NATIONAL BOARD OF ACCREDITATION

Compliance Report Format
(Tier – I/Tier – II)

PART- A: Institutional Information
(To be filled only once for all the programs under consideration)

A1. Name and Address of the College:- Visvesvaraya National Institute of Technology, Nagpur

City: - Nagpur | State:- Maharashtra

Pin Code:-440010

Phone No (including STD Code):- | Fax:- 07122223969

Website: - www.vnit.ac.in | E-mail:- registrar@vnit.ac.in

A2. Year of Establishment:- 1960

A3. First Approval Letter No.:28-313/2010-NBA | Date: 28/10/2016 & 22/02/2019

A4. Head of the Institution:-

Name: - Dr. P. M. Padole | Designation:- Director

Nature of Appointment:- Regular

Phone No: -07122223969 | Mobile:- 7588483969

E-mail:- director@vnit.ac.in | Fax No:- 07122223969

A5. Name and Address of the Affiliating University:- N.A.

City:-

State: - | Pin Code:-

Website: - | E-mail:-

Phone No (Including STD Code):- | Fax:-

A6. Type of the Institution:

Institute of National Importance	✓	Autonomous
University		*Any other (Please specify)
Deemed University		

*Provide Details:

A7. Ownership Status:

Central Government	✓	Trust
State Government		Society
Government Aided		Section 25 Company
Self-financing		*Any Other (Please specify)

*Provide Details:

A8. Students Admissions (Institute level considering all UG programs):

Item	CAY (2020-21)	CAYm1 (2019-20)	CAYm2 (2018-19)	Total
Sanctioned intake	**933**	**933**	**922**	**2788**
Number of students admitted (Corresponding to sanctioned intake)	**956**	**970**	**941**	**2867**
% of Students Admitted over last three assessment years (Total Admitted/Sanctioned Intake)				**100**

Kindly note that the year mentioned here is exemplary, institute has to consider the academic years as per the definition of CAY given in the document and according to the prevailing year.

Table A8

CAY: Current Academic Year
CAYm1: Current Academic Year minus 1 = Current Assessment Year
CAYm2: Current Academic Year minus 2 = Current Assessment Year minus 1

A9. Details of the Students actually admitted through Lateral Entry/Separate Division

Item	CAY	CAYm1	CAYm2
Number of students admitted through Lateral Entry	**N.A.**	**N.A.**	**N.A.**
Number of students admitted through Separate Division	**N.A.**	**N.A.**	**N.A.**
Total Number of students admitted in the second year	**N.A.**	**N.A.**	**N.A.**

Note: Provide student details of the second shift (if applicable)

A10. Provide separate Information for each of the program(s) for which compliance is to be submitted

Name of the Department	Name of the program being offered	Name of the program to be considered	Year of Start	Intake	Increase in intake, if any	Year of increas e	AICTE Approval	Accreditation Status*
Mining Engineering	B. Tech in Mining Engineering	B.Tech	1982	20	i)Increased to 32 ii)Increased to 40 iii) increased to 50	i) 2009 ii) 2013 iii) 2018	i) Increase due to implementation of reservation in admission (OBC act) ii) Approved by BOG VNIT, senate recommendation S 25.16 & BOG recommendation 31.09 iii) 25% increases in intake as per Government of	i) Accredited for 2 academic years(2016-17, 2017-18) ii) Accredited for 1 academic year (2018-19)

							India Directives.	

Write applicable one:

✓Granted provisional accreditation for two /three years for the period (2016-17 to 2018-19):

Granted accreditation for 5 / 6 years for the period (specify period)

Not accredited (specify visit dates, year)

Withdrawn (specify visit dates, year)

Not eligible for accreditation

Eligible but not applied

PART B- Program Information

B1. Name of the Program: B.Tech (Mining Engineering)

B2. Faculty Information and Contributions

Please provide the list of faculty in the department according to the below format as **Appendix I:** *Appendix I is attached*

B.2.1. Student Faculty Ratio (No of Faculty as per the sanctioned intake):-

(To be calculated at Department Level)

No. of UG Programs in the Department (n): 01
No. of PG Programs in the Department (m): 01
No. of Students in UG 2nd Year=**u1**
No. of Students in UG 3rd Year= **u2** No. of Students in UG 4th Year= **u3** No. of Students in PG 1st Year= **p1** No. of Students in PG 2nd Year=**p2**
No. of Students = Sanctioned Intake + applicable lateral entry, if any

(The above data to be provided considering all the UG and PG programs of the department)

S=Number of Students in the Department = UG1 + UG2 +UG3 + PG1 + PG2

F = Total Number of Faculty Members in the Department (excluding first year faculty)

Student Faculty Ratio (SFR) = S / F

Year	CAY (2020-21)	CAYm1 (2019-20)	CAYm2 (2018-19)
u1.1	50	50	40
u1.2	50	40	40
u1.3	40	40	40
UG1	140	130	120
p1.1	20	20	20
p1.2	20	20	20
PG1	40	40	40
Total No. of Students in the Department **(S)**	**180**	**170**	**160**
No. of Faculty in the Department **(F)**	**11.33***	**10.33***	**10.33***
Student Faculty Ratio (SFR)	**15.88**	**16.45**	**15.48**
Average SFR	**15.94**		

'' Includes 2.33 faculty from other department engaging the 7 subjects classes of basic engineering and OC/HM courses.*

B2.2. Faculty Details of the Department (UG+PG):

S.no.	Designation	CAYm1 (2019-20)			CAY (2020-21)		
		With Ph.D		Without PhD.	With Ph.D		Without PhD.
		Regular	Contra-ctual		Regular	Contra-ctual	
a.	Professors	3.0	0.0	0.0	3.0	0.0	0.0
b.	Associate Professors	1.0	0.0	0.0	0.0	0.0	0.0
c.	Assistant Professors	4.0	1.0	0	5.0	1.0	0.0
d.	Total number of Faculty in the Department (UG+PG)	8.0	1.0	0	8.0	1.0	0.0

Note: Additional two faculty from other dept are also contributing for the dept courses.

B2.3. Faculty Cadre Proportion

The reference Faculty cadre proportion is 1(F1):2(F2):6(F3)

F1: Number of Professors required = 1/9 x Number of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (N) as per B2.1

F2: Number of Associate Professors required = 2/9 x Number of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (N) as per B2.1

F3: Number of Assistant Professors required = 6/9 x Number of Faculty required to comply with 20:1 Student-Faculty ratio based on no. of students (N) as per B2.1

Year	Professors		Associate Professors		Assistant Professors	
	Required F1	Available	Required F2	Available	Required F3	Available
CAY	*	*	*	*	*	*
CAYm1	*	*	*	*	*	*
CAYm2	*	*	*	*	*	*
Average Numbers	RF1=*	AF1=*	RF2=*	AF2=*	RF3=*	AF3=*

**** Not applicable since NIT is an autonomous institute and hence is guided by 4-tier flexible structure for faculty position.***

B2.4. Faculty as participants in Faculty development/training activities/STTPs

Name of the Faculty	Details of the participation (Faculty development/training activities/STTPs)		
	CAYm1 (2019-20)	**CAYm2 (2018-19)**	**CAYm3 (2017-18)**
Prof. R. R. Yerpude	1) Recent Practices and Advancement in Mineral Industry (RPAMI), Organised by Department of Mining Engineering, VNIT Nagpur	1) STTP on "Mining Excavations in Difficult Ground Conditions: Issues & Challenges" Organised by Department of Mining Engineering, VNIT Nagpur	
Prof. N. R. Thote		1) International Conference on Energy and Environment, Vighyan Bhavan, New Delhi 2) National conference on Potential and opportunities in Maharashtra , MINCON2019, Nagpur	1) First International conference on 'Mining in Europe' AIMS 2017" during 6-8 June 2017 organized by Aachen RWTH University, Aachen, Germany, 2017 2) Int. conf.on Mining industry vision 2030 and beyond, Nagpur org by MEAI, pp 154,2017-
Prof. I. L. Muthreja	1) Recent Practices and Advancement in Mineral Industry (RPAMI), Organised by Department of Mining Engineering, VNIT Nagpur 2) 3rd International Conference on Opencast Mining Technology & Sustainability (ICOMS-2020), NCL, Singrauli	1) STTP on "Mining Excavations in Difficult Ground Conditions: Issues & Challenges"	-
Dr. S. S. Gupte	1) Recent Practices and Advancement in Mineral Industry (RPAMI), Organised by Department of Mining Engineering, VNIT Nagpur	-	-
Dr. A. K. Agarwal	1) Recent Practices and Advancement in Mineral Industry (RPAMI), Organised by Department of Mining Engineering, VNIT Nagpur	1) STTP on "Mining Excavations in Difficult Ground Conditions: Issues & Challenges"	1) Conference at NIT Raipur on 2nd Dec. 2017 and chairing a technical session as chairman. During the seminar, I got the opportunity to interact with the executives from various mining industry 2) 18th International Conference on Envirotech, Cleantech & Greentech (ECG); University of

			Washington - Rome Center (UWRC), Rome, Italy; June 2017
Dr. Ritesh D. Lokhande	1. Recent Practices and Advancement in Mineral Industry (RPAMI), Organised by Department of Mining Engineering, VNIT Nagpur	1) STTP on "Mining Excavations in Difficult Ground Conditions: Issues & Challenges"	1) Conference at NIT Raipur on 2nd Dec. 2017 and chairing a technical session as chairman. During the seminar, I got the opportunity to interact with the executives from various mining industry. 2) 18th International Conference on Envirotech, Cleantech & Greentech (ECG); University of Washington - Rome Center (UWRC), Rome, Italy; June 2017 3) Indian Coal Mining Industry: Overcoming Challenges for a Better Tomorrow, Organised by MGMI, Odisha, pp-19-26, August 30, 2017.
Dr. Sandeep Panchal	1) International Conference on Advances in Mechanical Engineering (ICAME-2020), Nagpur, India,	1) ARMS 10 : 10th Asian Rock Mechanics Symposium : the ISRM International Symposium, Singapore	1. Course on slope stability of Mines and Dump Jan 21-22 2017
Dr. Nikhil Sirdesai	1) International Conference on Advances in Mechanical Engineering (ICAME-2020), Nagpur, India 2) The 5th ISRM Young Scholars' Symposium on Rock Mechanics (YSRM 2019) & International Symposium on Rock Engineering for Innovative Future (REIF 2019), Okinawa, Japan	1) EUROCK 2018 - the ISRM European Rock Mechanics Symposium, St. Petersburg, Russia 2) Recent Advances in Mining Technology (RAMT-2019)	-
Dr. Anupam A Kher	1) Recent Practices and Advancement in Mineral Industry (RPAMI), Organised by Department of Mining Engineering, VNIT Nagpur	1) Not in VNIT during this period	1) Not in VNIT during this period

B2.5. Research and Development

Name of the faculty	Academic Research			
	Number of quality publications in refereed/SCI Journals, citations, Books/Book Chapters etc.		Ph.D. guided /Ph.D. awarded during the assessment period while working in the institute	
	As provided in SAR (2013-14 to 2015-16)	After evaluation (till the date of compliance report) (2016-17 to 2020-21)	As provided in SAR (2013-14 to 2015-16)	After evaluation (till the date of compliance report) (2016-17 to 2020-21)
Prof. S. B. Shringarputale	-	Retired	-	Retired
Prof. R. R. Yerpude	Journals papers: 04 Citations: 8	Journals papers: 02 Citations: 54	Awarded:02	Awarded:01 Ongoing :03
Prof. N. R. Thote	Journals papers: 02 Citations: 15	Journals papers: 00 Citations: 28	-	Awarded: 01 Ongoing :02
Prof. I. L. Muthreja	Journals papers: 05 Citations: 23	Journals papers: 05 Citations: 78	Ongoing:01	Ongoing:01
Dr. S. S. Gupte		Retired	-	Retired
Dr. A. K. Agarwal	Not in VNIT during this period	Journals papers: 07 Citations: 88	Not in VNIT during this period	Ongoing:02
Dr. Ritesh D. Lokhande	Not in VNIT during this period	Journals papers: 11 Citation: 145	Not in VNIT during this period	Ongoing:03
Dr. Sandeep Panchal	Not in VNIT during this period	Journals papers: 08 Citations: 75	Not in VNIT during this period	Ongoing:02
Dr. Nikhil Sirdesai	Not in VNIT during this period	Journal Papers: 10 Citations: 407 Book Chapters: 4	Not in VNIT during this period	Ongoing:02
Dr. A. Kher	Not in VNIT during this period	Journal Papers: 05 Citations: 24	Not in VNIT during this period	Ongoing:02

B2.6. Sponsored Research/Consultancy

(B) Details as provided in the SAR previously (2013-14 to 2015-16)

Name of the faculty	Project Title	Project Type Research/Consultancy	Funding Agency	Amount	Duration
Prof. S. B. Shringarputale Prof. N. R. Thote Prof. R. R. Yerpude Prof. I. L. Muthreja Dr. S. S. Gupte	1) Human Resources Development	Consultancy	WCL	2.7 L	3 months
	2) Human Resources Development	Consultancy	WCL	2.3 L	3 months
Prof. I. L. Muthreja Prof. R. R. Yerpude Dr A. Ghare	Technical & Feasibility study of overburden rock of Dongri Buzurg & Kandri Mine	Research	MOIL	39.25 L	3 years

(II) Details after evaluation (till the date of Compliance Report) (2016-17 to 2020-21)

	Name of the faculty	Project Title	Project Type Research/Consultancy	Funding Agency	Amount (Lac)	Duration
1	Prof. N. R. Thote Prof. R. R. Yerpude Dr. A.K. Agarwal Dr. R. D. Lokhande Dr. S. Panchal Dr. Y.B. Katpatal	Scientific Study of slope failure in DRC OC Mine.	Consultancy	WCL	6.08 L	3-4 months
2	Prof. N. R. Thote Prof. R. R. Yerpude Prof. I.L.Muthreja Dr. S.S. Gupte Dr. A.K. Agarwal Dr. R. D. Lokhande Dr. S. Panchal Dr. N. Sirdesai	HR competency test for engineer	Consultancy	MOIL	1.29 L	3 months
3	Prof. I.L.Muthreja Prof. R. R. Yerpude Prof. N. R. Thote Dr. A.K. Agarwal Dr. R. D. Lokhande Dr. S. Panchal	Scientific Investigation into the Design of External and Internal Dumps of Padmapur Opencast Mine	Consultancy	WCL	2.95 L	6 months
4	Prof. N. R. Thote Dr. S. Panchal Dr. N. Sirdesai	Scientific study of support design of Nehariya and Mathni mines	Consultancy	WCL	8.43 L	Ongoing
5	Prof. N. R. Thote Dr. S. Panchal Dr. N. Sirdesai	Scientific study of support design of Manganese mines	Consultancy	Radiant Minerals	3.74 L	Ongoing
6	Prof. N. R. Thote Prof. Ingle Dr. A.K. Singh	High shaft sinking of Balaghat & Gumgaon mines	Consultancy	MOIL	61.36 L	Ongoing
7	Prof. N. R. Thote	Powder Factor and fragmentation of DOC & POC mines	Consultancy	WCL	8.09 L	6 months
8	Prof. N. R. Thote Dr. N. Sirdesai	Estimation of Drillability Index and other geo-mechanical parameters Tandsi Mines	Consultancy	WCL	0.21 L	2 months
9	Prof. N. R. Thote Prof. Y. B. Katpatal	Blast vibration and strata monitoring of irrigation deptt for bridge	Consultancy	P.W.D	1.25 L	3 months
10	Prof. N. R. Thote	RMR and support design guidelines for their mines of steatite mines of Ananthpur	Consultancy	M/S Indra Minerals, Rayalacherulu, Ananthpur District (A.P.)	2.79 L	6 months
11	Prof. I. L.Muthreja Prof. R. R. Yerpude Dr. A.K. Agarwal	Slope Stability Analysis of Failure of Benches in Gowari Wadhona Manganese Mine	Consultancy	Chhindwara Mines Ltd, Sausar	2.41 L	6 months

12	Dr. R. D. Lokhande Dr. A. K.Agarwal Prof. I. L.Muthreja Prof. R. R. Yerpude	Scientific study to investigate the subsidence and strata control management	Consultancy	WCL	5.98 L	Ongoing
13	Prof. I. L. Muthreja Prof. R. R. Yerpude	Scientific Study for Verification of Ash Dyke Design for slope stability	Consultancy	Geotech Services, Nagpur	0.59 L	3 months
14	Prof. I. L. Muthreja Prof. R. R. Yerpude	Scientific Study for Verification of report on embankment rehabilitation and design of gabion wall by M/s Geotech Services, Nagpur	Consultancy	SEC Railway, Nagpur	0.50	6 months
15	Prof. I. L.Muthreja Dr. A. K.Agarwal Prof. R. R. Yerpude Dr. R. D. Lokhande	Determination of Degree of Gassiness for seam IX of Murpar Underground Mine, WCL	Consultancy	WCL	1.652	6 months
16	Prof. R. R. Yerpude Dr. R. D. Lokhande Prof. I. L.Muthreja Dr. A. K.Agarwal	Examination and evaluation of support system for in house MOIL Ltd. software	Consultancy	MOIL	1.392	3 months
17	Prof. R. R. Yerpude Dr. R. D. Lokhande Prof. I. L.Muthreja Dr. A. K.Agarwal	Scientific Study to ascertain the stability of workings and overlying strata developed below the railway track and railway acquired land at Sarni Mine, Patherkhera Area, WCL	Consultancy	WCL	4.22	3 months
18	Prof. R. R. Yerpude Prof. I. L.Muthreja Dr. A. K.Agarwal Dr. R. D. Lokhande	Scientific Study to determine slope stability of Benches, ultimate pit slope stability and OB Dump stability analysis at Integrated Baranj Open Cast Mine (IBOCM), Distt. Chandrapur.	Consultancy	EMTA Coal Ltd	4.30	6 months
19	Prof. R. R. Yerpude Prof. I. L.Muthreja Dr. A. K.Agarwal Dr. R. D. Lokhande	Slope Stability Study of Marki Mangali –III, Bhadrawati Distt. Chnadrapur	Consultancy	B S Ispat Ltd	5.55	6 months
20	Prof. R. R. Yerpude Dr. R. D. Lokhande Prof. I. L.Muthreja Dr. A. K.Agarwal Dr. A.A. Kher	Scientific study to investigate the subsidence impact on surface, support design and suggest the suitable safe method of complete extraction by caving method in W 1 panel of Chattarpur Mine of Pathakhera Area WCL	Consultancy	WCL	5.98	6 months

Research Projects

Name of the faculty	Project Title	Project Type Research/Consultancy	Funding Agency	Amount	Duration
Prof. I. L. Muthreja Prof. R. R. Yerpude	Technical & Feasibility study of overburden rock of Dongri Buzurg & Kandri Mine for consolidated stowing in underground mines	Research	MOIL	39.25 L	3 year
Dr. A. K.Agarwal Dr. R. D. Lokhande Prof. I. L.Muthreja Prof. R. R. Yerpude	Removal of metal ions contamination from mine water at deposit- 14/11C and deposit 11 B mines of BIOM, Kirandul complex	Research	NMDC	7.08 lac	1.5 Year
Dr. Nikhil Sirdesai	Physico-mechanical response of rocks under varied thermal environments	Research	DST	33 lac	2 Year
Prof. I. L.Muthreja Prof. R. R. Yerpude Dr. A. K.Agarwal Dr. R. D. Lokhande	Project Title: Risk investigations for slope failure of benches and dumps using geo-technical characteristics of rocks and their monitoring mechanism in Jayant opencast mine of Northern Coalfields Limited, (NCL)	Research	NCL	47.64 lac	2 Year
Prof. I. L.Muthreja Prof. R. R. Yerpude Dr. A. K.Agarwal Dr. R. D. Lokhande	Risk investigations for slope failure of benches and dumps using geo-technical characteristics of rocks and their monitoring mechanism in Dudhichua opencast mine of Northern Coalfields Limited, (NCL)	Research	NCL	43.56 lac	2 Year
Prof. N. R. Thote	Blasting and its effect on environment, buffer zone and protective measures of MOIL	Research	MOIL	4.51 Lac	2 Year
Dr. Swapnil Wanjari Dr. D. Z. Shende, Dr. K. I. Wasewar, Dr.A K Agarwal and Dr. A. A. Kher	Feasibility study on Flyash filling of open cast mine at Manikpur, Korba	Research	Bharat Aluminum Company Limited	69.45 Lakhs	2 years

B.3. Students' Performance

Student Intake Table

Item (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)	CAY (2020-21)	CAYm1 (2019-20)	CAYm2 (2018-19)	CAYm3 (2017-18)
Sanctioned intake of the program (*N*)	50	50	40	40
Total number of students admitted in first year *minus* number of students migrated to other programs/institutions, plus no. of students migrated to this program (*N*1)	49	48	44	37
Number of students admitted in 2nd year in the same batch via lateral entry (*N*2)	0	0	0	0
Separate division students, if applicable (N3)	-	-	-	-
Total number of students admitted in the Program (*N*1 + *N*2 + N3)	49	48	44	37

Academic Performance Table

Year of entry	*N*1 + *N*2 + N3 (As defined above)	Number of students who have successfully graduated			
		I Year	II Year	III Year	IV Year
CAY (2020-21)	49				
CAYm1 (2019-20)	48	42			
CAY*m*2 (2018-19)	44	37	37		
CAY*m*3 (2017-18)	37	33	33	36	
CAY*m*4 (LYG) (2016-17)	26	26	26	26	26
CAY*m*5 (LYG*m*1) (2015-16)	32	32	32	32	32
CAY*m*6 (LYG*m*2) (2014-15)	39	39	39	39	39

B3.1. Success rate without backlog in stipulated period

SI= (Number of students who graduated from the program without backlog in the stipulated period of course duration)/ (Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable)

Item	Latest Year of Graduation, LYG (2016-17)	Latest Year of Graduation minus 1, LYGm1 (2015-16)	Latest Year of Graduation minus 2, LYGm2 (2014-15)
Number of students admitted in the corresponding First Year + admitted in 2nd year via lateral entry and separate division, if applicable	26	32	39
Number of students who have graduated without backlogs in the stipulated period	21	31	33
Success Index (SI)	0.81	0.97	0.85
Average Success Index	0.88		

B3.2. Success rate with backlog in stipulated period of study

SI= (Number of students who graduated from the program with backlog in the stipulated period of course duration)/ (Number of students admitted in the first year of that batch and admitted in 2nd year via lateral entry and separate division, if applicable)

Item	LYG (2016-17) (CAYm4)	LYGm1 (2015-16) (CAYm5)	LYGm2 (2014-15) (CAYm6)
Number of students admitted in the corresponding First Year + admitted in 2nd year via lateral entry and separate division, if applicable	26	32	39
Number of students who have graduated with backlogs in the stipulated period	05	01	06
Success Index (SI)	0.19	0.03	0.15
Average Success Index	0.12		

B3.3. First Year Academic Performance

Academic Performance = ((Mean of 1st Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks in First Year of all successful students/10)) x *(number of successful students/number of students appeared in the examination)*

Successful students are those who are permitted to proceed to the second year.

Academic Performance	CAYm1 (2019-20)	CAYm2 (2018-19)	CAYm3 (2017-18)
Mean of CGPA or Mean Percentage of all successful students (X)	6.79	6.01	6.43
Total no. of successful students (Y)	42	37	33
Total no. of students appeared in the examination (Z)	42	37	33
API = x* (Y/Z)	6.79	6.01	6.43
Average API = (AP1 + AP2 + AP3)/3	6.41		

B3.4. Academic Performance in Second Year

API *= ((Mean of 2nd Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks of all successful students in Second Year/10)) x (number of successful students/number of students appeared in the examination)*

Successful students are those who are permitted to proceed to the Third year.

Academic Performance	CAYm1 (2019-20)	CAYm2 (2018-19)	CAYm3 (2017-18)
Mean of CGPA or Mean Percentage of all successful students (X)	6.61	6.95	6.74
Total no. of successful students (Y)	37	33	26
Total no. of students appeared in the examination (Z)	37	33	26
API = X* (Y/Z)	6.61	6.95	6.74
Average API = (AP1 + AP2 + AP3)/3	6.76		

B3.5. Academic Performance in Third Year

API *= ((Mean of 3rd Year Grade Point Average of all successful Students on a 10 point scale) or (Mean of the percentage of marks of all successful students in Third Year/10)) x (number of successful students/number of students appeared in the examination)*

Successful students are those who are permitted to proceed to the final year.

Academic Performance	CAYm1 (2019-20)	CAYm2 (2018-19)	CAYm3 (2017-18)
Mean of CGPA or Mean Percentage of all successful students (X)	7.37	7.12	7.43
Total no. of successful students (Y)	33	26	32
Total no. of students appeared in the examination (Z)	33	26	32
API = x* (Y/Z)	7.37	7.12	7.43
Average API = (AP1 + AP2 + AP3)/3	7.30		

B3.6.Placement, Higher Studies and Entrepreneurship

Item	CAYm1 (2019-20)	CAYm2 (2018-19)	CAYm3 (2017-18)
Total No. of Final Year Students (N)	26	30	36
No. of students placed in companies or Government Sector (x)	15	12	08
No. of students admitted to higher studies with valid qualifying scores (GATE or equivalent State or National Level Tests, GRE, GMAT etc.) (y)	3	16	6
No. of students turned entrepreneur in engineering/technology (z)	1	2	0
x + y + z =	19	30	14
Placement Index : (x + y + z)/N	0.73	1.0	0.38
Average placement= (P1 + P2 + P3)/3	0.70		

PART C. Criterion wise Compliance Status

S.N.	Criteria	Observations made by NBA (During the last accreditation visit)	Compliance Status (Action taken by the institution)
1	**Vision, Mission & PEOs**	**(W)** More clarity is required for defining processes of vision and mission **(C)** Process for establishing the PEOs is inadequate	Process for defining vision and mission has been revised (Appendix 2) Process for establishing the PEOs has been modified (Appendix 3)
1.1.	Formulation	-	-
1.2.	Dissemination	-	-
1.3	Assessment	-	-
1.4.	Any other observations of the NBA	**(C)** Tools and process used in assessment of attainment of PEOs are inadequate **(C)** Result of assessment of achievement of PEOs used for redefining PEOs need more use in redefining the PEOs	Tools and process modified (Appendix 4 Redefining process of PEO is modified and due weightage is given to the PEO attainment results. (Appendix 3)
2	**Course outcome and Program outcomes**		
2.1.	Formulation	-	-
2.2.	Mapping	-	-
2.3.	Any other observations of the NBA	**(C)** POs alignment with NBA attribute need more content **(C)** Indication of tools used to assess the impact of delivery of course/ course content contribute towards the attainment of COs/POs, are inadequate	PO's are revised (Appendix 5) Revised (Appendix 6)
3.	**Curriculum Design, if applicable**	-	-
3.1.	Process to identify the gap, if applicable and action taken thereof	-	-
3.2.	Curriculum Structure & Component (as applicable)	-	-
3.3.	Any other observations of the NBA	-	-

4 **Details of the Action taken on the Observation of NBA during last visit:**

Strengths, weaknesses and deficiencies as have been observed by NBA were conveyed to Management, faculty and students through interaction and attempt was made for its compliances through action taken.

Observation 1: The NBA team observed that total number of faculty available is very less for the U/G programme.

Action taken: Four more regular faculties have been recruited.

Observation 2: Improvement is required in faculty qualifications
Action taken: As on today all regular faculty members are having Ph.D degree.

Observation 3: Contractual faculty is very high for the programme
Action taken: With recruitment of new faculty members, numbers of contractual faculty have been reduced to 1 or 2. Regular faculty members in the department have been teaching four courses per academic year. However, a visiting faculty member has been teaching only one or two courses per academic year.

Observation 4: More contribution is expected from faculty as participations/resource person in faculty development/training activities.
Action taken: Contribution increased (Appendix- 7)

Observation 5: Faculty research publication needs improvement.
Action taken: Faculty research publication have been improved (Appendix-8)

Summary of Research publication:

S.No	Year	Research Publication in International / National Referred Journals	Research Publication in International Conferences / National Conference
1	2016-21	60	58

Observation 6: Faculty IPR needs methods to encourage to IPR.
Action taken: Present status of IPR in the Department is as follows:

SN	Name of Faculty	Patent Title	Application No. with date	Present status
1	Dr. A. K. Agarwal, Dr. I L Muthreja	Efficient Zn++ ions removal techniques from aqueous solution using mixture of fly ash and chitosan and its environmental friendly disposal by solidification with Portland Cement	5858/MUM/2014 2/6/2014	**Patent Granted (No. 327366)**
2	Dr. A. K. Agarwal, Dr. I L Muthreja	Utilisation of Coal Fly Ash of Thermal Power Plant in Conjunction with Chitosan for Efficient Removal of Different Heavy Metal Ions and their solidification for safe solid waste disposal	3619/MUM/2014A Nov 2014	**Patent Granted (No. 374208)**
3	Dr. Anupam Kher , Dr. R. R. Yerpude	Determination of Roof fall safety Index (RFSI) for Underground Coal Mine.	201721025044A July 2017	Published on 10/11/2017
4	Dr. Anupam Kher	Development of Stoping Index for the Selection of Optimum Stoping Method for Underground Hard Rock Mine	201721028796,	Published on 01/12/2017
5	Dr. Anupam Kher	Solar Powered Pre-Heater for Boilers Using Fresnel Lens	201921028311	Published on 16/08/2019

Observation 7: No. of research projects are not enough.
Action taken: As on today one project is completed, six projects are ongoing, and one project is submitted and waiting for the approval. The details of these projects is as mentioned below:

a) **The details of research projects are as follows:**

S. No.	Project Details	Status
1	**Project Title: Technical & Feasibility study of overburden rock of Dongri Buzurg & Kandri Mine for consolidated stowing in underground mines-Phase-I** **Funding Agency:** MOIL **Funding Amount:** INR 39.25 Lakhs **PI: Prof. I. L Muthreja & Prof. R. R. Yerpude** **Duration:** 3 Years	**Completed**
2	**Project Title:** Removal of metal ions contamination from mine water at deposit- 14/11C and deposit 11 B mines of BIOM, Kirandul complex **Funding Agency:** NMDC, Hydrabad **Funding Amount:** INR 7.08 Lakhs **PI:** Dr.A K Agarwal and Dr. R. D. Lokhande **Co-PI:** Dr. Ishwardas L. Muthreja Dr. Rajendra R. Yerpude Dr. Sangesh P. Zodape **Duration:** 1.5 Years	**Ongoing**
3	**Project Title:** Physico-mechanical response of rocks under varied thermal environments **Funding Agency:** Science and Engineering Research Board (SERB), DST **Scheme:** Start-Up Research Grant (SRG) **Funding Amount:** INR 33 Lakhs **PI:** Dr. Nikhil Ninad Sirdesai **Co-PI:** Not Applicable (Individual Fund) **Duration:** 2 Years (starts once the funds are received by VNIT)	**Ongoing**
4	**Project Title:** Risk investigations for slope failure of benches and dumps using geo-technical characteristics of rocks and their monitoring mechanism in Jayant opencast mine of Northern Coalfields Limited, (NCL) **Funding Agency:** NCL **Funding Amount:** INR 47.64 Lakhs **PI: Prof. Prof. R. R. Yerpude & I. L Muthreja** **CO PI:** Dr.A K Agarwal and Dr. R. D. Lokhande **Duration:** 2 Years	**Ongoing**
5	**Project Title:** Risk investigations for slope failure of benches and dumps using geo-technical characteristics of rocks and their monitoring mechanism in Dudhichua opencast mine of Northern Coalfields Limited, (NCL) **Funding Agency:** NCL **Funding Amount:** INR 43.56 Lakhs **PI: Prof. R. R. Yerpude & I. L Muthreja** **CO PI:** Dr.A K Agarwal and Dr. R. D. Lokhande	**Ongoing**

		Duration: 2 Years		
	6	**Project Title:** Blasting and its effect on environment, buffer zone and protective measures of MOIL ltd. Mines **Funding Agency:** MOIL Funding Amount: 4.51 lac **PI: Prof. N. R. Thote**	**Ongoing**	
	7	**Project Title:** Feasibility study on Flyash filling of open cast mine at Manikpur, Korba **Funding Agency: Bharat Aluminum Company Limited** **Funding Amount:** INR 69.45 Lakhs **PI:** Dr. Swapnil Wanjari **CO PI:** Dr. D. Z. Shende, Dr. K. I. Wasewar**, Dr.A K Agarwal and Dr. A. A. Kher** **Duration:** 2 Years	**Ongoing**	
	8	**Project Title:** Risk Assessment Of Sinkhole Subsidence And Investigations Of Its Potential Parameters **Funding Agency:** CMPDIL (Coal S & T) **Funding Amount:** INR 17425780 Lakhs **Name of Project Leader: Dr Ritesh D Lokhande** **Name of the project Co-ordinator: Dr. A K Agarwal** **Team Members: Dr. R R Yerpude, Dr. A A Kher** **Duration:** 3 Years	**Submitted and Approval awaited**	

Observation 8: More exposure is required in outside world**.**
Action taken: The faculty members have increased their exposure to outside world. The details are as presented in Appendix- 9.

Declaration

It is hereby declared that information provided in this Compliance Report is factually correct. I understand and agree that an appropriate action against the Institute will be initiated by the NBA (which may include debarring the institution for three years), in case any false statement/information is observed during the assessment of the compliance report.

Date:

Place:

Visvesvaraya National Institute of Technology
Nagpur (India)

Signature & Name

Head of the Institution with seal

Pramod M. Padole
Director
Visvesvaraya National Institute of Technology
Nagpur-440010.

Appendix-1

For 2020-21

S. No	Name	PAN No.	Qualification	Date of Joining	Designation	Date on which Designated as Professor/Associate Professor	Currently Associated (Y/N) Date of Leaving (In case Currently Associated is "No")
1	Rajendra Ramchandra Yerpude	AACPY1931A	M.Tech, Ph.D, M.B.A., LL.B	16/10/1990	Professor	10/12/2014	Y
2	N. R. Thote	AAWPT7920L	B.E., M.Tech., Ph.D	6/6/1988	Professor	10/12/2014	Y
3	I. L. Muthreja	ABUPM4029Q	B.E., M.Tech, Ph.D	21/7/1983	Associate Professor & Head	27/07/1989	Y
4	Ajay Kumar Agarwal	ACSPA8158R	B.E., AMIE, M.Tech, M.E., Ph.D	31/5/2016	Assistant Professor	-	Y
5	Ritesh Dharmraj Lokhande	ABVPL6698R	B.E., Ph.D	19/7/2016	Assistant Professor	-	Y
6	Sandeep Panchal	BDAPP9257L	B.E., M.Tech, Ph.D.	31/7/2008	Assistant Professor	-	Y
7	Nikhil Sirdesai	CHSPS3722C	B.Tech, M.Tech, Ph.D.	26/4/2018	Assistant Professor	-	Y
8	Anupam Kher	AJHPK0479P	BE,M.Tech PhD	06.05.2020	Assistant Professor	-	Y
9	Shyam Sumantrao Gupte	AAYPG5122H	B.E., M.Tech, Ph.D	19.07.21	Adjunct Professor of Practice	-	
10	S. K. Jagnania	ACAPJ8913B	B.E.	29/7/2016	Adjunct Professor of Practice	-	Y
11	V. M. Galande	AATPG0032F	B.E., M.Tech	20/12/2016	Visiting faculty	-	Y

*** Adjunct Assistant Professor of Practice (Visiting) are engaging only one course per semester.**

A regular faculty member in the department has been teaching two courses per semester. However, a contractual faculty member has been teaching only one course per academic year.

**** The following courses are taught by the faculty of other Departments of VNIT (equivalent to two regular faculty members)**

1. **Mining Geology**
2. **Mechanical Engineering**
3. **Probability and statistics**
4. **Industrial Electrical Engineering**
5. **Mineral Processing**
6. **Open course**
7. **Advance Mathematics**

For 2019-20

S. No	Name	PAN No.	Qualification	Date of Joining	Designation	Date on which Designated as Professor/Associate Professor	Currently Associated (Y/N)
1.	Rajendra Ramchandra Yerpude	AACPY1931A	M.Tech, Ph.D, M.B.A., LL.B	16/10/1990	Professor	10/12/2014	Y
2	N. R. Thote	AAWPT7920L	B.E., M.Tech., Ph.D	6/6/1988	Professor & Head	10/12/2014	Y
3	I. L. Muthreja	ABUPM4029Q	B.E., M.Tech, Ph.D	21/7/1983	Associate Professor /Professor	27/07/1989 15/03/2018	Y
4	Shyam Sumantrao Gupte	AAYPG5122H	B.E., M.Tech, Ph.D	18/8/1986	Associate Professor	01/01/2006	Y
5	Ajay Kumar Agarwal	ACSPA8158R	B.E., AMIE, M.Tech, M.E., Ph.D	31/5/2016	Assistant Professor	-	Y
6	Ritesh Dharmraj Lokhande	ABVPL6698R	B.E., Ph.D	19/7/2016	Assistant Professor	-	Y
7	Sandeep Panchal	BDAPP9257L	B.E., M.Tech, Ph.D.	31/7/2008	Assistant Professor	-	Y
8	Nikhil Sirdesai	CHSPS3722C	B.Tech, M.Tech, Ph.D.	26/4/2018	Assistant Professor	-	Y
9	S. K. Jagnania	ACAPJ8913B	B.E.	29/7/2016	Adjunct Professor of Practice	-	Y
10	V. M. Galande	AATPG0032F	B.E., M.Tech	01/1/2018	Visiting Faculty	-	Y

*** Adjunct Assistant Professor of Practice (Visiting) are engaging only one course per semester.**

A regular faculty member in the department has been teaching two courses per semester. However, a contractual faculty member has been teaching only one course per academic year.

**** The following courses are taught by the faculty of other Departments of VNIT (equivalent to two regular faculty members)**

1. **Mining Geology**
2. **Mechanical Engineering**
3. **Probability and statistics**
4. **Industrial Electrical Engineering**
5. **Mineral Processing**
6. **Open course**
7. **Advance Mathematics**

For 2018-19

No	Name	PAN No.	Qualification	Date of Joining	Designation	Date on which Designated as Professor/Associate Professor	Currently Associated (Y/N)
1.	Rajendra Ramchandra Yerpude	AACPY1931A	M.Tech, Ph.D, M.B.A., LL.B	16/10/1990	Professor	10/12/2014	Y
2	N. R. Thote	AAWPT7920L	B.E., M.Tech., Ph.D	6/6/1988	Professor & Head	10/12/2014	Y
3	I. L. Muthreja	ABUPM4029Q	B.E., M.Tech, Ph.D	21/7/1983	Professor	15/3/2018	Y
4	Shyam Sumantrao Gupte	AAYPG5122H	B.E., M.Tech, Ph.D	18/8/1986	Associate Professor	01/01/2006	Y
5	Ajay Kumar Agarwal	ACSPA8158R	B.E., AMIE, M.Tech, M.E., Ph.D	31/5/2016	Assistant Professor	-	Y
6	Ritesh Dharmraj Lokhande	ABVPL6698R	B.E., Ph.D	19/7/2016	Assistant Professor	-	Y
7	Sandeep Panchal	BDAPP9257L	B.E., M.Tech, Ph.D.	31/7/2008	Assistant Professor	-	Y
8	Nikhil Ninad Sirdesai	CHSPS3722C	B.Tech, M.Tech, Ph.D.	26/4/2018	Assistant Professor	-	Y
9	S. S. Sapkal	-	B.E.	08/1/2018	Visiting faculty	-	N
10	A. P. Dhurandhar	-	M.Sc, Ph.D.	21/12/2018	Visiting faculty	-	N
11	V. M. Galande	AATPG0032F	B.E., M.Tech	20/12/2018	Visiting faculty	-	N
12	A . Srikant	AKXPA5603J	B.Tech, Ph.D.	-	Visiting faculty	-	N

*** Adjunct Assistant Professor of Practice (Visiting) are engaging only one course per semester.**

A regular faculty member in the department has been teaching two courses per semester. However, a contractual faculty member has been teaching only one course per academic year.

**** The following courses are taught by the faculty of other Departments of VNIT (equivalent to two regular faculty members)**

1. **Mining Geology**
2. **Mechanical Engineering**
3. **Probability and statistics**
4. **Industrial Electrical Engineering**
5. **Mineral Processing**
6. **Open course**
7. **Advance Mathematics**

(Rev. 01)

1. 1.3: Process for defining Vision and Mission of the department

The department established the vision and mission through a consultative process involving the stakeholders, the future expansion plan, societal and global requirements. The process for establishing the vision and mission of the department can be explained in the following steps:

1. Vision and mission of the institute.
2. Updated policies, regulations and guidelines of MHRD and Ministry of Higher Education.
3. Industrial requirements and input given by various industries. Suggestions are invited from the industrial sector at the regular interval to update the Vision and Mission of the department.
4. Requirements received from academic and research institutes including the industrial research sector.
5. Expectations and feedback from the student community and alumni of VNIT.
6. Expectations of the society.

7. The Objective of education is to inculcate the virtues of truth, justice and nonviolence for a healthy mind.
8. Requirements from Foreign Universities to which students wish to join for higher studies.
9. All suggestions are deliberated in departmental meeting to check the consistency with the vision and mission of the institute.
10. It is submitted to BOS for its revision and approval

(Rev. 01),

1.2.4. Revised Process for establishing the PEOs

The PEOs established for the department are revised based on recommendations obtained from Departmental Advisory Board.

Departmental Advisory Board recommended the revision of PEO considering various aspects like requirement of industry, student's aspiration for higher studies, business opportunities, etc and recommendations made by NBA team and academic audit team visiting the department from time to time. The detail revised process of establishing PEOs is as given below.

1. Vision and mission of the Department.
2. Result of assessment of previous PEOs and feedback.
3. Updated policies, regulations and guidelines of Government of India.
4. Latest technological advancement in the mining industry in India & abroad.
5. Safety guidelines given by the DGMS from time to time.
6. Requirements received from academic and research institutes including the industrial research sector.
7. Expectations and feedback from the student community, alumni of VNIT and parents.
8. Expectations of the society for sustainable and economic development.
9. Requirements from Foreign Universities to which students wish to join for higher studies.
10. All suggestions are deliberated in departmental meeting to check the consistency with the vision and mission of the department.
11. It is submitted to BOS for its revision and approval if required.

(Rev. 01)

1.3 Tools and process used in assessment of attainment of PEOs

PEOs (Program Educational Objectives) relate to the career and professional accomplishments of passed out students after their graduation from the program. Consequently, assessment and evaluation of the objectives requires tools that can be applied after graduation. However, keeping the significance of contribution of the curriculum and the assessment opportunities such as examination and evaluation results, placement data, employer feedback and higher education entrance performance etc. are taken as tools for supplementary evidence to assess PEOs.

The curriculum is primary tool to prepare and motivate students to achieve PEOs e.g. their responsibility towards betterment of society and importance of lifelong learning. The curriculum is structured to accommodate core mining engineering, managerial skills and communication skills beside the basic science courses.

The curriculum is designed in such a manner so that it takes care of all possible options for mining engineering graduates to pursue their carrier as practicing engineers/entrepreneurs/researchers/academician. Field visits, compulsory training, seminar and projects make them aware about changing professional needs of mining engineering field.

Tools and process

The different tools used for assessment of PEO are divided in two parts, namely:

- Confirm evidences
- Supplementary evidences

Confirm evidences

This evidences are quantitative data based and it includes, results of final year students, average grade point, placement records, number of core companies visited the campus and higher study data. For PEO attainment all the evidences are divided into five parts from excellent to unsatisfactory and rated from 5 to 1 as shown in the rubric (table) given below:

PEOs Attainment Rubric

PEO attainment parameter	Type of evidence	Excellent (5)	Very Good (4)	Good (3)	Moderate (2)	Unsatisfactory (1)
Result Analysis	Confirm	>90%	80-90	70-80	60-70	<60
Av grade Point (CGPA) at the scale of 10	Confirm	>8	7-8	6-7	5-6	<5
Placement Records	Confirm	>80%	60-80	40-60	20-40	<20
No of core companies visited the campus	Confirm	>10	8-10	6-8	4-6	<6
Higher studies data	Confirm	>10%		5-10%	-	<5%

Supplementary evidences

The supplementary evidences are collected from the alumni and employers through the feedback form. The format for the alumni and employer feedback forms are as given below:

Employers Feedback

Name of the graduate/graduates for whom feedback is provided:

_____

Employed since: _____

Please put an '□' mark in the appropriate column

5 - Excellent, 4 – Very good, 3 – Good, 2 – Average, 1 - Poor

No	Parameters	5	4	3	2	1	Remarks
1.	To what degree our graduate could apply knowledge of Mining engineering for solving various technical problems?						
2.	To what extent you are comfortable with the technical ability of our graduate?						
3.	To what extent you are comfortable with the managerial skill of our graduate?						
4.	To what extent our graduate has shown inclination towards higher studies or research						
5.	How will you rate our graduate in adopting new technological changes?						
6.	To what extent you think that our graduate can execute the project independently?						
7.	To what extent you think that our graduates can analyze and take decision for solving various technical issues at the site?						
8.	To what extent our graduates take active part in various activities such as training/seminars/community programmes?						

Any additional comments:

_____

_____

_____

Signature: Date and Seal

Details of person providing feedback

Name: _____

Designation: _____

Organization: _____

Address: _____

Alumni Feedback

Name of Alumni: _____

Year of graduation: _____

Details of Employment

Employed since: _____

First job designation:_____ Present designation_____

Job description: _____

Organization: _____

Address: _____

_____

Phone no. /Mobile_____ Email ID_____

Please put an '□' mark in the appropriate column

5 - Excellent, 4 – Very good, 3 – Good, 2 – Average, 1 - Poor

No	Parameters	5	4	3	2	1	Remarks
1.	To what extent you are comfortable in present job?						
2.	To what extent your technical knowledge helped in your present career?						
3.	To what extent your managerial skills helped you for execution of various tasks given to you?						
4.	Do you consider yourself competent enough to take up new tasks/projects?						
5.	Do you think you have contributed your share in execution of job?						
6.	Have you acquired higher education / or interested to acquire the same.						
7.	State your awareness about technical changes/ softwares in the field of Mining engineering?						
8.	As a lifelong learner have you made any additional efforts to enhance your knowledge?						

Any additional suggestions/ remarks:

_____

_____

_____

Signature:

Appendix -5

2. Programme Outcomes (225)

At the end of the program B. Tech Mining Engineering, the student will be able to;

1. Exhibit knowledge of mining engineering and allied with basic sciences.
2. Identify, formulate, analyze and optimize mining engineering problems of various domains.
3. Plan Design and solve various mining engineering components with environmental, social and safety considerations.
4. Comprehend and solve interdisciplinary engineering problems through system approach.
5. Select and apply modern and virtual engineering tool, Design and analysis software and state of art equipment to solve mining engineering problems.
6. Demonstrate the understanding of social, cultural, environmental, land usages and legal issues in professional activities.
7. Exhibit the knowledge of contemporary issues such as effect of technology on environment and importance of sustainable development.
8. Integrate the knowledge of values and professional values and ethics in their activities.
9. Demonstrate the ability to work as individual and participatory learning through group work and working in group as a member or leader to accomplish target for industrial project.
10. Prepare reports to present and communicate technical information effectively by way of seminars.
11. Adopt and adapt technological changes through skill up gradation for lifelong learning.
12. Plan, organize and manage mining engineering projects for feasibility and effective use of financial and human resources.

Graduate Attributes prescribed by NBA:

i. Engineering Knowledge
ii. Problem Analysis
iii. Design & Development of Solutions
iv. Investigation of Complex Problem
v. Modern Tools Usage
vi. Engineer and Society
vii. Environment & Sustainability
viii. Ethics
ix. Individual & Team work
x. Communication
xi. Lifelong Learning
xii. Project management & Finance

Annexure – 6

(Rev. 01)

Assessment tools used for attainment of course outcomes/programme outcomes is as explained below

Every course has 3- 5 Course Outcomes (COs). In a question paper, CO(s) is assigned to each question. A course coordinator maps the maximum attainable value of every CO to all Program Outcomes (POs). The Table.1 for one of the subjects is shown below.

Table 1: Mapping of COs with PSOs

Course Name: XYZ												
Course Code: MNL123	**Levels:**	**0: Not Applicable; 1: Slight (1) Low; 2: Medium; 3: Substantial (High)**										
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	3	3	3	2	1	2	1	3	0	3
CO2	3	3	3	3	2	1	1	2	3	3	1	3
CO3	2	3	3	3	2	2	1	2	1	2	1	2
MNL123	0.89	1.00	1.00	1.00	0.78	0.56	0.33	0.67	0.56	0.89	0.22	0.89

The attainment of CO to POs is mapped in the scale of 1 to 3 viz.
1: Slight (Low); 2: Moderate (Medium); 3: Substantial (High); 0: not applicable

1) If the above Table I is represented as matrix T1 then every entry in the table will be T1(row, column). The Average of normalized value of attainment for each PO is calculated as below.

$$a = \frac{\frac{T_1(CO1,PO1)}{3} + \frac{T_1(CO2,PO1)}{3} + \frac{T_1(CO3,PO1)}{3} + \frac{T_1(CO4,PO1)}{3}}{4}$$

Here, 'a' represents maximum possible value of PO1 attainable for a given subject. Maximum possible values for all the POs are obtained for that subject. This procedure is repeated for all the subjects of the B.Tech (Mining) program.

2) The average of each of POs for all the subjects is then obtained. It represents maximum attainable value of each PO of the program.

The detail description of the attainment of Cos & POs is as given below:

An individual course coordinator enters the question-wise marks of each student in the way shown below and then the average of marks obtained by all the students in a given question is calculated as shown below in Table.2 (*First 10 students information is presented*).

Table.2

	Avg Marks	3.00	3.13	3.52	3.58	4.08	2.85	3.15
		Q1	Q2	Q3	Q4	Q5	Q6	Q7
	Max. Marks	5	5	5	5	5	5	5
SN	Enrolment no.							
1	BT18MIN002	3	2.5	3.5	4	5	3.5	3
2	BT18MIN003		3	2.5	4	3.5	3	
3	BT18MIN004	2.5	2.5	3	4	4	2	3.5
4	BT18MIN010		3.5	4	4	2.5	3.5	4
5	BT18MIN012	2.5	2.5	4	3.5	4.5		3.5
6	BT18MIN024		2.5	3	3	4	2	3
7	BT18MIN029	3.5	3	4	3.5	4	3.5	4
8	BT18MIN033	2	2.5	2	3	4.5	2.5	2.5
9	BT18MIN034	1.5	2.5	2.5	1.5	4.5	2	2
10	BT18MIN036	4	3.5	4	4	4	2.5	2.5
11	BT18MIN037	2.5	3	2.5	3.5	3		4.5
12	BT18MIN039	3.5	3	4.5	3.5	4	3.5	3
13	BT18MIN041		4	4	3.5	2	4	4.5
14	BT18MIN042	3	3	4	3.5	5	3.5	4
15	BT18MIN044	2.5	3.5	4	3.5	5	2.5	3.5
16	BT18MIN046	4.5	4	4.5	4	4	3	3.5
17	BT18MIN048	3	2.5	2	3.5	4	3.5	2.5
18	BT18MIN049	4	3.5	4	4	4	3	3
19	BT18MIN050		3.5	4	4	4	3	4
20	BT18MIN052	3.5	3.5	3.5	4	5	2.5	2

The course coordinator prepares the following table (Table.3). The entry is '1' if the given question is satisfying one or more COs.

Table.3: Mapping of questions with Cos

		Marks-CO Mapping		
Qn	Max	CO1	CO2	CO3
1	5	1	1	0
2	5	1	1	0
3	5	0	0	1
4	5	1	1	1
5	5	0	1	1
6	5	1	1	0
7	5	1	1	1

The maximum marks allotted to each question are entered in corresponding COs (e.g. CO1m) as shown below on the left side of the table. The average of the marks obtained by the students in a particular question from Table.2 is filled in the Table 4. This is shown on the right side of the Table.4.
The average attainment of each CO (e.g. CO1a) of the course by all the students is calculated as shown in the Table.4

Table.4

Qn	Max Marks	Average Marks	Max Marks			Marks Attained		
			CO1m	CO2m	CO3m	CO1a	CO2a	CO3a
1	5	3.00	5	5	0	3.00	3.00	0.00
2	5	3.13	5	5	0	3.13	3.13	0.00
3	5	3.52	0	0	5	0.00	0.00	3.52
4	5	3.58	5	5	5	3.58	3.58	3.58
5	5	4.08	0	5	5	0.00	4.08	4.08
6	5	2.85	5	5	0	4.08	4.08	0.00
7	5	3.15	5	5	5	4.08	4.08	4.08
SUM →			20	25	15	13.78	17.86	11.17
Avg[SUM(CO_a)/SUM(CO_m)]→						***0.69***	***0.71***	***0.74***

CO1	CO2	CO3	CO4
CO to be used for CO-PO attainment			

These attainment values of each CO are then mapped to all the POs as shown in the following table. Once the target is set by the course coordinator, the attainment of each PO by the particular course is obtained by dividing average attainment of CO by the target. Finally, average % attainment of POs for a particular course is calculated as shown in Table.5.

Table.5

	COs↓ from	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**0.69**	0.69	0.69	0.69	0.69	0.69	0.46	0.23	0.46	0.23	0.69	0.00	0.69
CO2	**0.71**	0.71	0.71	0.71	0.71	0.48	0.24	0.24	0.48	0.71	0.71	0.24	0.71
CO3	**0.74**	0.50	0.74	0.74	0.74	0.50	0.50	0.25	0.50	0.25	0.50	0.25	0.50
TARGET % = P													
Avg Attainment		0.63	0.72	0.72	0.72	0.55	0.40	0.24	0.48	0.40	0.63	0.16	0.63
Target (P% of a,		0.76	0.85	0.85	0.85	0.66	0.47	0.28	0.57	0.47	0.76	0.19	0.76
PO attainment (Avg)		**83.81**	**84.24**	**84.24**	**84.24**	**83.78**	**84.28**	**84.24**	**84.24**	**84.15**	**83.81**	**85.83**	**83.81**
Avg of POs (%)		***84.22***											

Similar procedure is repeated for all the courses to obtain the average of all POs for the program.

Annexure-7

Contribution from faculty as participations/resource person in faculty development/training activities

- The Mining Department has organized two days **Professional Development Course** on "Stability of Slopes and Waste Dumps in Surface Mines" from 21-22 January 2017. The workshop was attended by more than 45 participants from various organizations such as WCL, SECL, MOIL, SMS, UCIL, NCL, SCCL and MCL etc.
- The Department has also organized one week workshop on "Mining Excavations in Difficult Ground Conditions: Issues & Challenges'" from 9th – 13th July 2018. The workshop was attended by more than 40 participants from various organizations such as WCL, SECL, MOIL, SMS, UCIL, NCL, SCCL and MCL etc.

- The Department has also organized one week workshop on "Application of Rock Mechanics in Excavation" from 10th – 14th May 2021. The workshop was attended by more than 60 participants from various organizations such as WCL, MOIL, NCL, BCCL, HZL, HCL and MCL etc.

In these workshops most of the lecturers were engaged by in house faculty. However some expert lectures were also invited from outside organizations such as CIMFER, NIT Raipur etc.

The details of these workshops are as follows:

Professional Development Course on "Stability of Slopes and Waste Dumps in Surface Mines"
21-22 January 2017

Table 1: Details of lectures engaged by in house faculty

S. No	Name of Faculty	Topic
1	Prof A K Agarwal	Slope Stability Fundamentals
2	Prof. R D Lokhande	Interpretation of Rock Properties
3	Prof S.S.Gupte	Elements of Slope Stability Analysis
4	Prof. Rajendra Yerpude Prof. I.L.Muthreja	Slope stability analysis : computer applications
5	Prof. I.L.Muthreja	Stability of Waste Dumps
6	Prof. Rajendra Yerpude	Slope monitoring and stabilization
7	Prof. I.L.Muthreja Prof. Rajendra Yerpude	Practical session

One week workshop on "Mining Excavations in Difficult Ground Conditions: Issues & Challenges'" from 9th – 13th July 2018

Table 2: Details of lectures engaged by in house faculty

S. No	Name of Faculty	Topic
1	Dr. A. K. Agarwal	Characterization of Rock Mass
2	Dr. R. D. Lokhande	Advance Support System and Support Design
3	Dr. A. K. Agarwal	Fundamentals of Slope Stability
4	Dr. R. R. Yerpude	Slope Stability Analysis in Opencast Mines
5	Dr. I. L. Muthreja	Underground Mechanical Excavations
6	Dr. R. R. Yerpude	Slope monitoring and stabilization techniques
7	Dr. R. D. Lokhande	Study of Strata Behavior For Underground Mining
8	Dr. R. D. Lokhande	Trough and Pot hole subsidence
9	Prof. N. R. Thote	Role and Application of Rock Mechanics in Blasting Mechanism

One week workshop on "Application of Rock Mechanics in Excavation'" from 10th – 14th May 2021

Table 3: Details of lectures engaged by in house faculty

S. No	Name of Faculty	Topic
1	Dr. A. Kher	Characterization of Rock
2	Dr. R. D. Lokhande	Estimation of RMR and Support Design
3	Dr. N. Sirdesai	Estimation of Rock Mass Strength using Intact Rock Properties and Geological Conditions
4	Dr. A. Kher	Fundamentals of Slope Stability
5	Dr. R. R. Yerpude	Slope Stability Analysis Methodology in Surface Mines
6	Dr. I. L. Muthreja	Aspects of Underground Mechanical Excavations: Special reference to rock cutting Principles and Methods
7	Dr. R. D. Lokhande	Instrumentation and Monitoring for Underground Mining
8	Dr. R. D. Lokhande	An Investigation of Sinkhole Subsidence and its Risk Assessment

Appendix - 8

Faculty publications (2016 - 2021):

Table: Summary of Research publication

S.No	Year	Research Publication in International / National Referred Journals	Research Publication in International Conferences / National Conference
1	2016-21	60	58

Publication Details

Journal Publications:

1. Choudhary, N.S., Goel, M.D. and **Pancha**l, S., 2021. Numerical Analysis of Innovative Sacrificial Protection System under Blast Loading. *Practice Periodical on Structural Design and Construction*, p.04021075. https://doi.org/10.1061/(ASCE)SC.1943-5576.0000655 (**Scopus**)

2. Goel, M.D., Verma, S., Mandal, J. and **Panchal, S**., 2021. Effect of blast inside tunnel on surrounding soil mass, tunnel lining, and superstructure for varying shapes of tunnels. *Underground Space*. https://doi.org/10.1016/j.undsp.2021.01.003 (**Scopus/SCIE**)

3. Goel, M.D., Verma, S. and Panchal, S., 2021. Effect of Internal Blast on Tunnel Lining and Surrounding Soil. *Indian Geotechnical Journal*, *51*(2), p.359-368. https://doi.org/10.1007/s40098-020-00451-1

   (**Scopus/ESCI**)

4. Goel, M. D., Choudhary, N. S., & **Panchal, S.,** 2020. Resilient sacrificial protection system for concrete slab under blast loading. Indian Concrete Journal, 94(10), p. 1-13 https://www.icjonline.com/editionabstract_detail/102020 (**Scopus**)

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11. L. K. Sharma, **N. N. Sirdesai**, K. M. Sharma, T. N. Singh, Experimental study to examine the independent roles of lime and cement on the stabilization of a mountain soil: A comparative study, **2018**, *Applied Clay Science*, 152, pp.183-195, ISSN: 0169-1317. 10.1016/j.clay.2017.11.012 (**Scopus, SCI**)

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International Conference Publications:

1. M.D. Goel., S. Verma, S. Panchal, N. N. Sirdesai, 2020, Effect of Material Models on Dynamic Behavior of Reinforced Concrete Slabs Exposed to Blast Loading, *International Conference Advances in Civil Engineering (ACE 2020)*, Nagpur, India, 5-7 November 2020. (LINK TO BE PUBLISHED)

2. N. N. Sirdesai, Abil Aravind, S. Panchal, 2020, Impact of rock abrasivity on TBM cutter disks during tunneling in various rock formations, *International Conference on Advances in Mechanical Engineering (ICAME-2020)*, Nagpur, India, 10-11 January 2020. https://doi.org/10.1007/978-981-15-3639-7_63

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5. M.D. Goel., S. Verma, S. Panchal, N. N. Sirdesai, 2020, Effect of Material Models on Dynamic Behavior of Reinforced Concrete Slabs Exposed to Blast Loading, *International Conference Advances in Civil Engineering (ACE 2020)*, Nagpur, India, 5-7 November 2020. (LINK TO BE PUBLISHED)

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26. Ayush Thakur, **Ajay Agarwal,** Iron Contamination in Water : A Major Health Concern , An International Conference on Smart Strategies for Self Reliant Economy - An Industrial Engineering Perspective, 8 - 9 October 2021, Nagpur, pp 28, **(Reputed Conference)**

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2. N. N. Sirdesai, A. Aravind, S. Panchal, 2021, Impact of Rock Abrasivity on TBM Cutter-Discs During Tunnelling in Various Rock Formations, *Advances in Mechanical Engineering*, 527-534, Springer, ISBN: 9789811536380. https://doi.org/10.1007/978-981-15-3639-7_63

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4. Tripathy, V. Srinivasan, K. K. Maurya, N. N. Sirdesai and T. N. Singh, 2018, Acoustic and failure behaviour of Gondwana shale under uniaxial compressive and indirect Brazilian tensile loading - an experimental study, *Geomechanics and Geodynamics of Rock Masses: Proceedings of the 2018 European Rock Mechanics Symposium*, 687-694, CRC Press, ISBN: 9781138616455. https://www.routledge.com/Geomechanics-and-Geodynamics-of-Rock-Masses-Proceedings-of-the-2018-European/Litvinenko/p/book/9781138616455

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Appendix - 9

Exposure to outside world

Year 2016 – 17

Participation in International Conferences/ National Conferences in India & Abroad

S. No.	Name of faculty	Place of conference	Date(s) of conference
1	Dr. R. R. Yerpude	Denver, Colorado, USA	19-22 February 2017
2	Dr. N.R.Thote	RWTH University, Aachen, Germany	16-18 May, 2016
3	Dr. N.R.Thote	Saint Petersburg Mining University, Saint Petersburg , Russia	28 Sept. - 2 Oct.2016
4	Dr. N.R.Thote	National Institute of Rock Mechanics, Bangalore, India	14-16 November 2016
5	Dr. N.R.Thote	Vighyan Bhavan, CSIR, New Delhi	15-17 February 2017
6	Dr. I .L. Muthreja	Denver, Colorado, USA	19-22 February 2017
7	Dr.S.S.Gupte	Brisbane, Queensland, Australia	6-8 September 2016
8	Dr.S.S.Gupte	IIT Bombay	30 September 2016
9	Dr. R. D. Lokhande	NIRM, Bangalore	16-18 November 2016
10	Dr. Sandeep Panchal	Turkey	29-31 August 2016

Institution Industry Collaboration

S. No.	Name of Industry / organization	Consultancy Topic / Activity	Consultant Amount (Rs)	Investigator(s)	Present status
1	Sunflag Iron & Steel Co. Ltd.	Rock Mass Rating of roof and geotechnical study of Belgaon coal mine	3,55, 062.00	Dr. N. R. Thote, Dr. R. R. Yerpude	completed
2	MOIL Ltd	Examination and evaluation on subsidence management of forest land of Ukwa mines	52,578.00	Dr. N. R. Thote	completed
3	M/S Indra Minerals, Rayalacherulu, Ananthpur District (A.P.)	RMR and support design guidelines for their mines os steatite mines of Ananthpur District	2, 79,450.00	Dr. N. R. Thote	completed
4	RMC ReadyMix, Hyderabad	Evaluation of Ground vibration of Hyderabad RMC Quarry	25,300.00	Dr. N. R. Thote	completed
5	MOIL Ltd	Blast evaluation and VOD measurement of SME Blast of Dongari Buzurg mines of MOIL	49,700.00	Dr. N. R. Thote	completed
6	MOIL Ltd	Evaluation and Prediction of subsidence parameters and 3	77860.00	Dr. N. R. Thote	on going

		D analysis of subsidence monitoring at Balaghat mine			
7	MOIL Ltd	Technical & Feasibility study of overburden rock of Dongri Buzurg and Kandri Mine for consolidated stowing in underground mines	39,25,000.00	Dr. I .L. Muthreja Dr. R. R. Yerpude Dr A. Ghare	on going

Year 20 17 -18

Details of conference attended/paper presented outside VNIT

S. No.	Name of faculty	Place of conference	Date(s) of conference
1	Dr. N. R. Thote	RWTH Aachen University, Germany	5-6 June, 2017
2		Saint Petersburg Mining University, Russia	21-23September 2017
3		MEA international conference, Nagpur	6-8 December 2017
4	Dr I L Muthreja	SECL, Bilaspur	26- 27 August 2017
5		NIMH, Nagpur	15-16 December 2017
6	Dr. A K Agarwal	University of Washington, Rome, Italy	9-10 June 2017
7		NIT Raipur	2 December 2017
8	Dr. R D Lokhande	University of Washington, Rome, Italy	9-10 June 2017
9		NIT Raipur	2 December 2017

Institution Industry Collaboration

S. No.	Name of Industry / organization	Consultancy Topic / Activity	Consultant Amount	Investigator(s)
1	Western Coalfields Ltd	Blast performance evaluation of Durgapur and Padmapur opencast mines	8. 10 L	N. R. Thote
2	Sunflag Iron & Steel Co. Ltd.	Rock mass rating of roof and geotechnical study of belgaon coal mine	3.55L	N. R. Thote, R. R. Yerpude
3	M/S Indra Minerals, Rayalacherulu, Ananthpur District (A.P.)	RMR and support design guidelines for their mines of steatite mines of Ananthpur District	2. 79 L	N. R. Thote
4	MOIL Ltd	Blast evaluation and VOD measurement of SME Blast of Dongari Buzurg mines of MOIL	0.49 L	N. R. Thote
5	Western Coalfields ltd	Slope stability analysis of Durgapur O/C mines of Chandrapur area	6.10 L	N. R. Thote (Coordinator), R. R. Yerpude, R. D. Lokhande, A. K. Agarwal, S. Panchal, Y.G. Katpatal
6	Western Coalfields Ltd	Dump Slope stability analysis of Padmapur O/C mines of Chandrapur area	2.95 L	N. R. Thote. R. R. Yerpude, I. L. Mutherja, S. S. Gupte, R. D. Lokhande, A. K. Agarwal, S. Panchal
7	Chhindwara Mines Ltd, Sausar	Scientific Study of slope failure in Gowari Wadhona Mines	2.41L	I. L. Muthreja, R. R. Yerpude, Y. B. Katpatal, A. K. Agarwal
8	Geotech Services, Nagpur	Scientific Study for Verification of Ash Dyke Design for slope stability	0.59 L	I. L. Muthreja, R. R. Yerpude
9	NMDC	Removal of metal ions contamination from mine water at deposit- 14/11C and deposit 11 B mines of BIOM, Kirandul complex	7.08L	A. K. Agarwal, R. D. Lokhande, I. L. Mutherja, R. R. Yerpude,

Year 2018-19

S. No.	Name of faculty	Place of conference	Date(s) of conference
1	N. R. Thote	National Conference on Blasting Challenges and opportunities, CSIR-CIMFR Dhanbad	23-24 Nov. 2018
2	N. R. Thote	International Conference on Energy and Environment, Vighyan Bhavan, New Delhi	20-22 Feb. 2019
3	N. R. Thote	National conference on Potential and opportunities in Maharashtra , MINCON2019, Nagpur	9th – 10th Feb. 2019
4	Sandeep Panchal	ARMS10, Singapore	29 Oct - 3 Nov,2019
5	Nikhil Sirdesai	EUROCK-2018 St. Petersburg, Russia	22nd -26th May 2018

Institution Industry Collaboration

S. No.	Name of Industry / organization	Consultancy Topic / Activity	Consultancy Amount (Rs)	Investigator(s)
1	MOIL	High shaft sinking of Balaghat & Gumgaon mines	59.00 L	N. R. Thote, R.K. Ingale (A.M.), Arun Singh (Mech) Dr. Ballal (Elect.)
2	WCL	Powder factor and fragmentation of DOC & POC mines	7.85 L	N. R. Thote
3	WCL	Scientific Study of slope failure in DRC OC Mine	5.86 L	N R Thote R R Yerpude A K Agarwal R D Lokhande S Panchal Y Katpatal
4	WCL	Estimation of Drillability Index and other geo-mechanical parameters Tandsi Mines	0 .21 L	N. R. Thote N. N. Sirdesai
5	Technoblast Mining Corporation	Support Design for Incline Drivage	3.18 L	N. R. Thote; S. Panchal; N. N. Sirdesai
6	MOIL	HR competency test for engineer	1.29 L	N R Thote R R Yerpude I L Muthreja S. S. Gupte A K Agarwal R D Lokhande S Panchal Nikhil Sirdesai
7	P.W.D	Blast vibration and strata monitoring of irrigation deptt for bridge	1.39 L	N R Thote Y B Katpatal

8	Chhindwara Mines Ltd, Sausar	Slope Stability Analysis of Failure of Benches in Gowari Wadhona Manganese Mine	2.5 L	I L Muthreja R R Yerpude Y B Katpatal A K Agarwal
9	WCL, Chandrapur	Scientific investigation into the design of external and internal dumps of padmapur opencast mine	2.95 L	I L Muthreja R R Yerpude N R Thote A K Agarwal R D Lokhande S Panchal
10	WCL	Scientific study to investigate the subsidence and strata control management	5.98 L	R R Yerpude R D Lokhande I L Muthreja A K Agarwal
11	WCL	Scientific study of support design of Nehariya and mathni mines	9.75 L	N. R. Thote; S. Panchal; N. N. Sirdesai
12	Radiant Minerals	Scientific study of support design of Manganese mines	3.74 L	N. R. Thote; S. Panchal; N. N. Sirdesai

Year 2019-20

Details of conference attended/paper presented outside VNIT

S. No.	Name of faculty	Place of Conference	Date(s) of Conference
1	Dr I.L. Muthreja	New Delhi	28-29 January, 2020
1	Dr I.L. Muthreja	Malanjkhand	12-13 November, 2019
2	Dr. Sandeep Panchal	Nagpur, India	10-11 January, 2020
3	Dr. N. N. Sirdesai	Nagpur, India	10-11 January 2020
4	Dr. N. N. Sirdesai	Okinawa, Japan	1-4 December, 2019
5	Dr. N. N. Sirdesai	Bengaluru, India	23-24 May 2019

Institution Industry Collaboration

Sr. No.	Name of Industry / organization	Consultancy Topic / Activity	Consultancy Amount (Rs)	Investigator(s)
1	MOIL	Examination and Evaluation of support system developed by MOIL	1.18 L	I L Muthreja R R Yerpude A K Agarwal R D Lokhande
2	SEC Railway, Nagpur	Scientific Study for Verification of report on embankment rehabilitation and design of gabion wall by M/S Geotech Services, Nagpur	0.5 L	I L Muthreja Dr R R Yerpude
3	WCL	Scientific study to investigate the subsidence and strata control management	5.98 L	R R Yerpude R D Lokhande I L Muthreja A K Agarwal
4	WCL	Determination of Degree of Gassiness for seam IX of Murpar Underground Mine, WCL	1.652 L	I L Muthreja A K Agarwal R R Yerpude R D Lokhande
5	WCL	Scientific Investigation into the Design of External and Internal Dumps of Padmapur Opencast Mine	2.95 L	I L Muthreja R R Yerpude N R Thote A K Agarwal R D Lokhande S Panchal
6	MOIL	High shaft sinking of Balaghat & Gumgaon mines	59.00 L	N. R. Thote, R.K. Ingale (A.M.), Arun Singh (Mech) Dr. Ballal (Elect.)
7	WCL	Strata Monitoring and Support Design for Depillaring Panels	8.43 L	Prof. N. R. Thote, Dr. Sandeep Panchal, Dr. N. N. Sirdesai
7	Technoblast Mining Corporation	Scientific Study of RMR and Support Design for Incline Drivage	2.71 L	Prof. N. R. Thote, Dr. Sandeep Panchal, Dr. N. N. Sirdesai
8	WCL	Estimation of Drillability Index and Geomechanical Parameters Rocks	0.21 L	Prof. N. R. Thote, Dr. ~~Sandeep Panchal,~~ Dr. N. N. Sirdesai

9	Radiant Minerals	Scientific study of support design of Manganese mines	3.74 L	N. R. Thote; S. Panchal; N. N. Sirdesai
10	(SERB), DST	Physico-mechanical response of rocks under varied thermal environments	33 L	N. Sirdesai

Year 2020-21
Details of conference attended/paper presented outside VNIT

S. No.	Name of faculty	Place of Conference	Date(s) of Conference
1	Dr I.L. Muthreja	Singrauli	21-22 January 2021
2	Dr. A. A. Kher	Nagpur	27-28 November, 2020

Institution Industry Collaboration

S. No.	Name of Industry/ Organization	Consultancy Topic/Activity	Consultancy Amount (in Lacs)	Investigator(s)	Present Status
1.	Western Coalfields Ltd. (Pench Area)	Scientific Study for Method of work and Support design For Mathani and Nehariya Underground Mine	8.43 L	Prof. N. R. Thote Dr. Sandeep Panchal Dr. N. N. Sirdesai	Completed
2.	MOIL	Examination and evaluation of support system for in house MOIL Ltd. software	1.392 L	Dr. R R Yerpude Dr. R D Lokhande Dr. I L Muthreja Dr. A K Agarwal	Completed
3.	WCL	Scientific Study to ascertain the stability of workings and overlying strata developed below the railway track and railway acquired land at Sarni Mine, Patherkhera Area, WCL	4.22 L	Dr. R R Yerpude Dr. R D Lokhande Dr. I L Muthreja Dr. A K Agarwal	Ongoing
4.	EMTA Coal Ltd	Scientific Study to determine slope stability of Benches, ultimate pit slope stability and OB Dump stability analysis	4.30 L	Dr. I L Muthreja Dr. R R Yerpude Dr. A K Agarwal Dr. R D Lokhande	Ongoing

		at Integrated Baranj Open Cast Mine (IBOCM), Distt. Chandrapur.			
5.	B S Ispat Ltd	Slope Stability Study of Marki Mangali –III, Bhadrawati Distt. Chnadrapur	5.55 L	Dr. R R Yerpude Dr. I L Muthreja Dr. A K Agarwal Dr. R D Lokhande	Ongoing
6	NCL	Risk investigations for slope failure of benches and dumps using geo-technical characteristics of rocks and their monitoring mechanism in Jayant opencast mine of Northern Coalfields Limited, (NCL)	47.64 L	Dr. R R Yerpude Dr. I L Muthreja Dr. A K Agarwal Dr. R D Lokhande	Ongoing
7	NCl	Risk investigations for slope failure of benches and dumps using geo-technical characteristics of rocks and their monitoring mechanism in Dudhichua opencast mine of Northern Coalfields Limited, (NCL)	43.56 L	Dr. R R Yerpude Dr. I L Muthreja Dr. A K Agarwal Dr. R D Lokhande	Ongoing
8	MOIL	Blasting and its effect on environment, buffer zone and protective measures of MOIL ltd. Mines	4.51 L	Prof. N. R. Thote	Ongoing
9	WCL	Scientific study to investigate the subsidence impact on surface, support design and suggest the suitable safe method of complete extraction by caving method in W 1 panel of Chattarpur Mine of Pathakhera Area WCL	5.98	Prof. R. R. Yerpude Dr. R. D. Lokhande Prof. I. L.Muthreja Dr. A. K.Agarwal Dr. A.A. Kher	Ongoing