

**PROGRAM STRUCTURE**  
**I SEMESTER**

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
1	171HS1T01	English - I		✓		Students are able to demonstrate communication skills express their thoughts fluently in both written as well as oral form of language which is very much essential for the career growth and enhances the language competency.
2	171BS1T01	Mathematics - I		✓		Students are able to demonstrate problem solving skills by modelling physical phenomenon using ordinary differential equations, system of linear equations in various engineering disciplines.
3	171HS1T02	Environmental Studies				
4	171BS1T03	Engineering Chemistry				
5	171ES1T02	Engineering Mechanics	✓			Students are able to acquire skills related to principles of friction, kinetics, kinematics, resolving forces, trusses etc which forms the crux of design sciences.
6	171ES1T01	Computer Programming	✓			Students are able to acquire programming skills related to Structured programming, arrays, functions, pointers, structures and unions that enable them to be employed as a software developer.
7	171HS1L01	English Communication Skills Lab - I		✓		Students are able to demonstrate technical skills to express fluently in both written as well as oral form of language which is very much essential for the career growth

8	171BS1L01	Engineering Chemistry Lab				
9	171ES1L01	Computer Programming Lab	✓			Students are able to acquire programming skills related to Structured programming, arrays, functions, pointers, structures and unions enabling them to be employed as a software developer.

## II SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
10	171HS2T03	English - II		✓		Students are able to demonstrate communication skills express their thoughts fluently in both written as well as oral form of language which is very much essential for the career growth and enhances the language competency.
11	171BS2T02	Mathematics - II		✓		Students are able to demonstrate problem solving skills by modelling physical phenomenon using partial differential equations and their applications in various engineering disciplines.
12	171BS2T06	Mathematics - III		✓		Students are able to demonstrate problem solving skills by evaluating improper and vector integrals applicable in various engineering disciplines.
13	171BS2T07	Engineering Physics				
14	171ES2T03	Engineering Drawing		✓		Students are able to acquire skills related to creating technical drawings digitally by making a model of the product by displaying from different angles and adding dimensional information.
15	171ES2T05	Basic Electrical and Electronics Engineering		✓		This subject helps the student to improve their skills by analyzing various electrical networks, knowing the operation of DC generators, analyzing the performance of single phase transformers and 3-phase induction motors. This will create skills among student so that wherever they will find these types of machine their deal with their complexities.
16	171HS2L02	English Communication Skills Lab - II		✓		Students are able to demonstrate technical skills to express fluently in both written as well as oral form of language which is very much essential for the career growth



17	171BS2L02	Engineering Physics Lab				
18	171ES2L02	Engineering Workshop and IT Workshop		✓		Students are able to acquire skills related to system troubleshooting, implement MS office tools, develop LaTeX documents and to work with Linux commands. Students are able to acquire skills related to building various joints in different trades for several applications.

## III SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
19	171MI3T01	Introduction To Mining Technology		✓		This course demonstrate the technical skills of the student by giving them knowledge about life cycle of mines, ventilation, lighting and permanent lining of underground mines. It also gives knowledge about modern techniques of shaft sinking.
20	171MI3T02	Basic Mechanical Engineering for Mines		✓		<b>Skill Development-</b> This course demonstrate technical skills to improve the knowledge of the students about the law of thermodynamics, working principles of I.C engines and explain them about fluid statics, kinematics and dynamics.
21	171BS3T10	Probability and Statistics		✓		Students are able to demonstrate problem solving skills by learning about random variables, probability distributions, sampling theory , test of hypothesis, correlation and regression.
22	171ES3T22	Material Engineering		✓		Materials engineering subject develops the skill improvement of the student as it make the student to understand the basic concepts of Metallurgy and materials science and various types of heat treatments of alloys. This helps the student to understand the melting point of different minerals and mixing of alloys to make a metal more efficient and durable.
23	171MI3T03	Mining Geology-I		✓		It helps to enhance student's skills by giving them a clear picture of the nature of the material, the attitude of the beds, structures caused by deformed forces, etc. Geology also helps in choosing the method of exploitation and finding

						the solution for the problems associated with it. The depth of knowledge in this subject students will be able to explore different mineral beds under the earth.
24	171ME3T01	Computer Aided Engineering Drawing Practice		✓		Computer Aided Drawing practice is designed to improve the skills of the students as they will be able to draft packages and commands for computer aided drawing and modelling. Students will be able to gain the skills to draw complex drawing by using this tool.
25	171ES3L12	Electrical and Electronics Lab		✓		Electrical and electronics lab helps the students to improve their technical skills as they get to know how to determine the efficiency of dc shunt, Single phase transformers. This subject also helps to obtain the characteristics and performance of Dc shunt motors. This subject helps student to solve the Dc motor and transformers related problems at the mine site.
26	171ES3L13	Basic Mechanical Engineering Lab		✓		This course helps the students to demonstrate their technical skills by making them learn the basic principles of fluid flow, measurement of pressure, discharge and velocity of fluid flow. It also helps the students to have practical exposure on the performance evaluation methods of various flow measuring equipment, hydraulic turbines and pumps.
27	171HS3A09	Professional Ethics and Human Values		✓		Students are able to acquire skills which help them in becoming a professional with ethical and human values.
28	171HS3A10	Employability Skills-I	✓			This subject helps the students to acquire skills to be placed in a company as it will impart employability skills in students, which will enable the students to feel comfortable to face several competitive examinations with confidence and competence.



## IV SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
29	171ES4T27	Kinematics Of Machinery		✓		This subject helps the students to demonstrate their technical skills as they are able to understand the nature and role of the kinematics of machinery, the mechanisms and machines, it also helps the students to upgrade their skills by exposes the students to various kinds of power transmission devices like belt, rope, chain and gear drives and their working principles and their merits and demerits.
30	171MI4T04	Computer Application in Mining	✓			This subject helps the student to acquire skills in different mining companies as Providing them basic introduction on CAD applications, with reference to generation of basic CAD drawings which enable them to place in mine planning of different mining company.
31	171MI4T05	Mining Geology –II		✓		This subject demonstrate the technical skills of the student as it aware the students about different economic minerals and emphasizes their distribution in India. It also helps the student to know the basic principles of stratigraphy and procedure to be adopted in sampling. By the knowledge of this subject student can explore different mineral deposit by studying its stratigraphy.
32	171MI4T06	Mine Surveying – I		✓		This subject improve the skills of the student as it helps the student to determination of different levels and level difference and computation of areas, volumes which includes determination of capacity of reservoirs, volumes of barrow pits. This subject help the student to make a career as surveyor or asst. surveyor in the mining field.

33	171MI4T07	Surface Mining		✓		This subject demonstrate the technical skills and knowledge of students as they get to know about Opencast Mining, Ground Water control, use of drilling machines, Smooth Blasting and Pre-splitting, Mining methods and selection of high angle conveyor and In-Pit Crusher Conveyor System. This subject helps them to get placed in the surface mines as drilling & blasting expert or a surface mining engineer.
34	171MI4T08	Fundamentals Of Rock Mechanics		✓		This subject demonstrate the technical skills of student by making them learn basic principles of stress and strain, properties of rocks and their determination and also make them aware of failure theories of rock .
35	171MI4L01	Geology Lab		✓		This subject helps the student to demonstrate their technical skills as students were able to know the properties of minerals, different faults of minerals and economic justification of minerals. This subject helps the mining students to have ample knowledge about minerals so that they can participate in buying and selling of minerals.
36	171MI4L02	Computer Application In Mining Lab	✓			This subject helps the student to acquire skills in different mining companies as Providing them basic introduction on CAD applications, with reference to generation of basic CAD drawings enabling them to placed in mine planning.
37	171HS4A08	Intellectual Property Rights and Patents			✓	It helps the graduates safe guard the IP and innovations at their place of work.
38	171HS4A11	Employability Skills-II	✓			This subject helps the students to acquire skills to be placed in a company as it will impart employability skills in students, which will enable the students to feel comfortable to face several competitive examinations with confidence and competence.



## V SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
39	R1631261	Underground Coal Mining Technology		✓		This subject helps the student to demonstrate their technical skills as they will understand the peculiarities and limitations of metal mining, familiar with different stopping methods, design and planning of stopping methods. Students can be placed in different metal mining companies by possessing a depth knowledge in this subjects.
40	R1631262	Mine Environment Engineering – I		✓		This subject enhance the skill of students to understand atmosphere and mine atmosphere conditions, heat and humidity levels in mines and controlling method. It also help students to know about ventilation standards planning and layout.
41	R1631263	Electrical Equipment in Mines		✓		This subject helps the student to demonstrate their technical skills as it helps the students to understand standards of lighting in different working areas, AC and Dc motors and its maintenance, earthing methods and applicability. This subject will guide the students of mining to be self sufficient for the electrical related problems in mines.
42	R1631264	Mine Surveying– II		✓		This subject helps the student to demonstrate their technical skills by understanding the correlation and stope survey methods and also the limitations of photogrammetry and modern survey methods. This subject designed to make the students expert in the surveying methods so that they can become a surveyor in mines and different mining related fields.
43	R1631265	Mining Machinery & Mechanization – I				This subject helps the student to demonstrate their technical skills as they will able to know surface and pit bottom layouts, various coal face machinery. It also help to upgrade the skills of students as they

				✓		will able to know the design and construction details of excavating & transporting equipment's used in surface mines.
44	R1631266	Advanced English Communication Skills Lab		✓		Students are able to demonstrate technical skills to express fluently in both written as well as oral forms of language which is very much essential for career growth.
45	R1631267	Mine Surveying Lab		✓		This subject helps the student to demonstrated their technical skills as they will understand different equipment and compare accuracy levels and to study several experiments and conversant with it. This subject thorough knowledge will helps the mining students to placed as a surveyor in different mines.
46	R1631268	Mechanical Engineering Lab		✓		This subject demonstrates their technical skills by making them able to verify the principles studied in thermal and engineering design courses by performing experiments in the laboratory.
47	R1631269	Mine Field visit(Mandatory)	✓			This subject makes the student demonstrate skill as well as make them ready for mining field job as student will be directly exposed to the real condition of operation an opencast and underground mines.



## VI SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
48	R1632261	Mine Systems Engineering		✓		Mine system engineering helps the student to enhance technical skills as they expose the students to advanced optimization procedures to be adapted in mining.
49	R1632262	Mineral Engineering and Fuel Technology		✓		This subject help the students to enhance the technical skills of mining engineering students as they will know different mineral processing techniques and also they will get to know about a different type of fuel technology. This subject helps the mining student to get placed in different process-related plants.
50	R1632263	Mine Environmental Engineering – II		✓		This subject helps the student to demonstrate their problem solving skills of the students as they will understand the process of spontaneous heating, fires, explosion, inundation and adverse effects, rescue and recovery operation and standards of lighting arrangement.
51	R1632264	Mining Machinery & Mechanization – II		✓		This subject demonstrates technical skills as they will be aware of winding engines and other winding accessories, and various coal face machinery, they will also get to understand the design and construction details of excavating & transporting equipment used in surface mines.
52	R1632035C	Industrial Robotics	✓			Industrial robotics is quite a new subject in the era it will helpful to the student to demonstrate their technical skill as students practice applying their knowledge of mathematics, science, and Engineering and to expand this knowledge into the vast area of robotics and will be exposed to the



						concepts of robot kinematics, Dynamics, Trajectory planning.
53	R1632035A	Entrepreneurship			✓	This subject helps the students to demonstrate technical skills as they will know different types of equipment and its management including preventive maintenance measures to be adopted, They will also get to know the cause of the equipment failures, and reliability models and hazard models will help in understanding the machine performance and productivity in any machine operation.
54	R1632265A	Quality and Reliability Engineering			✓	This subject helps the students to demonstrate technical skills as they will know different types of equipment and its management including preventive maintenance measures to be adopted, They will also get to know the cause of the equipment failures, and reliability models and hazard models will help in understanding the machine performance and productivity in any machine operation.
55	R1632015D	Waste Water Management			✓	This subject demonstrate technical skills of students by making them know planning and the design of waste water collection ,conveyance and treatment systems for a community/town/city, also helps them to knowledge of characterization of waste water generated in a community.
56	R1632265B	Rock Excavation Engineering			✓	This subject demonstrate technical skills of the students by making them know the estimation of rock mass strength, its behaviour during excavation, types of drilling and blasting methods depend on the rock mass characterization
57	R163226C	Mine Safety Engineering			✓	This subject helps students to demonstrate technical skills by making them aware of the level

						of risk associated with mining, risk assessment and management.
58	R1632266	Mineral Engineering Lab		✓		Mineral Processing lab helps the students to demonstrate technical skills by giving them hands-on experience to the various laboratory techniques and procedures of mineral processing such as sampling, screening, crushing, grinding, etc which helps them to get placed in different process industry.
59	R1632267	Environmental Engineering Lab		✓		This subject demonstrate students to improve technical skills as students will familiar with detection of different gases using deferent methods detectors and multi gas detector to find flammable index of coal dust and understand the rescue and recovery operations using different rescue apparatus.
60	R1632268	Mine Planning & Design Lab		✓		This subject demonstrate technical skills of students by letting them know creation and utilization of data base for various studies and applications of the same for planning & design of mining projects.
61	R1632268	Industrial Training		✓		This subject demonstrate technical skills of students by letting them know creation and utilization of data base for various studies and applications of the same for planning & design of mining projects.



## VII SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
62	RT41261	Mine Economics		✓		This subject demonstrate technical skills to estimation and valuation of mineral deposits, Study of project appraisal and Study of finance and accounting which helps student to get their skill enhanced and get opportunity to employ as well.
63	RT41262	Computer Applications in Mining	✓			This subject helps the student to demonstrate technical skills in different mining companies as Providing them basic introduction on CAD applications, with reference to generation of basic CAD drawings for mine planning.
64	RT41263	Rock Mechanics & Ground Control		✓		This subject helps the students to demonstrate technical skills as they will understand geotechnical engineering studies will provide an understanding for the assessment of Rock mass characterization based on Rock mass properties. It also aware the student of stress and stress regime along the mine openings, methods of stress measurement, stress regime, induced stresses, failure modes, propagation of failures in the rock due to dynamic loading.
65	RT41264	Mine Legislation & General Safety		✓		This subject is vital and important subject of mining as it demonstrate the technical skills by provides an insight to various laws, rules and Acts related to Mines Safety and mining legislation. This subject will help the students to qualify different DGMS certification exam of Mines Manager.
66	RT41265	Industrial Robotics				Students are able to acquire skills to understand the concepts of robot kinematics, Dynamics and



			✓			trajectory planning enabling them to be employed in robot manufacturing companies.
67	RT41266	Environmental Impact Assessment		✓		This subject makes the students to demonstrate their technical skills as they will know the hazardous effect of various pollution that is happening because of mining activities. This course helps the student to enable their technical skills by making them socially responsible person.
68	RT4126L	Computer Applications in Mining Lab	✓			This subject helps the student to acquire skills in different mining companies as Providing them basic introduction on CAD applications, with reference to generation of basic CAD drawings enabling them to placed in mine planning.
69	RT4126M	Rock Mechanics & Ground Control Lab	✓			This subject helps the student to acquire skills in different mining companies as Providing them basic introduction on CAD applications, with reference to generation of basic CAD drawings enabling them to placed in mine planning.
70	RT4126N	Short Survey Camp (One Week)		✓		This helps the student to demonstrate their technical skills as they will visit a place and perform independent survey so that they can become a surveyor in a mining location.

## VIII SEMESTER

S. No	Course Code	Name of the Course	Employability	Skill Development	Entrepreneurship	Remarks
71	RT42031	Production Planning and Control	✓			This subject helps the student to demonstrate competency in the concepts of production and service systems, it also helps to know the principles and techniques in the design, planning and control of these systems to optimise and make best use of resources in achieving their objective which helps them to enable them a good entrepreneur.
72	RT42262A	Deep Sea Mining		✓		This subject acquire skills related to new technologies for the extraction of oil and gas production, developments in marine technologies for the extraction of deep seated minerals in future enabling them to be employed in petroleum and deep sea mining industries.
73	RT42262B	Mine Construction		✓		It improves the technical skills of the students as it involves various aspects of selection criteria starting from site selection, design of underground structures , access to different working areas and development of stopping and mining methods.
74	RT42262C	Tunnelling Engineering		✓		This subject helps the student to demonstrate their technical skills as they will understand the peculiarities and limitations of metal mining, familiar with different stopping methods, design and planning of stopping methods. Students can be placed in different metal mining companies by possessing a depth knowledge in this subjects.
75	RT42263A	Planning of Under Ground Metal Mining Project		✓		This subject helps the student to understand different mining methods in under ground metal mining that will help them to know what types of



						stopping methods can be adopted to different types of mineral deposits.
76	RT42263B	Planning of Under Ground Coal Mining Project		✓		This subject helps the students to understand different methods of coal mining, advantages and disadvantages which is analysed the logical application of choice of mining methods can be evaluated in the mines.
77	RT42263C	Planning of Surface Mining Projects		✓		It helps the student to demonstrate their technical skills as here entire phasing and sequencing of equipment planning, selection components are discussed for the optimization of the production and increasing the production cycle coupled with financial analysis. Possessing good knowledge of this subject helps them to placed as a surface mining planner.
78	RT42264C	Mine Health and Safety Engineering		✓		This subject demonstrates the technical skills of different aspects of mine health and safety related problems also it create awareness of the hazardous effect of mining in mining workers health.
79	RT42265	Project	✓			Students will be able to demonstrate problem identification, analysis, design solutions or applications in electronics and communication domain through the acquired technical, cognitive, communication and creative skills to address societal needs.
Total		79	15	57	02	



Program Coordinator



Head of the Department

**Head of the Department**  
**DEPARTMENT OF MINING ENGINEERING**  
**ADITYA ENGINEERING COLLEGE (A9)**