is expected to learn from this laboratory course the concept of error and its analysis. It also allows the student to develop experimental skills to design new experiments in Engineering.

With the exposure to these experiments the student can compare the theory and correlate with experiment.

ENGINEERING CHEMISTRY LAB

List of Experiments (Any Eight experiments compulsory)

Titrimetry:

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

Mineral analysis:

3. Estimation of manganese dioxide in pyrolusite.

Instrumental Methods:

Colorimetry:

4. Determination of ferrous iron in cement by colorimetric method

Conductometry:

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

Potentiometry:

7. Titration of strong acd vs strong base by potentiometry.

Preparation:

8. Preparation of Phenol Formaldehyde Resin

Physical properties:

9. Determination of viscosity of sample oil by Redwood Viscometer.
10. Determination of Surface tension of liquid by Stalagmometer

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R. N. Goyal and 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.

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(R15A0082) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB- 2

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.

Objective

- To facilitate computer aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

EXERCISE –IV

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

EXERCISE –V

CALL Lab: Intonation Types
ICS Lab: Giving Instructions and Directions

EXERCISE –VI

CALL Lab: Neutralisation of Mother Tongue Influence
ICS Lab: Oral Presentations Team and Individual
GRAMMAR EXERCISES: Articles, Prepositions, Concord, Correction of Sentences
VOCABULARY EXERCISES: Antonyms, Synonyms, One word substitutes, Prefix and Suffixes.

PROJECTS

Students have to choose one of the following projects for their internals, and submit before the end of the semester. This project carries 25 marks.

1. **Conduct interview using interrogative sentences.**

Students should interview any teacher, or HOD, or Principal, record their responses and submit the project with those questions and answers. The questions asked should not be less than ten.

2. **Project on differences between group discussion and debate.**

Students are supposed to do research on the differences between GD and debate and submit a project on it. There should a minimum of ten points with detailed explanation. Students can use pictures as well.

3. **Book Review**

Choose any fiction of your choice and write a book review on the following parameters.

- Characterization, plot, theme, message

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

4. Idioms and Phrasal Verbs

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

5. Project on Kinesics

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

6. UK and US vocabulary

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

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

7. Magazine Article Review

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

8. Career Guidance Project

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

9. Mother Tongue Influence

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

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

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

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

ELCS Lab:

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

The Computer aided Language Labfor 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) HardDisk –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):

1. Suresh Kumar, E. & Sreehari, P. 2009. A Handbook for English Language Laboratories.

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

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 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 with the help of another member of the staff of the same department of the same institution

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A0361) MECHANICAL TECHNOLOGY

OBJECTIVES:

- This course is detailed explanation of basic link mechanisms and various power transmission devices.
- Also explains about basic engine mechanism and working principles of various types of engines
- And deals with compressors and working principles and applications

Unit-I

MECHANISMS: Elements or Links – Classification – Rigid Link, flexible and fluid link – Types of kinematic pairs – sliding, turning, rolling, screw and spherical pairs – lower and higher pairs – closed and open pairs – constrained motion – completely, partially or successfully constrained and incompletely constrained

CAMS: Definitions of cams 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

Tooth 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 interferences.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 stroke 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 or air compressed with and without clearance volume in a reciprocating air compressor, two stage air compressor with inters cooling, simple problems. Distribution of compressed air, application of compressed air, in Mining machinery, maintenance of compressed air, distribution systems.

OUTCOME:

- Student will get benefit of fundamentals of mechanism of power transmission and IC engines
- This course will give fundamental knowledge on different machines which are used in mines.
- This course will give knowledge to implement the compressors and engines in mine environment.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A0206) ELECTRICAL ELECTRONICS ENGINEERING

Objective: This course introduces the concepts of electrical DC and AC circuits, basic law's of electricity, instruments to measure the electrical quantities, different methods to solve the electrical networks, construction operational features of energy conversion devices i.e. DC and AC machines, transformers. It also emphasis on basics of electronics, semiconductor devices and their characteristics and operational features.

UNIT-I:

Electrical Circuits: Basic definitions, Types of elements, Ohm's Law, Resistive networks, Kirchhoff's Laws, Inductive networks, Capacitive networks, Series, Parallel circuits and Star-delta and delta-star transformations.

Instruments: Basic Principle of indicating instruments, Permanent magnet moving coil and moving iron instruments.

UNIT-II:

DC Machines: Principle of operation and operation of DC Generator, EMF equation, Types, Losses and efficiency, Magnetization and load characteristics of DC generators. DC Motors-Types, Characteristics, Losses and efficiency, Swinburne's Test, 3-Pont starter, Speed control of DC shunt motor-Flux and armature voltage control methods.

UNIT-III:

Transformers: Principle of operation of single phase transformers, EMF equation, Equivalent circuit, Losses, OC and SC tests, Efficiency and regulation.

AC Machines: Principle of operation of alternators, Regulation by synchronous impedance method .Principle of operation of induction motor, slip – torque characteristics, Applications.

UNIT–IV:

Diodes: P-n junction diode, symbol, V-I Characteristics, Diode applications, and Rectifiers – Half wave, Full wave and Bridge rectifiers (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.

EEE: TEXT BOOKS:

1. Basic Electrical Engineering, Abhijit Chakrabarthi, Sudiptanath, Chandrakumar Chanda, Tata-McGraw-Hill.

2. Basic concepts of Electrical Engineering, PS Subramanyam, BS Publications.

3. Principles of Electrical Engineering, V.K Mehta, Rohit Mehta, S.Chand Publications.

EEE: REFERENCE BOOKS:

1. Basic Electrical Engineering, S.N. Singh, PHI.

2. Basic Electrical Engineering, T.K.Nagasarkar and M.S. Sukhija, Oxford University Press.

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI.

4. Basic Electrical Engineering by D.P.Kothari, I.J. Nagrath, McGraw-Hill.

ECE: TEXT BOOKS:

1. Electronic Devices and Circuits, S.Salivahanan, N.Suresh Kumar, A.Vallavaraj,Tata McGraw- Hill companies.

2. Electronic Devices and Circuits, K. Lal Kishore, BS Publications.

ECE: REFERENCE BOOKS:

1. Millman's Electronic Devices and Circuits,J. Millman, C.C.Halkias, and Satyabrata Jit, Tata McGraw-Hill companies.

2. Electronic Devices and Circuits, R.L. Boylestad and Louis Nashelsky,PEI/PHI.

3. Introduction to Electronic Devices and Circuits, Rober T. Paynter,PE.

4. Integrated Electronics, J. Millman and Christos C. Halkias, Tata McGraw-Hill companies.

5. Electronic Devices and Circuits, Anil K. Maini, Varsha Agarwal,Wiley India Pvt. Ltd.

Outcomes:

After going through this course the student gets a thorough knowledge on basic electrical circuits, parameters, electromechanical energy conversion, construction and operational characteristics of DC and AC machines, the constructional features and operation of measuring instruments like voltmeter, ammeter, wattmeter etc., different semiconductor devices, operation of diodes and transistors, their voltage-current characteristics, realization of various electronic circuits with the various semiconductor devices ,and cathode ray oscilloscope, With which he/she can able to apply the above conceptual things to real-world electrical, electronics problems and applications.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A2501) INTRODUCTION TO MINING

OBJECTIVES:

- Course introduces underground and surface mining methods along with the associated activities such as drilling , blasting and mine roof supporting etc.
- Mode of entry into the the underground mines with special emphasis on various shaft sinking methods
- Course is also aimed at explanation of development of mineral deposits are also described.

UNIT-I

Mining – definition and economic importance; Mine – definition, different types and classification; Mine life cycle; Mineral deposit – different types and their classification; Mineral resources of India.

UNIT-II

Modes of entry to a mine – shaft, incline, and adit ,Drivage of drifts, organisation and cycle of operations, supporting of development workings, modern methods of drifting, tunnelling, road heading and tunnel boring.

UNIT-III

Selection of site and size, sinking methods, support system, ventilation, lighting and drainage arrangements during sinking, material handling and safety in sinking shafts.

UNIT-IV

Introduction to piling, caisson and freezing methods - cementation method - widening and deepening of shafts. Modern techniques of shaft sinking – shaft boring,

UNIT-V

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

TEXT BOOKS:

1. Hartman, H.L., Introduction to Mining Engineering, John Wiley and Sons, Second Edition, 1999.

2. Deshmukh,D.J., Elements of Mining Technology, Vol.I, VidyasevaPrakashan, Nagpur, 1994.

3. Chugh,C.P., Drilling Technology Hand Book, Oxford & IBH Publications, 1994.

REFERENCE BOOKS:

4. Chugh,C.P. Diamond Drilling, Oxford & IBH Publishers, 1999.

5. Karnam,U.M.R., Principles of Rock Drilling, 1999.

6. Bhandari S., Engineering rock blasting operations, A. A. Balkema, 1997.

7. Cummings,A.B. and Given, I.A., SME Mining Engineers' Handbook, Vol.I and II, Society of Mining Engineers, New York, 1993.

8. Universal Mining School - Lecture notes, cardiff, U.

Outcomes:

- Students can understand the fundamentals of drilling and blasting techniques for underground mines which can be put in practice later in the concerned mining industries.
- Students can understand the fundamentals of drilling and blasting techniques for opencast mines which can be put in practice later in the concerned 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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A2502) FUNDAMENTALS OF GEOLOGY

OBJECTIVES:

- To introduce fundamentals of geology to the student emphasizing the importance of mineralogy.
- Also basic of 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 oreforming 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.

SUGGESTED TEXT BOOKS:

1. A Text Book of Geology by P.K. Mukherjee/ The word press Pvt Ltd.
2. A Text Book of Engineering and General Geology by Prof.Parbin Singh

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)
3. Engineering Geology by D.V Reddy, Vikas Publishing House Pvt Limited

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 opportunity 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.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A0306) MACHINE DRAWING

OBJECTIVES:

- This course deals with different parts of the machines
- It deals with the different types of nuts, bolts, keys, joints and etc.
- It deals with the assembly of different parts of machines

Machine Drawing Conventions:

Need for drawing conventions – introduction to IS conventions

a) Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs.
b) Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned.
c) Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers curved and tapered features.
d) Title boxes, their size, location and details - common abbreviations & their liberal usage
e) Types of Drawings – working drawings for machine parts.

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.
a) Engine parts – stuffing box, cross heads, Eccentric, Petrol Engine connecting rod.
b) Other machine parts - Screws jack, Machine Vice, Plummer block, Tailstock.
c) Valves: Steam stop valve, spring loaded safety valve, feed check valve and air cock.

NOTE: First angle projection to be adopted. The student should be able to provide working drawings of
actual parts.

TEXT BOOKS:

1. Machine Drawing –K.L.Narayana, P.Kannaiah& K. Venkata Reddy / New Age/ Publishers
2. Machine Drawing – Dhawan, S.Chand Publications

REFERENCES:

1. Machine Drawing – P.S.Gill.
2. Machine Drawing – Luzzader

3. Machine Drawing – Rajput

OUTCOME:

- It gives fundamental knowledge of different types of nuts, bolts, keys, joints and etc
- Student can able to understand different parts of the machines
- This course facilitates the basic knowledge assembly of different parts of machines

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A0061) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Open Elective-1)

OBJECTIVES:

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

Unit-I

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

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

Unit-II

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

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

Unit-III

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

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

Unit-IV

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

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

Unit-V

Investment Decision: Features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems). Financial Analysis: Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios.

TEXTBOOKS:

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

REFERENCES:

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

OUTCOMES:

Students should be able to understand the basic economic principles, forecast demand and supply and should be able to estimate cost and understand market structure, pricing practices and able to interpret the financial results of the organisation.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A0507) JAVA PROGRAMMING
(Open Elective-1)

OBJECTIVES:

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

UNIT-I

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

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

UNIT – II

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

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

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

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

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

UNIT-III

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

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

UNIT-IV

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

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

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

UNIT-V

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

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

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

TEXT BOOK:

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

REFERENCE BOOKS:

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

Course Outcomes:

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

IV Year B. Tech MN – I Sem

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

(R15A0569) APPS DESIGN & DEVELOPMENT
(Open Elective-1)

OBJECTIVES:

- Knowledge of basic software engineering fundamentals and practices.
- Introducing multimedia practices and graphic fundamental.
- Knowledge of basic java programming under client/server side and data base connection.

UNIT – I:

Fundamental concepts: Software Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process. Multimedia and hypermedia, World Wide Web, overview of multimedia software tools, Graphics data types, file formats, color in image and video: color models in images, color in video.

UNIT – II:

HTML Common tagsList, Tables, images, forms, Frames; Cascading Style sheets.

UNIT – III :

Introduction to Java ScriptsObjects in Java Script, Dynamic HTML with Java Script.

UNIT – IV :

Web Servers: Introduction to Servlets: Lifecycle of a Servlet, The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing, Environment: Installing the Java: Software Development Kit, Tomcat Server. Using Cookies-Session Tracking, Security Issues.

UNIT – V:

Database Access: Database Programming using JDBC, Studying Javax.sql.* package, Accessing a Database from a JSP Page, TESTING: Types of software testing ,test cases.

TEXT BOOKS:

1. Web Programming ,Building Internet Applications, CHRIS BATES Ii Edition, Wiley Dreamtech.
2. Programming world wide web ,SEBESTA,PEARSON.

REFERENCES:

1. Core Servlets And Java Servlets Pages Vol-1:Core Technologies BY MARTY HALL,LARRY BROWN PEARSON.
2. Software Engineering ,ROGERS PRESSMEN,TATA McGraw-HILL.
3. Software Testing Techniques, BORIS BEIZER,DREAMTECH,II EDITION.
4. Java Complete Reference ,7^{TH} EDITION ,HERBERTSCHILDT,TMH.

OUTCOMES

- Ability to identify the minimum requirements for the development of application.
- Ability to apply different multimedia development tools to produce web based and stand-alone user interfaces.
- Gain knowledge of client side scripting, understanding of server side scripting with java.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A2581) 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.
11. Simple structural geology problems
12. Interpretaion and drawing of sections for geological maps showing tilted beds, faults, unconformaties.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

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

(R15A0282) ELECTRICAL ELECTRONICS ENGINEERING LAB

LIST OF EXPERIMENT:

SECTION-A: ELECTRICAL ENGINEERING

1. Magnetization characteristics of D.C. shunt generator.
2. Speed control of DC shunt motor.
3. Swinburne's test on DC shunt machine.
4. Brake test on DC shunt motor.
5. OC and SC tests on Single-phase transformer.
6. Brake test on 3-phase induction motor.
7. Regulation of an alternator by synchronous impedance method.

SECTION-B: ELECTRONICS ENGINEERING

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

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - I Sem

L	T/P/D	C
2	1/-/-	-

(R15A0004/R15A0005) FOREIGN LANGUAGE-GERMAN / FRENCH

INTRODUCTION:

In view of the growing importance of foreign languages as a tool for local communication in few countries French has been identified as one of the most required language after English. So the consequent emphasis on training students to acquire communicative competence in foreign language, the syllabus has been designed to develop linguistic and communicative competencies of engineering students. In the French classes, the focus is on the basic speaking skills.

OBJECTIVES:

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

SYLLABUS

UNIT-I:

Pronunciation guidelines; Single vowels, Vowels and consonants combinations,; Numbers and

s; , articles verbs and their groups; present tense; adjectives from singular to plural

UNIT-II

Sentences Structures; Prepositions, affirmatives, Negative and, Interrogative Sentences, The Family, Conversation, Notes on Vocabulary, Grammar, Liaisons and mechanisms.

UNIT-III

D'oùviens-tu (Where do you come from); Vocabulary, Conversation, Notes on Vocabulary, Liaisons Guidelines.Comparer (Comparing); Vocabulary, Conversation, Liaisons, Ordinal Number up to 100. Grammar.

UNIT-IV

Le temps (Time); Vocabulary, Grammar; Vocabulary related to - The Family, Vocabulary - Some more grammar.

UNIT-IV

French Expressions and Idioms; Day-to-day Life, At Work, about Sports, Specia Events Other French Flavours; country of wine, pefumes and landscapes; - Québec and Accadie, , pass time in Suisse, people of france.

REFERENCE BOOKS:

1. Le Nouveau Sans Frontiere-1, Cle International | 2003 |
2. Cahier d' activit'esov Le Nouveau Sans Frontiere-1 Cle International | 2003 |
3. Easy French Step-by-step by Myrna Bell Rochester
2. Ultimate French Beginner-Intermediate (Coursebook) By Livid Language

3.Ã L'Aventure: An Introduction to French Language and Francophone Cultures Byby EvelyneCharvier-Berman, Anne C. Cummings.

OUTCOMES

- The student will be in a position to speak in French, Which is the second most widely learned foreign language after English, and the ninth most widely spoken language in the world. French is also the only language, alongside English, that is taught in every country in the world.

- The Student will get the ability to speak French is an advantage on the international job market.
- Students with a good level of French are eligible for French government scholarships to enroll in postgraduate courses in France in any discipline and qualify for internationally recognized French degrees.

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II Year B. Tech MN - II Sem

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

(R15A0389) FLUID MECHANICS AND HYDRAULIC MACHINERY

OBJECTIVES:

- It aims at flow of the fluid in different throats
- It deals different types of the fluid flow through the pipes
- It deals the characteristics and properties of fluid flow

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.

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..

UNIT II:

Fluid dynamics : Surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its application on force on pipe bend 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. Measurement of flow: pilot tube, venturimeter, and orifice meter, Flow nozzle, Turbine flow meter .

UNIT III:

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. Hydroelectric power stations : Elements of hydro electric power station-types-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies.

UNIT IV:

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 Sfunctions 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.

TEXT BOOKS:

1. Hydraulics, fluid mechanics and Hydraulic machinery MODI and SETH.
2. Fluid Mechanics and Hydraulic Machines by Rajput.

REFERENCES:

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

OUTCOMES:

- It gives good knowledge about characteristics and properties of fluid.
- Student can able to understand different types of the fluid flow through the pipes
- Students can get knowledge about various turbines.

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III Year B. Tech MN – II Sem

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

(R15A2503) UNDERGROUND COAL MINING TECHNOLOGY

OBJECTIVE:

- This course is at detailed explanation of the underground coal mining methods including opening of deposits,
- development into pillars, depillaring, longwall mining and other special methods of thick seam mining such as blasting gallery method, hydraulic mining etc.

UNIT I:

INTRODUCTION: Status of coal industry and deposit factors affecting choice of mining methods, classification of mining methods, grading and analysis of coal.

UNIT II:

BORD AND PILLAR METHOD-DEVELOPMENT:Design and development of a district, bord and pillar, room and pillar methods, with conventional and continuous mining techniques; panel system.

UNIT III:

BORD AND PILLAR METHOD – EXTRACTION: Pillar extraction by caving and stowing methods; mechanised extraction of pillars, shaft pillar extraction, systematic supports, surface, underground and face arrangements for stowing.

UNIT IV:

LONGWALL METHOD :Advance and retreat methods, continuous and cyclic systems, extraction with different machines-ploughs, shearers, design of longwall workings, optimum length of face, size of panel, gates, support system, personnel, organisation and safety measures, salvaging in long wall.

UNITV:

SPECIAL METHODS OF WORKING: Problems of working thick & thin seams, multi slices, sublevel caving, horizon mining, gallery blasting method, contiguous seam working, working steeply inclined seams, working under surface structures and seams liable to spontaneous heating, outburst and bumps, etc. hydraulic mining, wongawali, shortwall, underground coal gasification, shield mining.

Note: All the above are to be studied with emphasis on CMR and the relevant circulars

REFERENCES

1. Singh, R.D. Principles and Practices of Modern Coal Mining, New Age International (P) Ltd., Chennai, 1994.
2. Singh, T.N. Singh, Underground Winning of Coal – Oxford & IBH Publishing Co. Ltd., 1992.
3. Mathur, S.P., Coal Mining in India, M.S. Enterprises, Bilaspur, 1999.
4. Das S.K., Modern Coal Mining technology, Lovely Prakashan, Dhanbad 1994.
5. Singh T.N., Dhar, B.B. Thick Seam Mining, Problems and Issues, Oxford & IBH Publishers, 1992.
6. Mathur, S.P., Mining Planning for Coal., M.G. Consultants, Bilaspur, 1993.
7. Peng S.S., and Chiang, H.S., Longwall Mining, John Willey and Sons, New York, 1992.

Szwilski and Richards M.J., Underground Mining Methods and Technology, 1987. Internet: www.miningindia.com

OUTCOMES:

- Present share of about 20% production of coal in India from underground mining is expected to increase in near future, due to depletion of reserves amenable for opencast mining.
- Therefore, this course is highly useful for the future mining engineers to take challenge of producing coal feer vary difficult geoming conditions at deeper horizons with special emphasis on the latest experimental trails conducted in Indian coalfield.

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II Year B. Tech MN - II Sem

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

(R15A0305) MECHANICS OF SOLIDS

OBJECTIVES:

- It deals with the behavior of solids under different loads
- Its deals with the different types of the beams under different loads
- It also deals with the shafts and cylinders under different loads

UNIT – I

SIMPLE STRESSES &STRAINS : Elasticity and plasticity – Types of stresses & strains–Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio & volumetric strain – Elastic moduli & 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

FLEXURAL 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 angle sections.

UNIT – IV

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 & tension coefficient methods.

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. Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – V

Torsion of Circular Shafts: Theory of pure torsion, Derivation of torsion equations: T/J=q/r=Nθ/L-Assumptions made in theory of pure torsion-Torsional moment of resistance – Polar section modulus – Power transmitted by shaft s

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 – Thin spherical shells.

TEXT BOOKS :

1. Strength of materials by Bhavikatti, Lakshmi publications.
2. Solid Mechanics, by Popov

REFERENCES :

1. Strength of Materials -By Jindal, Umesh Publications.
2. Analysis of structures by Vazirani and Ratwani.
3. Mechanics of Structures Vol-III, by S.B.Junnarkar.
4. Strength of Materials by S.Timshenko
5. Strength of Materials by Andrew Pytel and Ferdinond L. Singer Longman.

OUTCOMES:

- Student can able to understand the behavior of the body under different loads
- Student can able to calculate the failure criteria of beams under different loads
- It give basic knowledge on synthesis of different parts of machine under given conditions.

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II Year B. Tech MN - II Sem

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4	-/-/-	3

(R15A2504) MINING GEOLOGY

OBJECTIVES:

- To introduce fundamentals of mining geology to the student emphasizing the importance of properties of rocks.
- To introduce fundamentals of mining geology to the student emphasizing the importance of properties of 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.

TEXT BOOKS:

1. Mining Geology by ArogyaSwamy/ Oxford & IBH Publishing Company
2. A Text Book of Engineering and General Geology by Prof.Parbin Singh
3. Mining Geology by McKinstry/ Prentice-Hall

REFERENCE BOOKS:

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

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.

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II Year B. Tech MN - II Sem

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

(R15A2505) DRILLING & BLASTING

OBJECTIVES:

- To familiarize the students with exploratory and production drilling including the factors affecting drilling with some case studies.
- Various types of the explosives and techniques for underground and opencast mining are also introduced besides blasting for civil constructions.

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. Drilling for oil and ground water.

UNIT II:

PRODUCTION DRILLING: Production drilling; Various methods of drilling - percussive, rotary, rotary percussive, Factors affecting drilling; mechanics of drilling; drill ability and drilling index; micro-bit drilling; selection of drilling equipment; different types of bit, bit wear; drill hole economics; case studies

UNIT III:

EXPLOSIVES, ACCESSORIES AND TOOLS: Explosives and Blasting Agents- ANFO, slurry, emulsion, LOX, permitted explosives, bulk explosives; Selection of explosives; Blasting accessories, Initiation systems, Testing of explosives; Storage, transportation and handling of explosives; Destruction of explosives and accessories. Theories of rock breakage; mechanics of rock fragmentation by explosive action, Instrumentation in blasting –V.O.D probe, vibration monitoring, high speed video camera, etc.

UNIT IV:

BLASTING IN UNDERGROUND MINES :Design of blast for coal and metal underground mines – gallery, Solid blasting techniques, periphery blasting, drilling pattern for tunnelling and shaft sinking, controlled blasting techniques, dangers associated with underground blasting and preventive measures; misfires, blown out shots, incomplete detonation – their causes and remedial measures.

UNIT V:

BLASTING IN SURFACE MINES AND ALLIED ENGG. FIELDS: Methods of blasting in surface mines, Blast design, Primary and secondary blasting, Rock fragmentation studies, Dangers associated with blasting in opencast mines and preventive measures, Environmental impacts due to blasting, Controlled blasting techniques, Blasting in opencast coal mines of developed galleries, Blasting economics, Computer aided design of blasts.

Blasting for road constructions, trench cutting in soft and hard rocks, demolition of buildings etc;

Note: Relevant portions of Coal and Metalliferrous Mines Regulations, DGMS Circulars shall be covered wherever required.

TEXT BOOKS:

1. Hustrulid, W. A. Blasting Principles of Open Pit Mining, Vol. 1- General Design Concept, A.A. Balkema, Rotterdam, 1999.
2. Jimeno, C.L., Jimeno, E.L, Carcedo, E.J. Drilling and Blasting of Rocks, A.A.Balkema, Rotterdam, 1995.
3. Clark, G.B., Principles of Rock fragmentation, Wiley Interscience Publication, 1987.
4. Konya, C.J. and Walter, E.J. Surface Blast Design, New Jersey, 1990.
5. Bhandari, Sushil, Engineering Rock Blasting Operations, A.A.Balkema, Rotterdam, 1997.
6. Per-Anders Persson, Roger Holmberg, and Jaimin Lee. Rock Blasting and Explosives Engineering, CRC Press, 1994.

REFERENCES:

1. Kennedy, B.A., Surface Mining – 2nd Edition, SME, New York, 1990.
2. Pijush Pal Roy., Rock blasting: effects and operations, A.A. Balkema, Rotterdam, 2005.
3. RaoKaranam, U.M and Mishra. B, Principles of Rock Drilling, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi, 1998.
4. JanuszReś, Krzysztof Wladzielczyk and Ajoy K. Ghose., Environment-friendly techniques of rock breaking, CRC Press, 2003.
5. MuhamedSućeska., Test Methods for Explosives, Springer, 1995.

OUTCOMES:

- As drilling and blasting is primary operation in any mining technology, student will be able to understand various methods of drilling, design and selection of drilling with some case studies.
- Knowledge about explosives and blasting techniques makes student confident in design of blasting operations in the field.

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- -/3/- 2

(R15A0006) GENDER SENSITIZATION

(An Activity-based Course)

Course Objectives:

The course objectives are:

- To develop students sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Unit-I:

UNDERSTANDING GENDER:

Gender: Why should we study It?(Towards a world of Equals: Unit-1)

Socialization: Making Women, making Men(Towards a world of Equals:Unit-2)

Introduction. Preparing for Womanhood. Growing up male, First lessons in /caste, Different Masculinities.

Just Relationships: Being Together as Equals(Towards a World of Equals:Unit-12)

Mary Kom and Onler, Love and Acid just do not Mix, Love Letters, Mothers and Fathers, Further Reading: Rosa Parks-The Brave Heart.

Unit-II:

GENDER AND BIOLOGY:

Missing Women: Sex Selection and its Consequences (Towards a World of Equals: Unit-4)

Declining Sex Ratio, Demographic Consequences.

Gender Spectrum : Beyond The Binary(Towards a World of Equals: Unit-10)

Two or Many? Struggles with Discrimination

Additional Reading : Our Bodies, Our Bodies, Our Health(Towards a World of Equals: Unit-13)

Unit-III:

GENDER AND LABOUR:

Housework: the Invisible Labour(Towards a World of Equals: Unit-3)

" My Mother doesn't Work." " Share the Load"

Women's Work: Its Politics and Economics(Towards a World of Equals: Unit-7)

Fact and Fiction Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

Unit-IV:

ISSUES OF VIOLENCE:

Sexual Harassment: Say No! (Towards a World of Equals: Unit-6)

Sexual Harassment,not-eve-teasing-coping with everyday harassment-further Reading: " Chupulu".

Domestic Violence: Speaking Out (Towards a World of Equals: Unit-8)

Is Home a safe Place?-When Women Unite(Film). Rebuilding Lives. Further Reading: New Forums for Justice.

Thinking about Sexual Violence (Towards a World of Equals: Unit-11)

Blaming the Victim-"I fought for my Life…"- Further Reading: The Caste Face of Violence

Unit-V:

GENDER STUDIES:

Knowledge: Through the Lens of Gender (Towards a World of Equals: Unit-5)

Point of View, Gender and the Structure of Knowledge. Further Reading : Unackowledged Women Artists of Telengana.

Whose History? Questions for Historians and others(Towards a World of Equals: Unit-9)
Reclaiming a Past. Writing other Histories. Further Reading: Missing Pages from Modern Telangana History.

Essential Reading : All The Units in the Textbook, "Towards a World of Equals: A Bilingual Textbook on Gender" written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.

Note: Since it is interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

REFERENCE BOOKS:

1. Sen, Amartya, " More than One Million Women are Missing," New York Review of Books 37.20(20 December 1990) Print ' We were Making History…' Life Stories of Women in Telangana Peoples Struggle , New Delhi: Kali for Women,1989.
2. Tripti Lahiri " By the Numbers: Where Indian Women Work " Womens Studies Journal (14 November 2012) Available Online at: http://blogs,wsj.com/India real time/2012/11/14/by-the numbers-where-Indian-women-work/>
3. K. Satyanarayana and Susie Tharu(Ed) Steel Nibs are Sprouting: New Dalit Writing from South India, Dossier 2: Telugu And Kannada http://harpercollins.co.in/BookDetail.asp?Book Code-3732
4. Vimala 'Vantillu (The Kitchen)" Women Writing in India:600 BC to the Present Volume II: The 20th Century.Ed.Susie Tharu and K. Lalita Delhi: Oxford University Press,1995 559-601
5. Shatrughuna, Veena et al Womens Work and its Impact on child Health and Nutitution, Hydeabad, National Institute of Nutrition, India Council of Medical Research,1993.
6. Stree Shakti Sanghatana "We were making history…' Life Life Stories of Women in Telangana Peoples Struggle , New Delhi: Kali for Women,1989.
7. Menon, Nivedita Seeing like a feminist, New Delhi: Zubaan-Penguin Books,2012.
8. Jayaprabha, A. 'Chupulu(stares), Women Writing in India:600 BC to the Present Volume II: The 20th Century.Ed.Susie Tharu and K. Lalita Delhi: Oxford University Press,1995 596-697
9. Javeed, Shayan and Anupam Manuhaar " Women and Wage Discrimination in India: A Critical Analysis"International Journal of Humanities and social science Invention2.4(2013)
10. Gautam, Liela and Gita Ramaswamy " A Conversation between a Daughter and a mother" Broardsheet on Contemporary Politics, Special Issue on Sexuality and Harassment : Gender Politics on Campus Today Ed Madhumeeta Sinha and Asma Rasheed Hyderabad: Anveshi Research Center for Women's Studies 2014
11. Abdulali Sohaila " I fought for my life and Won" Available online at : http://www.thealterative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
12. Jeganathan Pradeep,Partha Chatterjee (ED) " Community, Gender and Violence Subaltern Studies Xf Permanent Black and Ravi Dayal Publishers, New Delhi,2000.
13. K. Kapadia, The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India London: Zed Books,2002
14. S. Benhabib, Situating the Self: Gender, Community and Post modernism in contemporary Ethics, London: Routledge,1992
15. Virginia Woolf, A Room of One's own Oxford: Black Swan 1992
16. T. Banuri and M. Mahmood , Just Development: Beyond Adjustment with a Human Face, Karachi: Oxford University Press,1997.

Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.

- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and Women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women thetextbook will empower students to understand and respond to gender violence.

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	4	**-/-/-**	**3**

(R15A0070) PRODUCTION MANAGEMENT
(Open Elective -2)

Course Aim: The course aims to introduce concepts of production and operations management in an organization and expose to analytical methods.

Learning Outcome: The students will be able to understand operations management, product & process design, analysis, plant location, layout, Scheduling and Material Management.

Unit-I

Introduction to Operations Management: Functional Subsystems of Organization, Definition, Systems Concept of Production, Types of Production Systems – Flow Shop, Job Shop, Batch Manufacturing, The Project, Productivity, Strategic Management – Corporate Strategic, Generic competitive Strategies, Functional Strategies, Gross Domestic Product and its impact, World Class Manufacturing.

Unit-II

Product & Process Design and Analysis: Product Design and Analysis (Definition), new product development-its concepts, Steps of Product Design, Process Planning and Design-Selection of Process, Process Selection Decision, Process Planning Design, Responsibilities of Process Planning Engineer, Steps in Process Planning. Process Design- Process Research, Pilot Development, Capacity Consideration, Commercial Plan Transfer, Enhanced Capacity Using Optimization. Value Analysis/Value Engineering – History of Value Analysis/Value Engineering, When to Apply Value Analysis, Function, Aims, Value Engineering Procedure, Advantages and Application Areas. Standardization: Standardization Procedure, Advantages of Standardization, Application of Standardization. Ergonomic Considerations in Product Design.

Unit-III

Plant Location & Plant Layout: Factors Influencing Plant Location, Break-even Analysis. Single Facility Location Problem, Multi-facility Location Problems – Model for Multi-facility Location Problem, Method of Transformation, Model to Determine X- Coordinates of New Facilities, Model to Determine Y-Coordinate.

Plant Layout- Plant layout introduction, Classification of Layout, Advantages and limitations of Product Layout, Advantages and limitations of Group Technology Layout, Layout Design Procedures.

Unit-IV

Scheduling: Introduction, Johnson's Problem, Extension of Johnson's rule. Job Shop Scheduling: Introduction, Types of Schedules, Schedule Generation, heuristic Procedures, Priority Dispatching Rules. Two Jobs and Machines Scheduling.

Unit-V

Materials Management: Integrated Materials Management, Components of Integrated Materials Management- Materials Planning, Inventory Control, Purchase Management, Stores Management. Inventory Control- Inventory Decisions, Costs Trade Off. Models of Inventory, Operation of Inventory Systems, Quantity Discount, Implementation of Purchase Inventory Model, Purchasing Management, Stores Management – Incoming Materials Control, Store Accounting, Obsolete Surplus and Scrap Management, ABC Analysis, XYZ Analysis, VED Analysis, FSN Analysis, SDE Analysis.

TEXT BOOK:

- Panneerselvam " Production and Operations Management" PHI,2012
- Journal: Udyog Pragati: The Journal for Practising Managers, NITIE, Mumbai. SAGE.

REFERENCES:

- H.Kaushal, Production / Operations Management, Case Study Solutions, MacMillan, 2012.
- Ajay K Garg, Production and Operations Management, TMH, 2012
- B. Mahadevan, Operations Management: Theory and Practice, Second Edition, Pearson, 2010.
- Danny Samson "Operations Management: Integrated Approach"Cambridge, 2012.
- Kenneth K. Boyer, Rohit Verma, Operations Management: Cengage Learning, 2011.
- Dipak Kumar Bhattacharyya, Production and Operations Management, Universities Press, 2012.
- Prof. L.C. Jhamb: Production Operations Management, 18th edition, Everest Publishing House, 2013.
- J.K, Sharma: Operations Research, Macmillian, 2013.
- Richard B. Chase, Ravi Shankar, Operations and Supply Management 12th Edition, TMH, 2010.
- K.Ashwathappa, Sreedhar Bhat, Production and Operations Management, HPH, 2012.
- Scott,T. Young, Essentials of Operations Management, SAGE, 2009.
- Normen Gaither & Greg Frazier, Operations Management, Cengage, 2012

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II Year B. Tech MN - II Sem

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

(R15A0065) MANAGEMENT SCIENCE
(Open Elective -2)

OBJECTIVES:

- This course is intended to familiarize the students with the basic knowledge of Management related concepts, Organization structures.
- And Control charts, Marketing management, Human resource management, Project management, Strategic management.
- Also, in order to achieve the positions of future leaders and managers.

Unit-I

Introduction to Management: Nature of Management, importance functions of Management, Systems approach to Management, Taylor's scientific Management theory, Fayal's principles of Management, Maslow's need hierarchy theory, McGregor's Theory X and Theory Y, Hertzberg Two Factor Theory of Motivation, Leadership Styles, Social responsibilities of Management.

Unit-II

Organization Structures, Control charts and Marketing Management: Line Organization structure, Line and Staff organization structure, Matrix organization structure, Team Organization structure, Control charts ($\bar{X}$chart, R chart, C chart, P chart), EOQ, ABC analysis, Functions of Marketing, Marketing Mix, Marketing strategies based on PLC.

Unit-III

Human Resource Management: Importance of HRM, HRM Vs PMIR (Personnel Management and Industrial Relations), Functions of HR Manager: Man power planning, Recruitment, Selection, Training and Development, Wage and Salary administration, Performance Appraisal, Grievance handling and welfare administration, Job evaluation, and merit rating.

Unit-IV

Project Management(PERT and CPM): Network analysis, Program 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: Vision, Mission, Goals, Objectives, Policy, Strategy, Programs, Corporate planning process, Environmental scanning, SWOT analysis, Steps in strategy formulation and implementation.

TEXT BOOKS:

- Harold Koontz, Heinz Weihrich, A.R.Aryasri, Principles of Management, TMH, 2010.
- K. Aswathappa, "Human Resource Management, Text and Cases", TMH, 2011.
- Philip Kotler, Kevin Lane Keller, Abraham Koshy and MithleshwarJha: Marketing Management, 13/e, Pearson Education, 2012.
- Dipak Kumar Bhattacharyya, Production and Operations Management, Universities Press, 2012.

REFERENCES:

- Dilip Kumar Battacharya, Principles of Management, Pearson, 2012.
- Gary Dessler, “Human Resource Management”, 12 Edition, Pearson- 2012.
- RajanSaxena: Marketing Management, 4/e, TMH, 2013
- Aryasri: Management Science, McGraw Hill, 2012

OUTCOMES:

- To know the basic management practices, functional areas of the organization
- It helpsthe students to build up their career in the corporate world.

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

(R15A0069) INTELLECTUAL PROPERTY RIGHTS
(Open Elective-2)

OBJECTIVES:

- The objective of this course is to provide the knowledge on International IPR's and to make students efficient to take decisions in Global Corporate.
- This subject brings awareness to the students the basic legal aspects at present following at Global level.

Unit-I

Introduction: Intellectual property rights basics, the role and value of IP in international commerce, Issues affecting IP internationally. Agreement on trade related aspects of Intellectual Property Rights. (TRIPS) - Agreement on TRIPS and India.

Unit-II

Parties to IP Rights: Owner, customer, authorized user, licensee, attorney, protection of the weak and strong, finalizing ownership and use rights.

Unit-III

Ensuring the value of IP: Ensuring the value of IP at creation stage, after creation stage, precise contractual protection of IP rights. Key issues related to IP internationally. IP rights in international forums. Fundamentals in Country legal systems, generalities. Validity of IP rights locally: specifics.

Unit-IV

Managing IP Rights: Acquiring IP Rights: letters of instruction, joint collaboration agreement, work made for hire agreement - Protecting IP Rights: non disclosure agreement, cease and desist letter, settlement memorandum. Transferring IP Rights: assignment contract, license agreement, deed of assignment or license agreement, addendum to unrecorded assignment or license.

Unit-V

Remedies and IPR Evaluation - GATT - WTO - Role of WTO in solving IPR issues.

TEXT BOOKS:

- A short course in International Intellectual Property Rights – Karla C. Shippey, World Trade Press – 2nd Edition.
- Intellectual Property Rights – Heritage, Science, & Society under international treaties – A. Subbian, - Deep & Deep Publications – New Delhi.

REFERENCES:

- Intellectual Property Rights: N K Acharya: ISBN: 9381849309
- Intellectual Property Rights: C B Raju : ISBN-8183870341
- Intellectual Property : Examples and Explanation – Stephen M McJohn, 2/e, ISBN-13: 978-0735556652
- Intellectual Property Rights in the Global Economy – Keith E Maskus, PIIE, ISBN paper 0-88132-282-2

OUTCOMES:

- It allows students how to prepare and protect the Inventions ,start up ideas and rights of patents and copy rights etc.,
- This subject brings awareness to the students the basic legal aspects at present following at Global level.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - II Sem

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

(R15A0383) FLUID MECHNICS AND HYDRAULIC MACHINES LAB

List of Experiments:

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. Turbine flow meter.

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II Year B. Tech MN - II Sem

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

(R15A0381) MECHANICS OF SOLIDS LAB

List of Experiments:

1. Direct tension test
2. Bending test on
   a) Simple supported
3. Torsion test
4. Hardness test
   a) Brinells hardness test
   b) Rockwell hardness test
5. Test on springs
6. Compression test on cube
7. Impact test

Note: Total experiments are to be conducted.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – I Sem

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

(R15A2506) BASIC ENGINEERING SURVEYING

AIM:

To comprehend the principles of Surveying for efficient field operations

OBJECTIVES:

- To introduce Surveying and Levelling
- To introduce instruments and methods
- To offer details of Levelling
- To impart knowledge about triangulation and determination of azimuth of a survey line

UNIT I:

Objectives and general principles of mine surveying, definitions of plane and geodetic surveying, Chain surveying, principles, equipment, ranging, setting and chain lines, chaining on sloping ground, errors in chaining, use of steel tape and corrections, catenary taping, corrections to measured lengths, errors in measurement, metallic, steel tapes, miscellaneous field problems relating to sighting, taping and both, field notes, record of data, plotting and computation.

UNIT II:

Construction, testing, correction/adjustments of angle-measuring instruments: compass,bearing, different terms relating to compass survey, compass traversing, calculation of included angles, local attraction free needle surveying, etc.,

UNIT III:

Descriptions of plane table and accessories – adilade plumbing fork, etc., methods and use of plane table surveying, two and three point problems. Construction, testing and adjustment of leveling instruments methods of levelling, rise and fall, height of collimation, booking, errors, computations, standards of accuracy method.

UNIT-IV:

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-V:

Contouring: Characteristics and uses of contours, methods of conducting contour surveys – their plotting.L.S.and C.S. Surveying – their plotting.Traversing: Principles of Traversing, open traverse and closed traverse using chain /compass / theodolite, Bowditch correction.

TEXT BOOKS:

1. Bannister, A. and Raymond. S., Surveying, ELBS, 6th Edition 1992.
2. Kennetkar, T.P. Surveying and Levelling, Vols. 1 and 2, United Book Corporation, Pune, 2010.
3. Punmia, B.C. Surveying, Vols. 1, 2 and 3, Laxmi Publications, 2010.

REFERENCE BOOKS:

1. Schofield, W. Engineering Survey, Butterworth and Heinemann Publishers, 5th edition, 2001.
2. Clark, D. Plane and Geodetic Surveying, Vols.1 and 2., C. B.S. Publishers and Distributors, Delhi, 6th Edition, 1971.
Anderson, J.N. and Mikhail, E.M., Introduction to Surveying, McGraw Hill Book Company

OUTCOMES:

- Students will get the benefit of fundamentals of surveying knowledge being used for preparation of mine plans.
- Mine plans based on levelling, contouring , traversing etc are supposed to be used daily by the mining engineers in the field, and hence this course gives an opportunity to understand all the techniques of surveying.

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III Year B. Tech MN – I Sem

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

(R15A2507) MINE ENVIRONMENTAL ENGINEERING- I

OBJECTIVE:

- In view of very difficult/uncomfortable environment envisaged in deeper mines in future,
- This course aims at sampling and analysis of mine air, understanding of heat, humidity, distribution of air, natural ventilation etc for underground mines.
- Mechanical ventilation devices including auxiliary fans, booster fans etc are also covered in this course.

UNIT I :

MINE GASES: Occurrence, properties, physiological effects, detection – types of instruments, construction, principle and limitations, measurement and analysis, methane layering, methane drainage. Methods of ventilation survey, Instruments required for ventilation survey,

UNIT II:

MINE CLIMATE AND CONTROL: Psychrometric properties of air, Sources of heat and humidity in mines and their effects, heat stress estimation, cooling power of mine air and methods of improving cooling power including air conditioning.Psychrometric surveys.

UNIT III:

PRINCIPAL LAWS OF AIR MOVEMENT IN UNDERGROUND: Fundamentals of fluid flow and its application in mine ventilation with special reference to Bernoulli's Equation, Reynolds number, Poiseuille's equation, Atkinson's equation, Karman-Prandtl equation for rough flows, resistance of mine roadways, friction and shock resistance, etc.

UNIT IV:

NATURAL VENTILATION AND AIR CURRENT DISTRIBUTION IN MINES: Natural ventilation, effect of depth, temperature, pressure, etc. thermodynamic treatment, distribution of air current in mines – splitting, stoppings, regulators, ventilation doors, air crossings, controlled recirculation, etc. Retrograde and boundary, ascensional, decensional, homotropal and antitropal ventilation systems, Ventilation in deep and hot mines, remedial measures.

UNIT V:

MECHANICAL VENTILATION & VENTILATION PLANNING: Main mechanical ventilators, booster fans and auxiliary fans, and their selection, installation, fan performance, characteristics and testing, fans in series and parallel, fan drifts and evasees, reversal of air current, forcing versus exhaust ventilation, ventilation of long headings including overlap systems. Calculation of pressure and quantity requirements, economic analysis, ventilation standards, network analysis, monitoring of mine environment.principles and computer applications.

Note: All the above are to be studied with emphasis on CMR, MMR and the relevant circulars.

TEXT BOOKS:

1. Mishra, G.B. Mine Environment and Ventilation, Oxford University Press, 1992.
2. Hartman, H.L. Mine Ventilation and Air Conditioning, Wiley Interscience publication, 1993.

REFERENCE BOOKS:

1. Hall, C.J., Mine Ventilation Engineering, Society of Mining Engineers, New Engineers, New York, Second Edition, 1992.
2. Vutukuri, V.S., Mine Environment Engineering, Trans Tech Publishers, 1986.
3. McPherson, M.J., Subsurface Ventilation and Environmental Engineering, Chapman and Hall Publication, London, 1993

OUTCOMES:

- Student can understand the ventilation requirements for ground mines including selection of mine fans, ventilation planning, ventilation surveying etc.
- For any underground mine, ventilation officer is a statutory post as per Indian Mining Law.
- This course facilitates the required knowledge to perform the duties of ventilation planning effectively.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – I Sem

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

(R15A2508) SURFACE MINING TECHNOLOGY

AIM:

To give the student complete knowledge on layout, design and planning of opencast mines.

OBJECTIVES:

- To develop an understanding of surface mining equipments and its operations in a surface mine.
- To achieve the ability to classify and select surface mining .methods.
- To understand the slope failures in a surface mine and study the concept of waste dump formations.

UNIT I:

Status of surface mining, types of surface mines, applicability and limitations, compilation of basic data, concept of stripping ratio, stripping economics, concept of ultimate pit limits, design of haul roads, elements of surface mine planning.

UNIT II:

Selection of site for box cut, selection of operating parameters like bench height, width, slope, etc., Working pit slope and ultimate pit slope, various modes of slope failures, factors influencing slope stability, development of opencast mine layouts, stripping methods using different machinery, Various layout problems and their solutions. Conversion of Underground mine to opencast mines.

UNIT III:

Preparation of the site – Ripping, Drilling and Blasting; Types, operation, selection, applications and limitations of ground preparation equipments – Rippers, Dozers, Blasthole drills and rock breakers, Placer mining,Dredging and hydraulicking. Economics of Drilling and blasting.

UNIT IV:

Selection criteria for excavation / loading and material transport equipment used in surface mines. Classification, construction, capacity, operation, productivity and application of different types of excavating / loading equipment used in surface mining projects - Shovels, Draglines, Front end loaders, Scrapers, Bucket wheel and bucket chain excavators, Surface miners. Problems of Deep open cast mining.

UNIT-V:

Scope and application of different modes of transport system in surface mines – Trucks, Conveyors (shiftable and high-angle), Aerial ropeways, Rail transport and Pipeline transport systems.Scope and application of in-pit crushers in surface mines. Types of waste dump – internal and external; dump formation methods and corresponding equipment; Dump stability and stabilisation measures.

Note: All Statutory aspects like CMR, MMR and relevant DGMS circulars are to be covered by the faculty.

TEXT BOOKS:

1. Kennedy, B.A., Surface Mining – 2nd Edition, SME, New York, 1990.
2. Hartman H.L., Introductory Mining Engineering, John Wiley and Sons, 2002.
3. Hartman, H.L. (Ed.), SME Mining Engg. Handbook Vol. I and II, Society for Mining, Metallurgy, and Exploration, Inc., Colorado, 1992.
4. Pfleider, E. P, Surface Mining, 1st Edition, New York, 1968.
5. Konya, C.J. and Walter, E.J., Surface Blast Design, New Jersey, 1990.
6. Rzhevsky V., Open pit Mining Operations, Mir Publications, 1971.

REFERENCES:

1. Amitosh De, Heavy Earth Moving Machinery, Lovely Prakashan, Dhanbad, 2000.
2. Hustrulid, W. and Kuchta, M, Open Pit Mine Planning & Design, Vol. 1, Fundamentals, Balkema, Rotterdam, 1998.
3. Singh, R.D., Principles and Practices of Modern Coal Mining, New Age International (P) Ltd., Publishers, 1997.
4. Mishra G.B., Surface Mining, Dhanbad Publishers, Dhanbad, 1990.
5. Hustrulid, W. A., Mccarter, M. K., And Van Zyl, D. J. A., Ed., Slope Stability in Surface Mining, Littleton, 2000.
6. Hoek, E., and Bray, J. W., Rock Slope Engineering, 3rd edition., Institution of Mining and Metallurgy, London, 1974.
7. Das, S.K., Surface Mining Technology, Lovely Prakashan, Dhanbad, 1994.

OUTCOMES:

- At present 80% of the coal production and significant proportion of other mineral output is coming from surface mines
- Students get a benefit of detailed understanding of various techniques of surface mining including operations
- Students get a benefit of detailed understanding of maintenance of associated machinery as outcome of this course.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – I Sem

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

(R15A2509) MINE MECHANISATION-I

OBJECTIVE:

- Aimed to introduce elements of mechanical powered transmission, rope haulages, track laying, mine locomotive etc along with its statutory requirements.
- Mechanization in primary drilling operation, construction and maintenance of the machinery is also added as objective of the course.

UNIT I:

Introduction :Different types of motive power used in mines – their fields of application, relative merits and demerits; transmission and distribution of compressed air in mines, compressed air drills.Elements of the transport system, classification and techno-economic indices.

UNIT II:

Rope Haulage:Wire ropes – classification, construction, fields of application, rope capping and splicing; deterioration of rope in use and its prevention; testing of ropes, selection and maintenance, rope calculations.Rail Track and tubs– gauge; layout, curves, turnouts and cross-over, track maintenance, main features of rolling stock like tubs, mine cars man riding cars and tipplers;Types of rope haulages – merits, demerits and fields of application, constructional features, safety appliances and rope haulage calculations.

UNIT III:

Other Transport Systems:Locomotives – diesel, trolley-wire, battery locomotives, constructional features and safety devices and comparison of different types; underground and surface battery charging stations and safety measures, locomotive calculations; shuttle cars, underground trucks, load-haul-dumpers, SDL vehicles, aerial rope ways, gravity transport, principles of hydraulic& pneumatic transportation and their fields of application, electric layouts, man-riding systems.

UNIT IV:

Pumping:Different types of drives, installation and maintenance of pumps and pipes in shafts and roadways, electrical layouts, various sources of water in mines, design of sumps.

UNIT V:

Mine Electrical Engineering:Distribution of electric power in mines, types of mine cables and their fields of applications, mining switch gears and their installation in hazardous atmosphere, flame proof enclosures, intrinsically safe circuits, (examples) safety aspects and signalling. Mine telephone system and latest development in mine communications.

Note: All statutory aspects like CMR, MMR and the relevant DGMS circulars are to be covered by the faculty.

REFERENCE BOOKS:

1. Cherkassky, B.M., Pumps, Fans, Compressors, MIR Publishers, 1980.
2. Deshmukh, D.J., Elements of Mining Technology, Vol. I and II EMDEE Publishers, Nagpur,1989.
3. Walker, S.C., Mine Winding and Transport, Elsevier, 1988.
4. Karelin N.T., Mine Transport, Orient Longmans, N. Delhi.

5. Mason, E., Coal Mining Series, Mining Machinery, Virtue and Company Ltd., London.
6. Statham, I.C.F., Coal Mining, Vol. I, II, III and IV, Caxton Eastern Agencies, Calcutta.

OUTCOMES:

- Students are expected to learn the latest trends in mine mechanization including transportation arrangements in mines ,
- And principle types and their operations and also various types of drills used in mining industry as outcome of this course.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – I Sem

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

(R15A2517) MAINTENANCE & RELIABILITY ENGINEERING
(Core Elective-1)

OBJECTIVES:

- Teach the essentiality of SQC, sampling and reliability engineering. Study on various types of control charts, six sigma and process capability to help the students understand various quality control techniques.
- Reliability engineering focuses on the dependability, failure mode analysis, reliability prediction and management of a system.

UNIT I:
STATISTICAL QUALITY CONTROL: Methods and Philosophy of Statistical Process Control - Control Charts for Variables and Attributes -Cumulative sum and Exponentially weighted moving average control charts - Other SPC Techniques – Process - Capability Analysis - Six sigma concept.

UNIT II:
ACCEPTANCE SAMPLING: Acceptance Sampling Problem - Single sampling plans for attributes – double sampling - multiple sampling - sequential sampling - Military standards - The Dodge Roming sampling plans – Random sampling.

UNIT III:
RELIABILITY ENGINEERING: Definition of reliability – Performance and reliability - Reliability requirements – System life cycle – Mean time between failures – Mean time to failure - Mortality Curve - Availability – Maintainability.

UNIT IV :
FAILURE DATA ANALYSIS: Statistical failures of components – failure distributions – Bath tub curve – Negative exponential distribution – Normal distribution - log normal distribution – Gamma distribution - Weibull distribution Life distribution measurements – Accelerated life tests - Data requirements for reliability.

UNIT V:
RELIABILITY PREDICTION AND MANAGEMENT: Failure rate estimates - Effect of environment and stress - Series and Parallel systems - RDB analysis – Standby Systems - Complex Systems - Reliability demonstration testing - Reliability growth testing - Duane curve - Risk assessment – FMEA and Fault tree analysis.

TEXT BOOKS:

1. Khanna O.P., “Statistical Quality Control”, DhanpatRai Publications (P) Ltd., 2001.
Lewis E.E., “Introduction to Reliability Engineering”, John Wiley and Sons, 1987.

REFERENCES:

1. Zairi M., “Total Quality Management for Engineers”, Woodhead Publishing Limited 1991.

2. Noori H. and Russell, “Production and Operations Management - Total Quality and Responsiveness”, McGraw-Hill Inc, 1995.

3. Montgomery D.C., “Introduction to Statistical Quality Control”, 2nd Edition, John Wiley and Sons, 1991.
4. Klaasssen H.B. and Peppen J.C.L, “System reliability concepts and applications”, Edward Arnold, 1989.

OUTCOMES:
In the ever increasing mechanization in mining industry , students can plan for high production and productivity levels with clear understanding of maintenance management, reliability etc as outcome of this course.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – I Sem

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

(R15A2509) MINE SUBSIDENCE ENGINEERING
(Core Elective-1)

OBJECTIVE:

- To familiarize the student with the specialized knowledge on mechanisim, predication.
- The student with the specialized knowledge of control of subsidence due to underground mining.

UNIT I:

INTRODUCTION : Strata movement at the mining horizon, convergence in mine working, factors influencing convergence in mine workings.

UNIT II:

SUBSIDENCE MECHANISm:Zones of movement in the overlying 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 longwall and bord and pillar workings.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 for mining and building ground in respect of subsidence.

REFERENCES

1. Kratzsch, H., Mining Subsidence Engineering, Springer Verlag Publications, Berlin, 1983

2. Whittaker, B.N., and Reddish, D.J. Subsidence, Occurrence, Prediction and Control, Elsvier Publications, Amsterdam, 1989.

3. Brauner, G., Subsidence Due to Underground Mining, Part I, II and III, U.S. Department of Interior, Bureau of Mines, 1973.

4. Singh, B. (Ed)., Mine Subsidence, ParijatMudranalaya Publications, Dhanbad, 1982.
5. Peng, S., Surface Subsidence Engineering, SME, New York, 1992.

OUTCOMES:

- Students will get an opportunity to understand the effects of underground mining on the surface and subsurface structures,
- Students will get an opportunity to understand the design of methods to minimize the damage to structures and laws governing mining subsidence.

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III Year B. Tech MN – I Sem

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

(R15A2519) MINE HEALTH AND SAFETY ENGINEERING
(Core Elective-1)

OBJECTIVES:

- To specialist the mining professional in health and safety engineering concept.
- Causes of accident, training, human behavioral approach in safety etc .

UNIT I:

MINE ACCIDENTS: Accident in mines;- different types, accident investigations; accident analysis; accident prevention and corrective action, accident proneness, creating and maintaining safety awareness, ZAP and MAP, job safety analysis, safety meeting and committee.

UNIT II:

HEALTH AND MINE SAFETY: Definition of health and safety, management's role – function; evolution of management involvement, management's training, responsibility, cost of health and safety, role of labour organizations – Union impact and involvement, role of government – statutory controls and directions, spot and regular inspections, enforcement of standards, penalties for violations, collection and distribution of statistical data.

UNIT III:

FAULT TREE ANALYSIS: Introduction – methodology, symbols and Boolean techniques, qualitative analysis, computerized methods, statistical analysis, safety information, systems design.

UNIT IV:

RISK ASSESSEMENT AND DISASTER MANAGEMENT: Principles, risk and hazard control, risk and hazard evaluation and data collection for identified health risks, exposure assessment and risk characterization, probabilistic risk analysis, risk management, safety culture, human factors, reliability evaluation, safety audit. Identification of causes of mine disasters, preventive action, disaster management and mitigation, typical cases of mine disasters in India

UNIT V:

MINER'S OCCUPATIONAL DISEASES AND ENQUIRYCOMMITTEE :Miner's occupational health and diseases, preventive medical examinations, various types of injuries, compensable diseases, medical attention and removable of causative factors in the mines. Recommendations of inquiry committee carried out for safety and health issues in India.

REFERENCES

1. Brown, D.B., System Analysis and Design for Safety, Prentice Hall, 1976.
2. Stranks, J., Management Systems for Safety, Pitman Publishing, 1994.
3. DeReamer, R., Modern Safety Practices, John Wiley and Sons.
4. WahabKhair. A., New Technology in Health and Safety, SMME, 1992.
5. Zyl, D.A., Koval, M, Li Ta, M. (Ed.). Risk Assessment / Management Issues in the Environmental Planning in Mines, SMME, 1992.
6. Prasad, S.D. and Rakesh., A Critical Appraisal of Mine Legislations. Lovely Prakashan, 1995.Dhanbad.
7. Mine Disasters of India, NCSM Publication.
8. Kejriwal, B.K., Safety in Mines, Gyan Khan Prakashan, Dhanbad, 1994.

OUTCOMES:

- Prevention student will be able to work better as safety official in mining projects
- Detailed knowledge in safety management, accident approaches..

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III Year B. Tech MN – I Sem

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

(R15A0312) INDUSTRIAL ENGINEERING
(OPEN ELECTIVE-3)

UNIT- I

Concepts of Management and Organisation – Functions of Management – Evolution of Management Thought : Taylor's Scientific Management, Fayol's Principles of Management, Douglas Mc-Gregor's Theory X and Theory Y, Mayo's Hawthorne Experiments, Hertzberg's Two Factor Theory of Motivation, Maslow's Hierarchy of Human Needs – Systems Approach to Management.

Designing Organisational Structures : Basic concepts related to Organisation - Departmentation and Decentralisation, Types of mechanistic and organic structures of organisation (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat organization structure) and their merits, demerits and suitability.

UNIT- II

Plant location, definition, factors affecting the plant location, comparison of rural and urban sites-methods for selection of plant- Matrix approach. Plant Layout – definition, objectives, types of production, types of plant layout – various data analyzing forms-travel chart.

UNIT- III

Work study - Definition, objectives, method study - definition, objectives, steps involved- various types of associated charts-difference between micromotion and memomotion studies. Work measurement- definition, time study, steps involved-equipment, different methods of performance rating- allowances, standard time calculation. Work Sampling – definition, steps involved, standard time calculations, differences with time study.

Materials Management-Objectives, Inventory – functions, types, associated costs, inventory classification techniques-ABC and VED analysis. Inventory Control Systems-Continuous review system-periodical review system.Stores Management and Stores Records. Purchase management, duties of purchase of manager, associated forms.

UNIT- VI

Introduction to PERT / CPM : Project management, network modeling-probabilistic model, various types of activity times estimation-programme evaluation review techniques- Critical Path-probability of completing the project, deterministic model, critical path method (CPM)-critical path calculation-crashing of simple of networks.

UNIT -V

Inspection and quality control, types of inspections - Statistical Quality Control-techniques-variables and attributes-assignable and non assignable causes- variable control charts, and R charts, attributes control charts, p charts and c charts. Acceptance sampling plan- single sampling and double sampling plans-OC curves. Introduction to TQM-Quality Circles, ISO 9000 series procedures.

Introduction to Human Resource Management, Functions of HRM, Job Evaluation, different types of evaluation methods. Job description, Merit Rating.- difference with job evaluation, different methods of merit ratings, wage incentives, different types of wage incentive schemes. Marketing, marketing vs selling, marketing mix, product life cycle.

TEXT BOOKS:

1. Amrine, Manufacturing Organization and Management, Pearson, 2nd Edition, 2004.
2. Industrial Engineering and Management O.P. KhannaDhanpatRai.
3. Dr. C. Nadha Muni Reddy and Dr. K. Vijaya Kumar Reddy, Reliability Engineering & Quality Engineering, Galgotia Publications, Pvt., Limited

REFERENCES :

1. Stoner, Freeman, Gilbert, *Management*, 6th Ed, Pearson Education, New Delhi, 2005.
2. Phillip Kotler, Marketing Management, Pearson, 2004.
3. A.R.Aryasri, Management Science for JNTU (B.Tech), Tata McGraw-Hill, 2002.

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III Year B. Tech MN – I Sem

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

(R15A0064) ENTERPRISE RESOURCE PLANNING

OBJECTIVES:

- It enables the student to understand the foundations of Enterprise planning and ERP System Options.

Unit-I

Introduction to ERP: Foundation for Understanding ERP systems-Business benefits of ERP-The challenges of implementing ERP system-ERP modules and Historical Development.

Unit-II

ERP System Options & Selection Methods: Measurement of project Impact- information Technology Selection-ERP proposal evaluation-Project Evaluation Technique.

Unit-III

ERP System Installation Options: IS/IT Management results-Risk Identification analysis-System Projects- Demonstration of the system-Failure method-system Architecture & ERP.

Unit-IV

ERP-Sales and Marketing- Management control process in sales and marking-ERP customer Relationship Management-ERP systems- Accounting & Finance control processes. Financial modules in ERP systems.

Unit-V

ERP–Production and Material Management-Control process on production and manufacturing-Production module in ERP- supply chain Management & e-market place-e-businesses & ERP-e supply chain & ERP- Future directions for ERP.

TEXT BOOK:

- Mary Sumner “Enterprise Resource Planning” Pearson, 2012.
- David L.Olson “Managerial Issues in ERP systems” TMH 2012.

REFERENCES:

- Ellen Monk “Enterprise Resource Planning” Cengage, 2012.
- Alexis Leon “Enterprise Resource Planning” 2nd Edition, TMH ,2012
- Goyal “Enterprise Resource Planning” TMH, 2012
- Jagan Nathan Vaman “ERP Strategies for Steering Organizational competence and competitive Advantage” TMH, 2012.
- Rajesh Ray “Enterprise Resource Planning” TMH, 2012
- JyotindraZaveri, Enterprise Resource Planning, HPH, 2012.

OUTCOMES:

- The student understands the challenges in implementation of ERP system, ERP System Implementation options, and functional modules of ERP.

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III Year B. Tech MN – I Sem

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

(R15A0068) TOTAL QUALITY MANAGEMENT

OBJECTIVES:

- Total Quality Management is a method by which management and employees can become involved in the continuous improvement of the production of goods and services.
- It is a combination of Quality and management tools aimed at increasing business and reducing losses due to wasteful practices.
- The simple objective of TQM is "Do the right things, right the first time, every time."

Unit-I

Principles and Practices-I: Introduction,- Gurus of TQM,- Historic Review, Benefits of TQM-Leadership, characteristics of Quality leaders.-The Deming Philosophy-Quality councils-Strategic Planning- Customer Satisfaction-Customer perception of Quality-service Quality,-Customer Retention- Employee Involvement- Employee survey-Empowerment-Gain sharing-Performance Appraisal.

Unit-II

Principles and Practices-II: Continuous process Improvement,- the Juran trilogy,- The PDCA Cycle-Kaizen- Reengineering. Supplier Partnership- Partnering-Sourcing-Supplier Selection-Supplier rating-Performance Measures-Basic concept-Strategy-Quality cost- Bench marking- reasons for bench marking-Process-Understanding current performance-Pitfalls and criticism of benchmarking.

Unit-III

Tools and Techniques-I: Information Technology-Computers and the quality functions-Information quality Issues-Quality management System-Benefits of ISO registration-ISO 9000 series Standards-Internal Audits. Environmental Management System-ISO 14000 series-Benefits of EMS- Relation to Healthy and safety-Quality Function Deployment-The voice of the Customer- Building a House of Quality-QFD Process.

Unit-IV

Tools and Techniques-II: Quality by Design- Benefits-Communication Model-Failure Mode and Effective Analysis-Failure Rate, FMEA Documentation-The process of FMEA Documentation-Product liability-Proof and Expert Witness. Total Productive Maintenance- promoting the Philosophy and Training-Improvements and needs-Autonomous Work groups.

Unit-V

Management Tools: Management Tools,-Introduction-Forced field Analysis-Tree diagram- Process decision Program Chart-Statistical Process Control-Cause and Effect diagram-Histogram-state of control – Process Capability- Experimental Design-Hypothesis-Orthogonal Design-Two factors and Full factors-Quality Strategy for Indian Industries-Quality Management in India.

TEXTBOOKS:

- Dale H. Besterfield, Total Quality Management, 4/e, Pearson Education India, 2015.
- P M Charantimath, Total Quality Management, 2/e, Pearson Education India, 2011.

REFERENCES:

- John Bank, The essence of Total Quality Management, 2/e, Prentice Hall of India 2001.
- Suganthi, L, Samuel, AAnand, Total Quality Management, PHI

- Dr. K.C. Arora, Total Quality Management, S.K. Kataria& Sons, 2010.
- Singhal, K. R.Singhal, Divya, Implementing ISO 9001:2008 Quality Management System: A Reference Guide, 2/e, PHI
- SridharaBhat: Total Quality Management, 1/e, Himalaya, 2011
- S.D.Bagade, Total Quality Management, 1/e, Himalaya, 2011

OUTCOMES:

- The student knows the TQM views in an organization as a collection of processes.
- It maintains that organizations must strive to continuously improve these processes by incorporating the knowledge and experiences of workers.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – I Sem

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

(R15A2582) BASIC ENGINEERING SURVEYING LAB-I

1. To study and understand the parts and terms common to different survey instruments such as chains, tapes, ranging rods, offset rods, prismatic compass, trough compass, transit theodolite, dumpy levels, etc.
2. Ranging a line, measuring the distance between two points.
3. Chain triangulation, booking, calculation of areas and plotting.
4. Obstacle to chaining but not ranging.
5. Cross staff survey.
6. Traversing with compass.
7. Introduction and temporary adjustment of the Dumpy levels.
8. Fly levelling & Reduction of level.
9. Profile levelling (Longitudinal Sectioning) and plotting the section.
10. Cross sectioning (CS) and plotting the section.
11. Indirect method of Contouring by square methods.
12. Measurement of Horizontal angle by using Repetition and Reiteration method.
13. Measurement of vertical angle.
14. Theodolite traversing.
15. Finding distance between two inaccessible points

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III Year B. Tech MN – I Sem

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

(R15A2583) MINE ENVIRONMENTAL ENGINEERING LAB-I

AIM:

To demonstrate the various methods and instrumentation involved in analysing an underground mine atmosphere.

1. To determine the psychrometric properties, gas percentage in atmosphere.
2. To study the principles and characteristics governing mine fans.
3. Operation of fans in series and parallel.
4. Constructional features of centrifugal fan and axil flow fans.
5. To understand lamp design and perform underground illumination surveys.
6. Study of mine flame safety lamp, gas testing with flame safety lamp, electric cap lamps, lamp room layouts and illumination survey.
7. Mine air sampling and detection of various mine gasses, like, methane, carbon monoxide (CO), by conventional methods and by gas chromatograph, etc.
8. Determination of psychrometric properties of air, measurement of cooling power by Kata thermometer.

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III Year B. Tech MN – II Sem

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

(R15A2510) MINE SURVEYING

OBJECTIVE:

- With basic knowledge on fundamentals of surveying through basic engineering surveying course,
- this course illustrates tachometry, photogrammetry, global positioning systems(GPS) etc along with application of modern instruments for mine surveying,

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.

Unit-IV

Global positioning systems: Introduction to Global Information system (GIS), Remote Sensing – basic Principles, Integration of RS and GIS. Total station : Description, users, Types of Surveys by Total station, Mapping of sites by Total Station Surveys – Elementary exercises only.

Unit-V

Correlation: Purpose and importance of correlation. Correlation methods- Co-plan nation method, Weiss triangle method, Weiss quadrilateral method, two shaft method.

Text Book:

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

REFERENCES:

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

OUTCOMES:

- Student can get sufficient knowledge on conducting mine surveys using latest instruments
- These also provide elementary exercise using total station, GPS, GIS, data generation, preparation of mine plans in the mining industries.

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III Year B. Tech MN– II Sem

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

(R15A2511) MINE ENVIRONMENTAL ENGINEERING- II

OBJECTIVE:

- To introduce causes of mine fires.
- Advance in more lighten technology, explosion causes of, mine inundation etc.

UNIT I:

SPONTANEOUS HEATING AND FIRES: Causes, detection, incubation period, precautions against spontaneous heating in underground and surface coalmines including coal benches, surface coal stocks, and dumps. Detection, prevention and control of underground fires, fire fighting, study of atmosphere behind sealed-off fire areas for reopening, methods of reopening sealed off fire areas.

UNIT II:

EXPLOSIONS: Causes, prevention and control of underground fire-damp and coal dust explosions including stone dusting, stone dust barriers, water barriers and triggered barriers, investigation after an explosion.

UNIT III :

MINE RESCUE AND FIRST AID: Classification of rescue apparatus including self rescuer, various types of rescue and escape apparatus, rescue organisation of a mining company, layout of a modern rescue station including personnel, first aid to the persons injured in mine-accidents, electric shock, asphyxiation, different methods of artificial respiration, rescue and recovery work in mines including through boreholes, rescue rules.

UNIT IV:

INUNDATION: Surface and underground inundation, their causes and preventive measures, precautions to be taken while approaching old waterlogged workings, safety boring apparatus, design and construction of water dams and barriers, recovery of flooded mines, dewatering of old workings, layout of drainage systems and sumps.

UNIT-V:

MINE ILLUMINATION: Electric safety lamps, their maintenance and examination, lamp room design and organisation, lighting from mains, lighting on mechanised long wall faces and gassy mines, photometry and illumination survey, legislations related to illumination survey.

Note: All the above are to be studied with emphasis on CMR and the relevant circulars

TEXT BOOKS:

1. Ramlu, M.A., Mines Fires, Explosion, Rescue, Recovery and Inundations, Mukhertu Publishers, Kharagpur, 1989.
2. Ramlu, M.A., Mine Disasters and Mine Rescue, Oxford and IBH Publishers, 1991.
3. McPherson, M.J., Subsurface Ventilation and Environmental Engineering, Chapman & Hall Publication, London, 1993.

REFERENCES:

1. Misra, G.B., Mine Environment and Ventilation, Oxford University Press, 1993.
2. The Mine Rescue Rules, 1986, Lovely Prakashan, Dhanbad, 1992.
3. Cummings A.B., and Given, I.V., SME Mining Engg. Hand Book Vol. I and II, New York, 1994.
4. Sarkar, S.K. and Sarkar, S., State of Environment and Development in Indian Coalfields,Oxford and IBH, 1996.
5. Classified Circulars by D.G.M.S., Dhanbad.
6. Ghatak, S., Mine Management, Legislation & General Safety.
7. Kaku, L.C. Fires in Coal Mines.

OUTCOMES:

- Student can get through knowledge on various issue of mine environmental engineering including assessment and control of hazards due to mine fires, inundations, mine dust etc
- And can be able to apply the concepts of hazard control measures in the world mining problems in future.

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III Year B. TechMN – II Sem

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

(R15A2512) UNDERGROUND METAL MINING METHOD

OBJECTIVE:

- To give details of working of various types of metal ore deposits by underground technology.
- Special methods of mining of thin and thick ore deposits along with its applicability, productivity and economical issues of mining are added objective.

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 wins in ore body.

UNIT-II:

Different types of raising methods and their merits and demerits. Classification of stopping methods, factors influencing the choice of stopping method. toping Methods: Room &Pillar ,Sublevel Open Stopping, Shrinkage method of Stopping, Cut & Fill method of Stopping

UNIT-III

Sublevel Cavin, Block Caving, Special methods of working of thin deposits

UNIT-IV

Applicability of methods, stop layout stop 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.

TEXT BOOKS:

1. Woooroof S.C. Methods of working Coal & Metal Mines Vol-III
2. Peele – mining Engineers handbook Vol.I& II
3. Popov- Working of Mineral deposits.

REFERENCE BOOKS

1. Underground Mining Methods handbook
2. Underground Mining Methods and Technology – Elsevier Science publication.
3. Karmakar H. – Mine working Vol. I & II, Lovely Prakasan, Dhanbad.

OUTCOMES:

- Student shall get opportunity to learn almost all the variants of underground metal mining Technologies
- This can help in selection of suitable metal mining technologies vis-à-vis Geo-logical condition of the deposit in the field/Mining industry.

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III Year B. Tech MN – II Sem

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

(R15A2513) MINE MECHANISATION-II

OBJECTIVE:

- To give comprehensive knowledge on types of winders and their application along with safety devices. Also to introduce various mining machinery such as cutter , loaders, shearers, and their constructional features .
- To familiarize with Heavy Earth Moving Machinery (HEMM) being used at present in most mechanized mines is also an added objective of the course.

UNIT I:

WINDING ENGINES: Winding systems, drum winders, drives, mechanical braking of winders, safety devices in winding, over wind and over speed protection, Koepe and multi-rope friction winding, electrical layouts. Duty cycles of drum winders of different drum cross sections. Special problems of deep shaft winding.

UNIT II:

WINDING ACCESSORIES : Head gear and their design, head sheave, cages and skips, suspension gear, shaft fittings and appliances – guides, keps, etc., signalling system, winding calculations relating to rope size & numbers, capacity & power requirement for cage, skip, drum and Koepe winding systems.

UNIT III:

SURFACE AND PIT BOTTOM LAYOUTS: Mine car circuits at the surface and pit bottom, creepers, skip winding – loading and discharge arrangements.

UNIT IV :

COAL FACE MACHINERY: Construction, salient mechanical and electrical features and operations of coal drills and their control panels, coal cutters, different types of mechanical loaders coal ploughs, cutter loaders and continuous miners; development road headers in face mechanisation, longwall mining equipment, electrical and hydraulic layouts; condition monitoring of mining machinery for underground and opencast miens and ore handling plants, modern concepts in underground mine mechanisation.

UNIT V:

FACE HAULAGE AND CONVEYORS: Scraper chain conveyors, AFCs, belt conveyors, shaking and vibrating conveyors, armoured flexible conveyors, high angle conveying, electrical layouts.

Note: All the above are to be studied with emphasis on CMR, MMR and the relevant circulars

REFERENCES

1. A Cummings, A.B. and Given, I.V., SME Mining Engg. Handbook Vol .I and II, New York, 1992.
2. Mason, E., Coal Mining Series, Surveying, Vol I and II Virtue and Company Limited, London, 1985.
3. Cherkassky, B.M., Pumps, Fans, Compressors, MIR Publishers, 1980.
4. Deshmukh, D.J., Elements of Mining Technology, Vol. I, II and III, EMDEEE Publishers, Nagpur, 1979.

5. Alemgren G., Kumar U., and Vagenas N., Mine Mechanisation and Automation, A.A., Balkema Publication, 1993.
6. Walker, S.C., Mine Winding and Transport, Elsevier, 1988.

OUTCOMES:

- Now-a –days , demand of minerals such as coal has been increasing exponentially compelling to adopt last level of mechanization in render mines students
- It can understand the adoptability of different machines both underground and opencast mines along with the layout, maintenance of the machinery as outcome of the course.

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III Year B. Tech MN – II Sem

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

(R15A2520) MINE ECONOMICS
(Core Elective-2)

OBJECTIVES:

- To familiarize the student with economic issues are related to mining indursty such as mine valuation, mine accounts , application of geo-statistical techniques, assaying,.
- Estimation of ore reserves preparation assay plans etc.

UNIT I:

INTRODUCTION : Mineral industry and its role in national economy; world and national mineral resources; Mining - A unique investment environment; special risk factors in mine investment and evaluation; national mineral policy.

UNIT II:

ORE RESERVE ESTIMATION: Methods of sampling, sampling frequency; analysis of sampling data, estimation of reserves, introduction to geo-statistica l methods, classification of reserves.

UNIT III:

MINE VALUATION: Time value of money; annuity; redemption of capital, net present value; depletion allowance; depreciation; inflation; escalation; rates of return; Hoskold's Two rate method; capital and operating cost including wages, incentives, material, etc.; assets; liabilities; cash flows and discounted cash flow; profitability index – their implications in mine economic evaluation.

UNIT IV :

PROJECT APPRAISAL: Methods of project evaluation – pay back, annual value, benefit/cost ratio, ERR and IRR, etc., evaluation of exploratory mining areas and operating mines; mine project financing, its risks and constraints; mine taxation; critical impact of depreciation, depletion, type of funding, reserves, life, etc., on mine profitability.

UNIT V:

FINANCE AND ACCOUNTING: Sources of mine funds – shares, debentures, fixed deposit, sinking fund, capital gearing, P &L account, balance sheet, typical case studies of mine feasibility. Cost estimation of individual mining operations and overall mining cost, cost control methods.

REFERENCES

1. Sloan, D.A., Mine Management, Chapman and Hall, London, 1983.
2. Deshmukh, R.T., Mineral and Mine Economics, Mira Publications, Nagpur, 1986.
3. Arogyaswamy, R.N.P. Courses in Mining Geology, Oxford and IBH Publishing Co., 1994.
4. Chatterjee, K.K., Mineral economics, Wiley Eastern, 1992.
5. Park, R.J., Examination and Valuation of mineral property
6. How to read a balance sheet ILO 1992.
7. Indian Mining Year Book 1994 – MMRD Act and Mineral Concession Rules.

OUTCOMES:

- Any industries depend largely on profit besides other parameters, and mining is no exception.
- Details of the course enable the student to understand various issues related to finance/accounts starting from project planning stage presentation of account, balance sheet etc as outcome of the course.

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III Year B. Tech MN – II Sem

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

(R15A2521) STRATA CONTROL ENGINEERING
(Core Elective-2)

OBJECTIVE:

- In spite of increasing trend of accident due to strata control problems in India, and establishment of "STRATA CONTROL CELL" in all coal mine areas, application of scientific approaches for strata control called not be achieved satisfactorily.
- Hence, the course aims at specialized techniques for strata control in underground coal mines with topics on softer statics, strata behaviour studies, organization of strata control cell etc.

Unit I:

Strata and ground movements: Strata conditions before and after mining operations – Theories of mechanics of Strata 135heavier 3 Strata pressure redistribution in and around Bord and pillar and long wall workings. 3 Surface Movements and Deformation during Bord and pillar and Longwall Mining

Unit II:

Subsidence: Causes and impact, Mechanics and theory of subsidence, Angle of draw and angle of fracture, factors affecting subsidence, 3 Protective measures, Subsidence measurements, Estimation of vertical and lateral movements, 2 Subsidence monitoring and prediction, Sub-critical, critical and super-critical widths of extraction

Unit III:

Supports: Necessity, Materials used, Classification of supporting Systems, Applicability of various types of supports, Size and Shape of supports, 3 Rigid and Yielding props, constructional details of Friction and Hydraulic props, Principle of roof bolting, stitching – Merits and demerits of bolting, 3 Self advancing powered supports, Method of setting various supports at different locations, Systematic Supporting, Clearance of roof Collapse, withdrawal of supports

Unit IV:

Stowing: Applicability conditions, classification, advantages & limitation, factors influencing and description of various methods of goaf stowing, 3 Surface and underground arrangements and precautions with stowing, Sand gathering methodsmanual, shovel, pontoon, pumping of sand slurry, transportation of sand, mixing chambers, hydraulic profile, face arrangements. 3 Pneumatic and hydraulic stowing, their applicability, merits and demerits. Comparison of Various Mining Methods

Unit V:

Mine Openings: Stress distribution around narrow and wide openings.3 Extent of failure around mine openings.Determination of size of opening and extent of failure. 2 Determination of shape and size of pillars in coal and hard rock mines, shaft pillars, barrier pillars

TEXT BOOK

1 1 R.D. Singh, Principles & Practices of Modern Coal Mining Pub:-New Age International Pvt.Ltd. New Delhi
2. S.S.Peng, Coal Mine Ground Control. Pub: John Willey & Sons

REFERENCE BOOKS

1 Obert&Duall, Rock Mechanics and design of structures in rock. Pub: John Willey & Sons
2 Railey&Dalley, Experimental stress analysis. Pub: McGraw Hill Book Company
3 B.S. Verma, Elements of Mechanics of Mining Ground.Pub.Tuhin& Co., E-1898(MIG) Rajajipuram, Lucknow, U.P
4 Vutukuri& lama, Handbook of Mechanical properties of rock Vol.I&II. Pub: Transtech, Germany

OUTCOMES:

- Future mining in complex geo mining conditions demand innovative strata control technologies to be adopted for safe and stable mining structures.
- The course in deep knowledge to deal with strata control problems , especially in underground coal mines.

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III Year B. Tech MN – II Sem

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

(R15A2522) DEEP SEAM ENGINEERING
(Core Elective-2)

OBJECTIVES:

- To give very highly specialized knowledge to the upcoming mining professional
- It deals with future demand of deep seam mining for coal extraction.

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. Modern Techniques: Application of Numerical Modeling Techniques to Control Ground Problems of Complex Deposits.

UNIT-IV

Use of Modern Instruments for Strata Control of deep seated deposits.

UNIT-V

In-situ Gasification and Mineral Biotechnology for Complex Coal Deposits.

Text Books:

1. R.D. Singh, Principles & Practices of Modern Coal Mining, New age international New Delhi, 1997
2. T.N. Singh, Underground winning of Coal, Oxford and IBH New Delhi, 1992

Reference Books:

1. Peng S S and Chiang H S. Longwall mining, Wiley, New York, 708p
2. S.K. Das, Modern Coal Mining Technology, Lovely prakashanDhanbad, 1992
3. Prasad D. and rakesh S, Legislation in Indian Mines-Acritical Appraisal, Niskam Press, New Delhi, 1883p
4. S.P. Mathur, Coal Mining in India, M.S. Enterprises Bilaspur, 1999

OUTCOMES:

- Future coal production laying depends on deep seam mining associated with complex geo mining conditions, and have the students.
- In this course gets an opportunity to understand the challenges of deep seam mining alternative method of safe extraction of coal.

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III Year B. Tech MN – II Sem

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

(R15A0522) WEB TECHNOLOGY
(Open Elective-4)

OBJECTIVES:

- Giving the students the insights of the Internet programming and how to design and implement complete applications over the web.
- It covers the notions of Web servers and Web Application Servers, Design Methodologies with concentration on Object-Oriented concepts, Client-Side
- Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications,
- Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

UNIT I:

Web Basics and Overview: Introduction to Internet, World wide web, Web Browsers, URL, MIME, HTTP, Web Programmers Tool box.

HTML Common tags: List, Tables, images, forms, Frames; Cascading Style sheets. Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

UNIT II:

Introduction to XML: Document type definition, XML Schemas, Document Object model, Presenting XML ,Introduction to XHTML, Using XML Processors: DOM and SAX.

Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB‘s.

UNIT III:

Web Servers and Servlets: Tomcat web server, Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. Servlet Package, Reading Servlet 150 parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

UNIT IV:

Database Access: Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Accessing a Database from a Servlet. Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment.

UNIT V:

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing : Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1, 2)
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson (UNITs 3,4,5)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta,Pearson Education ,2007.
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook, Bill Siggelkow, S P D O'Reilly for chap 8.
5. March's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to Web Design and Programming –Wang-Thomson

Course Outcomes:

- Analyze a web page and identify its elements and attributes.
- Create web pages using XHTML and Cascading Styles sheets.
- Installation and usage of Server software's.
- Database Connectivity to web applications
- Build web applications using Servlet and JSP

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III Year B. Tech MN – II Sem

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

(R15A0062) Logistics and Supply chain management
(Open Elective-4)

Course Aim:

- To introduce the major building blocks, major functions, major business processes, performance metrics, and major decisions (strategic, tactical, and operational) in supply chain networks.
- To provide an insight into the role of Internet Technologies and technical aspects of key ITEC components in supply chain management.

Learning Outcome:

- Student will get awareness how to obtain customer sophistication, increasing network fragmentation, and fast-paced globalisation, the primary role of supply chain management, along with the coordination of material, information and cash flows, has become complex.

Unit-I

Understanding the Supply Chain: What is supply chain; objectives and importance of supply chain; decision phases in supply chain; process views of s supply chain; examples of supply chain.

Unit-II

Designing Distribution Networks: The role of distribution in the supply chain; factors influencing distribution network design; design options for distribution network; e-business and the distribution network; distribution channels for FMCG sector, commodities, and agricultural produce; factors influencing network design decisions; models for facility location and capacity allocation.

Unit-III

Demand Forecasting And Aggregate Planning: Methods and Characteristics of demand forecasting; forecasting in practice; the role of aggregate planning in SCM; aggregate planning strategies; aggregate planning using linear programming; the role of IT in aggregate planning; implementing aggregate planning in practice.

Unit-IV

Managing Inventories in Supply chains: Cycle inventory; estimating cycle inventory cost; economies of scale to exploit fixed costs and quantity discounts; short term discounting: trade promotions; safety inventory in supply chain and uncertainties; the role of IT in inventory management; estimating and managing safety inventory in practice. Nature of global supply chain management.

Unit-V

Transportation and Sourcing in SCM: Role of transportation in SCM; transportation infrastructure and policies; design options for transportation network and trade-offs; tailored transportation system; risk management; transportation decisions in practice; Sourcing in SCM: in-house or outsource; third and fourth party logistics; contracts, risk sharing and supply chain performance; vendor analysis; the procurement process. Lack of coordination and the Bullwhip Effect; obstacles to coordination in a supply chain; building strategic partnership and trust within a supply chain.

TEXTBOOK:

- Chopra, S, and P. Meindl, 2010, Supply Chain Management - Strategy, Planning and Operation, 4th Edition, Pearson Education Inc.

REFERENCES:

- Raghuram, G. and N. Rangaraj, Logistics and Supply Chain Management: Cases and Concepts, Macmillan, New Delhi
- Simchi-Levi, D., P. Kaminski and E. Simchi-Levi, 2003, Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies, 2nd Edition, Irwin, McGraw-Hill.
- Shapiro, J., 2001, Modelling the Supply Chain, Duxbury Thomson Learning.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

II Year B. Tech MN - II Sem

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

(R15A0067) TECHNOLOGY MANAGEMENT
(Open Elective-4)

OBJECTIVES:

- The Objective of the course is to expose students to the importance of technology in conduct of business and its skilful management for optimum results.

Unit-I

The Process of Technological Innovation: The Need for a Conceptual Approach, Technological Innovation as a Conversion Process, Factors Contributing to Successful Technological Innovation. Strategies For Research and Development: R&D as A Business, Resource Allocation to R&D, R&D Strategy In the Decision Making Process, Selection and Implementation of R&D Strategy, R and D and Competitive Advantage, New Product Development- Techniques For Creative Problem Solving.

Unit-II

Financial Evaluation of Research and Development Projects: The Need For Cost Effectiveness, R&D Financial Forecasts, Risk as a Factor In Financial Analysis, Project Selection Formulae, Allocation of Resources, DCF and Other Techniques of evaluating R&D ventures.

Unit-III

Research and Development: Programme Planning and Control, Portfolio Planning, Project Planning and Control, Project Termination, Resource Allocation and Management- New Product Development: New Product Development as a Competitive Strategy, Market Research For Developing New Products, Commercialisation of Research Outcomes, Industrial Design, Product Architecture and Design For Manufacture, Developing Indigenous Substitute For Raw Materials.

Unit-IV

Technological Forecasting For Decision Making: The Definition of Technological Forecasting, Forecasting System Inputs and Outputs, Classification of Forecasting Techniques, Organisation For Technological Forecasting, Current Status.

Unit-V

Transfer of Technology: Modes of technology transfer, Price of technology transfer, Negotiation for price of MOT.

REFERENCES:

- Tarek Khalil: Management of Technology-The Key to Competitiveness and Wealth Creation, McGraw Hill, Boston, 2009.
- Krishnamacharyulu: Management of Technology, HPH, 2009
- V.K.Narayanan: Managing Technology and Innovation for Competitive Advantage, Pearson Education, 2009.
- Krishnamacharyulu & Lalitha: Management of Innovation, Himalaya, 2009.
- Norma Harison and Samson: Technology management – Text and cases, TMH, 2009
- Shane: Technology Strategy for Managers and Entrepreneurs, Pearson, 2009

OUTCOMES:

- Improvement of best practices in companies.
- Assessment of impact of technology in different areas to meet desired outputs.
- Identification of tech mgt activities and areas of strength and weaknesses in specific sectors of businesses.
- Insight into detailed process of key areas of technology.

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

(R15A2584) MINE SURVEY LAB-II

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

Suggested Text Books/Reference Books

1. Punimia —Surveying Vol. II and III
2. Baska —Surveying and Levelling
3. Ghatak —Mine Surveying an Levelling

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

(R15A2585) MINE ENVIRONMENTAL ENGINEERING LAB-II

AIM:

To demonstrate the various methods and instrumentation involved in analysing an underground mine atmosphere.

1. Study of air-reversal arrangement in mine fans.
2. Study and analysis ventilation network circuit.
3. Study of pressure survey and quantity survey in mines using velometer, anemometer and barometer.
4. Determination of air born dust by gravimetric dust sampler, personal dust sampler and by high volume sampler.
5. Determination of relative humidity by whirling hygrometer.
6. Study of self rescuers of different types.
7. Study of self contained breathing apparatus.

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

(R15A0007) TECHNICAL COMMUNICATION AND SOFT SKILLS

INTRODUCTION:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students.

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

OBJECTIVES:

a. To improve the language proficiency of the students in English with emphasis on LSRW skills.

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

c. To develop the professional skills and communication skills in formal and informal situations and hone the required professional ethics.

UNIT- 1:

Factors affecting information and document design, Principles of effective writing , Technical Writing, Grammar and Editing- Technical writing process, Writing drafts and revising, Collaborative writing, technical writing style and language.

UNIT- 2:

Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication.

UNIT-3:.

Communication and Technical Writing- Public speaking, Group discussion, Oral; presentation, Interviews, Graphic presentation, Presentation aids. Writing reports, Email writing, official notes, business letters, memos, progress reports, minutes of meetings, event report.

UNIT- 4:

Self Development and Assessment- Self assessment, Awareness, Perception and Attitudes, Values and belief, Personal goal setting, career planning, self esteem.

UNIT- 5:

Ethics- Business ethics, , Personality Development in social and office settings, netiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work culture in jobs, Rapid reading, Complex problem solving, Creativity, leadership skills ,cubicle Etiquettes, team building.

TEXT BOOKS:

1. David F. Beer and David McMurrey, Guide to writing as an Engineer, John Willey. New York, 2004

2. Diane Hacker, Pocket Style Manual, Bedford Publication, New York, 2003. (ISBN 0312406843)
Reference Books:
1. Dale Jung k, Applied Writing for Technicians, McGraw Hill, New York, 2004. (ISBN: 07828357-4)
2. Sharma, R. and Mohan, K. Business Correspondence and Report Writing, TMH New Delhi 2002.
3. Xebec, Presentation Book, TMH New Delhi, 2000. (ISBN 0402213)

OUTCOMES:

a. The student will become proficient in LSRW skills.
b. They develop formal LSRW skills approach to different situations.
c. They hone professional ethics and learn to be proficient formally.

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4	-/-/-	3

(R15A2514) MINERAL PROCESSING

OBJECTIVE:

- The prime objective of this course is to build a solid foundation on principles, equipment of various mineral beneficiation procedures that would facilitate metal extraction.
- It also focuses on mathematical derivations that are associated with concentration process.

UNIT-I

Scope, objectives, minerals/ores for mineral processing, methods of treatment, choice of methods, sequence of operations, product, flow sheets, ore sorting – hand, mechanical, electronic, removal of harmful materials, ore transportation.

UNIT II:

Introduction to comminution, primary/secondary/tertiary crushing, purpose, duty, theory of crushing, crushing sequence, reduction ratio, types of crushers and comparison, general crushing flow sheet, wet/dry grinding, mechanism and various affecting parameters.Gravity concentration methods**:** Jigging, heavy media separation, flowing film concentrator'stheory,application and Limitations, Froth flotation**:** Physico-chemical principles; Reagents; Machines; Flotation of sulphides, oxides andcoal.

UNIT III:

Purpose, factors governing particle behaviour, laboratory and industrial screens, trommels, vibrating screens, etc. wet and dry screening, classification, classifiers.Electrical and magnetic methods of concentration**:** Principles, fields of application and limitations. Dewatering**:** Thickener and filter.

UNIT IV:

Purpose, sampling - solid ore, pulp, head feed, grinding circuit samples, flotation products, etc., X-ray fluorescence, automatic sampling. Metallurgical accounting.Simplified flow sheets for coal, copper, lead, zinc, gold, iron, manganese ores and lime stone

UNIT V:

Newton's and Stoke's Laws of particle settlement, different concentration techniques – gravity, chemical froth flotation, wet & dry magnetic separation, electromagnetic, heavy media, jigging, shaking tables, sluicing, spirals, coal washing.

TEXT BOOKS:

1. Jain, S.K., Ore Processing, Oxford – IBH Publishing, 1984.
2. Gaudin, A.M., Principles of Mineral Dressing – McGraw Hill Book Company, 1971.

REFERENCES BOOKS:

1. Taggart, A.F., Handbook of Mineral Dressing, John Wiley and Sons, New York, 1990.
2. Wills, B.A. Mineral Processing Technology, Pergamon Press, 1985.
3. Vijayendra, H.G., Handbook on Mineral Dressing, Vikas Publishing House Pvt. Ltd. 1995.

OUTCOMES:

- The student will be able to judge the concentrations process for a particular mineral.

He will also have complete understanding on principles, construction, and working of the equipment for concentration and classification.

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

(R15A2515) MINE LEGISLATION AND SAFETY

OBJECTIVES:

- Introduce mining laws and legislation to the students with basic knowledge on mining engineering aspects.
- It poses the student to Indian electricity rules, vocational training. Principles of management, industrial relations etc.

UNIT I:

INTRODUCTION TO MINING LAWS AND LEGISLATION: General principles of mining laws, development of mining legislation of India.

UNIT II:

ACTS, RULES AND REGULATIONS – Mines Act, Mines Rules, Coal and metalliferous mines Regulations, Bye-laws, Circulars, and standing orders (Except the ones which are collected in course Drilling & Blasting, SurfaceMining, Mining Machinery I & II, Mine Environmental Engineering I, II & III, Underground Mining methods (Coal & Metal))

UNIT III :

ACTS RULES AND REGULATIONS – II: Indian electricity rules, coalmines conservation and development act, Workman's compensation act., General provisions of Mines and Minerals Regulation and DevelopmentAct, Mineral Concession Rules, 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 :

ACCIDENTS AND DISEASES: Classification of accidents, causes and prevention of accidents, accident enquiry reports, cost of accidents, occupational diseases and their social effects.

UNIT V:

MINE SAFETY: Role of management, labour and government, Safety audit, instrumentation, organisation for disaster management in mines, safety conferences.

REFERENCES

1. Mines Act 1952, Lovely Prakashan, Dhanbad, 1995.
2. Coal Mines Regulations, 1961, Lovely Prakashan, Dhanbad, 1995.
3. Metal Mines Regulations, 1961, Lovely Prakashan, Dhanbad, 1995.
4. DGMS Circulars, By National Council of Safety in Mines, Dhanbad, 1995.
5. Mines rules, 1955, Lovely Prakashan, Dhanbad, 1995.
6. The Mines Rescue Rules, 1986, Lovely Prakashan, Dhanbad, 1995.
7. The Indian Electricity Rules, 1995, Lovely Prakashan, Dhanbad, 1995.
8. The Payment of Wages Act, 1936, Ram NarainLalBeni Prasad, 1995.
9. Vocational Training Rules, Lovely Prakashan, Dhanbad, 1995.
10. The Workmen's compensation Act, 1923, Ram NarainlalBeni Prasad, Allahabad, 1995.
11. Kejriwal, B.K., Safety in Mines, Gyan Khan Prakashan, Dhanbad, 1994.

OUTCOMES:

- As the outgoing students career is mainly dependent on mining industry, exposure to state and central laws related to mining are highly solicited.

This course gives an opportunity for the students to understand the situations requirement for coal/metal mining by opencast/underground methods.

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

(R15A0333) OPERATION RESEARCH

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.

UNIT – II

TRANSPORTATION PROBLEM – Formulation – Optimal solution, unbalanced transportation problem –Degeneracy.Assignment problem – Formulation – Optimal solution - Variants of Assignment Problem-Traveling Salesman problem.

SEQUENCING – Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines.

UNIT – III

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 – IV

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.

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.

UNIT – V

DYNAMIC PROGRAMMING: Introduction – Bellman's Principle of optimality – Applications of dynamic programming- capital budgeting problem – 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 – Simulation Languages.

TEXT BOOK :

Operations Research / S.D.Sharma-Kedarnath

2. Introduction to O.R/Hiller &Libermann (TMH).
3. Introduction to O.R /Taha/PHI

REFERENCES:

1. Operations Research /A.M.Natarajan,P.Balasubramani,A. Tamilarasi/Pearson Education.
3. Operations Research / R.Pannerselvam,PHI Publications.
5. Operation Research /J.K.Sharma/MacMilan.

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IV Year B. Tech MN – I Sem

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

(R15A2516) ROCK MECHANICS& GROUND CONTROL

OBJECTIVES:

- To give details of mechanics of rock failure and other aspects of stability of underground
- It deals opencast working including mechanics of subsidence, design of supports etc.

UNIT-I

Physico-mechanical properties of rocks, Elastic and time dependent behavior, Rock mass classification.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-II

Subsidence: Causes and impacts of subsidence, Mechanics of surface subsidence, discontinuous and continuous subsidence.Monitoring, prediction, control and management of subsidence.

UNIT-III

Mechanics of rock burst and bumps, Stability of slopes. Instrumentation and measurement of insitu stresses and rock strength, Photolasticity and scale model studies.Basics of numerical methods in geomechanics with applications.

UNIT-IV

Definition and concept of ground control in Mines. Ground control practice in Mines. Constraints on ground control design; characteristics of coal measure strata. Design of structures in rock; design of underground openings.Design of pillars, design of openpit slopes, waste dumps and embankments.Design of stopes.Bumps and rock bursts-causes, occurrence and control.

UNIT-V

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.

TEXT / REFERENCE BOOKS:

1. Coal Mining ground Control by Peng.
2. Rock Mechanics by Jumikis
3. Fundamental of Rock Mechanics by Jager& Cook.
4. Rock Mechanics – Brounden.

OUTCOMES:

- This professional course contents encourage the students to the study various aspects of ground control problems in underground and open cast mines
- Better understandings of scope for application of various numerical methods and model studies in geomechanics.

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

(R15A2523) PLANNING & DESIGN OF SURFACE MINING
(Core Elective-3)

OBJECTIVES:

- To introduce various aspects of planning of surface mines
- This professional elective course mining project including estimation of reserve, facilitates to be provided such as haul roads, workshops, lighting etc.

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.

TEXT / REFERENCE BOOKS:

1. R.T. Deshmukh – Open cast Mining, Lovely Prakash, Dhanbad.
2. Das S.K. – Surface mining Technology
3. G.B. Misra – Surface Mining
4. haertman H.L. – Introduction to Mining Engineering

OUTCOMES:

- Now-a days the trend in mining industries is to produce major quantity (80% coal) of numeral by opencast mining and hence details of planning such mines is highly solicited from the students aspiring to be a good mine manager, planner, researchers, academician etc.
- Better understanding of the challenges in planning surface mining project is also an outcome of this course.

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

(R15A2524) PLANNING & DESIGN OF UNDERGROUND METAL MINING
(Core Elective-3)

OBJECTIVES:

- To familiarize the student with specialized knowledge on underground metal mining project
- It deals planning including stope designs, production planning, scheduling etc.

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.

UNIT-V

Division of Mining Area: Division of the mining area into working units on district and level pattern. Dimensions of panels and blocks. Production and Cycle time estimates, Production Planning and Scheduling

TEXT / REFERENCE BOOKS:

1. Y.P. Chacharkar, A Study of Metalliferous Mining, Methods, Lovely Prakashan, Dhanbad, 1994.
2. B.C. Arthur, SME Mining Engineers Hand Book, American Institute of Mining, Metallurgical and Petroleum Engineers, New York, 1973.
3. D.J. Deshmukh, Elements of Mining Technology, Vol.-II, Central Techno Publications, Nagapur, 2001.
4. Meta Mines Regulations -1961, Lovely Prakashan 5. Introductory Mining Engineering, Howard L. Hatman.

OUTCOMES:

- Students can be able to plan extraction methods for metal mining by underground techniques as outcome of the course

Also students can plan ncluding stope designs, production planning, scheduling etc

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

(15R15A2525)PLANNING AND DESIGN OF UNDERGROUND COAL MINE
(Core Elective-3)

OBJECTIVE:

- Aimed at specialized knowledge of planning of underground coal mining project
- It deals with recent extraction methods, economics and strata control measures.

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-VI

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, Roof c onvergence measurements.

TEXT /REFERENCE BOOKS:

1. Peng SS – Longwall Mining.
2. R.D. Singh – Principles and Practices of Modern Coal Mining.
3. Mathur S.P. – Coal Mining in India.
4. Das S.K. Modern Coal Mining Technology.
5. BB Dhar, Singh T.N. – Thick Séance Mining Problems and Issues.

OUTCOMES:

In future, underground mining is supposed to produce 80% of coal demand the students can get the opportunity to be specialist in planning for such underground coal mining project as the outcome of the course

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II Year B. Tech MN - I Sem

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

(R15A2526) CLEAN COAL TECHNOLOGY
(Core Elective-4)

OBJECTIVES:

- This course is at detailed explanation of the clean coal technology including Coal Utilization, Pre-Combustion Technology, Combustion Technology,
- Combustion Technology, Post-Combustion Technology and Wastes and Pollutants etc.

Unit 1:

Coal Utilization: Coal production and utilization trends. Status of coal utilization technology and related operating and environmental problems. Coal qualities and their effect on selection of efficient methods for eco-friendly utilization of coal.

Unit 2:

Pre-Combustion Technology: Necessity, scope and limitations of pre-combustion coal cleaning technology. Washability characteristics and preparation problems related to coal quality. Principles, operations and selection of processes for coal preparation

Unit 3:

Combustion Technology: Necessity, scope and limitations of combustion Principles, operations and selection of processes for coal preparation. Plant performance evaluation and forecasting of cleaning results. Environmental problems and related mitigating measures.

Unit 4:

Post-Combustion Technology: Necessity, scope and limitations of post-combustion clean coal technologies. Developments, basic principles, operating features of clean coal technologies. Selection, performance and related environmental problems and their control.

Unit 5:

Wastes and Pollutants: Characterization, impacts, control, treatment and safe disposal of wastes and pollutants released from various stages of clean coal technologies. Utilization of wastes and pollutants.

OUTCOMES:

- Present share of about 20% production of coal in India from underground mining is expected to increase in near future, due to depletion of reserves amenable for opencast mining.
- Therefore, this course is highly useful for the future mining engineers to take challenge of producing coal feer vary difficult geoming conditions at deeper horizons with special emphasis on the latest experimental trails conducted in Indian coalfield

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IV Year B. Tech MN – I Sem

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

(R15A2527) ROCK EXCAVATION ENGINEERING
(Core Elective-4)

OBJECTIVE :

- Aimed at specialized knowledge on drilling, blasting, rock cutting technologies related to opencast.
- Aimed at specialized knowledge on drilling, blasting, rock cutting technologies related underground excavations.

UNIT-I :

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.

UNIT-IV:

Advanced blast initiation systems, blast performance evaluation, cast blasting, technoeconomic and safety aspects of surface and underground blasting. 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.

TEXT / REFERENCE BOOKS

1. Cark G.B – Principles of Rock fragmentation, John Wiley & Sons.
2. Chugh C.P. – Diamond Drilling, Oxford Publication.

OUTCOMES:

- Mining engineers specialized in various aspects of excavation technologies
- The student will get knowledge about recent concepts of blast less mining with continues miners / surface miners to drilling/blasting designs is expected as an outcome of the course.

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

(R15A2528) ROCK FRAGMENTATION ENGINEERING
(Core Elective-4)

OBJECTIVE :

- Aimed at specialized knowledge on drilling, blasting, rock cutting technologies related to opencast.
- Aimed at specialized knowledge on drilling, blasting, rock cutting technologies related underground excavations.

Unit-I

General theory of rock cutting, selection of cutting tools for optimum penetration and wear characteristics.

Unit-II

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-III

Mechanism of rock breaking machines, Pneumatic and Hydraulic rock hammers. Mechanics of rock fragmentation and fracture by explosive action, explosive.

Unit-IV

Blasting accessories, blasting parameters, design of blasting rounds for opencast and underground mines, Blastability of rocks, blasting efficiency, mean fragment size.

Unit-V

Computational models of blasting, transient ground motion, misfires, blown out shots, incomplete detonation – their cases and remedial measures.

Unit-VI

Controlled blasting techniques, perimeter blasting, safety precautions, ground vibrations and air over pressure from blasting.

Unit-VII

Instrumentation in blasting, Borehole pressure transducer, V.O.D probe, vibration monitor, high speed video camera.

Unit-VIII

Impact of ground vibration and sound on the neighboring structures and communities, and mitigative measures.

Text / Reference Books:

1. Pradhan G.K., Ghosh A.K. _Drilling & Blasting‘ Mine Tchnology
2. Sastry V.R. – _Advacne in Driiling & Blasting

OUTCOMES:

- Mining engineers specialized in various aspects of excavation technologies
- The student will get knowledge about recent concepts of blast less mining with continues miners / surface miners to drilling/blasting designs is expected as an outcome of the course.

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IV Year B. Tech MN – I Sem

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

(R15A2586) MINERAL PROCESSING LAB

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 jaw crusher
3. Determination of the grinding characteristics of a given mineral sample using ball mill
4. Sieve analysis of a given sample and to calculate (a) percentage sample retained on screens (b) average size of sample material and (c) to plot sizing curves
5. Determination the reduction ratio of a Jaw crusher.
6. Verification of Laws of Comminution (Study)
7. Study of the variation of reduction ratio with process variables in Roll Crusher.
8. Concentration of a given mineral sample using mineral jig
9. Concentration of a given mineral using Wilfley table
10. Concentration of a given mineral using froth flotation cell
11. Concentration of a given mineral using magnetic separator
12. Study of wash ability characteristic of a coal sample using float and sink test.
13. Study of sedimentation characteristics of a given sample

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IV Year B. Tech MN – I Sem

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

(R15A2587) ROCK MECHANICS and Ground Control LAB

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 design of mine pillars.
15. Prediction of Subsidence.
16. Study of measurement of insitu stresses and strengths.

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III Year B. Tech MN – II Sem

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

(R15A2529) MINE ELECTRICAL ENGINEERING
(Core Elective-5)

OBJECTIVE:

To introduce basic knowledge on application of various electrical equipment, power supply, safety and protection of electrical equipment for opencast and underground.

UNIT-I

Transmission and Distribution of Electrical Power in Mines: Performance of short transmission lines; radial and ring–main distribution systems, substation arrangements for opencast and underground mines, distribution of electrical power in mines, mining type cable.

UNIT-II

Mining type switchgears and protective devices: Types of circuit breakers, Gate end box, Drill panel, and Tran switch, Field Switch. Protective relays: Thermal and induction disc type overload relays; mining type earth fault relay

UNIT-III

Signaling and communication: Haulage and Coal face signaling systems for underground coal mines, basic concept of underground mine communication. Power Economics: Types of industrial tariffs, power factor improvement in mines. Electrical drives and Power Semiconductor Controller: Selection of motors and starters for mining applications; introduction to power semiconductor devices, basic principles of operation of thyristor controlled variable speed mine electrical drives, electrical braking.

UNIT-IV

Electrical Safety in Mines: Neutral Grounding and Equipment earthing practice in mines, principles of flameproof enclosure, intrinsic safety, Indian Electricity Rules as applied to mines – main provisions. Mine lighting system.

References:

1. A text book on power system engineering, Soni, Gupta, Bhatnagar, Chakrabarti.
2. Coal Mining Practice [Vol – III], Statham
3. Electrical Equipment in Mines, H. Cotton.
4. Electrical Drives, G. K. Dubey.

OUTCOMES:

Students gets awareness on various issues related to planning of electrical systems in mines with special emphasis on problems and remedial measures to be implemented for safe and efficient working, maintenance of electrical equipment in mines

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IV Year B. Tech MN – II Sem

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

(R15A2530) ADVANCED SURFACE MINING
(Core Elective -5)

OBJECTIVES:

- To develop an understanding of surface mining equipments and its operations in a surface mine.
- To achieve the ability to classify and select surface mining .methods.
- To understand the slope failures in a surface mine and study the concept of waste dump formations.

UNIT I:

PLANNING: Open-pit 164 optimization techniques for mine geometry and output, mine development phases, quality control and conservation. Output and manpower planning; calendar planning, mine scheduling, production scheduling, truck dispatch system, design of sumps and pumping systems and drainage.

UNIT II:

GEOTECHNICAL PARAMETERS: Application of geotechnical investigation for design of ultimate pit slope and other design parameter, slope stability analysis including mine waste rock dumps and tailing dumps.

UNIT III :

EQUIPMENT MANAGEMENT: Machine availability, productivity, maintenance, maintenance scheduling, preventive maintenance, control and monitoring inventory. Workshops for HEMM.Power supply arrangements in opencast mines.

UNIT IV :

SAFETY AND ENVIRONMENT: Safety aspects in opencast mines regarding height, width and slope of benches, drilling and blasting, fly rock, nearby dwellings, mine illumination, gradient and other aspects of haul roads, formation of spoil dumps, tailings management etc. pollution due to noise, vibrations due to machinery and blasting, water pollution, measurement monitoring and control measures for the same, land reclamation and afforestation, environmental audit.

UNIT V:

MODERN TRENDS IN OPENCAST MINES: Recent developments in mining methods and layouts. In pit crushing & conveying, continuous surface mining. Selective extraction and dumping. Extraction of seams developed/extracted by underground methods. Deep OCM. Placer mining and solution mining – scope of applicability, sequence of development and machinery

REFERENCES

1. Cummings, A.B. and Given, I.V., SME Mining Engg. Hand book Vol.I and II, New York, 1994
2. Proceedings of National Seminar on Surface Mining, IME Publications/ Calcutta, 1995
3. Das, S.K., Surface Mining Technology, Lovely Prakashan, Dhanbad, 1994
4. Das, S.K., Modern Coal Mining Technology, Lovely Prakashan, Dhanbad, 1994
5. Kennedy, B.A., Surface Mining – 2nd Edition, SME, New York, 1990
6. Hustrulid, W. and Kuchta, M., (eds)., Fundamentals of Open Pit Mine Planning & Design, Elsevier, 1995.

OUTCOMES:

- At present 80% of the coal production and significant proportion of other mineral output is coming from surface mines
- students get a benefit of detailed understanding of various techniques of surface mining including operations and maintenance of associated machinery as outcome of this course.

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

IV Year B. Tech MN – II Sem

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

(R15A2531) COMPUTER APPLICATION IN MINING

AIM:

To impart skills on designing and development of mining software and appreciate the scope of Computer application in Mining

OBJECTIVES:

- To impart knowledge on hardware and software issues concerned with computers in mining industry.
- To develop algorithms and programs on various mining related problems
- To impart knowledge on high-end simulation methodologies
- To study modern techniques on solving mining problems.

UNIT I:

INTRODUTION TO COMPUTERS: Hardware concepts – CPU architecture and developments – Overview on input, output and memory devices – interfacing concepts; evolution of operating systems; operating systems functions, characteristics – distributed operating system – Cloud computing / grid computing in mining.

UNIT II:

SOFTWARE: Application of structured and object oriented programming languages to mining problems like pillar design, blast design, subsidence etc., - modular programming – Top down and bottom approach for mine design and planning.

UNIT III:

DATABASE MANAGEMENT SYSTEMS: Database and Relational database - development of software packages for mining companies– forms, queries and reports - management information system – enterprise resource planning for production machineries, manpower, finance , and other mining operations.

UNIT IV :

PROBLEM SOLVING – APPLICATIONS IN MINING: Ventilation network analysis; online and offline monitoring and control. MINOS, FIDOS. CAD in mining – geostatistics, reserve estimation, krigging, block modelling and ore body modelling, pit design and optimization; mine scheduling, TDS, blast design etc., digitization and scanning of mine maps - GIS in mining.

UNIT V:

MODERN TRENDS: Computer graphics and virtual reality, artificial intelligence, expert system, neural networks, simulated annealing, robotics and their applications in mining.

REFERENCES:

1. R.V.Ramani – Editor, APCOM Proceedings Application of Computers and Operations Research in the Mineral Industry, The Society of Mining, Metallurgy and Exploration, Inc.,1996

2. KadriDagdelen, Editor, Computer Applications in the Minerals Industries, Colorado School of Mines, 1999.
3. Ramani R.V., et al. Computers in Mineral Industry, Oxford and IBH Publishers, 1994.
4. Fytas, K. and Singhal, R.K. Computers Applications in Mineral Industry, A.A.Balkema Publication, 1988.
5. E Balagurusamy , Fundamentals of Computers , McGraw Hills Publication, 2009
6. Basandra S K, Computers Today Fourth Edition, Galgotia Publications Pvt. Ltd, 2004

OUTCOMES:

- As the outgoing students career is mainly dependent on mining industry, exposure to different mining planning
- Scheduling related software as well modeling the different issues related to mining
- Estimation the reserve of the mining deposits.

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IV Year B. Tech MN – II Sem

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

(R15A2532) SMALL SCALE AND MARINE MINING
(Core Elective-6)

OBJECTIVES:

- To develop an understanding of surface mining equipments and its operations in a surface mine.
- To achieve the ability to classify and select surface mining .methods.
- To understand the slope failures in a surface mine and study the concept of waste dump formations.

UNIT I

INTRODUCTION TO SMALL SCALE MINING :Concept of small scale mining, small scale mines – worldwide, Indian Policy in small scale mines – practices, policies and perspectives, problems of small scale mines – finance, legislative support, technical expertise, environmental obligations, safety, health and training, environmental impacts and protection.

UNIT II

SMALL SCALE MINING METHODS :Classification and mode of occurrence of granite and other minor minerals, physical, mechanical and chemical properties, geological aspects of mining, granite and dimensional stone mining – manual, semi-mechanized and mechanized mining methods, conventional & novel techniques, recent trends, processing, finishing, quality control, marketing & export of minerals. Case studies of mining of other minerals like sandstone, marble, beach sands, alluvial mining, mica, barytes, diamond and gemstones, etc.

UNIT III

INTRODUCTION TO MARINE MINING :Introduction to marine environment, development & status of ocean resources of mining in India and other parts of the world, Ocean profile, ocean floor topography, economic exclusive zone & fundamentals of law of the sea, coastal zone & its characteristics.

UNIT IV

MARINE GEOLOGY AND RESOURCES :Physical and chemical properties of seawater, overview of marine mineral deposits, deep-sea bed mineral resources, polymetallic nodules, sulphate nodules, chemicals from the ocean, dissolved and un-dissolved mineral deposits, sea water as resource and beach placers.

UNIT V

EXPLOITATION OF MARINE DEPOSTS :Shallow and deep sea bed, oceanographic instruments, mining of manganese nodules, deep sea drilling methods, ocean bottom samplers, drag buckets, grab buckets, coring systems, ocean bathymetry, temperature measurement systems, water samplers, ocean dynamic analysis, beach placer mining, underwater photographs, vehicles and transportation, offshore oil platforms.

TEXT BOOKS:

1. Chatterjee, S.K., An Introduction to Mineral Resources, Wiley Eastern Ltd., 1983.
2. Ghose, A.K., (Ed). Small Scale Mining – A Global Overview, Oxford - IBH Publishers, 1991
3. Shepherd, F.P., Sub-marine Geology, Harper and Row, New York, 1963.

REFERENCE BOOKS:

4. Graff, W.J., Introduction to Offshore Structures: Design, Fabrication and Installation, Gulf Publishing Company, London, 1961.
5. Herbich, J.B., Coastal and Deep Ocean Dredging, Gulf Publishing Co. Houston, 1975.

6. Murthy, T.K.S., Mining the Ocean, CSIR Golden Jubilee Series, CSIR Publications, New Delhi, 1995.

OUTCOMES:

- At present 80% of the coal production and significant proportion of other mineral output is coming from surface mines

Students get a benefit of detailed understanding of various techniques of surface mining including operations and maintenance of associated machinery as outcome of this course

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

III Year B. Tech MN – II Sem

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

(R15A2533) TUNNELING ENGINEERING
(Core Elective-6)

OBJECTIVE:

- To familiarize the student with the recent trends in tunnelling methods.
- Also it deals design of supports, maintenance of tunnels, provision of facilities such as ventilation, illumination etc in tunnels.

UNIT-I

Introduction to tunnelling; geological concept of tunnelling. Influence of geological aspects on design & construction of tunnels.

UNIT-II

Tunnelling 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 tunnelling and drivages. Design of Supports of Tunnels; Steel supports, rock enforcements, new Australian tunnelling 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.

Text Books:

1 Richards E. Bullock – Tunnelling and Underground Construction Techniques
2. Stack Barbara – Hand Book of Mining and Tunnelling Machinery, John Wiley & Sons.
Reference Books
1. R.V. Proctor – Rock Tunnelling with Steel Supports
2. J. Johnsen – Modern Trends in Tunnelling and Blast Design.

OUTCOMES:

- Students can understand various methods of tunnelling use of latest numerical techniques for tunnel design, stability analysis and ground control.
- And measures with various steel support and rock reinforcement

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IV Year B. Tech MN – II Sem

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

(R15A2534) ENVIRONMENTAL MANAGEMENT IN SURFACE MINES
(Core Elective-6)

OBJECTIVES:

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

UNIT I:

ENVIRONMENT & ECOLOGY: Concept of Ecology, ecological principle, nature of the environment ecology and man. Goals, strategies and tools for environmental management – systems approach to environmental management – environmental guideline – National Policies on environment with respects to mining activities – Global and Local environmental issues – resource degradation – desertification – Industrialization, Objectives of Sustainable Development.

UNIT II:

ENVIRONMENTAL POLLUTION: Environmental Pollutants due to surface and underground Mining – Air, Water, Noise, Sources and Classification of pollutants including dust and their effect on human health, Sources, hazards, sampling and analysis, standards, instrumentation and measurement of pollutants including dust, Control and preventive measures for air pollution including for dust, Structure of the atmosphere – ozone layer depletion – Acid rain – Green house gases and global warming Ambient Air quality and emission standards, Air quality Sampling and monitoring, Dispersion of air pollutants,

UNIT III:

ENVIRONMENTAL POLLUTION – II: Environmental Pollution due to Water - Sources and Classification of pollutants and their effect on human health, hazards, sampling and analysis, Water pollution standards, Noise standards – Measurement – Noise Impact Index assessment, Control and preventive measures for water, noise pollution. Pollution due to vibrations their monitoring, prevention and control, Land pollution, land for alternation dealing with mind out land , re-vegetation, tailing management, tailing dams, method and construction, land use plan, Mine closure planning. Textural classification and properties of soil. Impact of pollution on human health, miner's diseases and their social impact.

UNIT IV:

ENVIRONMENTAL MANAGEMENT: Environmental quality objectives, Emission and ambient standards – Minimum National standards – International environmental standards – ISO 14000 – EIA Notification – Sitting of Industries – Environmental management plans, Environmental impact assessment, Environmental management system audits, Environmental economics – Principles of cost benefit analysis – Valuing the Environment – Environmental Accounting, Environmental administration- training awareness and competence.

UNIT V:

ENVIRONMENTAL LEGISLATIONS: Environmental laws, the Environmental (Protective) Act, 2004, The Water Act (1974), The Air act (1981), The Forest Act 1927, The forest conservation act 1980, Power and responsibilities of regularity agencies and occupation consent to establish and operate wild life protection act and rules , Environmental clearance procedure for a mining Project.

TEXT BOOKS:

1. Hartman, H.L. Mine Ventilation and Air Conditioning, Wiley Interscience publication, 1999.
2. Mishra, G.B. Mine Environment and Ventilation, Oxford University Press, 1992.
3. McPherson, M.J. Subsurface Ventilation and Environmental Engineering, Chapman & Hall Publication, London, 1993.
4. Manahan S.E. Environmental Science and Technology.
5. Mackenthun, K.M. Basic Concepts in Environmental Management, Lewis Publications, London, 1998.
6. Shyam Divan and Armin Rosencranz, Environmental Law and Policy in India, Oxford University Press, New Delhi. (2001)

REFERENCES:

1. Gregor I. Mcgregor. Environmental Law and Enforcement, Lewis Publishers, London, 1994.
2. Noel de Nevers, Air Pollution Control Engg., McGraw Hill, New York, 1995
3. Anjaneyulu,Y. Air Pollution & Control Technologies, Allied Publishers (P) Ltd, India, 2002.
4. Nick Hanley, Jaison F. Shogren and Ben White. Environmental Economics – In Theory and Practice, Macmillan India Ltd, New Delhi, 1999.
5. Roger Perman, Yue Ma and James McGilvray. Natural Resources and Environmental Economics, Second edition, Addision Wesley Longman Ltd, Singapore, 1997.
6. Christopher Sheldon and Mark Yoxon, Installing Environmental Management System – a step by step guide, Earthsecan Publications Ltd, London, 1999.
7. Lee Kuhre, ISO 14001 Certification –Environmental Management Systems, PrenticeHall, USA, 1995.

OUTCOMES:

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