JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA - 533 003, Andhra Pradesh, India
MINING ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG – R-20

B. TECH - MINING ENGINEERING

(Applicable for batches admitted from 2020-2021)

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COURSE STRUCTURE

I Year – I SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	BSC-1	Mathematics – I (Calculus)	3	0	0	3
2	BSC-2	Engineering Chemistry	3	0	0	3
3	ESC-1	Engineering Mechanics	3	0	0	3
4	HSC-1	Communicative English	3	0	0	3
5	ESC-2	Programming for Problem Solving using C	3	0	0	3
6	BSC-L1	Engineering Chemistry Laboratory	0	0	3	1.5
7	ESC-L1	Programming for Problem Solving using C Laboratory	0	0	3	1.5
8	HSC-L1	English Communication Skills Laboratory	0	0	3	1.5
9	MC -1	Environmental Science	2	0	0	0
Total Credits			**17**	**0**	**11**	**19.5**

I Year – II SEMESTER

S.No	Course Code	Course Title	L	T	P	Credits
1	BSC-3	Mathematics – II (Mathematical Methods)	3	0	0	3
2	BSC-4	Engineering Physics	3	0	0	3
3	ESC-3	Mechanics of Solids	3	0	0	3
4	ESC-4	Basic Electrical and Electronics Engineering	3	0	0	3
5	ESC-5	Engineering Drawing	3	0	0	3
6	ESC-L2	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5
7	BSC-L2	Engineering Physics Laboratory	0	0	3	1.5
8	ESC-L3	Engineering Workshop & ITWorkshop Laboratory	0	0	3	1.5
9	MC-2	Constitution of India	2	0	0	0
Total Credits			**17**	**0**	**9**	**19.5**

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II YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	BSC-5	MATHEMATICS-III(Vector Calculus, Transforms And PDE)	3	0	0	3
2	PCC-1	Development of Mineral Deposits	3	0	0	3
3	PCC-2	Mine Surveying	3	0	0	3
4	PCC-3	Engineering and Economic Geology	3	0	0	3
5	PCC-4	Mineral Processing Technology	3	0	0	3
6	PCC-L1	Mine Surveying Lab	0	0	3	1.5
7	PCC-L2	Engineering and Economic Geology Lab	0	0	3	1.5
8	PCC-L3	Mineral Processing Technology Lab	0	0	3	1.5
9	SOC-1	Numerical Techniques Through Matlab and Python	1	0	2	2
10	MC-3	Essence of Indian Traditional Knowledge	2	0	0	0
		Total Credits	**18**	**0**	**11**	**21.5**

II YEAR II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	ESC-6	Fluid Mechanics and Hydraulic Power	3	0	0	3
2	BSC-6	Complex Variables and Statistical Methods	3	0	0	3
3	PCC-5	Rock Mechanics	3	0	0	3
4	PCC-6	Mine Ventilation	3	0	0	3
5	HSC-2	Managerial Economics and Financial Accountancy	3	0	0	3
6	ESC-L4	Fluid Mechanics and Hydraulic Power Lab	0	0	3	1.5
7	PCC-L6	Mine Ventilation Lab	0	0	3	1.5
8	PCC-L7	Rock Mechanics Lab	0	0	3	1.5
9	SOC-2	Data Analytics for Geo-resources using R	1	0	2	2
10	MC-4	Engineering Exploration Project	1	0	0	0
		Total Credits	**17**	**0**	**11**	**21.5**
Honors/Minor courses			**4**	**0**	**0**	**4**

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III YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	PCC-7	Mine Hazards and Rescue	3	0	0	3
2	PCC-8	Underground Coal Mining	3	0	0	3
3	PCC-9	Mine Hoisting and Transportation	3	0	0	3
4	OE-1	1.Introduction to Underground Mining 2.Introduction to Surface Mining 3.Tunneling and Underground Space Design 4.Engineering Survey	3	0	0	3
5	PEC-1	1. Remote Sensing and GIS 2. Resource Evaluation and Geo-statistics 3. Mine Planning and Design 4. Mine Safety & Ergonomics	3	0	0	3
6	PCC-L6	Mine Hoisting and Transportation Lab	0	0	3	1.5
7	PCC-L7	Mine Hazards and Rescue Lab	0	0	3	1.5
8	SOC-3	Soft Skills	0	0	4	2
9	MC-5	Physical Fitness Activities	0	0	4	0
10	Evaluation of Summer Internship, completed after II B. Tech. II Semester					1.5
		Total Credits	**17**	**0**	**10**	**21.5**
Honors/Minor courses			**4**	**0**	**0**	**4**

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III YEAR II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	PCC-10	Surface Mining	3	0	0	3
2	PCC-11	Mine Legislation and Safety	3	0	0	3
3	PCC-12	Underground Metal Mining	3	0	0	3
3	OE-2	1.Mineral Economics, Business and Trade 2. Landslides & Slope Stability Engineering 3. Remote Sensing and GIS 4.Geostatistics	3	0	0	3
5	PEC-2	1. Computer Applications and Tools 2. Mine Economics 3. Mine Mechanization 4. Mine Automation	3	0	0	3
6	PCC-L8	Mine Mechanization Lab	0	0	3	1.5
7	PCC-L9	Computer Applications in Mining Lab	0	0	3	1.5
8	PCC-L10	Mine Planning and Design Lab	0	0	3	1.5
9	SOC-4	Numerical modeling techniques in Mining Lab	0	0	4	2
10	MC-6	Research Methodologies & IPR	2	0	0	0
		Total Credits	**18**	**0**	**11**	**21.5**
Honors/Minor courses			**4**	**0**	**0**	**4**

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IV YEAR I SEMESTER

S. No	Code	Course Title	L	T	P	Credits
1	PE-3	1. Operations Research 2. Dimensional Stone Mining 3. Advanced Mining Techniques 4. Planning of Underground Metal mining techniques	3	0	0	3
2	PE-4	1. Mine closure and Reclamation 2. Surface Mine Environment 3. Sustainable Development for Mining 4. Mineral Economics, Business and Trade	3	0	0	3
3	PE-5	1. Subsidence Engineering 2. Rock Slope Engineering 3. Advances in Rock Fragmentation 4. Tunneling and Underground Space Technology	3	0	0	3
4	OE-3	1.Mine Waste Management 2.Sustainable Development in Mining Industry 3.Mine Reclamation 4.Environmental Impact of Mining	3	0	0	3
5	OE-4	1. Principles of Mineral Engineering 2.Mine Instrumentation 3. Mine Safety & Ergonomics 4. Numerical Methods in Mining Engineering	3	0	0	3
6	HSC-3	Universal Human Values: Understanding Harmony	3	0	0	3
7	SOC-5	Soft Computing and Applications Lab	0	0	4	2
Evaluation of Summer Internship completed after III B. Tech II Semester						3
Total credits			**19**	**0**	**2**	**23**
Honors/Minor courses			**4**	0	**0**	**4**

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IV YEAR II SEMESTER

S No.	Category	Code	Course Title	Hours per week			Credits
				L	T	P	
1	Major Project	PROJ	Project work*	0	4	16	12
					Total credits		**12**

***Students can complete Project work @ Industries/ Higher Learning Institutions/ APSSDC.**

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MINOR IN MINING ENGINEERING:

S. NO	SUBJECT	PRE-REQUISTES
1	Development of Mineral Deposits	None
2	Rock Mechanics	Strength of Materials
3	Mine Ventilation	None
4	Underground Coal Mining	Development of Mineral Deposits
5	Mine Hoisting and Transportation	None
6	Surface Mining	Development of Mineral Deposits

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HONORS IN MINING ENGINEERING

HONORS IN MINING ENGINEERING		Pre-requisites
POOL – 1 (in II-II)		
1.	Optimization Techniques	-
2.	Modern Mining Techniques	-
3.	Mine Power Systems	-
4	Ground Improvement Techniques	-
POOL-2 (in III-I)		
1.	Mine Construction Engineering	-
2.	Grouting Technology	-
3.	Advanced Rock Mechanics	Rock Mechanics
4.	Concrete and Shotcrete Technology	-
POOL-3 (in III-II)		
1.	Rock Fragmentation engineering	-
2.	Mass Production Technology for Underground Coal	Mine Mechanization
3.	Introduction to Robotics and applications to Mining	-
4.	Deep Sea Mining	-
POOL-4 (in IV-I)		
1.	Mining Equipment Reliability, Maintainability and Availability	-
2.	Groundwater Engineering	-
3.	Production planning and control	-
4.	Introduction to Artificial Intelligence and Machine Learning	-