

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

**Semester – VI**

**MIA 601- MINING ENVIRONMENT-II**

<b>MIA 601</b>	<b>MINE ENVIRONMENT-II</b>	<b>2L:1T:0P</b>	<b>3 credits</b>	<b>3Hrs/Week</b>
----------------	----------------------------	-----------------	------------------	------------------

**Course objectives:**

- To study the measure and monitor different types of gases in mines.
- To study the theory of Mine Fans.
- To study ventilation survey
- To study the handling of rescue apparatus
- To study the dust sampling in mines.

- An ability to measure and monitor different types of gases in mines.
- An ability to do ventilation survey.
- An ability to handling of rescue apparatus.
- An ability to dust sampling in mines.

**UNIT 1: VENTILATION SYSTEMS AND PLANNING (10 Hours)**

Calculation of pressure and quantity requirements, network problems, Hardy-Cross method, Ventilation planning and economic analysis, central and boundary ventilation, ascensional and descensional ventilation, antitropical, homotropical ventilation

**UNIT 2: MECHANICAL VENTILATION - I (6 Hours)**

Theory of mine fans, Types of mine fans, their characteristics & suitability, Process for selection of mine fans

**UNIT 3: MECHANICAL VENTILATION – II (8 Hours)**

Auxiliary and booster fans, series and parallel operation of fans, fan drift and evasee, forcing and exhaust ventilation, fan reversal, ventilation in long headings

**UNIT 4: VENTILATION SURVEY (8 Hours)**

Object of ventilation survey, instruments for the measurement of pressure, velocity, and quantity of air.

**UNIT 5: MINE DUST (10 Hours)**

Classification, physiological effects, measurement of dust concentration, dynamics of small particles, sampling of air borne dust, prevention and suppression of dust

**Reference Books:**

1. Mine Environment - G.B. Mishra
2. Elements of Mining Technology, Vol.2, D. J. Deshmukh
3. Underground Mine Environment, M. Mcpherson
4. Subsurface Mine Ventilation, H.L. Hartman

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

<b>MIA 601</b>	<b>MINE ENVIRONMENT-II</b>	<b>0L:0T:2P</b>	<b>1 credits</b>	<b>2Hrs/Week</b>
----------------	----------------------------	-----------------	------------------	------------------

**List of experiments (Extendable):**

1. Study of installation of axial flow fan.
  2. Study of installation of centrifugal flow fan.
  3. Study of installation and positioning of booster fan.
  4. Study of characteristic curve of different fans and their comparison
  5. Study of principal and working of vane anemometer
  6. Study of principal and working of velometer.
  7. Study of principal and working of pitot tube.
  8. Study of central and boundary ventilation system.
  9. Study of gravimetric dust sampler
  10. Study of thermal precipitator dust sampler
-

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

**MIA- 602 UNDERGROUND METAL MINING**

<b>MIA- 602</b>	<b>UNDERGROUND METAL MINING</b>	<b>2L:1T:0P</b>	<b>3 credits</b>	<b>3Hrs/Week</b>
-----------------	---------------------------------	-----------------	------------------	------------------

**Course objectives:**

- Understand the construction of the mine developments to the deposit.
- Understand the different methods of extraction of ore blocks in metal mine.
- Understand the modern methods of extraction of ore blocks in metal mine.
- Understand the problems, method of extraction in deep mining and machineries used.

**Course outcomes:** At the end of the course the student will be able to:

- Ability to construct the mine developments to the deposit
- Ability to extract the ore block by different methods.
- Ability to extract the ore block by modern methods.
- Ability to identify the machineries used, methods of extraction and to analyse the problems in deep underground mine.

**UNIT-I GENERAL( 8 Hours)**

Status and scope of Underground metal mining methods; Definitions of important terms used in underground metal mining methods. Classification of mining methods; Factors affecting the choice of mining methods.

**UNIT-II DEVELOPMENT (10 Hours)**

Mode of access; Variables affecting the choice of mode of access; Crosscuts, Levels, Raises, Winzes, Ore passes; Their method of drivages with the description of various unit operations; Introduction to Raise boring and introduction to tunnel boring .

**UNIT 3: STOPING METHODS-I (8 Hours)**

Overhand, Underhand and Breast stoping methods; Open stoping; Vertical Crater Retreat method; Sub level stoping Room and Pillar method, Resuing method.

**UNIT 4: STOPING METHODS-II (6 Hours)**

Shrinkage stoping; Cut and fill stoping, Introduction to Square set stoping, Sub level caving, Block caving, Top slicing.

**UNIT 5: SUPPORT SYSTEMS (10 Hours)**

Pillars; Back fill, Cable bolting, Steel Rock bolting, Grouting, Shotcreting etc. Code of timbering rules.

**REFERENCE BOOKS:**

1. Elements of Mining Tech. Vol II by D. J. Deshmukh
2. S M E Handbook
3. Underground mining methods, Hustrulid
4. Introduction to Mining, H. L. Hartman

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

<b>MIA-602</b>	<b>UNDERGROUND METAL MINING</b>	<b>0L:0T:2P</b>	<b>1 credits</b>	<b>2Hrs/Week</b>
----------------	---------------------------------	-----------------	------------------	------------------

**LIST OF EXPERIMENTS:**

1. Study of Underground metal mining methods.
2. Study of method of drivages
3. Study of Underhand and Breast stoping methods
4. Study of Cut and fill stoping methods
5. Study of Steel Rock bolting

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

**Program Elective - II**  
**MIA-603(A) SURFACE MINING**

<b>MIA-603(A)</b>	<b>SURFACE MINING</b>	<b>3L:1T:0P</b>	<b>4 credits</b>	<b>4Hrs/Week</b>
-------------------	-----------------------	-----------------	------------------	------------------

**Course objectives:**

- Understand the basic concept of surface mining and associated methods.
- Learn various aspects of drilling and blasting practices in open cast mines.
- Learn application of various heavy earth moving machinery and their selection criteria.

**Course outcomes:**

At the end of the course the student will be able to:

- An understanding of various design parameters associated with different methods of surface mining.
- Ability to design blasting round to have desired productivity with minimum damaging effect.
- Ability to select appropriate equipment for excavating, loading and transporting material in opencast mines.

**UNIT-I**

**OPEN PIT DESIGN AND LAYOUTS (10 Hours)**

Classification of surface mining method mineral deposits suitable for open pit mining, Important parameters of Open pit design; Design of Benches, Ultimate pit, Stripping ratio, Break even stripping ratio, Different methods of opening up the deposits; Box cuts, internal and external box cut, Methods of driving Box cuts; Layout of open pits; Layout of waste dumps, unit operations in opencast mining.

**UNIT-II**

**ROCK DRILLING (10 Hours)**

Theory of Rock Drilling, Different Types of Drill Machines Used in Open Pits; Rotary, Percussive and Rotary Percussive Drilling, Selection of Drill Machines on the basis of Drill ability; Computation of Productivity of Drill Machines; Inclined Drilling; their Advantages and Disadvantages.

**UNIT-III**

**PIT PREPARATION (6 Hours)**

Dozers, Scrapers, Front-End Loaders, Grader, Back Hoe, etc.; their Construction, Operation, Suitability and applicability; Calculation of Their Productivity.

**UNIT-IV**

**LOADING AND EXCAVATION (10 Hours)**

Different Types of Excavators used in Open Pits; Shovel, Dragline, Hydraulic Excavators, Multi Bucket Excavators, their Construction, Specifications, Operation, Suitability and Applicability; Calculation of their Productivity.

**UNIT-V**

**TRANSPORT IN OPEN PITS (6 Hours)**

Automobile Transport, Rail Transport and Conveyors; their Suitability; Computation of their Productivity; Automation in Open Pit transport such as Truck Dispatch System.

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**REFERENCE BOOKS:**

1. Surface Mining: Pfeleider
2. Mining Equipment: Boki
3. SME handbook: Hartman
4. Surface Mining Technology: S. K. Das
5. Rock Slope Engineering Hock and Bray, The Institution of Mining and Metallurgy, 1981
6. Opencast Mining R.T. Deshmukh M. Publications, Nagpur 1996

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**MIA-603(B) MINE VENTILATION AND CLIMATE ENGINEERING**

<b>MIA-603(B)</b>	<b>MINE VENTILATION AND CLIMATE ENGINEERING</b>	<b>3L:1T:0P</b>	<b>4 credits</b>	<b>4Hrs/Week</b>
-------------------	---	-----------------	------------------	------------------

**Course objectives:**

- To gain insights of mine air, mine climate and mine ventilation
- To comprehend the ventilation requirements of an underground mine.
- Analysis of mine air, mine climate, natural ventilation, mechanical ventilation and to conduct ventilation survey.

**Course outcomes:**

At the end of the course the student will be able to:

1. To be familiar with the mine air composition, climate and physiological effects
2. An ability to estimate the requirements of ventilation in an underground mine
3. An ability to analyze the components of mine air sample, design natural and mechanical ventilation and conduct ventilation survey.
4. An ability to decide and design ventilation system for underground mine.

**UNIT-1**

**Composition Of Mine Atmosphere (10 Hours)**

Mine gases - production, properties, effects and detection; sampling and analysis of mine air; methane content; methane drainage; methane layering; flame safety lamp and its uses; methanometer; radon gas and its daughter products; continuous monitoring of gases

**UNIT- 2**

**Heat And Humidity (6 Hours)**

Sources of heat in mines; effects of heat and humidity; psychrometry, kata thermometer; heat stress, air-conditioning

**UNIT-3**

**Natural Ventilation (6 Hours)**

Seasonal variations, calculation of NVP from air densities and thermodynamic principles

**UNIT- 4**

**Air Flow Through Mine Openings (10 Hours)**

Laws of flow, resistance of air ways, equivalent orifice, distribution of air; flow control devices; automation and remote control of ventilation installations; ventilation surveys; permissible air velocities in different types of workings

**UNIT- 5**

**Mechanical Ventilation (10 Hours)**

Types of mine fans; theory, characteristics and suitability of fans; selection, testing and output control; fans in series and parallel; forcing and exhaust configurations; reversal of flow; fan drifts, diffusers, evasees

**Reference Books:**

1. Mine Ventilation : G. B. Mishra
2. Sub-surface mine ventilation : Macperson
3. Mine ventilation and air-conditioning in mines : Hartman
4. Element of Mining Technology Vol 2 : D. J. Deshmukh

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**Program Elective-III MIA-604(A) GROUND CONTROL**

<b>MIA-604(A)</b>	<b>GROUND CONTROL</b>	<b>3L:0T:0P</b>	<b>3 credits</b>	<b>3Hrs/Week</b>
-------------------	-----------------------	-----------------	------------------	------------------

- Knowledge of underground excavation ; stability around the excavation, subsidence and stress around the excavation
- To comprehend the rock mass classification and support system for underground excavation
- To monitor and predict subsidence and underground disasters
- To design single and multiple opening and support system for underground excavations.

**Course outcomes:** At the end of the course the student will be able to:

- To be familiar with the types of underground excavation and to stabilize the excavation.
- Support the rock mass based on different properties of rock.
- Ability to estimate the subsidence and monitor the disasters.
- To design an opening and support system for underground.

**UNIT-1 DESIGN OF MINE OPENING (10 Hours)**

Stress distribution around narrow and wide openings. Extent of failure around mine openings. Determination of size of opening and extent of failure.

**UNIT-2 DESIGN OF PILLARS (6 Hours)**

Mine pillars and their classification; pillar mechanics; Design of mine pillars and shaft pillar: stresses acting on pillars; stress distribution in pillars; mechanics of pillar failure; interaction of pillar, floor and roof; design of rooms and pillars; design of barrier and yield pillars, Numerical Problems.

**UNIT-3 SUBSIDENCE (10 Hours)**

Theories of subsidence. Factors affecting subsidence. Sub-critical, critical and super-critical widths of extraction. Subsidence prediction and control. Design of shaft pillar.

**UNIT-4 SLOPES (10 Hours)**

Types of slope failure. Analysis of slope failure. Factors affecting slope stability. Drainage and reinforcement of slopes. Monitoring of slopes. Stability of waste dump.

**UNIT-5 ROCK BURSTS (6 Hours)**

Phenomenology of rockbursts and coal bump; causes, prediction, monitoring and control of rockbursts; gas outbursts.



**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**REFERENCE BOOKS:**

1. Elements of Mining Tech. Vol I,II,III by D. J. Deshmukh
2. Coal Mine Ground Control by Syd S Peng
3. Underground Excavations in rock, E. Hoek and E.T. Brown, IMM, 1980
4. Underground Excavation in Hard Rock ,E. Hoeket. Al, Oxford and IBH 1995

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

**MIA-604(B) MINE SAFETY ENGINEERING**

<b>MIA-604(B)</b>	<b>MINE SAFETY ENGINEERING</b>	<b>3L:0T:0P</b>	<b>3 credits</b>	<b>3Hrs/Week</b>
-------------------	--------------------------------	-----------------	------------------	------------------

**Course Preambles:**

- To learn the level of risk associated with mining, risk assessment and management .
- To know the occupational diseases, mine disasters and mitigation.
- Gain insights of hazards and accidents of different working conditions in industries.
- Have knowledge of occupational health and safety in different industries

**Course Outcome:**

At the end of the course the student will be able to:

- The students will have deep knowledge about the mine accidents, disaster, disease and mine safety with risk assessment, mitigation and management.
- Be familiar with hazards in different industries.
- Decide precautions of safety and health in different occupation.

**UNIT 1:(10 Hours)**

Safety scenario in Indian mines., Safety management and organization. Permit to work-safety in operations, confined spaces, Safety in painting, welding, cutting and soldering operations, Safety in finishing operations like cleaning, polishing and buffing and related hazards, Selection, care and maintenance of associated equipment's and instruments, Maintenance of these machines and selection of equipment w.r.t safety, Shot blasting.

**UNIT 2: (10 Hours)**

Causes of accidents, accident report. ,Human behavioural approach in safety Heat treatment operations, Heat treatment methods, Hazards and safety measures, Control measures, Safety in handling medium\_ Disposal methods, Power presses(all types)Shearing, Bending, Rolling, Drawing, Turning, Boring, Milling, Planning, Grinding.

**UNIT 3: (8 Hours)**

Accident analysis and control. Safety in demolition operation, Safety in underground works such as Excavation, Drilling and Blasting, Tunnelling, Pneumatic, Trenching, Safety in working of fragile roof.

**UNIT 4: (8 Hours)**

Cost of accident., Emergency organisation for disaster management. Classification of accidents, statistics, causes and preventive measures of various accidents; Accident enquiry report for accidents due to roof fall, blasting, machinery failure etc.

**UNIT 5: (6 Hours)**

Systems engineering approach to safety, techniques used in safety analysis. Introduction, Hot working of metals, Cold working of metals, Foundry operations, Steps in casting process, Different types of furnaces, Process wise hazards and safety measures in casting, Major health hazards and safe methods in foundry,

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**REFERENCE BOOKS:**

1. Mines Act-1952 & Mines Rules-1955 L. C. Kaku.
2. Vocational Training Rules L. C. Kaku.
3. Mine Accidents S.J. Kejeriwal

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**Open Core Elective - II**  
**MIA -605(A) MINE DEVELOPMENT**

<b>MIA-605(A)</b>	<b>MINE DEVELOPMENT</b>	<b>3L:0T:0P</b>	<b>3 credits</b>	<b>3Hrs/Week</b>
-------------------	-------------------------	-----------------	------------------	------------------

- Design tunnels, rock support and grouting and evaluate the most important issues in the procedure
- To make students aware about the concept of excavation engineering and its relevance to mining
- To be familiar with the various methods for opening up of deposits.
- To understand the technical details of various unit operations involved in shaft sinking.
- To learn various methods of shaft sinking and Tunneling methods.

**Course outcomes:**

At the end of the course the student will be able to:

- The students will gain technical knowledge on stages of mining and methods of development.
- They will be able to design various drilling patterns used in drivage of adit, shaft, incline, drives, crosscut and tunnel.
- They will be able to identify, formulate and solve engineering problems in shaft sinking.
- They will possess ability to use the techniques, skills, and modern engineering tools necessary for mine development practice.
- Design tunnels, rock support and grouting and evaluate the most important issues in the procedure
- Students will acquire knowledge about excavation techniques and their selection

**UNIT I INTRODUCTION TO MINING (10 Hours)**

History of mining, contribution of mining to civilization and national economy Indian mineral resources and world status, role of mining engineers in industry. Introduction to opencast and underground coal & metalliferous mining – selection criteria, comparison. Modes of entry into deposits for underground mining – shafts, inclines, adits, etc.

**UNIT II INTRODUCTION TO DRILLING (8 Hours)**

Principles of drilling, methods, selection, applications and limitations, drill bits, flushing methods, fields of application, exploration and production drilling, drilling in underground workings, variables affecting the performance of drilling, novel methods of drilling.

**UNIT III SHAFT SINKING (10 Hours)**

Selection of site and size, sinking methods, support system, ventilation, lighting and drainage arrangements during sinking, material handling and safety in sinking shafts. Introduction to piling, caisson and freezing methods - cementation method - widening and deepening of shafts. Modern techniques of shaft sink – shaft boring, design of shaft insets, pit bottom excavation and shaft raising.

**UNIT IV INTRODUCTION TO EXPLOSIVES AND BLASTING (8 Hours)**

Types of explosives, fuses, detonators and other accessories, alternatives to explosives, cause of accidents and safety precautions, drilling and blasting pattern for underground excavations, merits, demerits and limitations of blasting. Storage and transport of explosives.

**UNIT V DRIFTING AND TUNNELING (6 Hours)**

Drivage of drifts, organization and cycle of operations, supporting of development workings, modern methods of drifting, tunneling, road heading and tunnel boring.

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering &**  
**Technology Department of Mining Engineering**

**REFERENCE 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, Vidyaseva Prakashan, Nagpur, 1994.
3. Chugh, C.P., Drilling Technology Hand Book, Oxford & IBH Publications, 1994.
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.

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

**MIA-605(B) – MINE RECLAMATION**

<b>MIA-605(B)</b>	<b>MINE RECLAMATION</b>	<b>3L:0T:0P</b>	<b>3 credits</b>	<b>3Hrs/Week</b>
-------------------	-------------------------	-----------------	------------------	------------------

**UNIT-I MINE RECLAMATION PROCESSES (10 Hours)**

Introduction and classification and types of Mine Reclamation processes, Salient features of the Mine Reclamation laws in India. Environmental Impact Assessment, Environmental Management Plan, Environmental Audit

**. UNIT-II Reclamation (8 Hours)**

Act of 1977 Under the Surface Mining Control and Reclamation Act of 1977, Abandoned Mine Lands Program, Clean Water act, Land rehabilitation, Environmental remediation

**UNIT-III MINE CLOSURE PLANNING (6 Hours)**

Introduction, predevelopment conditions, mine operation explained, Reclamation technologies and methods.

**UNIT -IV ENVIRONMENTAL IMPACT OF MINING (8 Hours)**

Introduction , Environmental impact of mining coal industry, Environmental impact of iron ore mining, Ecological impact of Explosives.

**UNIT-V LAND POLLUTION (10 Hours)**

Land pollution and land reclamation, land reclamation techniques, Physical and Biological reclamation, Mine Closure Plan.

**Reference Books:**

1. Air & Water Acts.
2. Forest Conservation acts.
3. Legislation in Indian Mines - A Critical appraisal by Rakesh and Prasad.
4. Environmental Impact of Mining By Down and Stokes.
5. Surface mining Technology By S.K. Das.

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

**MIA-606 Minor Project**

<b>MIA-606</b>	<b>Minor Project</b>	<b>0L:0T:4P</b>	<b>2 credits</b>	<b>4Hrs/Week</b>
----------------	----------------------	-----------------	------------------	------------------

**Course objectives:**

- To support independent learning and innovative attitude.
- To guide to select and utilize adequate information from varied resources upholding ethics.
- To guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly.
- To develop interactive, communication, organisation, time management, and presentation skills.
- To impart flexibility and adaptability.
- To inspire independent and team working.
- To expand intellectual capacity, credibility, judgement, intuition.
- To adhere to punctuality, setting and meeting deadlines.
- To instil responsibilities to oneself and others.
- To train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas.

**Course outcomes:** At the end of the course the student will be able to:

- Present the mini-project and be able to defend it.
- Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
- Habituated to critical thinking and use problem solving skills.
- Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
- Work in a team to achieve common goal.
- Learn on their own, reflect on their learning and take appropriate actions to improve it.

**Course content:**

The student should work in groups to achieve the aforementioned objectives and the outcomes.

Task/Process	Week	Evaluation	Marks For Term Work
Orientation of students by HOD/Project Guide	1st	-	-
Literature survey and resource collection	2nd	-	-
Selection and finalization of topic before a Committee*	3rd	Seminar-I	20
(Detailing and preparation of Project) Modeling, Analysis and Design of Project work	4th to 5th	-	20
Testing, improvements, quality control of project	6th to 10th - 11th	-	25

**SCHOOL OF ENGINEERING**  
**SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES**  
**Outcome based Curriculum for Undergraduate Degree Courses in Engineering & Technology**  
**Department of Mining Engineering**

Report Writing	12th to 15th		25
Presentation before a committee (including user manual, if any)	16th	Seminar-II	30

**Working schedule:**

**The faculty and student should work according to following schedule:**

Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff. The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.

**Action plan for Minor Project work and its evaluation scheme (Suggestive)**

\* Committee comprises of HOD, all project supervisions including external guide from Industry (if any)

**Note:** At every stage of action plan, students must submit a write up to the concerned guide.