JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF MINING ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For

B. TECH MINING ENGINEERING

(Applicable for batches admitted from 2019-2020)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

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DEPARTMENT OF MINING ENGINEERING

III Year - I Semester

S.No	Category	Subjects	L	T	P	Credits
1	PCC	Underground Coal Mining Technology	3	--	--	3
2	PCC	Mine Environment Engineering – II	3	--	--	3
3	PCC	Rock Mechanics	3	--	--	3
4		**OPEN ELECTIVE-I** 1. Waste Water Management 2. Environmental impact analysis 3. Disaster Management and Mitigations	3	--	--	3
5	PCC	Mining Machinery & Mechanization-I	3	--	--	3
6	BSC	Advanced English Communication Skills Lab	-	--	3	1.5
7	PCC	Mine Surveying - II Lab	-	--	3	1.5
8	PCC	Rock Mechanics Lab	-	--	3	1.5
9	PCC	Corporate Social Responsibility in mining	1			0.5
10	PCC	Mine Field visit(Mandatory)(internship)	-	--	--	1
		Total Credits				**21**

III Year - II Semester

S.No	Category	Subjects	L	T	P	Credits
1	PCC	Mine Ground Control	3	--	--	3
2	PCC	Mineral processing	3	--	--	3
3	PCC	Under Ground Metal Mining Technology	3	--	--	3
4	PCC	Mining Machinery & Mechanization –II	3	--	--	3
5		**OPEN ELECTIVE - II** 1.Industrial Robotics 2.Artificial intelligence 3.Introduction to Data Base Management System	3	--	--	3
6	PCC	Mineral processing Lab	--	--	3	1.5
7	PCC	Mine Environmental Engineering Lab	--	--	3	1.5
8	PCC	Mining Machinery & Mechanization Lab	--	--	3	1.5
9	PCC	Industrial Training(3-4weeks) or Skill development or Research project	--	--	--	0.5
		Total Credits				**20**

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III Year - I Semester		L	T	P	C
		3	0	0	3
UNDERGROUND COAL MINING TECHNOLOGY					

Course Objectives: Tounderstand coal growth in India and all over the world and different terminology used in coal mining including modern methods. the student will have the new innovative thoughts through computer application.

UNIT - I

Introduction:Present situation and future growth of coal mining industry in India and world, different coal mining industries in India, factors effecting selection of mode of entry and different types of mode entry: incline, shaft, inclined shaft, coal mine development and its scenario, different terminology used in coal mine development, different coal mining methods, factors influencing choice of coal mining methods. Software application in coal mines for development and depillaring operations.

UNIT - II

Boad and Pillar Mining: applicability, limitations, advantages and disadvantages of Bord and pillar mining method, development and depillaring sequence operations in Bord and Pillar mining, and its related calculations, local fall, main fall, air blast. Dangers associated with B& P method and precautions. Case study with layout.

UNIT – III

Longwall Mining: Applicability, limitations, merits and demerits, different longwall mining methods, factors influencing selection of longwall method, method of development and depillaring and its related calculations. Thin seam and thick seam mining with longwall mining method, Case study with layout.

UNIT - IV

Thick Seam and deep seam Mining:Problems associated with thick and deep seam Mining, selection of mining method, caving and stowing methods, limitations and applicability: different slicing methods-(inclined Slicing, Horizontal Slicing, Diagonal Slicing, Transversely Inclined Slicing),and Caving methods (Sublevel Caving) Working Steep and Moderately Thick Seams: Blasting Gallery Method , room and pillar method , The Velenje Method, Descending Shield Method of Mining.

UNIT – V

Modern coal mining methods: applicability, limitations, merits and demerits of Inseam Mining and Horizon Mining, Hydraulic Mining, plough methods, chirimiri caving method, shield mining, method of extraction by coal gasification and contiguous seam. Working underneath surface features, extraction of multi seams, problems and issues: Coal Bed Methane. Goaf Control: strip packing or solid stowing, Hydraulic Stowing etc. Procurement of stowing materials and its transportation, theoretical aspects and case studies.

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Course Outcomes: understand students about all coal mining methods and their limitations, handling and working in difficult working conditions in the field.

TEXT BOOKS:

1. Principles and Practices of Modern Coal Mining – R. D. Singh, New Age International, 1997.
2. Modern Coal Mining Technology – S. K. Das, 2nd edition, Lovely Prakashan Publishers, 1994.

REFERENCE BOOKS:

1. Underground Coal Mining Methods – J. G. Singh, BrajKalpa Publishers, Varnasi, 2000.
2. Coal Mining – I.C.F. Statham, Vol. I, II, III and Vol. III. The Caxton Publishing Company Ltd. Inc. 1958.
3. Elements of Minning technology- D.J Deshmukh Vol.1
4. Modern Coal mining Technology: Samir kumar Das
5. Underground winning of coal:T.N Singh

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III Year - I Semester		L	T	P	C
		3	0	0	3
MINE ENVIRONMENTAL ENGINEERING-II					

Course Objectives: Understand process of spontaneous heating, fires, explosion, inundation and adverse effects, rescue and recovery operation and standards of lighting arrangement.

UNIT – I:
Mine Fires: Classification, surface and underground fires, Prevention and control of underground fires, fire fighting and its organization, study of atmosphere behind sealed off areas, re-opening sealed off areas.

UNIT-II:
Spontaneous heating: Mechanism, factors governing spontaneous heating, stages of spontaneous heating, symptoms of spontaneous heating in underground mines, detection and prevention of Spontaneous heating, interpretation of mine air samples, Graham's index, and problems on Graham's index. Incubation period

UNIT – III:
Explosions: Types, mechanism, ignition temperature, lag on ignition, Causes and preventive measures of underground explosions (Fire damp and coal dust explosions) causes and preventive measures. Stone dusting, stone dust and water barriers, investigation after explosion. Dust production in mines and its control. Health hazards. Sampling and assessment of airborne dust.

Mine Rescue: Mine rescue and equipment, Short distance apparatus. Self-contained oxygen – breathing apparatus, Self rescuers, gas masks,rescue stations, rescue organization, reviving apparatus. Rescue and recovery work in connection with fire, explosions, and inundations. Basic principles of risk management.

UNIT – IV:
Inundations: Causes of mine inundations from surface and underground sources. Dams: Types, design, construction of water dams. Dewatering water logged workings, Precautionary and protective measures on surface and in underground when approaching old water logged areas and dewatering of water logged areas/workings, safety boring apparatus.

UNIT-V:
Mine Illumination/Mine Lighting:Technical terms in lighting and photometry, underground lighting, electric safety lamp, different types of portable lamps, methods of illumination in underground mines-Fixed system, mobile system. standards of mine lighting in opencast and underground mines, Illumination survey lamina and luminance calculations.

Course outcomes: prevent occurrence of disaster, familiar with rescue and recovery operation from fire, explosion inundation disasters

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TEXT BOOKS:

1. *Elements Of Mining Technology Vol 2, Dj Deshmukh, Denett& Co publisher,2014*
2. *Mine Environment and Ventilation, G. B. Misra, Oxford University Press, 1986*

REFERENCE BOOKS:

1. M ine fire and spontaneous heating, S. P. Banarjee
2. Mine Ventilation – Penman
3. Ramulu M.A “Mine fires, explosions, rescue, recovery and inundations”
4.Fires in coal Mines L.C Kaku

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III Year - I Semester		L	T	P	C
		3	0	0	3
ROCK MECHANICS					

Course Objectives: To study about application of Rock Mechanics in mining and allied engineering. To study Physico-Mechanical properties of rocks, non-destructive testing methods, time dependent properties of rock.To study the theories of failure and approaches used for open pit and underground designs.

UNIT-I:
Introduction: Definition of some important terms used in rock mechanics, application of rock mechanics in mining, introduction to stress analysis, stresses in two and three dimensions, Mohr's circle.

UNIT -II:
Physical properties of rocks and rock indices: Physical properties of rocks — density, porosity, moisture content, permeability, water absorption various indices of rocks like swell index, slake durability index, impact strength index, protodynakov index, etc., thermal conductivity, hardness, durability, rock mass classification.

UNIT -III:
Mechanical properties of rocks :
A:Preparation of test specimens, laboratory determination of mechanical properties of rocks - compressive strength, tensile strength, flexural strength, shear and triaxial strength,
B**:** Modulus of elasticity, Poisson's ratio, Mohr's envelope, effect of various parameters on the strength of rocks, in-situ strength, post failure behavior of rocks.

UNIT -IV:
Non-destructive testing methods and time dependent properties of rocks: Dynamic wave velocities, dynamic elastic constants, their determination in the laboratory, application in mining, time dependent properties of rocks, creep, mechanism of creep of rocks — different stages, rheological models.

UNIT -V:
Theories of failure of rocks &Design of underground workings**:** Different theories of failure of rocks, modes of failure - Griffith, Coulumb-Navier, Mohr's, Hoek-Brown, empirical criteria, etc. and their field of applications. Stress distribution in underground workings

TEXT BOOKS:
1. Vutukuri, V.S., and Lama, R.D., Handbook on Mechanical Properties of Rocks, Vol. I, II, III and IV, Transtech Publication, Berlin, 1974/78.
2. Peng, S.S., Ground Control, Wiley Interscience, New York, 1987.

REFERENCE BOOKS:
1. Obert, L. and Duvall, W.I., Rock Mechanics and Design of Structure in Rock John Wiley andSons Inc., New York, 1967.
2. Brady, B.H.G. and Brown, S.T., Rock Mechanics, Wiley Interscience, 1985.
3. Hoek, E., and Brown, S.T., Underground Excavations in Rocks, Institute of Mining

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III Year - I Semester		L	T	P	C
		3	0	0	3
OPEN ELECTIVE- I **WATER WASTE MANAGEMENT**					

Course Objectives:

- Outline planning and the design of waste water collection ,conveyance and treatment systems for a community/town/city
- Provide knowledge of characterization of waste water generated in a community
- Impart understanding of treatment of sewage and the need for its treatment
- Summarize the appurtenance in sewage systems and their necessity
- Teach planning and design of septic tank and imhoff tank and the disposal of the effluent from these low cost treatment systems
- Effluent disposal method and realize the importance of regulations in the disposal of effluents in rivers

UNIT-I:

Introduction to Sanitation-Systems of sanitation- relative merits and demerits - collection and conveyance of waste water - classification of sewerage systems-Estimation of sewage flow and storm water drainage- fluctuations-types of sewers- Hydraulics of sewers and storm drains-design of sewers- appurtenances in sewerage- cleaning and ventilation of sewers

UNIT-II:

Pumping of wastewater: Pumping stations-location- components- types of pumps and their suitability with regard to wastewaters.

House Plumbing: Systems of plumbing-sanitary fittings and other accessories-one pipe and two pipe systems-Design of building drainage

UNIT-III:

Sewage characteristics-Sampling and analysis of waste water-Physical, chemical and Biological examination-measurement of BOD & COD- BOD equations

Treatment of sewage: Primary treatment- Screens-grit chambers- grease traps- floatation-sedimentation-design of preliminary and primary treatment units.

UNIT-IV:

Secondary treatment: Aerobic and anaerobic treatment process -comparison.

Suspended growth process: Activated sludge process, principles, design and operational problems, modifications of Activated sludge processes, Oxidation ponds, Aerated Lagoons.

Attached Growth process: Trickling Filters-mechanism of impurities removal-classification-design - operation and maintenance problems. RBCs. Fluidized bed reactors

UNIT-V:

Miscellaneous Treatment Methods: Nitrification and Denitrification- Removal of phosphates- UASB-Membrane reactors- Integrated fixed film reactors. Anaerobic Processes: Septic Tanks, Imhoff tanks-working principles and Design-disposal of septic tank effluent-FAB Reactors

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Bio-solids (sludge) management: Characteristics- handling and treatment of sludge-thickening- anaerobic digestion of sludge

Disposal of sewage: Methods of disposal- disposal into water bodies- Oxygen sag Curve- Disposal into sea-disposal on land- sewage sickness

Course Outcomes:

By the end of successful completion of this course, the students will be able to:

- Plan and design the sewerage systems
- Characterization of sewage
- Select the appropriate appurtenances in the sewerage systems
- Select the suitable treatment flow for sewage treatment
- Identify the critical point of pollution in a river for a specific amount of pollutant disposal into the river

TEXT BOOKS:

1. Waste water Engineering Treatment and Reuse by Metcalf & Eddy, Tata McGraw- Hill edition.
2. Elements of Environmental Engineering by K.N. Duggal, S.Chand& Company Ltd. New Delhi, 2012.

REFERENCE BOOKS:

1. Environmental Engineering-II: Sewage disposal and Air pollution Engineering , by Garg, S.K.,: Khanna publishers
2. Sewage treatment and disposal by Dr.P.N.Modi& Sethi.
3. Environmental Engineering, by Ruth F. Weiner and Robin Matthews- 4th Edition Elsevier, 2003
4. Environmental Engineering by D. Srinivasan, PHI Learning private Limited , New Delhi,2011.
5. Environmental Engineering by Howard S.Peavy , Donald R. Rowe, Teorge George Tchobanoglus- Mc-Graw-Hill Book Company, New Delhi, 1985
6. Wastewater Treatment for pollution control and Reuuse, by soli.JAreivala, sham R Asolekar, Mc-GrawHill, New Delhi; 3rd Edition
7. Industrial water & wastewater management by KVSG MuraliKrishna

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		3	0	0	3
OPEN ELECTIVE- I **ENVIRONMENTAL IMPACT ANALYSIS**					

Course Objectives: This course introduces influencing factors of environmental.

UNIT I:
Sustainable development: Ecology, Sustainable activity and Control Measures, Land environment, Land degradation due to mining; Physical and biological reclamation.
Ecology: Introduction to ecology, ecosystem structures and functions. Sustainable development,environmental carrying capacity - concepts & principles; Base line studies, pre-mining status of environment.

UNIT II:
Water pollution: Study of surface sources of water. Global hydrological cycle; Self purification mechanism, sources of water pollution, important parameters–pH, turbidity, oil & grease, nitrates, DO, BOD, COD; Eutrophication, deoxygenation, Study of water table. Acid mine drainage and heavy metal pollution–preventive and control measures.

UNIT III:
Air, Noise and Vibration pollution:
A: Air pollution due to dust: Atmospheric composition and meteorology; Sources of air pollution – Pollution due to Drilling and Blasting, HEMM, Air pollution due to mine gases, mine fires, mine explosions, point and non-point pollutions; Emission factors; Control measures – extraction, suppression and consolidation of dust.
B**:** Noise and vibration: Basic concepts, sources, monitoring and control measures. Vibration Reduction techniques.Waste disposal, Fuels, oils and Hazardous materials produced due to mining and dealing them.

UNIT IV:
Environmental administration: The basis for Environmental laws. Laws related to mining environment; National procedure for accreditation of laboratories and consulting organizations, Different functional area experts, Environmental co-ordinators. Impact assessment. Impact management. Environmental clearance of projects procedure for mines and projects.

UNIT V:
Human Angle to the Mine Environment: Public participation in project approvals. Project effected persons, Socio Economic Study. Corporate Social Responsibility: Concepts and principles.140
Mine closure: Concepts and principles. Audit of Mine Closure activities. A case study.

TEXT BOOKS:
1**.** Environmental impact assessment: a guide to best professional practices 2011 by charles H. Eccleston
2. Water pollusion , Agarwal S. K, New Age International (P) Limited, 2009

REFERENCE BOOKS:
1. Fundamentals of air pollution by daniel vallero
2. Fundamentals of noise and vibration by frank fahy, john walke

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		3	0	0	3
OPEN ELECTIVE- I **DISASTER MANAGEMENT AND MITIGATIONS**					

Course Objectives: To learn the principles of systematically designing and using large scale Database Management Systems for various applications.

UNIT I Introduction - Concepts and definitions: disaster, hazard, vulnerability, resilience, risks severity, frequency and details, capacity, impact, prevention, mitigation.

UNIT II Disasters- Disasters classification; natural disasters (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportation accidents, terrorist strikes, etc.); hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility.

UNIT III Disaster Impacts- Disaster impacts (environmental, physical, social, ecological, economic, political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazard locations; global and national disaster trends; climate change and urban disasters.

UNIT IV Disaster Risk Reduction (DRR) - Disaster management cycle – its phases; prevention, mitigation, preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Post disaster environmental response (water, sanitation, food safety, waste management, disease control, security, communications); Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority

UNIT V Disasters, Environment and Development- Factors affecting vulnerability such as impact of developmental projects and environmental modifications (including of dams, landuse changes, urbanization etc.), sustainable and environmental friendly recovery; reconstruction and development methods.

Text Books:

1. Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
2. Singh B.K., 2008, Handbook of Disaster Management: Techniques & Guidelines, Rajat Publication.
3. Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation

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Reference Books:

1. http://ndma.gov.in/ (Home page of National Disaster Management Authority)
2. http://www.ndmindia.nic.in/ (National Disaster management in India, Ministry of Home Affairs).
3. Disaster Medical Systems Guidelines. Emergency Medical Services Authority, State of California, EMSA no.214, June 2003
4. Inter Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC

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III Year - I Semester		L	T	P	C
		3	0	0	3
MINING MACHINERY AND MECHANIZATION-I					

Course Objectives:
To understand the electrical layouts and power distribution in mine, rope haulage layouts, technical details and applications. To study the various modes of transport means and electrical circuits, the types of pumps, installations and design calculations. And to know the various statutory aspects like CMR, MMR and the relevant DGMS circulars related to this course.

UNIT I
Introduction: Differenttypes of motivepowerusedinmines–theirfieldsof application,relativemeritsand demerits; transmission and distribution of compressed air in mines, compressed air drills. Elements of the transport system, classification and techno-economic indices. 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.

UNIT II
Rope Haulage: RailTrackandtubs–gauge;layout,curves,turnoutsandcross-over,trackmaintenance,main features of rolling stock like tubs, mine cars man riding cars and tipplers;Typesofropehaulages–merits,demeritsandfieldsofapplication,constructionalfeatures, safety appliances and rope haulage calculations.

UNIT III
Other Transport Systems-I: 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;
Other Transport Systems-I: shuttle cars, underground trucks, load-haul- dumpers, SDL vehicles, aerial ropeways, gravity transport, principles of hydraulic & pneumatic transportation and their fields of application, electric layouts, man-riding systems.

UNIT IV
Pumping & Conveying: 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.
Face haulage and conveyors – Various types of conveyors, Scraper chain conveyors, AFCs, belt conveyors, cable belt conveyor, shaking and vibrating conveyors, armoured flexible conveyors, high angle conveying, electrical layouts. Numerical problems in conveyors

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.

Course Outcomes: The students will have basic knowledge on motive power used in mines, pumping, rope haulage and face haulage & conveying transport systems. They also will know about mine electrical engineering in all statutory aspects.

TEXT BOOKS:

1. Cherkassky, B.M., Pumps, Fans, Compressors, MIR Publishers, 1980.
2. Walker, S.C., Mine Winding andTransport, Elsevier, 1988.

REFERENCE BOOKS:

1. Karelin N.T., MineTransport, Orient Longmans, N. Delhi.
2. Mason, E., Coal Mining Series, Mining Machinery, Virtue and Company Ltd., London.
3. Statham, I.C.F., Coal Mining, Vol. I, II, III and IV, Caxton Eastern Agencies, Calcutta.
4. Deshmukh D.J.,ElementsofMiningTechnology,Vol.IIIEMDEEPublishers, Nagpur,1989.
5. Universal Mining School - Lecture notes, cardiff, U.K

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III Year - I Semester		L	T	P	C
		0	0	3	1.5
ADVANCED ENGLISH COMMUNICATION SKILLS LAB					

1. Introduction

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context. The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

i) Gather ideas and information, to organize ideas relevantly and coherently.

ii) Engage in debates.

iii) Participate in group discussions.

iv) Face interviews.

v) Write project/research reports/technical reports.

vi) Make oral presentations.

vii) Write formal letters.

viii) Transfer information from non-verbal to verbal texts and vice versa.

ix) To take part in social and professional communication.

2. Course Objectives:

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

i) To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.

ii) Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

i) Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.

ii) Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.

iii) Group Discussion – dynamics of group discussion , intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.

iv) Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.

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v) Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.

vi) Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.

vii) Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

The English Language Lab shall have two parts:

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

ii) The Communication Skills Lab with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

iii) P – IV Processor

a) Speed – 2.8 GHZ
b) RAM – 512 MB Minimum
c) Hard Disk – 80 GB

iv) Headphones of High quality

5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software:

i) Clarity Pronunciation Power – part II

ii) Oxford Advanced Learner's Compass, 7th Edition

iii) DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.

iv) Lingua TOEFL CBT Insider, by Dreamtech

v) TOEFL & GRE(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

The following software from 'train2success.com'

i) Preparing for being Interviewed,
ii) Positive Thinking,
iii) Interviewing Skills,
iv) Telephone Skills,
v) Time Management
vi) Team Building,
vii) Decision making

English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge6.

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Books Recommended:

1. Effective Technical Communication, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. A Course in English communication by Madhavi Apte, Prentice-Hall of India, 2007.
3. Communication Skills by Leena Sen, Prentice-Hall of India, 2005.
4. Academic Writing- A Practical guide for students by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. Body Language- Your Success Mantra by Dr. Shalini Verma, S. Chand, 2006.
7. DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice, New Age International (P) Ltd.,Publishers, New Delhi.
8. Books on TOEFL/GRE/GMAT/CAT by Barron's/cup
9. IELTS series with CDs by Cambridge University Press.
10. Technical Report Writing Today by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. Basic Communication Skills for Technology by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. Communication Skills for Engineers by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. Objective English by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. Cambridge Preparation for the TOEFL Test by Jolene Gear & Robert Gear, 4th Edition.
15. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 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 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.

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III Year - I Semester		L	T	P	C
		0	0	3	1.5
MINE SURVEYING II LAB					

Course Objectives:
To familiarize with the various surveying instruments and methods.

List of experiments:
1. Correlation by two shafts by total station.
2. Correlation by single shaft by total station.
3. Correlation by single shaft weiss quadrilateral by total station.
4. Curve ranging offsets from long chord
5. Curve ranging Ranking methods
6. Curve Tachometric methods
7. Curve ranging total station method.
8. Reading mine plans
9. Determination of K and C in Tachometric Survey
10. Finding Horizontal &Vertical distance by Tachometer
11. Study of opencast map.
12. Study of underground map.

Course Outcomes:
At the end of the course, students will be able to
1: Conduct the correlation by two shaft co-planar method.
2: Conduct the correlation by shaft weisbatch methods and shaft Weiss quadrilateral methods.
3: Set a curve by ranging offsets from long chord and ranging ranking method.
4: Set a curve by Tachometric and ranging Tachometric methods.
5: Conduct the weisbatch method

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF MINING ENGINEERING

III Year - I Semester		L	T	P	C
		0	0	3	1.5
ROCK MECHANICS LAB					

Course Objectives:
To study the various of methods to determine the properties of rocks. To study the operation of various instruments and equipment.

List of experiments:
1. Determination of RQD of rocks.
2. Determination of Protodyaknov index of a given rock sample
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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. Study of different types of supports used in mines
12. Study of design of mine pillars.

Course Outcomes:
At the end of the course, students will be able to
1:Determine the properties of rocks
2:Knowledge of various instruments and equipment.
3:Design the supports for mine openings.
4:Design mine pillars.
5**:** Knowledge of various equipments.

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III Year - I Semester		L	T	P	C
		1	0	0	0.5
CORPORATE SOCIAL RESPONSIBILITY IN MINING					

UNIT-I

Concept of Corporate Responsibilty A perspective for Mining Industry. Importance of CORPORATE SOCIAL RESPONSIBILITY for sustainable development

Concept of Sustainable development for mining industry-Sustainable development –a perspective of mineral professional community. International sustainability reporting and tools for measurement of sustainability. Milos statement on Sustainable mineral industry. Legislative measures for sustainable development-

UNIT-II

Current status of CORPORATE SOCIAL RESPONSIBILITY and their impact on sustainability. Mining and environmental frame work , National mineral policies in mineral based countries. Indian national mineral policy, its historical development with the changing goals and sustainable practices. Issues of leases , auctions for mineral development in India.

UNIT-III

MMRD Act and its provisions on CORPORATE SOCIAL RESPONSIBILITY, District Mineral Fund. Companies Act and the provisions for all stake holders in mining areas and their development. Concept of Triple Bottom Line for achieving better results in CORPORATE SOCIAL RESPONSIBILITY.

UNIT-IV

Mine water- Water conservation Acts and rules in India.New Initiatives in mines. Underground mine water, Water pollution and control measures, Phyto-remediation, Sewage and effluent treatment plants, their use and benfits.Waste management- processing of overburden material for underground stowing and innovative methods for utilisation of waste from mines.Mine closure plan- Collection and disbursement of Mine closure fund for both open pit and underground mines in India.

UNIT-V

Best mining practices of CORPORATE SOCIAL RESPONSIBILITY in the world and India..- Case studies .Innovative practices for achievement and recent guidelines from MOEF&CC.

TEXT BOOKS:

1.Corporate Social Responsibility in the Mining Industries *By Natalia Yakovleva* Copyright Year 2005

2.ISBN 9781138255630 Published March 6, 2017 by Routledge 324 Pages

REFERENCE BOOKS:

MMRD Act 2015 and amendments, Ministry of Mines
Mineral concession Rules
Guidelines of MOEF and Climate change,- Annual reports of MOEF&CC, Ministry of Mines, Ministry of Coal in India,
Sustaianble mining practices –A global perspective by Vasudevan Rajaram, Subijoy Dutta, Krishna Paremeswaran,ISBN-90-5809-689-0